DESIRED AND ACHIEVED FERTILITY OF THE WOMEN OF TEHRAN

by

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ABSTRACT

The findings of the 2016 Iranian Census show that the total fertility rate (TFR) has reached sub-replacement levels in 15 out of the 31 provinces of Iran. In particular, in the province of Tehran, a woman gives birth to only 1.5 children on average during her reproductive period. However, the 'two children' norm still prevails in the country and even women of young reproductive age value having two children on average. In other words, there exists a gap between a couple's actual and desired fertility.

This thesis examines the gap between actual and desired fertility among a statistically drawn sample of 400 women aged 15-49 from five selected regions of Tehran city (the capital of Iran), which would be a representation of a combination of the country's various ethnic and cultural groups. More specifically, the thesis analyses the relationship of demographic and socio-economic variables, such as age, age at first marriage, sex composition of their surviving children, consanguineous marriage, women's level of education, their employment status and women's contraceptive use, with the gap between the women's actual and desired family sizes. The study is based on analyses of primary as well as secondary data. The primary data were collected during fieldwork in Tehran city in 2015.

One of the objectives of this study is to investigate the gap between desired and actual fertility. The fertility gap was categorised into three groups: underachieved (when the difference is negative), achieved (when the difference is zero) and overachieved (when the difference is positive). The findings of this study show that all mentioned demographic and socio-economic variables, except contraceptive use, have a statistically significant relationship with the fertility gap. Moreover, almost 60 percent of women have either achieved or overachieved their desired fertility.

Since this study is conducted in the low fertility context of Tehran city, it was also pertinent to examine contraceptive use as one of the proximate determinants of fertility. The results of logistic regression show that the odds of withdrawal use (the most prevalent method) increased with improvement in women's educational attainment. Moreover, women who lived in regions with the higher levels of

socio-economic development were more likely to practise withdrawal (as opposed to modern methods) than women who lived in regions with lower levels of development.

An examination of Iran's population policies which are among the most successful family planning programs in developing countries shows that the influence of socio-economic development, such as improvements in women's education, has been more effective in reducing fertility in the country. Regarding the new pronatalist population approach adopted by the government, in response to open-ended questions during the interviews the women stated that the total fertility rate should be determined by the decision of individual couples as to how many children they want based on their individual needs assessment rather than what by the government wanted them to do.

DECLARATION

I certify that this thesis:

1. does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and
2. to the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.

Maryamsadat Hosseini

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CHAPTER 1: INTRODUCTION

1.1. Background of the study

Low fertility has become a significant area of demographic research as many countries, especially advanced industrialised countries, have experienced fertility decline to below replacement levels over the last few decades (Chesnais, 1998; Frejka & Sobotka, 2008; Van de Kaa, 1987; Wilson, 2004). Some developed countries have even experienced the lowest-low levels of fertility (TFR below 1.3) (Kohler et al., 2002; Lee & Choi, 2015). Some advanced Asian countries such as Japan, Singapore, Taiwan, South Korea and Hong Kong SAR have also experienced the 'ultra-low fertility' (Jones et al., 2008).

According to the United Nations, 46 percent of the world's population (83 countries) in 2010-2015 lived in countries where fertility had fallen to below replacement level[1] (United Nations, 2015a). However, the most recent UN estimates (United Nations, 2017), reveal that almost one half of the world's population lives in countries with a total fertility rate (TFR) below 2.1 children per woman. This proportion is predicted to increase to 69 percent in 2045-2050 (United Nations, 2017).

Several East, North-East, Southeast as well as North and Central Asian countries have experienced below replacement fertility in recent decades (Feng, 2015; Gubhaju & Moriki-Durand, 2003; Makoto, 2001; Yoo & Sobotka, 2018). However, every country may attain low fertility in a different way. According to Hirschman et al. (1994) the fertility decline in advanced East Asian countries such as Hong Kong, China, Singapore, the Republic of Korea, and Taiwan, in terms of rapid economic growth and Confucian cultural heritage would not be a model for fertility decline in other Asian countries. Yoo and Sobotka (2018) have argued that the tempo effect coupled with a shift toward delayed childbearing has had a strong and significant negative influence on the total fertility rate in South Korea since the early 1980s. Feng (2015) reveals that the current low fertility in China cannot be attributed only to the one-child policy because fertility had already declined before the introduction of the government's one-

[1] In 2010-2015, fertility in 25 out of 83 countries with below replacement fertility was even below 1.5.

child policy. According to Feng (2015), the rapid urbanisation and rising aspirations for children, linked with high costs of child-raising are contributors of the below replacement fertility in China. Abbasi-Shavazi et al. (2007) argue that the consequences of the low fertility at both the macro-(national/country) and micro-(family/individual) levels may be influenced by the timing and the pathways through which low fertility is reached. For example, negative population growth and shortages of labour are named as the macro-level consequences of low fertility in industrialised countries.

Different explanations have been proposed for the fertility decline to below replacement level or further to lowest-low fertility. The delay of marriage and childbearing (Bongaarts, 2002; Bongaarts & Feeney, 1998; Quesnel-Vallée & Morgan, 2003); the second demographic transition (along with post-modern views towards life) (Lesthaeghe & Willems, 1999; Lesthaeghe, 2007; Van de Kaa, 1987, 1994); post-materialistic values, high costs of children, avoiding the risk of making long-term commitments in the face of an uncertain future, and the uneven nature of gender equity (McDonald, 2000c) have been the most cited factors leading to low fertility below replacement level.

1.2. Fertility decline and the emergence of below replacement fertility in Iran

The Islamic Republic of Iran has experienced one of the fastest fertility declines which was not only unique for a Muslim country but has never been recorded elsewhere (Abbasi-Shavazi, Lutz, et al., 2008; Vahidnia, 2007). A review of the history of fertility decline in Iran supports this claim. The first national census of population and housing in Iran conducted in 1956, identified a population of 18.9 million with an average annual growth rate of 1.7 percent (Abbasi-Shavazi et al., 2009). Between 1956 and 1966 mortality declined, and along with continuing high fertility it resulted in a 3.1 percent annual population growth rate in the country (Table 1-1) (Hosseini-Chavoshi & Abbasi-Shavazi, 2012).

The first national family planning program in Iran was established in 1967 (Abbasi-Shavazi, 2001a) in order to improve and promote the physical, mental and socio-economic welfare of the family and to

reduce the annual population growth rate in the country (Aghajanian, 1994). As a result of the implementation of the family planning program, the total fertility rate in Iran decreased from around 7.7 in 1966 (Amani, 1970) to around 6.0 (and the population increased to 33.7 million) in 1976 (Abbasi-Shavazi, 2000, 2002). The results of the 1976 census showed that, the population growth rate in Iran decreased from 3.1 percent per annum in 1966 to 2.7 percent per annum in 1976 (Aghajanian, 1991).

Table 1-1: Annual population growth rate in rural and urban areas of Iran (%), 1956-2016 [2]

Census period	Urban areas	Rural areas	Total
1956-1966	5.02	2.13	3.13
1966-1976	4.93	1.11	2.71
1976-1986	5.41	2.39	3.91
1986-1996	2.95	0.28	1.96
1996-2006	2.74	-0.44	1.61
2006-2011	2.14	-0.63	1.29
2011-2016	1.97	-0.73	1.24

Source: Statistical Centre of Iran (2016a)

Shortly after the Islamic revolution of 1979, the family planning program adopted in 1967 was undermined by the new government, and early marriage and family formation were promoted as basic Islamic values (Abbasi-Shavazi, Mehryar, et al., 2002; Aghajanian & Mehryar, 1999). Further, because of social, cultural, and political circumstances, fertility increased to around seven children per woman by 1986 (Hosseini-Chavoshi & Abbasi-Shavazi, 2012).

The eight-year (1980-1988) war between Iran and Iraq gave further impetus to the pronatalist population policies because a large population was considered to be advantageous. During the war a rationing system[3] was offered by the post-revolutionary government (Abbasi-Shavazi, 2000) and families were encouraged to produce more soldiers for the creation of the "*Twenty Million Army*" proposed by

[2] The lower annual population growth rate in rural areas in Iran can be attributed to large-scale youth migration from rural to urban areas. According to the 2011 Census in Iran, a majority of rural migrants (over 60 percent) are in the age group 15 to 34 years (Statistical Centre of Iran, 2011), who leave rural areas in hope of finding a better job and enhancing their life (Vazin et al., 2017).

[3] The rationing system was introduced for food and basic necessities which was helpful for large families (Abbasi-Shavazi, 2000).

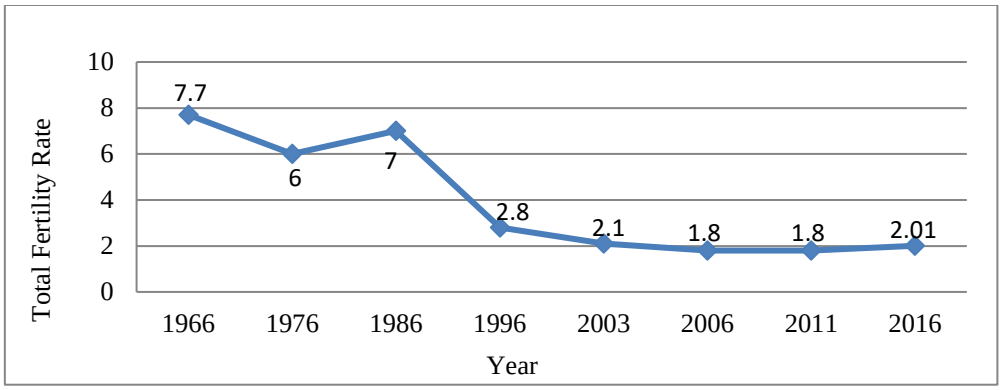
Ayatollah Khomeini (the former Supreme leader of Iran) (Abbasi-Shavazi, 2001b). The pronatalist policies and the lack of attention to the population growth rate continued even after end of the war. The results of the census 1986 revealed that despite the large losses from the war, Iran had attained the highest population growth (3.9 percent) ever recorded.(Table 1-1) (Salehi-Isfahani et al., 2010).

Finally, after several campaigns in 1988 in order to control the rapid population growth, the "Ministry of Health and Medical Education" along with the "Plan and Budget Organization" convinced many of the top policy makers about the importance of family planning in Iran. The government officials also could count on religious authorities and above all, the late supreme leader, Imam Khomeini's approval to implement a family planning program (Hashemi & Salehi-Isfahani, 2009). At the same time the government also adopted the "National Five Year Socioeconomic Development Plan" to focus on the socio-economic development of the country for the next five years. Subsequently, the Family Planning Program was revived, and the government officially launched a new family program in December 1989 (Vahidnia, 2007). One of the objectives of the "National Five Year Socioeconomic Development Plan" was to reduce the rate of natural population growth from 3.2 to 2.2 percent per year and to achieve a TFR of 3.5 births per woman by 2009. However, the above goals were attained much faster than was expected. After 1989, the TFR fell sharply from 5.5 in 1988, reaching 3.6 in 1993 and a population growth rate of 2.3 percent per annum. The TFR further declined to below 2.8 in 1996 (Abbasi-Shavazi, 2002; Vahidnia, 2007) (Table 1-1). The second 'National Five Year Socioeconomic Development Plan' (1994–1998) aimed for a further reduction of the population growth rate to 1.5 percent per year and the TFR to 2.5 by 1998 (Vahidnia, 2007). The 2000 Iran Demographic and Health Survey (DHS) showed that the TFR dropped further and reached near replacement level (2.26) during the period 1998-2000 (Abbasi-Shavazi, 2002; Vahidnia, 2007)[4]. Iran's fertility rate further declined to 1.8 by 2006-2011 (Abbasi-Shavazi et al., 2013; Abbasi-Shavazi et al., 2009; Statistical Centre of Iran, 2016a). Interestingly, according to the latest census (2016) in Iran, after almost 16 years the total fertility rate has increased and reached 2.01 children per woman (Statistical Centre of Iran, 2016a). The annual population growth rate in the country has been almost stable between the two periods of 2006-2011 and

[4] The figure for the year 2000 was 2.17 (Abbasi-Shavazi, 2002).

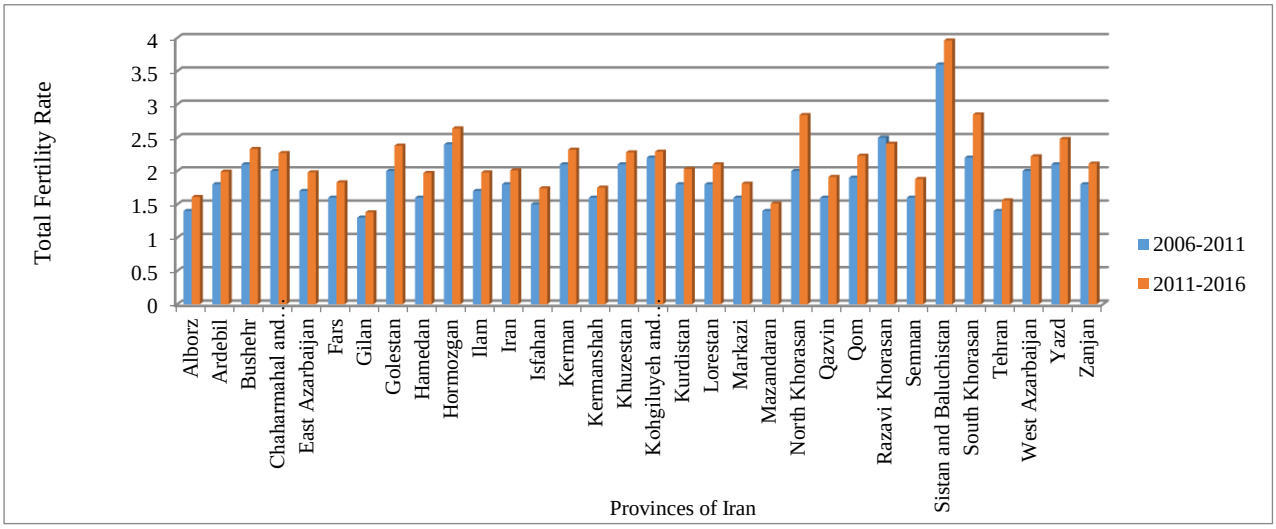
2011-2016 (Table 1-1). As a result of a sharp fertility decline (that began at mid-1980s) in the country (Figure 1-1), in 2006-2011 the total fertility rate in 22 out of the 31 provinces of Iran was below replacement level (Abbasi-Shavazi et al., 2013). However, according to the 2016 census, the number of provinces experiencing below replacement fertility decreased to 15 (Figure 1-2). It should be noted that the TFR in urban areas in Iran is still below replacement level (1.86), while it is 2.48 in rural areas.

Figure 1-1: Total fertility rate in Iran, 1966-2016



Source: Abbasi-Shavazi et al. (2013); Abbasi-Shavazi et al.(2007); Statistical Centre of Iran (2011, 2016a)

Figure 1-2: Total fertility rate in the provinces of Iran, Census 2006-2016



Source: Statistical Centre of Iran (2011, 2016a)

The drastic fertility decline in Iran has been attributed to several factors such as the rise in literacy and increasing education levels, particularly for women, urbanisation, the high cost of child raising and

falling family income in the 1980s and the high prevalence of contraceptive use in the country (Abbasi-Shavazi, 2002; Mehryar & Tabibian, 1997; Salehi-Isfahani et al., 2010).

1.3. Changes in the population policy of Iran

Despite the success of an antinatalist family planning program in the country, the concerns of politicians and policy makers regarding the consequences of long term fertility decline (such as an aging crisis and shortage of working-age population in the future), led to a switch in the policy approach from antinatalist to again pronatalist population policy in the country. More especially, the emphasis of the Supreme Leader of Iran, Ayatollah Seyed Ali Khamenei, on population increase up to 150 million and stopping the antinatalist policies in Iran (The Office of Supreme Leader of Iran, 2013), accelerated the policy change and motivated the adaptation of a pronatalist approach by Iran's provincial governors. Although no official (pronatalist) policy has been introduced in the country, the funding for population control programs has been eliminated (Dastjerdi, 2012) and having a large family is explicitly being promoted in the country (Figure 1-3).

Figure 1-3: A billboard in Tehran city which promotes the motto "More children, A happier life"

Source: Poster designed by Khane Tarrahane Enghelabe Eslami (2013)

Despite the exaggerated (non-scientific) speculations of the current demographic situation in Iran (Mahmoodi, 2013; Mahmoodi & Moshfegh, 2008; Moshfegh et al., 2012), there are some facts that show that the country will not face a negative population growth or labour shortage until the next few

decades. According to the findings of the Census 2011 in Iran, more than 70 percent of the population in the country is in the working-age (aged 15-64), 23.4 percent is less than 15 years old and 5.7 percent of the population is 65 years and older (Sadeghi, 2012). Based on the definition of the United Nations Population Division (United Nations, 2004b) when the proportion of children and youth under 15 years old drops below 30 percent and the proportion of people 65 years and older is still below 15 percent, the *demographic window*[5] opens in a given country. This phenomenon takes place because the working-age populations are growing more rapidly than the dependent population and provides an extra boost to per capita income (Lee & Mason, 2006). Based on this definition, on the eve of 2006 Population and Housing Census the demographic window opened in Iran (Hosseini, 2012a; Sadeghi, 2012) and will be closed at the mid-21st century (Hosseini, 2012b). Despite the fact in the years leading to 2030 the population of Iran (by increasing the relative share of population 65 years and older) will have an old age structure (Hosseini, 2010), the country will not face zero or negative population growth for at least a few decades (Hosseini, 2012a). Abbasi-Shavazi (2012) argues that currently Iran is in a favourable demographic situation in terms of the annual population growth rate and the age structure. Nevertheless, regarding the challenges and negative consequences of long term fertility decline below replacement level, relevant policies should be adopted to prevent further fertility decline in the country and sustain the total fertility rate at 2.1 children per woman (replacement level) in the whole country.

1.4. Problem statement

Despite the decline of fertility to below replacement level in most provinces of Iran (22 out of the 31 provinces in 2011 Census) (Abbasi-Shavazi et al., 2013), the *Two-Child Norm* is still prevalent in the country (Abbasi-Shavazi, Hosseini-Chavoshi, et al., 2004; Askari-Nodoushan et al., 2009; Erfani, 2011a; Razeghi Nasrabad & Mirzaei, 2012). A comparison of three birth cohorts of women (born in

[5] or Window of Opportunity

the 1980s, 1970s and 1960s) in Iran shows that even the youngest cohort still values having children (Razeghi-Nasrabad & Saraei, 2014).

The negative consequences of long term fertility decline in the next four decades in the country (when the window of opportunity will be closed), calls for investigation on women's fertility desires and whether there is any discrepancy between the number of children women would really wish and their fertility behaviour.

What exists in the whole of Iran can be found on a smaller scale in Tehran city which represents a combination of various ethnic and cultural groups of the country very well (Erfani, 2013). Therefore, in this thesis the research problem stated above (the gap between desired and actual family size) for Iran will be investigated with a statistically selected sample of women of reproductive ages in Tehran city.

1.5. Significance and importance of the Study

Despite some previous studies on fertility intentions in Iran, there have been few attempts to investigate the gap between desired and actual fertility (Razeghi-Nasrabad & Mirzaei, 2012). Studying the 'fertility gap' in Tehran city is significant for the reasons mentioned above. Moreover, there are considerable gaps between the desired and actual fertility among the people of different socio-economic status living in different suburbs of Tehran. In addition, the previous attempts to investigate the fertility preferences in Tehran city (Erfani, 2010b, 2015) have not been comprehensive enough in terms of sample selection and analysis to be generalisable.

1.6. Research questions

The thesis addresses the following questions:

1. What is the difference between desired and expected[6] fertility among women of different age-groups in Tehran city?
2. What are the underlying socio-economic factors that shape the fertility gap between expected and desired fertility?
3. Since an overwhelming proportion of women of Tehran (78 percent) are using contraceptive, it is evident that most women of Tehran city are using contraception to control their child bearing. Therefore, it may be assumed that contraception may be playing a role in these women's expected and desired fertility. Thus, in a low fertility situation like that of Tehran, it would be pertinent to examine these women's use of contraception and the factors influencing the same.

Therefore, the research questions with respect to contraceptive use are:

3.1. What are the factors influencing the use (and non-use) of contraception by the women of Tehran?

3.2. If the women of Tehran prefer one or more methods of contraception over other methods, what are their reasons for doing so?

4. What are the demographic implications of the pronatalist approach adopted by the government of Iran?

1.7. Research objectives

The main aim of the thesis is to investigate the demographic behaviour of married women aged 15-49 years in Tehran city in terms of the gap between women's actual and desired fertility and the factors influencing the gap such as women's age, their age at marriage, sex composition of their surviving

[6] It will be mentioned in Chapter Two that 'expected' number of children is being used to represent 'actual' fertility.

children, consanguineous marriage, women's level of education, their employment status and women's contraceptive use.

The study has four objectives to provide explanations to the designed questions:

1. To review the trends of fertility transition and emergence of the below replacement fertility in recent decades in Iran.
2. To study the gap between women's desired and actual fertility and the socio-economic factors affecting the expected-desired fertility gap.
3. To examine the factors affecting the contraceptive use in Iran as well as among women in Tehran city and to investigate the reasons for the high prevalence of withdrawal use in Iran.
4. To review the history of the (population) pronatalist policies in Europe, Asia and Iran and examine the implications for the study on newly designed pronatalist population policy in Iran.

1.8. Outline of the thesis

This thesis is divided into eight chapters. Chapter One provides a background of the fertility transition and the implementation of the family planning program in Iran. This chapter also examines the emergence of below replacement level fertility in the country. Moreover, the 'demographic window', as a new phenomenon in the demographic history of Iran, is discussed.

Chapter Two presents an overview of the previous studies conducted in the world and Iran. It makes particular reference to the lack of research relating to fertility intentions and obstacles to achieving desired fertility in Iran. In Chapter Two the relevant theoretical considerations are presented. 'Proximate determinants of fertility' and 'Microeconomic theories of fertility' are the main theoretical frameworks adopted in this study.

Chapter Three outlines the data collection methodology and describes how the data are used. This chapter also briefly outlines the various analytical techniques that have been used throughout this thesis.

Chapter Four provides a review of the population dynamics in Tehran. This chapter describes the socio-cultural and socio-economic characteristics of the study women.

Chapter Five, which is the core of the thesis, analyses the gap between desired and actual fertility. The relevant socio-economic and demographic characteristics that may result in the emergence of the gap will be examined in this chapter.

Chapter Six examines the role of contraceptive use as one of the proximate determinants of fertility, in Iran as well as among surveyed women in Tehran city. Understanding the causes and patterns of contraceptive use among married women and the reasons behind the specific method use is examined in this chapter.

Chapter Seven reviews the history of pronatalist policies in Europe and Aisa as well as Iran. In this chapter the reasons behind the success and failure of a pronatalist policy and also its implications for the future of the fertility in the country will be examined.

Finally, Chapter Eight presents a summary of the results found in this study and draws a conclusion. It uses the proposed framework to explore the various settings explored and how they affect the demographic behaviour of the study population. Also, the limitations,future research and the implications for the study on newly designed pronatalist population policy in Iran will be discussesed in this chapter.

CHAPTER 2: CONCEPTUAL FRAMEWORK

2.1. Introduction

The studies on fertility preferences in developed countries reveal that despite the fact that desired fertility in these countries is above two, the observed fertility has dropped to below replacement level (Bongaarts, 2001, 2002; Goldstein et al., 2003; Quesnel-Vallée & Morgan, 2003; Van de Kaa, 2001). According to Goldstein et al. (2003, p. 479), the higher levels of desired fertility rate compared with the observed fertility is a puzzle for demographers. In fact, understanding the gap between desired family size and fertility outcome is important as it shows the inability of women to achieve their stated desired fertility (Ibisomi et al., 2011). Bongaarts (2001) is one the scholars who have investigated the gap between desired and observed fertility in different stages of the fertility transition. Bongaarts (2001) argued that during the early and middle stages of the demographic transition, the desired fertility is lower than the observed number of children. Conversely, during the last stages of the fertility transition, when fertility drops below replacement level, the desired fertility exceeds the observed fertility. The different stages of the fertility transition in Iran show that over the last three decades fertility has drastically declined from seven children in 1979 to 1.8 children per woman in 2006 and 2011. Despite the fact the recent census in Iran (2016) shows an increase in TFR (2.01) (Abbasi-Shavazi, 2002; Statistical Centre of Iran, 2016a), the total fertility rate in urban areas is still below replacement level (1.86). It should be noted that fertility decline below replacement level in Iran has taken place in a situation that the two child norm still exists in the country and the majority of couples state they want to have two children (Abbasi-Shavazi et al., 2005; Askari-Nodoushan et al., 2009; Razeghi-Nasrabad et al., 2012). There have been few previous studies to examine the differences between desired and actual fertility, as well as, the implications for women's reproductive health and also for the future population in any given country. Chapter two initially provides the definitions for the main components of the gap between desired family size and fertility behaviour. This chapter also shows how the different demographic theories have dealt with fertility change. Regarding the main objective of this study, which is analysing the gap between desired and actual fertility, this chapter will critically review desired family

size and its role in predicting the final parity. Then, regarding the low fertility context of Iran the theories of fertility decline including 'the proximate determinants of fertility', 'the micro-economic theories of fertility', 'the risk aversion theory', 'the gender equity theory' as well as 'the theory of second demographic transition' will be examined. Finally based on this literature review and also background information introduced in chapter one, a theoretical framework will be designed to examine the objectives of this study.

2.2. An overview of the definitions of desired and observed fertility

The concept of desired family size and its importance for understanding reproductive behaviour has been examined in various studies. In fact, changes in fertility desires still play an essential role in most theories of fertility decline (Freedman et al., 1975; Lesthaeghe & Surkyn, 1988; Pritchett, 1994; Van de Kaa, 2002). In some studies the two concepts of the desired and ideal family size are considered the same concepts (Adsera, 2006; Günther & Harttgen, 2016; Ibisomi et al., 2011; Razeghi-Nasrabad & Mirzaee, 2012). For example, Hagewen and Morgan (2005) state that they don't distinguish between intended, expected, or desired fertility. They believe that while demographers sometimes distinguish between these terms, evidence suggests that respondents generally do not. In the multilingual demographic dictionary ideal and desired family size are defined as two distinct concepts:

> Birth expectations differ from reproductive intentions. A distinction is made between desired family size, the number of children a woman, man or couple wants to have, and the ideal family size which they envision for their society. (Van de Walle, 1982, p. 80)

Consistent with this definition, Morgan (2001) defines the ideal and desired family size as follows:

> Ideal family size usually alters the referent for the question to 'an average American family 'or to a 'family like yours 'and removes it from the context of what the respondent is likely to do. Desired family size refers to the number [of children] a woman would like to have. Empirically, answers to this question are similar to answers to the intended/expected questions. (Morgan, 2001, p. 168)

The concepts of the general and ideal family size which are the representations of desired and ideal number of children, were adopted in the different rounds of the Eurobarometer survey (2001, 2006 and 2011) (Testa, 2012). According to Testa (2012) 'general ideal (societal ideal) family size' reflects childbearing preferences at the normative level whereas, the 'personal ideal family size' reflects childbearing preferences at the individual level but in the absence of any possible obstacle, that is, under ideal conditions (Testa, 2012, p. 7). This definition is consistent with the definition of Easterlin (1978) who considered the desired family size as demand for children. He defines desired family size as 'the number of children parents would have if there were no subjective or economic problems involved in regulating fertility (Easterlin, 1978, p. 82).

Goldstein et al. (2003) state that in the previous rounds of the Eurobarometer Survey (1979 and 1989) the questions asking about the ideal family size were ambiguous and it was not clear whether they were asking the respondents' own family size or that of the respondents 'larger society' (Goldstein et al., 2003, p. 481). Testa (2012) considers that the definition of personal ideal family *size* is consistent with that of desired family size which expresses wishes and emotional feelings without containing any commitment to act (Table 2-1).

Table 2-1: Wording of the questions on the family size Eurobarometer survey 2011

Family size	Survey items
General/Societal ideal	Generally speaking, what do you think is the ideal number of children for a family?
Personal ideal	And for you personally, what would be the ideal number of children you would like to have or would have liked to have had?

Source: Testa (2012)

There are two ways to ask about the desired fertility in cross-sectional studies. One is to ask about the number of children a woman says that she would have if she could start married life and have the number of children she wanted by the end of the childbearing period (Freedman et al., 1975). The second way is to ask about respondents' current desired number of children (both were asked in 2001, 2006 and 2011 Eurobarometer surveys). A problem that would arise from asking desired family size in

the past is that respondents (especially women aged 40-49) may have forgotten their desired parity or they state their current number of children as their desired family size. In addition, considering the cross-sectional nature of this study, asking about the desired fertility at the time of the marriage doesn't make sense for the respondents who were newly married at the time of survey. Consequently, in this study following Easterlin (1978) the surveyed women were asked about their current desired number of children through the following question:

'For you personally, what would be the number of children you would like to have in absence of any possible obstacle (economic, health…)?'

It is worth noting that respondents in this study are aged 15-49. Therefore, a majority still have years to complete their reproductive span. Despite the fact that investigating the gap between actual (observed) fertility and desired family size may be more realistic, in this study the term 'actual fertility' is replaced with 'expected family size'. Expected family size or so-called 'ultimately intended family size' (Testa, 2012, p. 8) is goal-related fertility behaviour of women and is the most proximate determinant of childbearing behaviour (Goldstein et al., 2003; Testa, 2012). Consistent with Goldstein et al. (2003, p. 483), expected family size is defined in this thesis as:

'The sum of the number of children a woman has already had at the time of the survey and the number of children the respondent still plan[s] to have'.

To achieve the number of children the respondent plans to have, which is called 'the additionally intended family size' (Testa, 2012, p. 7), respondents were questioned:

'In addition of the number of children you already have, how many (more) children you have intended to have in the rest of your childbearing period? '

To answer this question, respondents needed to think more correctly about their own situation. They should take into account the obstacles that might interfere with achieving desired family size. In fact, the expected fertility is considered to be more realistic than the desired family size. Considering the difficulties women may face in achieving their desired family size, according to Goldstein et al. (2003), the expected family size is considered to be universally smaller than the desired number of children. The gap between desired and expected family size is calculated by subtracting the woman's desired

number of children from the expected number of children. Investigating the discrepancies between desired fertility and fertility outcome is a relatively new topic in demographic research in Iran. However, the different dimensions of the observed fertility, desired or ideal fertility have been separately examined (Hosseini & Abbasi-Shavazi, 2009a; Mahmoodian & Mahmoodiani, 2014; Mahmoudiani, 2015). Razeghi-Nasrabad and Mirzaee (2012) argue that although the socio-economic and demographic circumstances and obstacles may change the desired fertility over the time, the estimated gap between desired and actual fertility will give a possible idea of the future of fertility.

2.3. A review of studies on desired family size

The importance of desired family size for understanding reproductive behaviour is examined in various theories, and changes in fertility desires still play a role in most theories of fertility decline (Lesthaeghe & Surkyn, 1988; Van de Kaa, 2002). In addition, reproductive desires are a basic factor in theories of contraceptive use (Van de Walle, 1992) and in justifications for family planning programs (Koenig et al., 2006). Moreover, desired family size is an important concept for understanding intended and unintended births, as well as unmet reproductive goals (Bongaarts et al., 1990; Quesnel-Vallée & Morgan, 2003). Pritchett (1994) argues that nearly all of the differences in actual fertility across countries are due to differences in fertility desires. According to Pritchett (1994), factors like the level of contraceptive use, availability of contraceptives and implementation of family planning programs have a minor effect on actual fertility and have no impact on excess fertility after controlling for fertility desires. In fact, the challenge of reducing fertility is the challenge of reducing the people's desired fertility. Bongaarts (2001) in a study about the reproductive preferences in post-transitional societies, has examined the predicted validity and discrepancies between "desired" and "observed fertility". Bongaarts (2001) argues that although the decline in desired fertility is one of the causes of the fertility transition, observed fertility often deviates substantially from desired fertility. According to Bongaarts (2001), observed diverging trends in fertility and reproductive preferences in 12 European[7] countries imply that in every country the desired family size exceeds the actual (observed) fertility. For example,

[7] Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain and the UK.

in the European Union in 1989 the average observed fertility (1.6) was well below the desired family size of 2.2. Bongaarts (2001) also argues that similar differences are seen in contemporary developing countries such as Thailand and Taiwan at the end of their fertility transition, which is unlike what is often seen in the earlier phases of fertility transition, when observed fertility is almost always more than the desired number of children.

Studies on individual's fertility desires in developed and developing countries have documented influences of various life course events on different measures of fertility preferences. Goldstein et al. (2003), using data from the Eurobarometer 2001 survey, show that the younger cohorts desire smaller family sizes than older people. According to Goldstein et al. (2003) both temporal and life-cycle events can influence the fertility preferences of women in different age groups. In fact, the older cohorts grew up in a different time and were surveyed at an older age. It may be that the fertility desires of the younger age cohorts will approach those of the older cohorts as they age (Goldstein et al., 2003, p. 485). Uddin et al. (2011) show that the desired family size decreases with the age at marriage. In fact, young mothers are more prone to have more children. Consistently, education is an important variable negatively influencing the actual and desired family size in Bangladesh. According to Uddin et al. (2011) a negative relationship was observed between the wealth index and the desired family size; the higher the wealth index, the lower the fertility level and desired family size. Another study in Bangladesh reveals son preference as a determinant of desired family size (Kabir et al., 1994). In fact, women with their sex composition of children in favour of girls are more likely to have more desired family size than women who have more sons. The results of the logistic model in this study show that age, current contraceptive use, work status, land ownership, and visits of family planning workers, have a significant relationship with their desired number of children.

A review of the determinants of desired family size in the Palestinian Territory shows that there is an inverse association between women's desired family size and their level of education (Kamal, 2006). Women's employment status is another determinant which has a negative significant association with desired family size. The findings of a study by Kamal (2006) revealed that son preference has no

relationship with women's desired family size in the Palestinian Territory. However, preference for son was found to be one of the main factors affecting the desired number of children in India. Lane (2004) argues that in North India, women's desired number of children is positively associated with the level of son preference. In fact, the smaller the reported desired number of children, the lower the likelihood of preference for son. According to Summers (1992) increasing female education through expanded access in Pakistan would be an important factor for the decline in the desired number of children. Unger and Molina (1997), in a study among Hispanic women of low socioeconomic status, conclude that women's age (older than 30), their lower level of education (having less than an eighth grade education), being separated, divorced or widowed, and growing up in a large family, were positively associated with a desire for a greater number.

In their study in Iran, Abbasi-Shavazi and Askari-Nodoushan (2005) argue that growing up in urban areas, the later age at marriage and the higher levels of education are factors negatively associated with lower desired family size among women. Abbasi-Shavazi and Khani (2014) in another study in one of the Western provinces of Iran, examine the effects of variables such as women's age, place of residence, the level of education and the religion on the fertility desires of women. They conclude that women's university education is related to the lower levels of desired number of children. Abbasi-Shavazi and Khani (2014) argue that older women with the lower levels of education, living in rural areas have the higher desired family size.

2.4. A review of literature of fertility change

As noted previously Iran experienced a drastic fertility decline during 1990s (Abbasi-Shavazi, 2002) which led to a fall in the total fertility rate from 6.8 children per woman in 1986 to 1.8 in 2011 and 2.01 in 2016 (Abbasi-Shavazi, 2001b; Hosseini-Chavoshi & Abbasi-Shavazi, 2012; Statistical Centre of Iran, 2011, 2016a). Therefore, the main theoretical positions to examine the discrepancies between women's desired and actual family size are outlined here with consideration given to their applicability in the Iranian fertility transition. According to Abbasi-Shavazi et al. (2009), any theoretical explanation of fertility decline must be operationalised through the *proximate determinants* of fertility which are

essentially conditions that influence whether or not a woman will have a live birth (Abbasi-Shavazi et al., 2009). Moreover, McDonald (2002) argues that understanding the possible reasons for low fertility is essential for countries which are looking for a strategy to increase their fertility rates or to stop fertility from declining further. Therefore, he provides a theoretical perspective (of fertility decline) under four theories of 'rational choice theory', 'risk aversion theory', 'post-materialist values theory', and 'gender equity theory' (McDonald, 2002, p. 422).

It should be noted that the assumptions of rationality are incorporated in different demographic theories such as the micro-economic theories of fertility (Becker, 1960; Easterlin, 1975, 1978). Following McDonald, in addition of proximate determinants of fertility, this study will adopt the theoretical perspectives of micro-economic theories of fertility, risk aversion and gender equity. However, the second demographic transition theory, which is a comprehensive theory related to the concept of the post-materialist theory, will be replaced to explain the fertility gap in low fertility context of Iran.

2.4.1. Proximate determinants of fertility

According to Bongaarts and Potter (1983), the proximate determinants of fertility are the biological and behavioural factors through which social, economic and environmental variables, affect fertility. Bongaarts (1978) argues that if an intermediate fertility variable changes, then fertility necessarily changes also (assuming the other intermediate fertility variables remain constant), whereas the change in an indirect determinant of fertility such as income or education does not necessarily change the fertility. The main characteristic of a proximate determinant is its direct impact on fertility. In fact, the application of the proximate determinants of fertility is to assess fertility in an environment where regulation of fertility is being intentionally practiced, therefore total fertility rates diverges from natural fertility (Coutinho et al., 2016).

The term intermediate (proximate) fertility variable was first recognised in the mid-1950s in a theoretical paper by Davis and Blake (1956) and then developed by Bongaarts (1978) who was the first to introduce measurements of the proximate determinants (Coutinho et al., 2016). According to Davis

and Blake (1956) the process of reproduction involves three necessary steps: (1) intercourse, (2) conception, and (3) gestation and parturition. These three steps are operationalized into 11 variables through which cultural conditions can affect fertility. These variables are described as follows:

1. **Factors affecting exposure to intercourse (intercourse variables)**

A) ***Factors governing the formation and dissolution of unions during the reproductive period:***

- Age of entry into sexual unions;
- Permanent celibacy: proportion of women never entering sexual unions;
- Amount of the reproductive period spent between or after unions:
    a. When unions are broken by divorce, separation, or desertion,
    b. When unions are broken by death of husband.

B) Factors governing the exposure to intercourse within unions:

- Voluntary abstinence;
- Involuntary abstinence (from impotence, illness, unavoidable but temporary separations);
- Coital frequency (excluding periods of abstinence).

2. **Factors affecting exposure to conception (conception variables)**

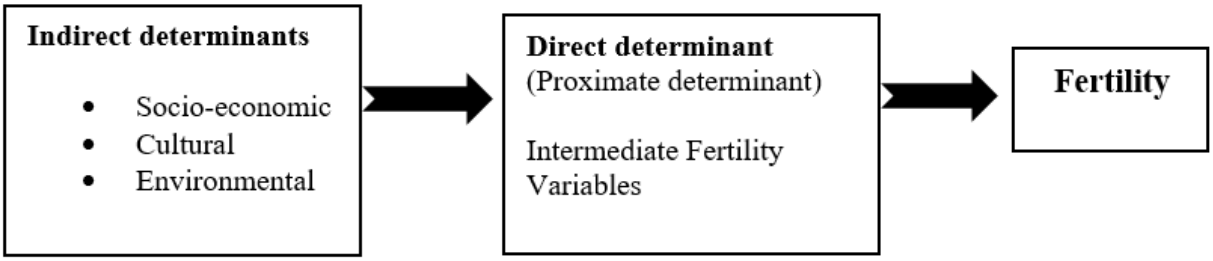
- Fecundity or infecundity, as affected by involuntary causes;
- Use or non-use of contraception;
    a. By mechanical and chemical means,
    b. By other means.
- Fecundity or infecundity, as affected by voluntary causes (sterilization, sub incision, medical treatment etc.).

3. **Factors affecting gestation and successful parturition (gestation variables)**

- Foetal mortality from involuntary causes.

Despite the fact that the framework of Davis and Blake (1956) has found wide acceptance (for analysing the determinants of fertility), it has proven difficult to measure the strength of the intermediate variable and to incorporate this into quantitative reproductive models (Bongaarts, 1978, 1982). Bongaarts (1978, p. 106) has simplified the framework of Davis and Blake (1956) in order to quantify the effects of intermediate variables on fertility (Figure 2-1).

Figure 2-1: proximate determinants of fertility



Source: Bongaarts (1978)

In the framework proposed by Bongaarts (1982), the number of intermediate variables has been collapsed into seven fertility variables (called proximate determinants) which is closely related to the Davis and Blake set. The following is a complete set of intermediate fertility variables often encountered in reproductive models: 1) Proportions married among females, 2) Contraceptive use and effectiveness, 3) Prevalence of induced abortion, 4) Duration of postpartum infecundability, 5) Fecundability (or frequency of intercourse), 6) Spontaneous intrauterine mortality and 7) Prevalence of permanent sterility.

Bongaarts (1982) discusses that:

> Each of these seven intermediate variables directly influences fertility, and together they determine the level of fertility. The first factor measures the extent to which women are exposed to regular intercourse (marriage is defined broadly to include consensual unions).

> The second and third factors measure the prevalence of deliberate marital fertility control and the last four are the determinants of natural marital fertility. (Bongaarts, 1982, p. 179)

According to Bongaarts (1982), it is not necessary to allocate the equal effort to analysing and measuring each of these variables because they don't have the same magnitude. Bongaarts (1982) argues that two criteria deserve most attention in application for selecting the intermediate (proximate) variables: 1) sensitivity of fertility rate to variations in a determinant. For example, if a large variation in a determinant leads to a minor change in fertility rate, this determinant is considered as uninteresting, *2)* The extent of variation of a determinant among populations over the time. Therefore, a relatively stable intermediate variable can contribute little to explaining fertility variations. Therefore, this variable is less important. Table 2-2 displays the seven intermediate variables which are given an approximate rating for these two criteria. Using data on 41 historical, developed and developing populations, showed that 96 percent of the variance in the total fertility rate of these population could be explained by reference to the four (out of seven mentioned determinants) primary proximate determinants: Marriage, Contraception, induced abortion and postpartum infecundability (Bongaarts & Potter, 1983).

Table 2-2: Rating of intermediate fertility variables with respect to sensitivity of fertility and variability among populations

Proximate determinants	Sensitivity of fertility to the determinant	Variability among populations	Overall rating
1. Marriage and marital disruption	***	***	***
2. Onset of permanent sterility	**	*	*
3. Postpartum infecundability	**	***	***
4. Fecundability	**	**	**
5. Contraception	***	***	***
6. Spontaneous intrauterine mortality	*	*	*
7. Induced abortion	**	***	***

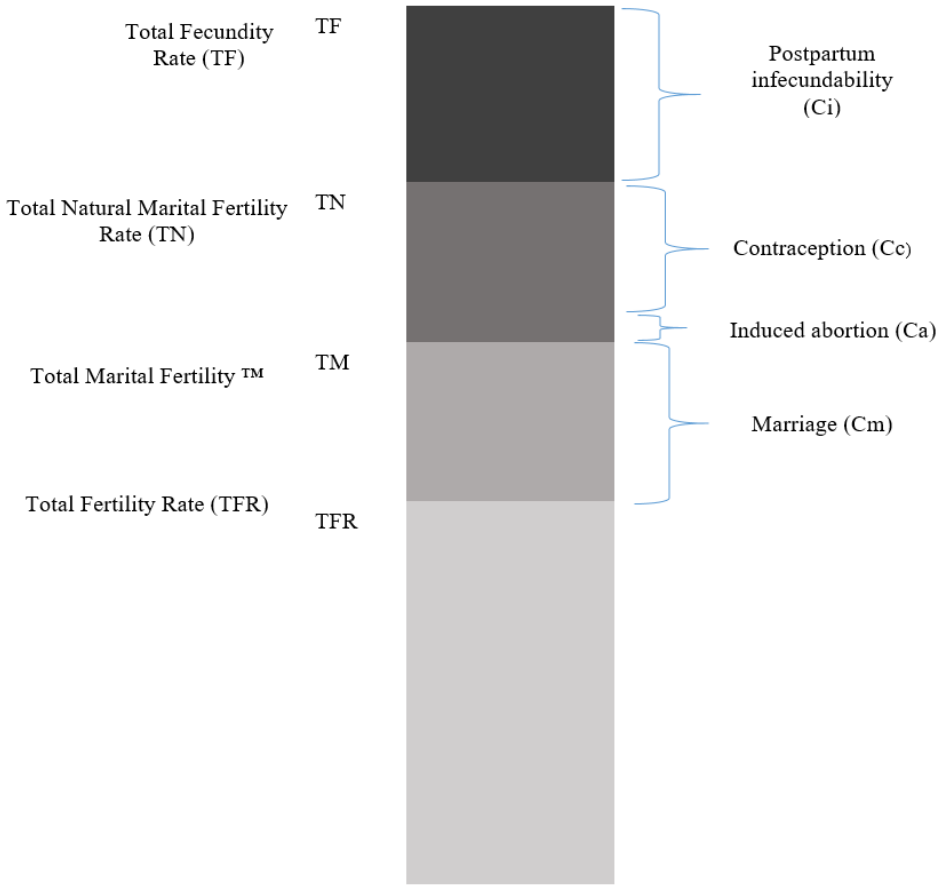
Source: Bongaarts (1982, p. 180)

Bongaarts conceptual model expresses the observed level of fertility in a population (measured by the total fertility rate, TFR) as a product of the maximum total fecundity rate (TF) and quantities measuring the fertility-reducing effects of the four principal proximate determinants of fertility (Table 2-2). Bongaarts (1982) suggests the conceptual model which summarises the relationship between the total fertility rate and the intermediate fertility variables:

$$\textbf{(1)} \qquad \textbf{TFR = Cm * Cc* Ca* Ci* TF}$$

In this model TF is the total fecundity rate, while Cm is index of marriage, Cc is index of contraception, Ca is index of induced abortion and Ci is index of postpartum infecundability. In fact, each index values between zero and one and indicates the extent to which fertility is influenced (reduced) by the specific determinant. According to this model, fertility is lower than its maximum value as a result of delayed marriage (and marital disruption), contraceptive use, induced abortion, and postpartum infecundability (Bongaarts, 1982) (Figure 2-2).

Figure 2-2: Relationships between the fertility inhibiting effects of the intermediate variables and various measures of fertility



Source: Bongaarts (1982)

Later a model suggested by Bongaarts (2001; 2002) was able to explain both the decline and increase in fertility relative to fertility desires. The framework is as follows:

$$\mathbf{(2)} \qquad \mathbf{FP = IP \times Fu \times Fr \times Fg \times Ft \times Fi \times Fc}$$

In this framework, a parameter of 1.0 reflects no effect net of intentions, values above 1.0 increase fertility relative to intentions, and values lower than 1.0 decrease fertility relative to intentions (Morgan, 2003).

In this conceptual model, (Fu) is the index of unwanted fertility, (Fr) is the index of replacement of children who have died and *(*Fg) refers to additional children needed to satisfy strong gender preferences. It's expected that the effects of these factors would be greater than 1.0 and thus increase observed fertility relative to intentions. Other factors represent parameters that (at least in recent periods) would be expected to reduce fertility relative to intentions (the effect of these parameters is expected to be less than 1.0). These factors include changes in the timing of fertility (adjustments for fertility delay or tempo effect) (Ft), subfecundity and infecundity (Fi), and competition with other energy- and time-intensive activities (opportunity costs matters) that may lead people to revise downward their intentions (Fc) (Hagewen & Morgan, 2005; Hayford & Morgan, 2007; Morgan, 2003). In this model if all women meet their fertility, then FP (final parity) equals IP (intended parity).

Building on Bongaarts (2001), Quesnel-Vallée and Morgan (2003) offered a conceptual model that focuses explicitly on the interaction between intentions and proximate determinants of fertility (3); however, unlike Bongaarts (2001, 2002) they exclude the tempo effect as their focus was on early intent and completed fertility.

$$\textbf{(3)} \qquad \mathbf{FP = IP \times (F, U, M, S, C)}$$

The terminology 'underachieved' and "overachieved" fertility was introduced by Quesnel-Vallée and Morgan (2003) to describe a situation when couples have fewer children or more children than intended respectively. Quesnel-Vallée and Morgan (2003) argue that the impact of child death in Bongaarts' framework is not considerable because its impact in a low mortality context is very small. However, the effect of sex composition of children (S) is taken into account. To describe the fecundity impairments (F) which leads to having fewer children than intended, Quesnel-Vallée and Morgan (2003) argue that despite the fact a relatively small proportion of women are unable to have children at young ages, disease history, age and age-related infertility increase this proportion.

Factor M in Quesnel-Vallée and Morgan (2003) model refers to finding a suitable partner (M) which is a precondition for childbearing. In fact, the underachievement of fertility (relative to intentions) can be

described by a decline in marriage rates and/or an increase in marital dissolution. In Quesnel-Vallée and Morgan (2003) model, factor C may be the result of either blocked opportunities that decrease actual opportunity costs (compared with what was expected) or from rewards (financial or emotional) that are less than those expected (Quesnel-Vallée & Morgan, 2003, p. 501). As Quesnel-Vallée and Morgan (2003) discuss a common and normative life course strategy is to order activities sequentially, therefore, life time activities compete less directly. For example, couples may delay their fertility to accumulate human capital. This experience may later compete with intentions to have children. The opportunities that are provided by enhanced human capital, are attractive as they bring, for example, income, status, prestige, and self-fulfilment (Quesnel-Vallée & Morgan, 2003, p. 503); however, despite the fact that these activities are energy consuming, they tend to be organised sequentially with childbearing. Quesnel-Vallée and Morgan (2003) discuss that continued postponement of childbearing can lead to further opportunity costs of childbearing. The postponement of childbearing may be more significant to women, as they may underestimate their age-related fecundity declines and normative and structural obstacles to childbearing at older ages. Quesnel-Vallée and Morgan (2003) define a net error as a difference between achieved parity at t+1 and intended parity at t. A 0 error means that individuals have met their fertility intentions. A positive net error indicates that individuals have more children than they intended (desired) (they have overachieved relative to their intentions); however, a negative net error indicates that they have fewer than expected (they have underachieved their intended fertility).

Despite the fact that Bongaarts' framework does not offer any explanations for the variations in the intermediate variables between societies, the proximate determinants model has been commonly adopted to examine change in a society or population over time (Islam et al., 2004; Onuoha, 1992; Sibanda et al., 2003).

A number of studies have applied Bongaarts' framework to investigate the failure in achieving fertility goals (Balbo et al., 2013; Francesco Billari et al., 2009; Booth, 2006; Hagewen & Morgan, 2005; Koropeckyj-Cox & Pendell, 2007; Philipov et al., 2006; Sobotka & Beaujouan, 2014). Also, studies have used proximate determinants model to explain couples' reproductive behaviour in Iran (Abbasi-Shavazi et al., 2009; Hosseini & Hosseini, 2013; Hosseini & Abbasi-Shavazi, 2009b).

2.4.2. The micro-economic theories of fertility decline

Economic theories of fertility argue that if the costs of a child outweigh the benefits, a couple will not choose to have a child; however, if the benefits of an additional child outweigh the costs, a child will be desired (Becker, 1991; Becker et al., 1990; Beckman et al., 1983; Easterlin, 1975; Leibenstein, 1974, 1975). The main idea of the economic theory of fertility is that couples take their decision with regard to the number of children they want to have after an extensive cost-benefit-assessment (Groll & Abedieh, 2016). According to Leibenstein (1957), children have three types of benefits to their parents: *a consume benefit*, as they bring joy, affection and gratification to their parents' lives; *an income benefit*, as their productive activities help the family's economy; and finally, *an insurance benefit*, as children care for and assist their parents in their old ages. Children also cause direct and indirect costs. The direct cost includes material expenses such as costs of food, clothes, education and so forth. Indirect costs of children refer to expenditure of time which limits the engagement of parents in other activities (Leibenstein, 1957). Leibenstein (1957) argues that the last two types of benefit (income and insurance benefits of children) are no longer applicable, at least in western societies, where child labour has not been legal for ages. Also, the requirement of insurance benefit has already transferred to other relevant institutions. Leibenstein (1957) discussed that the consume benefit has remained consistent and is achievable by a small number of children. A similar approach is adopted by Becker (1960) who argues that children are considered as consumer products bringing psychological benefits to their parents. According to Becker (1960) a family must determine not only its number of children (quantity of children) but also the amount spent on them (quality of children) such as education, health, future income and so forth. Becker (1965) claims that quantity and quality of children are more or less exchangeable which, for example, provide an incentive for parents to invest in the quality of their children, rather than to realise a bigger family size.

Becker believes that the key change over the course of the fertility decline is a preference for the higher quality of children which require more purchased external inputs, particularly resources for education and health, and are more time-intensive within the household (Becker, 1991). According to Razin and Sadka (1995) child quality is a multi-dimensional construct consisting of nutrition, education, skill development, health care and so forth. Razin and Sadka (1995) argue that:

> The improvement in the quality of a child can be done in a variety of ways: spending on the current consumption of a child, investing in the child's health or education (investing in human capital) and providing for the child's future consumption (bequest). (Razin & Sadka, 1995, pp. 6-13)

A theoretical framework was developed by Easterlin (1975) containing elements of both demand for, and supply of, children. Easterlin (1975) argues that:

> The standard formulation of the microeconomic theory of fertility emphasizes the demand for children as the key to understanding fertility behavior. It also treats, but less fully and systematically, the costs of controlling fertility. (Easterlin, 1975, p. 54)

As Easterlin (1975) argues, innovation in his approach is a more explicit and formal treatment of the production of children, including the possibility of shifts in output independent of demand conditions. In his framework the determinants of fertility include: the demand for children if fertility regulation were costless and determined by income, the price of children relative to goods, and subjective preferences for children compared with goods; the potential output of children (if no conscious effort were made to control fertility) which depends on natural fertility and the survival prospects of a baby to adulthood; and the costs of fertility regulation which include subjective costs (‘attitudes’) as well as the time and money necessary to learn about and use specific techniques (‘access’) (Easterlin, 1975).

Caldwell (1978, 1982) argues about the reversal of wealth flow between generations. When net wealth transfer from children to parents is positive (when the value of all children's transfers to parents is more

than the value of all parental wealth transfers to children), parents are expected to demand as many children as possible. Conversely, when wealth flow is negative, which means children consume more parental wealth than they provide, parents are expected to desire fewer children (Caldwell, 1978, 1982). Fertility decline was a response by parents to the change in the direction of 'net wealth flows' between parents and children (Caldwell, 1976; Caldwell & Ruzicka, 1978). According to Caldwell (1982) the introduction of mass education played a major role in fertility decline in the late 19th century and produced a reversal of the direction of the flow of wealth between parents and children, because children through their labour became a liability rather than an economic asset to their parents (Caldwell, 1982, 2006). According to Caldwell (1980) reduction of the child's potential as a worker, increased children's schooling costs and the fact that schooling makes the child more dependent are three mechanisms through which mass education changes the wealth flow between parents and children.

The economic theories of fertility have been criticised as they are not sufficient to understand reproductive behaviour and mostly view childbearing as a rational, voluntary process and focus on the 'costs' of having children. The critics argue that rational theories may explain why people do not have children; however, they don't help to explain why people would have children in developed societies (Friedman et al., 1994; Schoen et al., 1997; Van Peer, 2002). Neal and Groat (1980) argue that there are many examples of couples where their fertility has not been an outcome of deliberate decision making. According to Neal and Groat (1980) and Van Peer (2002), many couples may adjust their childbearing behaviour based on the reality of their circumstances and future prospects instead of planning about the number and spacing of their children. They argue that the rational choice theories rarely have considered the role of variables such as values, attitudes and social norms. However, emotional, social or psychological factors may be even more important than rational or economic factors in reproductive behaviour (Van Peer, 2002).

Despite the reviewed criticisms the application of the micro-economic theories of fertility have been considered in numerous studies in Iran. Economic constraints and high costs of child rearing have been found to be the main factors affecting fertility decline in the country. Abbasi-Shavazi (2002) argues that Iran has been experiencing economic hardship since the revolution, especially the decade after the war

with Iraq, which accelerated the fertility decline in the country from the mid-1980s. According to Abbasi-Shavazi (2002) the economic pressure has had a major role in the postponement of marriage and childbearing in the country. In fact, the increasing cost of rearing children, particularly the cost of education, is an important factor in family decision-making in Iran., Studying the gap between ideal and actual fertility in three provinces, Semnan, Kohgiluyeh-Boyer Ahmad and Hormozgan, Razeghi-Nasrabad and Mirzaee (2012) state that the high cost of child-raising is one of the prime reasons reported by women who have fewer children than their ideal family size. The evaluation of costs and benefits of children among parents in these provinces has been toward having fewer children with higher quality. Moeeni et al. (2014), using data from the 2010 Household Expenditure and Income Survey (HEIS), analyses the extent to which economic determinants are associated with the number of children in Iran. Their findings reveal that preferences of parents have shifted towards fewer but more qualified children, which confirms Becker's theory of 'quality and quantity of children'. Also, economic conditions at the macro level, such as house rent prices and value added in manufacturing establishments, are associated with the number of children. Moreover, Eshaghi et al. (2014) and Aghayari et al. (2016) in their qualitative studies in Tehran and Tabriz city conclude that the direct and indirect cost of children have been the most reported reason by women for restricting their number of children.

2.4.3. Risk aversion theory

An extension of the rational choice theory is risk aversion theory. However, the context of risk theory is different from rational choice theory. According to the theory people invest in economic security, education, attachment to the labour force, long hours of work and savings, rather than in the insecurity that accompanies having children (McDonald, 2000c).

According to McDonald (2000c) in risk aversion theory there is an assumption which implies that in having a child people decide to change their future life course and therefore their decision depends on their future orientation. If people perceive that their socio-economic, intimate or personal future is uncertain, they may avert the risk which means decide not to have a child. McDonald (2000c) argues:

> There is a risk that children may disrupt the relationship of the parents. There is a risk that children will follow pathways that cause parents considerable anxiety. There is a risk that some harm will come to the child. There is a risk that the relationship will breakup and we will be left alone to support the child… (McDonald, 2000c, p. 15)

Lack of family friendly social atmosphere may affect fertility decision making. Thus, in a society that doesn't compensate for children, couples inevitable will restrict the number of their children (Finch & Bradshaw, 2003; Frątczak, 2004). McDonald (2000c) argues that risk aversion theory is an important reason for why people have no children or fewer children. According to McDonald (2000c) in almost all developed countries, the social policies increase the risks that people face, rather than to reduce them.

2.4.4. Women's status and autonomy

All over the world women are more likely than men to be socially and economically disadvantaged (Vlassoff & Moreno, 2002). Women and men not only are biologically different but also they differ in their access to, and control over, material, personal, and social resources, and their power of decision-making in the household and the community (McDonough & Walters, 2001; Östlin et al., 2006). Promotion of women's status and gender equality is a long-standing goal of international development organisations because it is positively associated with better health for women and children (Samari, 2015).

Women's autonomy is defined as freedom from external control or influences and the ability to formulate strategic choices and control resources. Women's autonomy, which is often based on the amount of interpersonal control, can include things like financial independence or a woman's ability to control her own income (Bloom et al., 2001; Dyson & Moore, 1983; Jejeebhoy, 1991). To have autonomy, women need to have influence over interpersonal issues, and be able to formulate strategic choices, control resources, and participate in decision-making within the family. Control over household decisions, or lack thereof, is an important and more direct measure of women's autonomy

within their families (Gupta, 1995). Factors, such as marriage circumstances and family formation, may at times be at odds with gains in autonomy, especially from education or a job, and have to be negotiated with existing social norms. Despite the fact age and marital status are associated with autonomy, educational attainment and employment status are cited as the most important determinants of autonomy (Al Riyami et al., 2004; Anderson & Eswaran, 2009; Jejeebhoy, 1995).

Women's autonomy captures different aspects of women's roles and participation in fertility decision-making and behaviour. There are several ideas about how household autonomy affects fertility. More autonomy is associated with the desire for fewer children and allows for women's fertility desires to play an increasingly important role in fertility decisions (Hogan et al., 1999; Kritz et al. 2000). More autonomy also enables women to enact these new fertility attitudes in relationships and make the wife's voice in fertility-related issues stronger (Mason, 1987). Essentially, a woman's ability to make fertility decisions is reduced by her low position in the household hierarchy. Women's autonomy in household decision-making can stand between the young woman's desire to have a small family and her ability to realise it. Less autonomy may limit a woman's ability to achieve her own reproductive health goals by limiting her access to information and her ability to negotiate the circumstances around sexual activity and fertility. Women with less control in relationships may be more restricted in family planning decision-making, negotiations with partners about contraceptive use, and they face more difficulty in enacting their fertility desires (Bawah et al., 1999; Blanc, 2001; Harvey et al., 2002; Pulerwitz et al., 2000; Wolff et al., 2000; Woolf & Maisto, 2008).

Another perspective assumes that autonomy is associated with fertility in the same way as measures of women's status (education and employment) are associated with fertility. Education and employment increase the cost of having children, which has a direct influence on fertility outcomes such as contraceptive use and desired number of children (Balk 1994; Mason 1987). Since there are competing demands for women's time and resources, and women make choices depending on these constraints, decisions about children are made while taking other life course experiences, like education, into consideration. It's been argued that increases in education lead to gains in female autonomy, more

control of fertility behaviour, and subsequently lower fertility (Mason, 1986, 1987; Presser & Sen, 2000). Women who have more control over economic decision-making are also more likely to be involved with their husbands in family planning and therefore, more likely to use any method, female-only methods, and barrier methods compared with women who are not autonomous (Do & Kurimoto, 2012). It has been argued women's autonomy is a critical component to promote gender equality and equitable treatment and representation of women (World Bank, 2012).

Inequalities of control and power among men and women in work, family life, or divisions of labour, have direct implications for reproductive health and fertility often being associated with poor health outcomes and higher fertility rates (Dyson & Moore, 1983; Jejeebhoy, 1991; Mason, 1987). Gender equity theory of low fertility, which is well described by McDonald, argues that very low fertility in advanced countries today is the result of a conflict or inconsistency between high levels of gender equity in individual-oriented social institutions such as market employment, and formal education and sustained gender inequity in family-oriented social institutions. In fact, the higher levels of gender equity in the family-oriented social institution are required to avoid very low fertility (McDonald, 2000a, 2000b). In Iran, a few attempts have been made to investigate the correlation between gender equity and the fertility transition. According to Abbasi-Shavazi et al. (2009) Iran exemplifies the pre-conditions of gender equity theory. Abbasi-Shavazi et al. (2009) argue that female's educational attainments have risen strikingly in the country. In addition, women have been freely able to engage with other women and with institutions such as the health system and the education system. However, the substantial change in educational attainment was not translated into an increased level of paid employment for women in Iran (Abbasi-Shavazi et al. (2009, p. 164). According to the Statistical Centre of Iran (2016b), women's employment rate in 2016 was 15.9 percent which was much lower than men's (64.9 percent). In another study Afshari (2015) examined the relationship between gender equity and fertility transition in family-oriented and individual-oriented institutions in Iran. Her findings show that the fertility transition from high to below replacement level in Iran has occurred simultaneously with a considerable increase in gender equity in individual-oriented institutions like education; however, with less equity in other individual-oriented institutions such as the employment market. The results also

reveal that the fertility decline in Iran has had a significant relationship with the emergence of high levels of gender equity in the family; while with less gender equity in family-oriented institutions. In fact, family oriented institutions have shown a lower level of gender equity, for instance, in providing a family-friendly workplace or facilities for couples during pregnancy or childbearing (Afshari, 2015).

2.4.5. The theory of the second demographic transition

The concept of the second demographic transition (SDT) proposed by Van de Kaa (1987) refers to substantial changes in family behaviour, such as the postponement of marriage and pregnancy, increase in unmarried cohabitation, decreasing birth rate, increase in individualism and childlessness (Lesthaeghe, 2010; Van de Kaa, 1997).

According to Lesthaeghe (2010), the early signs of the second demographic transition emerged in the 1950s when divorce was increasing in the United States and Scandinavia. From the second half of the 1960s, fertility started to drop from its highest level (baby boom) and the age at marriage and the proportion of singlehood started to increase. Moreover, the rise in premarital cohabitation and post cohabitation, after divorce and widowhood, became more evident (Lesthaeghe, 2010). By 1970 the total fertility rate in many European countries had declined to near-replacement levels. Denmark, Finland, and Sweden experienced total fertility rates below two children: the TFR in Austria and Spain was 2.3 and 2.8 respectively, however, fertility rates in Europe further declined to fall below replacement level (Van de Kaa, 1987). It worth noting that by the 1980s the impact of extramarital childbearing had spread from Scandinavia to the rest of Western Europe (Lesthaeghe, 2010). There is a common discussion about the coverage of the second demographic transition among non-European or Asian countries. A number of studies argue that the second demographic transition is a Western-European (plus Canada and Australia) theory and would not spread to the United States and central, Eastern and Southern Europe, let alone to Asian countries (David Coleman, 2004). However, some studies indicate that the transition, or at least many of its features, has spread to non-European countries (Lesthaeghe & Neidert, 2006; Lesthaeghe, 2010; Matsuo, 2001). Saraee (2006) argues that Iran, before the exit of the first

demographic transition, has partially experienced the second demographic transition. For example, age at marriage has increased and fertility has declined. Moreover, the country has experienced an increase in the divorce rate (Saraee, 2006). It should be noted that cohabitation and extra-wedlock childbearing is illegal and religiously prohibited in the country and is not practiced by Iranians. In addition, as mentioned in chapters one and five, couples still value having children. Therefore, some features of the second demographic transition are still not applicable in Iran.

2.5. Summary and Theoretical frameworks for the study

Understanding the gap between desired family size and fertility outcome is important as it clarifies the inability of women to achieve their stated desired fertility (Ibisomi et al., 2011). While some women have more children than they desired, others have fewer children than their desired number. Unfortunately, issues relating to the latter group remain largely ignored due to the preoccupation with population control in the developing world. For low-fertility countries, it has been argued that below-replacement fertility would disappear if respondents' fertility desires were realised (Bongaarts, 2001, 2002; Goldstein et al., 2003). This study has discussed approaches for each demographic process of fertility decline. To examine factors affecting the fertility decline, the analytical framework by Quesnel-Vallée and Morgan (2003) built on Bongaarts' (2001; 2002) model was adopted as a main conceptual framework which provides a model for explaining desired-behaviour inconsistency among women. The important aspect of the interrelationships between all factors influencing the fertility gap is that each is shaped by a set of demographic and socio-economic factors. The indirect determinants must operate through the direct determinants, before influencing the fertility gap, which establishes the primary characteristics of the direct relationship. The age at marriage factor is one of the explanatory variables drawn from this model. In Bongaarts' framework finding a suitable parenthood partner is a precondition for childbearing. Therefore, delayed marriage is a principal intermediate variable reducing the fertility rate relative to the desired family size (Bongaarts, 1982).

The fecundity impairment is another variable in Bongaarts' (2001; 2002) and Quesnel-Vallée and Morgan (2003) model that can reduce the observed fertility relative to the number of children desired

by women. This variable can be considered as both a cause of fertility decline relative to desired family size and an effect of age and age at marriage. Physiological sterility and also disease-induced sterility are the aspects of fecundity impairments that have a directly depressing effect on fertility and will lead to fertility levels which are lower than that initially desired (Bongaarts, 2001). However, fecundity impairment may also be a result of age-related declines in fecundity (especially after age 35) (Quesnel-Vallée & Morgan, 2003). Therefore, the variables 'age' and 'age at marriage' can directly or indirectly have an attenuating effect on fertility outcomes relative to desired family size.

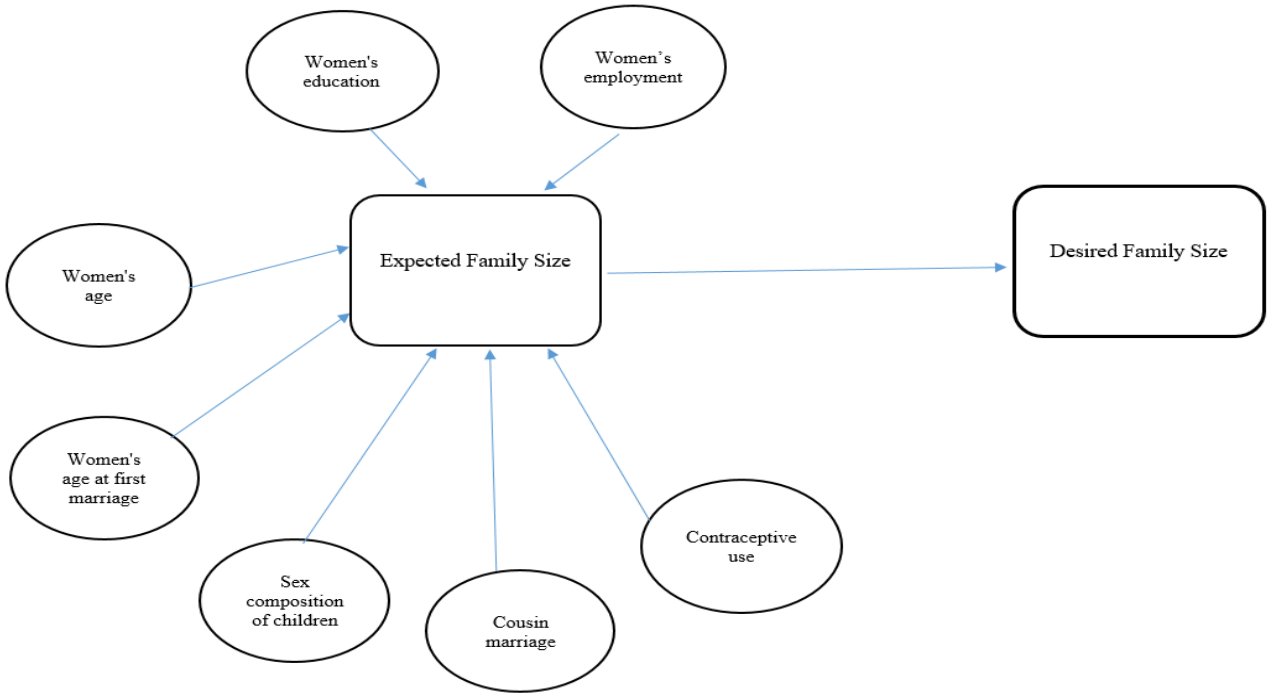
In Bongaarts' (2001; 2002) model unwanted fertility is a factor which can result in having more children than desired. However, 'unwanted pregnancies and consequently unwanted fertility can be a result of contraceptive failure as well (Quesnel-Vallée & Morgan, 2003). Therefore, the factors 'unwanted fertility' and 'contraceptive use' are selected as the explanatory variables influencing the desired-actual fertility gap.

Sex preference for children is another selected variable. When a couple state a preference for a family of a particular size, they may have a specific sex composition in mind. In such cases parents may continue their childbearing even after reaching their desired number of children if their preferred sex composition has not been achieved. Therefore, the existence of sex preferences leads to higher fertility than women initially desired (Bongaarts, 2001, p. 269).

The consanguineous marriage between two cousins (cousin marriage) has been very common and a culturally preferred form of marriage in Iran and has remained prevalent in certain parts of the country despite the wide acceptance of modern familial values, norms, and attitudes toward marriage and family formation in recent decades (Abbasi-Shavazi, McDonald, & Hosseini-Chavoshi, 2003; Abbasi-Shavazi, McDonald, et al., 2008; Abbasi & Torabi, 2007; Hosseini & Abbasi-Shavazi, 2009a; Hosseini & Erfani, 2014). The family control over cousin marriage, and the low levels of female autonomy in this kind of marriage, have resulted in an increase in fertility outcomes relative to the number of children women desired (Razeghi-Nasrabad & Mirzaee, 2012). Therefore, the variable cousin marriage is selected as an independent variable which indirectly affects the gap between fertility desires and outcomes.

The increased opportunity costs of childbearing have an attenuating effect on fertility outcomes relative to fertility desires. The significant and negative effect of female education and labour force participation on their fertility behaviour has been emphasised in a variety of reviewed literature. The microeconomic theories of fertility (Becker, 1960), the risk aversion theory (McDonald & Evans, 2002) and the literature relevant to female autonomy, as well as Bongaarts' (2001; 2002) model describe the effects of increased opportunity costs on fertility outcome well. Improvements in women's educational attainments and female employment rate have been known as variables that increase the opportunity costs of having (more) children but subsequently result in having fewer children than initially desired. Considering the fact the current survey does not have information on infecundity and unwanted fertility, finally the variables women's current age, women's age at first marriage, the sex composition of current (surviving children), consanguineous marriage, women's level of education, their employment status and women's contraceptive use are selected as the explanatory (independent) variables. Based on the review of literature, the proposed analytical framework which shows the relationship between mentioned explanatory variables and the expected-desired fertility gap as a dependent variable is shown in Figure 2-3. The relationship of each variable with expected and desired fertility gap is discussed in detail in Chapter 5.

Figure 2-3: Proposed theoretical framework to investigate the expected-desired fertility gap



Source: Fieldwork (2015)

CHAPTER 3: METHODOLOGY: DATA SOURCES AND RESEARCH METHODS

3.1. Introduction

This study is based on analyses of primary as well as secondary data. This chapter discusses the sources of data, methods of primary and secondary data collection and the statistical techniques used for analysing the data that have been adopted in the present study. The major sources of secondary data were the National Censuses and vital statistics mainly from 'Statistical Centre of Iran' (Statistical Centre of Iran, 2006, 2011, 2016a), 'Tehran Municipality' (Tehran Municipality, 2016), 'Sabte-Ahval organization'[8] (Sabte-Ahval organization, 2010, 2014) and 'Ostandari-Tehran'[9] (Ostandari-Tehran, 2014, 2016). Primary data were collected in a field survey (2015) undertaken by the author to meet the requirements of quantitative analysis for this research. Both the primary and secondary data are cross-sectional data.

This chapter outlines the primary data collection methodology and describes how the data have been used in this research. It begins with a description of the Household and the Women's Survey conducted for this research. The methods of analysis and the indicators that have been used are discussed in detail in the relevant chapters.

3.2. Primary data collection

Earlier in this thesis it was noted that the primary data were gathered while undertaking a field survey conducted in 2015. The field survey was undertaken in Tehran city during April-September 2015 to collect information about the socio-economic characteristics and the reproductive behaviour of women in the city. A statistically selected sample of married women aged 15 to 49 years was interviewed with

[8] Sabte-Ahval is one of the Iranian government agencies that collects population data and statistics from Iran. This organization, with its independent functions, is one of the subordinate institutions of the Ministry of the Interior. This organization is responsible for providing basic information such as birth, death and marriage, as well as the issuance of identity documents such as birth certificates (Sabte-Ahval organization, 2017).

[9] Ostandari-Tehran is the Tehran Provincial Government.

the help of a structured questionnaire, developed by the researcher (a copy of the questionnaire is attached in Appendix (1).

Ethical clearance for the research was granted by the "Social and Behavioural Research Ethics committee" (SBREC) of Flinders University, in February 2015. Local approval to conduct the research in Tehran was obtained from the "National Population Studies and Comprehensive Management Institute" (NPSCMI) prior to conducting the survey. In addition, approval was also obtained from participants (married women aged 15-49) who gave their informed consent for participation in the survey, by signing the consent forms given to them prior to interviewing them. The forms were approved by the Ethics committee, were written in Farsi, and translated into English by principal researcher.

3.3. Survey method and sample design

The survey among married women was conducted in order to fulfil the main aim of the thesis, which is to examine the gap between married women's desired and actual fertility. To establish the demographic and socioeconomic characteristics of the women in Tehran, data were collected in a comprehensive manner covering a number of characteristics influencing fertility such as age, age at marriage, education and region of residence.

According to the 2011 National census,[10] Tehran city has a total population of approximately 8.15 million as of 2011, which comprises 1.57 million married women of childbearing ages 15-49 years. This population lived in 2.830 million households (Statistical Centre of Iran, 2011). The present study is based on information collected from a sample of the population of these women. Due to time and resource constraints it was not possible to select a larger sample which could be fully representative of the study region. However, all attempts have been made in the sample selection to minimise any bias in the sample. It should be noted that in this study only married women were interviewed because as in

[10] The latest census before conducting this study

other Muslim countries, cohabitation and out of wedlock childbearing is prohibited in Iran (DeJong et al., 2005; Karim, 1997) and a vast majority of births occur within marriage.

The sample size 'n' was determined by using Cochran's formula (Cochran, 1977):

$$n = \frac{NZ^2p(1-p)}{Z^2p(1-p) + Nd^2}$$

Where n = sample size, N = population size, z = standard normal variate, (z = 1.96 at 95% confidence level), P = proportion or degree of variability = 50%, q= (1-p) and d = the level of precision = 5%.

With these specifications, the sample size was calculated at 384. However, a round figure of 400 was taken to account for possible non-responses. According to the 2011 National Census, the average household size of Tehran province is 3.3 (Statistical Centre of Iran, 2011), therefore it was assumed that on average there would be at least one married woman aged 15-49 years in a household. Thus, households were selected first and from each selected household, one currently married woman of reproductive ages 15-49[11] years was chosen as an eligible woman for interview. In case a selected household had more than one eligible woman, only one woman was chosen by simple random sampling and if a household had no eligible woman living there, the interviewer chose the next household which did have an eligible woman.

Tehran city has 22 regions. These regions are classified into five zones according to each region's level of development, known as 'zoning development' (see Table 3-1). From each zone, one region was chosen by random sampling, giving a total of five randomly selected regions. These selected regions are Regions 3, 6, 8, 10, and 20 (as shown in bold in Table 3.1). Thus, regions were primary sampling units (PSU). As mentioned earlier, according to Cochran's formula given above, it was decided to take a total sample of 400 married women of reproductive ages from the five selected regions. A simple

[11] The childbearing period varies among women and societies and is usually defined in the age group of 15-49 (Dawson et al., 1980; Maine, 1991).

random sample of eligible women was chosen from all the eligible women in each selected region, so that the sample size of each selected region bears the same proportion to its total number of eligible women as does the total number of eligible women of that region to the total number of eligible women in Tehran city. More specifically, the sample size of eligible women in each selected region was calculated by the following equation:

$$\textbf{Proportion of sample size in each selected region} = \frac{\textbf{Population of married women aged 15–49 in each region}}{\textbf{Total population of married women aged 15–49 in the five selected regions}^{12}} * \textbf{400}$$

Table 3-1: The classification of 22 regions of Tehran city based on zoning development

Level of development	Regions of Tehran City
High	**3**, 2,1
Moderate to high	5,**6**,7
Moderate	**8**,4,13,11,22
Moderate to low	**10**,12,21,14,9
Low	16,**20**,15,17,18,19

Source: Sadeghi (2014)

First, the population of married women aged 15-49 in a selected region (Table 3-2) was divided by the total population of eligible women in the five selected regions in Tehran city, which equalled 276,699 women as shown in Table 3-2. Then the fraction was multiplied into the total sample size of 400 (married women aged 15-49) in Tehran city. The population of currently married women aged 15-49 years in each selected region is given in Table 3.2. In case a selected household had more than one married woman, only one of them was randomly selected and interviewed.

[12] 3, 6, 8, 10 and 20

Table 3-2: the population of married women aged 15-49 in each selected region

Region (Column1)	Total population of eligible women in each region (Column 2)	Population of eligible women in each selected region Column 3 = (Column 2/276,999) *400
3	45,482	66
6	30,985	45
8	70,640	102
10	59,617	86
20	69,975	101
Total	276,699	400

Source: Statistical Centre of Iran (2016a)

Thus, the sampling technique employed in the present study may be termed as stratified three-stage random sampling in which the regions of Tehran were stratified into development zones according to level of development (Stage 1) after which a region was selected by simple random sampling from each zone (Stage 2). Lastly, the sample of eligible women was selected by simple random sampling from each selected zone (Stage 3). The purpose of applying a three-stage random sampling was to keep the accuracy and balance to cover the women from the different regions of Tehran city which varied in population and socio-economic characteristics. According to Cochran (2007) this method is more efficient and practical when a given population (like Tehran city) is divided into sub-populations which together comprise its whole.

3.4. Survey instruments

The survey instruments consisted of a structured questionnaire for gathering detailed quantitative information from married[13] women of reproductive ages 15 to 49 years. The overall content of the questionnaire was similar to the questionnaire used in Iran's Multiple Indicator Demographic and Health Survey (IrMIDHS) (Rashidian et al., 2010). However, the questions were tailored to suit the study population. Some additional sections in this questionnaire were included in order to collect information concerning respondents' attitudes towards marriage and also the recent pronatalist population policies in the country. A copy of the questionnaire is given in Appendix (1).

The time taken to complete the entire questionnaire for each respondent was on an average 30 minutes, although it varied from 20 minutes (minimum) to 2 hours (maximum).

3.4.1. Sections of questionnaire

The questionnaire designed for this study comprised of six sections which are as follows:

Section A Respondent's Background, Section B: Reproduction, Section C: Fertility Preferences, Section D: Division of Household Labour, Section E: Marriage and Fertility, Section F: Policy related.

Section A: In this section information was gathered on current age, place of birth, marital history, educational attainment, socio-cultural characteristics and occupation of eligible women. The respondent's age was obtained through a variety of questions. The age of respondents was asked directly (through asking their date of birth) and indirectly (through asking their age at first marriage and the date of their marriage) in order to re-check the accuracy of their answers. Marital history of surveyed women consisted of date of marriage (month and year), age at first marriage, and consanguineous marriage (women's relationships with their husbands in terms of relatives or non-relatives).

[13] Currently married at the time of the survey.

Socio-cultural characteristics of women in terms of education, ethnicity and religion were also asked about in the questionnaire. Moreover, the information associated with economic status and occupation of surveyed women was obtained through different ways such as by asking about the ownership of their accommodation, their household's monthly income and the type of job that women had. Finally the information on women's access to health care facilities was collected. These questions were designed to identify the socio-economic background of women which were found to be associated with the women's fertility desires and intentions.

Section B: In most demographic surveys, detailed questions about children ever born have become the standard type of questions. Designing these questions is rationally justified because in many societies women may ignore the existence of or under-count live-born children who have already died or children who are not living with their parents. Therefore, in this section of the questionnaire women were asked about their pregnancy histories, birth histories and the gender composition of their children. Moreover, surveyed women were asked about their method of contraception (if any) and also their reasons for use or non-use of contraceptives.

Section C: This section investigates the fertility preferences of the surveyed women. A variety of questions related to fertility preference examined actual and desired family size of respondents, their fertility intentions and preferred sex composition of children.

Section D: Women's role in household decision-making is identified as an important dimension of their status and autonomy which has implications for reproductive behaviour (Al Riyami et al., 2004; Jejeebhoy, 1995; Jejeebhoy & Sathar, 2001; Mahmood, 2002). This section asks about women's participation in household decision making in terms of economic, health and fertility (decision making). In addition, Section D asks about the division of household labour and the participation of men in household work.

Section E: This section (with two questions) asks about the ideal age of (first) marriage for girls and boys in Iran. The age at first marriage has a special importance for population studies because of its

bearing on fertility (Raymo, 2003; Shami et al., 1990; Torabi & Baschieri, 2010). According to Davis and Blake (1956) age at initiation of sexual union is one of the intermediate variables through which fertility is influenced. Cohabitation and extra-marital relationship is prohibited in Iran, which is an Islamic country (DeJong et al., 2005). Childbearing occurs within marriage: therefore the age at first marriage is considered to be the age of first sexual union which can influence childbearing in an Iranian context (Abbasi-Shavazi, 2000). The second question focuses on the surveyed women's attitudes towards marriage patterns in terms of love match' or 'arranged marriage' in the modernising context of the capital city. The findings from this section contribute to understanding the cultural context in which surveyed women live and reproduce.

Section F: This section aims to get information about respondents' attitudes toward population policies in the country and their impact on the environment, economy and society. This last section of the questionnaire also focuses on the newly introduced population policy in Iran which is implicitly a pronatalist population policy. For this purpose, women were asked if they agreed or disagreed with (support or not support) the implementation of a pronatalist population policy in Iran. Women's answers to this section will fulfil the aim of Chapter seven in the thesis which specifically reviews the pronatalist policies and their success or failure in the world and in Iran.

3.4.2. Training of interviewers and pilot test of the questionnaire

Five experienced and qualified female interviews were recruited as research assistants. They had Master's degrees in the field of demography and applied population studies: they also had extensive experience conducting socio- demographic surveys in their resumes. Research assistants, who were available from the "National Population Studies and Comprehensive Management Institute (NPSCMI)", were trained by the principal researcher for the purpose of conducting the fieldwork for this research. A one week training program was organised and conducted at "NPSCMI" and the information regarding aims of the survey and other valuable elements of study were discussed by the principal researcher. The aim of the training was to familiarise the interviewers with the questionnaire,

procedures of approaching the respondents and also creating rapport.

A pre-test of the questionnaire (pilot test) was conducted by the research team with 50 eligible women a couple of weeks before conducting the main fieldwork. The aim of the pre-test was to evaluate the effectiveness of the questionnaire in terms of logical sequence, consistency of questions and time. At the end of the pre-test, a meeting was held with the team of research assistants to discuss their comments on questions and plausible difficulties during the pre-test. The pre-test was very valuable as it provided comments that were useful in dealing with the questionnaires and in correcting minor errors, before preparing the final version of the questionnaires. The finalised questionnaire was printed in 450 copies in Farsi language and distributed among research assistants and the principal researcher.

3.5. Statistical tests used

For Chapter four, certain useful demographic indictors were measured through descriptive statistics such as frequencies, proportions and rates. The strength and the direction of relationships of a selected factor (for example, level of education) associated with each nominated demographic variable, (for example, children ever born and age at marriage), were examined through the bivariate analysis approach, mainly using the Chi-square test ($\chi 2$). A further statistical technique used in this study is logistic regression (Hosmer et al., 2013). Multinominal and binary logistic regressions were adopted in Chapters five and six respectively. The binominal logistic regression is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary) (Kleinbaum & Klein, 2010) and is used to explain the relationship between one dependent variable and one or more nominal, ordinal, interval or ratio-level independent variables. In Chapter six using logistic regression, the influence of women's characteristics (age, age at first marriage, level of education, employment status…) on the likelihood of contraceptive use versus non-use and also withdrawal use versus modern method use, as dependent variables, are examined. Multinomial logistic regression which is an extension of binary logistic regression allows for more than two categories of the dependent variables. Moreover, multinomial logistic regression, like binary logistic regression uses maximum likelihood

estimation to evaluate the probability of categorical membership (Hosmer et al., 2013). In Chapter five, multinomial logistic regression analyses the impact of the explanatory variables like age, age at first marriage, sex composition of children, women's level of education, women's employment status and contraceptive use on the likelihood of achieving the fertility goals.

3.6. Limitations and Difficulties of the study

There were certain limitations faced in the execution of this research. It was essential for the research team to assure the surveyed women (the respondents) that the project has no connection with the political parties or any governmental institution in Iran. Overall, the respondents were successfully convinced that the only aim of the research is scientific inquiry and their questionnaire will remain anonymous. However, despite the fact that steps were taken to assure the respondents of their anonymity and privacy, a limited number of respondents did not feel comfortable answering personal questions which were relevant to family planning and contraceptive use and insisted on stopping the interview. In such cases the interviews were stopped immediately to respect the respondents' wishes.

Moreover, in some cases, respondents (especially inhabitants of regions with high levels of development) requested more details about the implications of this study to ensure that their participation (spending their time) on the survey was important for the future of the country. In order to persuade this group of respondents to participate, the research assistants spent more time (than the average time taken to complete the entire questionnaire) to provide them with a convincing explanation with some further insights. For example, interviewers explained to the respondents that the findings of this research can assist the policy makers to revise their future plans in terms of health, economy and education and brought them some facts from other similar studies.

Another difficulty of this fieldwork was a lack of social trust[14] among the respondents in some regions of Tehran city. Hezarjaribi and Hamed (2007) concluded that the level of sense of security in Tehran

[14] According to Coleman (1990), social trust gives group members confidence in the expectation that others will act reliably and competently.

city is medium to low which has affected the social trust among residents of the capital city. Therefore, lack of cooperation among some respondents can be attributed to lack of social trust as they might be in fear that their security and benefits are threatened by others. During the fieldwork some research assistants reported cases in which the respondents hardly trusted them and sometimes did not open the door. These cases were mostly reported from Region 3 which is mostly inhabited by educated and wealthier residents. In such cases the respondents were treated as non-responses.

Availability of an online and updated database to get the demographic information of Tehran city was another restriction of the current research. The only available online statistics database in Iran is the website of 'Statistical Centre of Iran' and 'Sabte-Ahval organization'. Unfortunately, these websites were frequently not updated and they do not include demographic data for Tehran city (especially data relevant to the National Censuses of 2006 and 2011). Therefore, requesting data from the office of the Statistical Centre of Iran was the only way to get updated data, which was a time-consuming process. However, the assistance received from the National Population Studies and Comprehensive Management Institute (NPSCMI) accelerated this process.

3.7. Conclusion

This chapter outlines the data collection methodology and describes how the data are used. The data for this research was collected through a field-survey. Using Cochran's formula, a sample of 400 households, with at least one married woman aged 15-49 years, was drawn from Tehran city. The sample was identified through the two-stage stratified random sampling from the 22 regions of Tehran city. A structured questionnaire for gathering detailed quantitative information was designed though which women were interviewed face to face. A pre-test of the questionnaire (pilot test) was conducted by the research team among 50 eligible women prior to conducting the fieldwork in order to evaluate the effectiveness of the questionnaire in terms of logical sequence, consistency of questions and time. The bivariate analysis approach, mainly using the Chi-square test (χ^2) and the multinominal and binary logistic regressions were adopted as the frequent statistical techniques in this study.

CHAPTER 4: ANALYSIS OF SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF WOMEN IN THE STUDY AREA

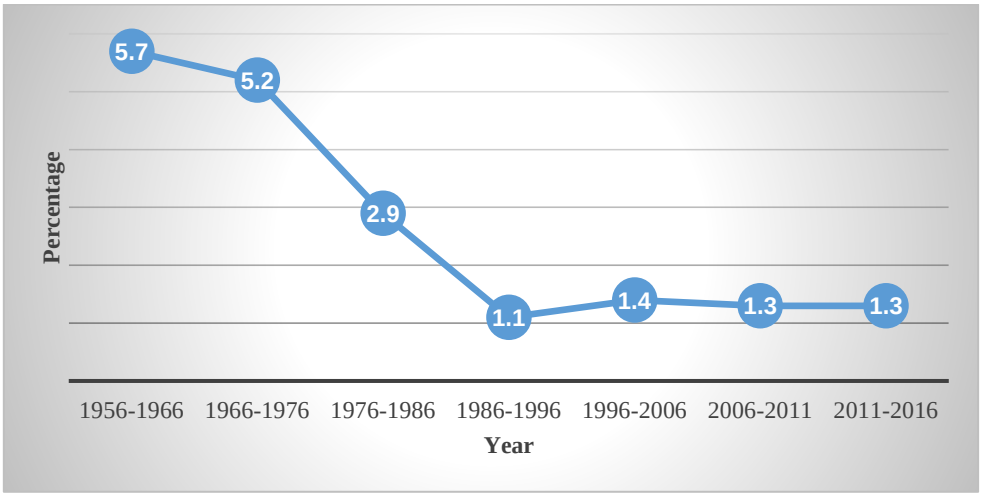
4.1. Introduction

This chapter provides a review of the overall population dynamics in Tehran and addresses an analytical discussion of socio-economic and demographic characteristics of women surveyed for this study. The information and discussion provided in this chapter offers the foundation for further in-depth analysis in the remaining chapters in this thesis.

4.2. Population dynamics in Tehran city

Tehran city is the capital of Tehran province as well as the capital of the country Iran. About 64 percent of the urban population of Tehran province has settled in Tehran city (Statistical Centre of Iran, 2011). The population of Tehran city reached two million people by 1960 with the annual population growth rate of 5.7 percent (Ostandari-Tehran, 2016; Tehran Municipality, 2016), however the growth rate dropped dramatically to 1.1 percent in the early 1990s. Nevertheless, by this time the total population has reached 6.3 million. This sharp decline in capital city growth was consistent with the drastic decline in the population growth rate in the country from the mid-1980s (Abbasi-Shavazi, 2002). The population growth rate in Tehran slightly increased by the early 2000s (Figure 4-1) and from then it has been quite stable. According to the latest census of Iran (2016), the population of the capital city has reached 8.6 million which represents 14.7 percent of the urban population of the whole country (Statistical Centre of Iran, 2016a).

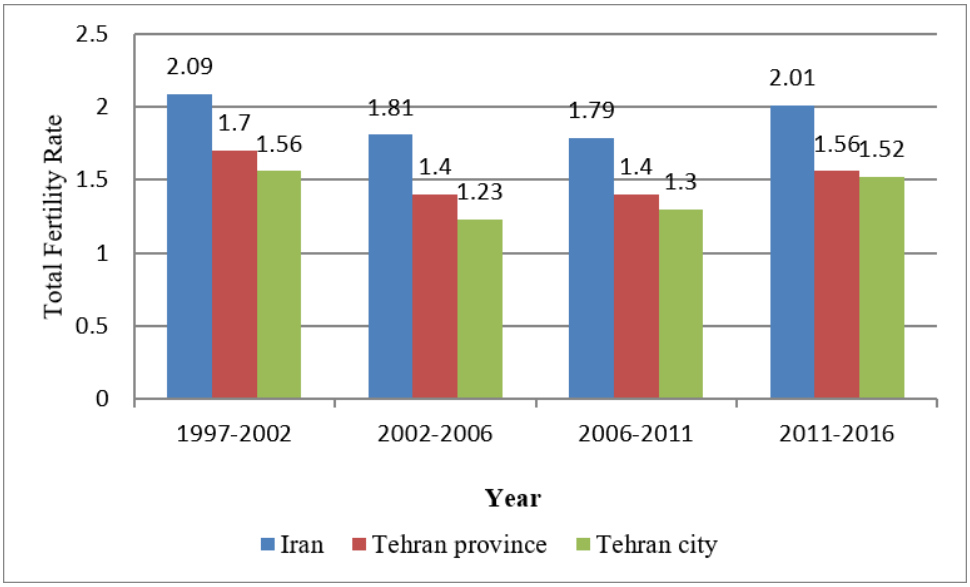
Figure 4-1: Population growth rate in Tehran city, 1956-2011



Source: Tehran Municipality (2016); Statistical Centre of Iran (2016a)

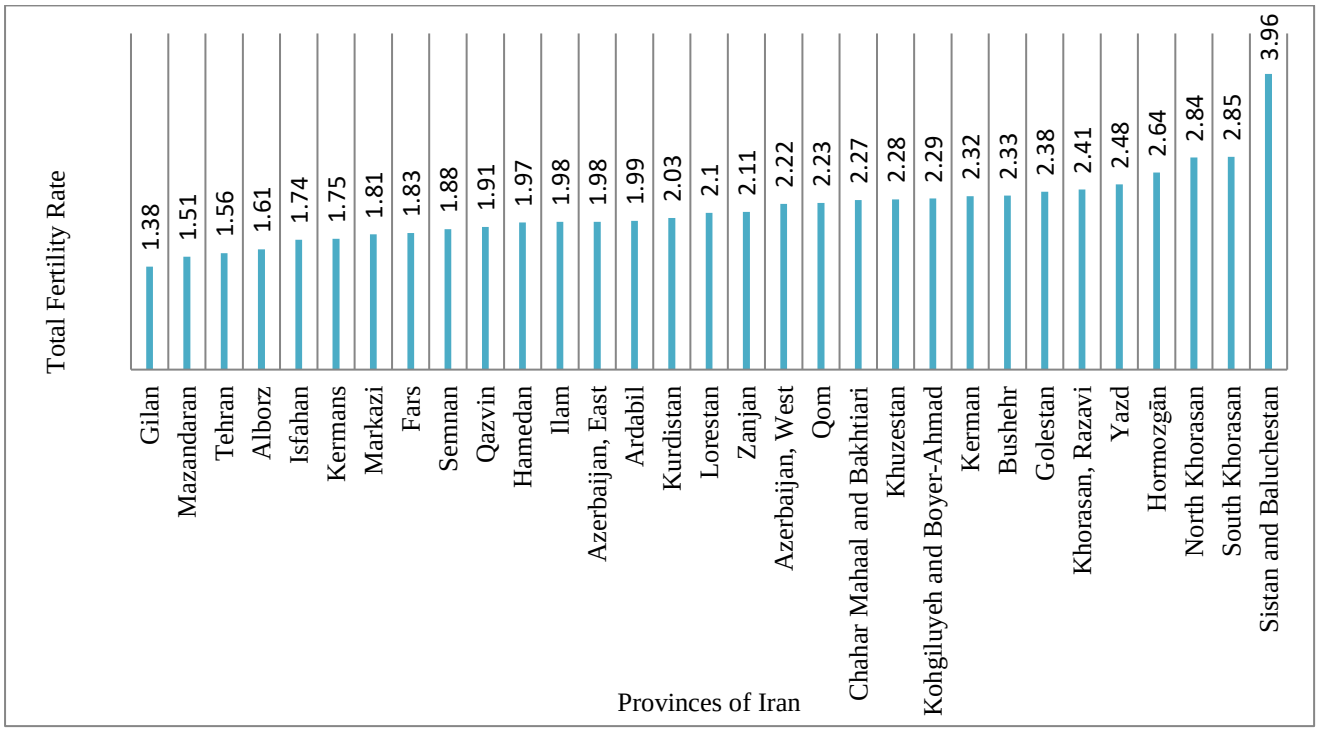
As far as total fertility rate (TFR) is concerned, Tehran city overall shows a continuing decline. Figure 4-2 demonstrates the total fertility rate (TFR) in Iran, Tehran province and Tehran city from 1997 to 2011. The total fertility rate in Tehran city which was about 1.6 in 1997-2002, further declined to 1.3 in 2002-2006. In the 2006-2011 period the total fertility rate in the capital city has been quite stable (Figure 4-2) (Abbasi-Shavazi et al., 2013). The findings of the latest census (2016) show that the total fertility rate in Tehran city has increased to 1.52 (Figure 4-2). As illustrated in Figure 4-2, the trend in total fertility rate in Tehran city is in accordance with the TFR in Iran and Tehran province. The TFR in Iran as a whole has remained stable for almost a decade (1.8) after a slight decline between 1997-2002 and 2002- 2006. However, the TFR increased between 2011 and 2016 and reached 2.01 (Statistical Centre of Iran, 2016a). The same trend can be seen in Tehran province. In this province TFR decreased from 1.70 in 1997-2002 to 1.40 in 2002-2006 and then has been steady until 2011. However, the 2016 Census shows that consistent with the increase in the total fertility in Iran, Tehran province experienced an increase in the TFR from 1.4 in 2011 to 1.56 in 2016 (Figure 4-2). It is worth noting that Tehran province has the third lowest TFR in Iran (Figure 4-2).

Figure 4-2: Total fertility rate in Iran, Tehran Province and Tehran city, 1997-2016



Source: Abbasi-Shavazi et al. (2013)

Figure 4-3: The total fertility rate in the provinces of Iran



Source: Statistical Centre of Iran (2016a)

The 2016 Census reveals that 88 percent of population increase between 2011 and 2016 (which equates to 1.84 million) in the capital city can be attributed to migrant population (Statistical Centre of Iran, 2016a). The migration history in Tehran city shows that the capital city has always been a favourite destination for migrants from all over the country. In 1976, the population composition of Tehran province showed that out of 4.5 million, about two million people immigrated from other provinces and the rest (2.5 million) were from Tehran city (Tehran Municipality, 2016). Between 1986 and 1996, around 568,000 people immigrated to Tehran city which showed a 14 percent increase compared with the previous decade. In 2006, Tehran province had the highest number of migrants (617,000) among the other provinces in the country and by attracting 31 percent of total number of migrants in the country Tehran was the most favourite destination for migrants (Tehran Municipality, 2016). Between 2006 and 2011, about two million people in Iran experienced out-province migration and a majority of these migrants (19.3 percent) moved to Tehran province (Statistical Centre of Iran, 2011). According to the findings of the 2016 Census, Tehran province comprise 20.2 percent of the total migrant population in the country (Statistical Centre of Iran, 2016a). Concentration of economic, political and administrative centers, and also high ranked universities and educational centres have been the most important reasons for migration to Tehran city (Zarghami, 2009). The sex ratio[15] among migrants who moved to Tehran city between 1976 and 1986 was 130. (Table 4-1).

Table 4-1: The sex ratio in Tehran city, Tehran Province and Iran

Year	Tehran city	Tehran province	Iran
1996	105.4	-	103
2006	104.4	106	104
2011	100.6	102	102
2016	100.51	101	103

Source: Statistical Centre of Iran (2011; 2016a); Tehran Municipality (2016)

[15] The ratio of males to 100 females.

The higher proportion of men to women in 1996-2006 in Tehran city and Tehran province was mainly due to men's economic immigration in search of better job opportunities in the capital city (Tehran Municipality, 2016). Because of the culture of "male breadwinner" in the country, men mostly look for jobs and hence migrate to the capital city. Moreover, since the cost of living in Tehran is more expensive than the other provinces, the majority of men do not bring their families. Interestingly, the findings of the 2011 and 2016 censuses show that the sex ratio in Tehran province and Tehran city has declined and is now lower than the sex ratio in the country (Table 4-1) which shows consistency with the reduction in the number of migrants between 2006 and 2011 in Tehran province and Tehran city (Statistical Centre of Iran, 2011) who were mostly men. The decrease in number of migrants (mostly male migrants) to Tehran city and Tehran province can be attributed to 'the Plan of Decentralisation from Capital City' proposed by the former president of Iran (Ahmadinejad, 2005-2013). This plan aimed to transfer some governmental institutions which were concentrated unnecessarily in Tehran, to other provinces of Iran. However, this plan was never completely implemented and discussions about it ended in 2015 (DW, 2010; Fararu, 2015). The findings of the latest census in Iran (2016) show that the sex ratio in Tehran city and province has been quite stable.

4.3. Demographic characteristics of women in Tehran and study sample

4.3.1. Women's age distribution in Tehran city

The age structure of women 15-49 in Tehran city in two consecutive censuses, 2011 and 2016, are displayed in Table 4-2 and Table 4-3. As can be seen in Table 4-2, in 2011, women aged 20-24, 25-29 and 30-34 years have the highest proportion among all women in the reproductive age group. Subsequently, in 2016 (Table 4-3), age groups 25-29, 30-34 and 35-39 years are in the majority (with a 5-year time delay). The high proportion of women in the two specific age groups is the result of the increase in the fertility rate in the 1980s in Iran which was the consequence of adaptation of a pronatalist approach after the Islamic revolution (1979) and postponement of the family planning program in the country (Abbasi-Shavazi, 2002; Hosseini-Chavoshi & Abbasi-Shavazi, 2012).

Table 4-2: Population distribution of women aged (15-49) in Tehran city (5 year age-group), 2011

Age group	Population of all women	Percent	Population of married women	Percent
15-19	268,333	10.6	25,826	1.6
20-24	411,259	16.3	150,908	9.6
25-29	512,606	20.3	313,676	20.0
30-34	418,666	16.6	318,597	20.3
35-39	316,911	12.6	262,279	16.7
40-44	310,254	12.3	260,422	16.6
45-49	283,880	11.3	238,540	15.2
Total	2,521,909	100 (N=2521909)	1,570,248	100 (N=1570248)

Source: (Statistical Centre of Iran, 2011)

Table 4-3: Population distribution of women aged (15-49) in Tehran city (5 year age-group), 2016

Age group	Population of All women	Percent	Population of Married Women	Percent
15-19	248,953	9.8	19,820	1.2
20-24	295,177	11.6	106,536	6.5
25-29	429,150	16.8	261,296	16.0
30-34	519,236	20.4	380,258	23.3
35-39	427,952	16.8	342,073	20.9
40-44	321,729	12.6	267,674	16.4
45-49	308,836	12.1	256,639	15.7
Total	2,551,033	100 (N=2,5510,333)	1,580,129	100 (N=1,634,296)

Source: Statistical Centre of Iran (2016a)

Table 4-2 and Table 4-3 provide information on the number of married women in reproductive age group in Tehran city. Marital status plays an important role in determining the chances of childbearing in societies where premarital births are not approved of. In Iran cohabitation and giving birth to children in informal unions has always faced resistance by Iranian social norms (Saraee & Ojaghloo, 2013). Therefore, this research is focused on births to married women in the reproductive age group in Tehran city. As can be seen in Table 4-2 and Table 4-3 the proportion of married women in the younger age

groups (15-19, 20-24 and 30-39) has declined from 2011 to 2016. Consequently, in 2016 the proportion of married women aged 30-34 and 35-39 has increased which is consistent with the increase in women's age at marriage in Iran (more details in section 4.3.2). The findings of this study (Table 4-4) shows that consistent with the 2016 Census, women aged 25-39 have the highest proportion, however, the proportion of married women aged 15-19 is negligible.

Table 4-4: Percentage distribution of women's age group

Age group	Population of surveyed women	Percent
15-19	4	1.0
20-24	29	7.2
25-29	78	19.3
30-34	104	25.7
35-39	77	19.0
40-44	75	18.5
45-49	38	9.4
Total	405	100 (N= 405)

Source: Fieldwork (2015)

4.3.2. Trends in the female singulate mean age at first marriage in Iran and Tehran

Increase in female's age at first marriage is a global phenomenon (Blossfeld, 1995; Carmichael et al., 2016; Dixon & Grant, 2014; Jones, 2007a, 2009). In the 1970s, female singulate mean age at marriage[16] in Asia was less than 22 years in 20 countries. Three decades later, this reduced to six countries, whereas in 33 Asian countries, women's singulate age at marriage was recorded above 22 years (Torabi & Abbasi-Shavazi, 2016).

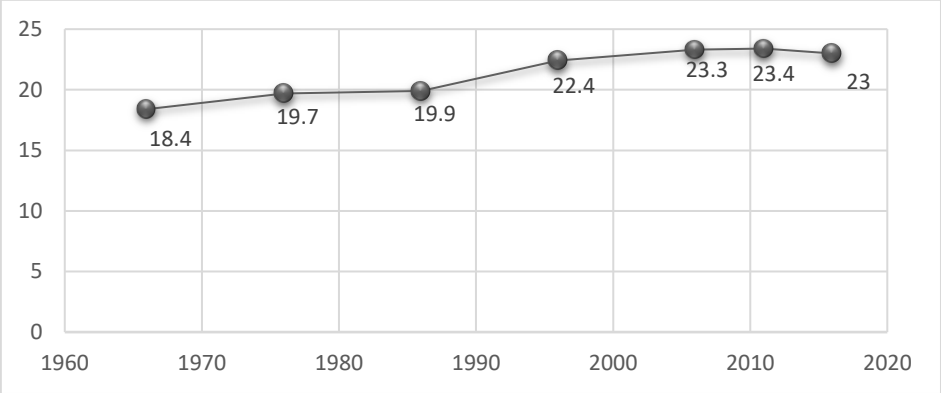
[16] The singulate mean age at marriage (SMAM) is the average length of single life expressed in years among those who marry before age 50 (United Nations, 2013).

The trend in delay at marriage varies in different cultures. In Asia, delayed marriage has been attributed to socio-economic and ideational changes (Jones, 1980, 2007b; Rashad et al., 2005; Situmorang, 2007; Tsuya, 2000). The better access to formal education especially for women, increase in female's economic participation in paid work and changes in youth expectations towards marriage because of urbanisation and modernisation, are examples of changes in Asian countries. In Iran, the trends in age at marriage can be explained by different periods of social change in the country:

Before the 1980s: During this period the first national family planning program (1989) was introduced in the country. Therefore, the legal minimum age at marriage for boys and girls was increased. Also, the various programs were implemented to improve women's status in the country. **1980s:** Following the Islamic revolution and the war between Iran and Iraq, family planning in Iran was suspended and the minimum legal age at marriage was reduced, from 15 to 13 for girls and 18 to 15 for boys (Abbasi-Shavazi et al., 2013). **After the 1980s:** In order to improve the socio-economic situation in the country, the government implemented many infrastructure projects. During this period, the family planning program was resumed and supported by the Islamic government and the age at marriage was increased (Abbasi-Shavazi, McDonald, & Hosseini-Chavoshi, 2003). In this context, women's age at first marriage increased from 18.4 years in 1966 to 23.4 years in 2011 (Figure 4-4).

Despite the fact the mean age at first marriage, especially for women, has increased over the past 50 years in Iran, the results of the 2016 Census show that between 2011 and 2016 the mean age at first marriage, for the first time over the last decades, decreased to 23 (Statistical Centre of Iran, 2016a).

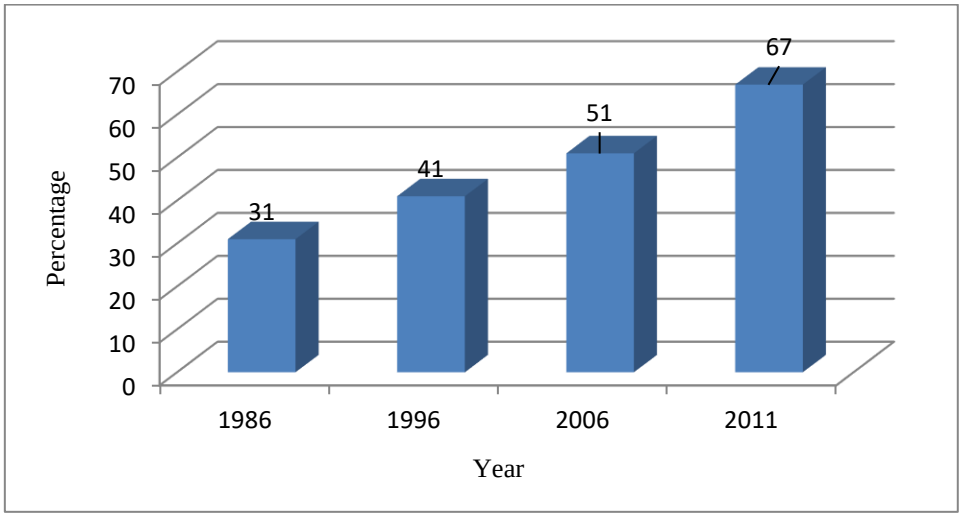
Figure 4-4: Female's mean age at first marriage in Iran, 1966-2016



Source: Statistical Centre of Iran (2016a)

The increase in the mean age at first marriage from 1966 to 2011 has been coupled with urbanisation, changes in material expectations and an imbalance in the number of eligible men and women due to the changes in the age structure of the population (Torabi & Abbasi-Shavazi, 2016). However, consistent with the findings of studies conducted about marriage timing around the world (Blossfeld, 1995; England & Farkas, 1986; Jones, 2007a, 2007c, 2009; Oppenheimer, 1988; Raymo, 2003; Thornton et al., 1994), an increase in human capital and improvements in female education have been major sources of influence on marriage postponement in the country (Habibpour Gotabi & Ghaffary, 2011; Mahmoudian, 2005; Torabi & Baschieri, 2010; Torabi et al., 2013). Examining the causes of delayed marriage among women in 1976–1980 birth cohort (who contributed to the recent marriage postponement in Iran), Torabi et al. (2013) argue that a growing importance of high school education for Iranian girls has been associated with the lower marriage rate in this birth cohort. This trend can be extended to the higher educational attainment of Iranian women which has led to the further postponement of age at first marriage in the country. As can be seen in Figure 4-5 in 1986, women constituted 31 percent of university students (versus 69 percent men) which increased to 41 percent by 1996. The participation of women in higher degree education has further increased to 51 percent and 67 percent by 2006 and 2011 respectively (Statistical Centre of Iran, 2011) (see more details in section 4.1).

Figure 4-5: Proportion of women among all students in the university sector Iran, 1986-2011



Source: Statistical Centre of Iran (2011)

Table 4-5 shows that Tehran has the fourth highest age at first marriage for women in the country. As can be seen in Table 4-5 there is no specific relationship between the age at first marriage and the total fertility rate in the country. For example, the total fertility rate in Ilam province and Kohgiluyeh and Boyer-Ahmad, which have the highest age at first marriage, are respectively 1.98 and 2.28. On the other hand, the age at first marriage in Sistan and Baluchestan with the highest total fertility rate in the country (3.96) is 23.3 which is higher than age at first marriage in the provinces of Qazvin and East Azerbaijan which have the lower levels of the TFR. Nevertheless, the last five provinces in Table 4-5 which have lowest age at marriage for women are the provinces with the highest levels of fertility in the country.

Table 4-5: The mean age at first marriage and the TFR among women in 31 provinces of Iran, 2016

Province	Mean age at first marriage	TFR
Ilam	26.1	1.98
Kohgiluyeh and Boyer-Ahmad	25.2	2.29
Kermanshah	24.7	1.75
Tehran	24.2	1.56
Lorestan	24.2	2.10
Semnan	24.1	1.88
Alborz	23.8	1.61
Fars	23.8	1.83
Gilan	23.7	1.38
Chahar Mahaal and Bakhtiari	23.5	2.27
Khuzestan	23.5	2.28
Isfahan	23.3	1.74
Kurdistan	23.2	2.03
Kerman	23.0	2.32
Mazandaran	22.7	1.51
Hamedan	22.7	1.97
Azerbaijan, West	22.5	2.22
Markazi	22.5	1.81
Golestan	22.5	2.38
Bushehr	22.4	2.33
Hormozgān	22.4	2.64
Zanjan	22.4	2.11
Ardabil	22.4	1.99
Sistan and Baluchestan	22.3	3.96
Qazvin	22.1	1.91
Azerbaijan, East	22.0	1.98
South Khorasan	22.0	2.85
Qom	21.9	2.23
North Khorasan	21.9	2.84
Yazd	21.3	2.48
Khorasan, Razavi	21.1	2.41

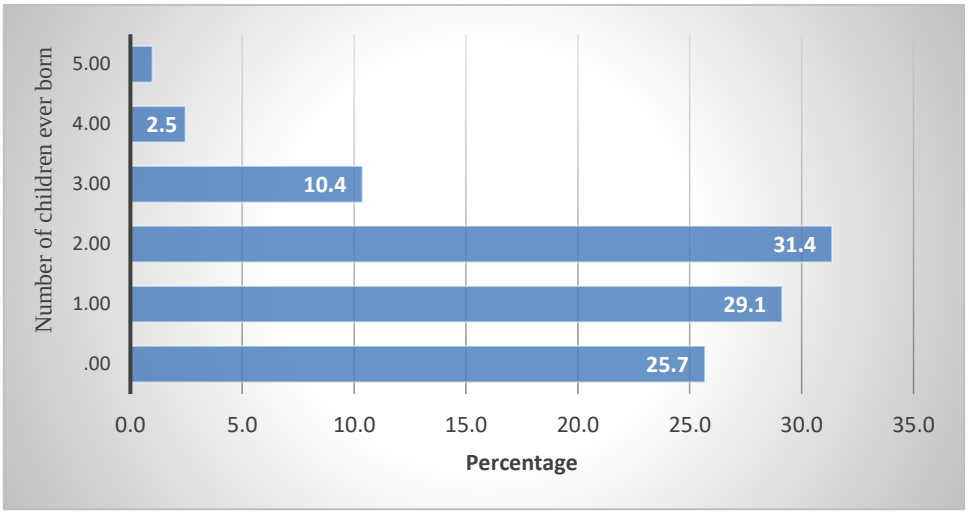
Source: Statistical Centre of Iran (2016a)

The findings of the 2011 Census in Iran revealed that women's mean age at first marriage in Tehran city reached 26 which is the highest of the urban areas in the country (Tehran Municipality, 2016). In this study the mean age at first marriage for selected women is estimated 22.8 years which is consistent with women's mean age at first marriage in Iran (23) in the census 2016. However, it's lower that the mean age at first marriage in Tehran city in 2011.

4.3.3. Children ever born to surveyed women

The overall review of the number of children ever born (CEB)[17] to women aged 15-49 in this study is displayed in Figure 4-6. The mean CEB of surveyed women is 1.38. In this study, as the majority of women (72 percent) are aged 15-39 i.e. still have 10 years and more to complete their reproductive span, it's not surprising that the mean CEB is also relatively low. As can be seen in Figure 4-6 almost 30 percent of women have two children. The proportion of women with three children and more is only 14 percent.

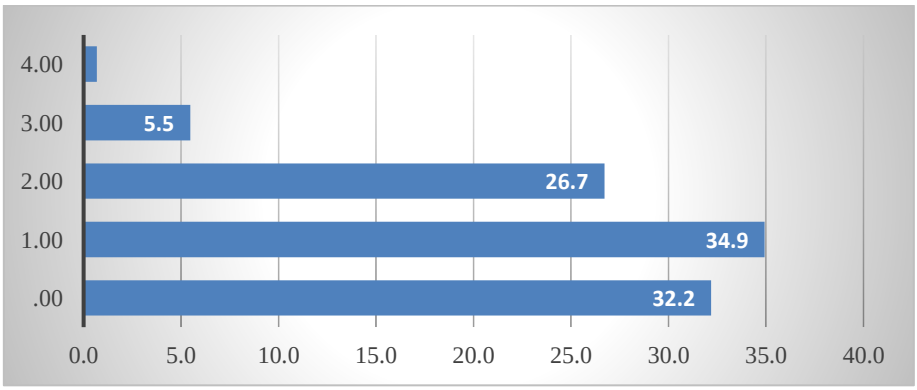
Figure 4-6: Percentage distribution of women according to children ever born to them, Tehran, 2015



Source: Fieldwork (2015)

[17] Children ever born (CEB) to women in a particular age group is the mean number of children born alive to women in that age group. The number of children ever born to a particular woman is a measure of her lifetime fertility experience up to the moment at which the data are collected (United Nations, 2018).

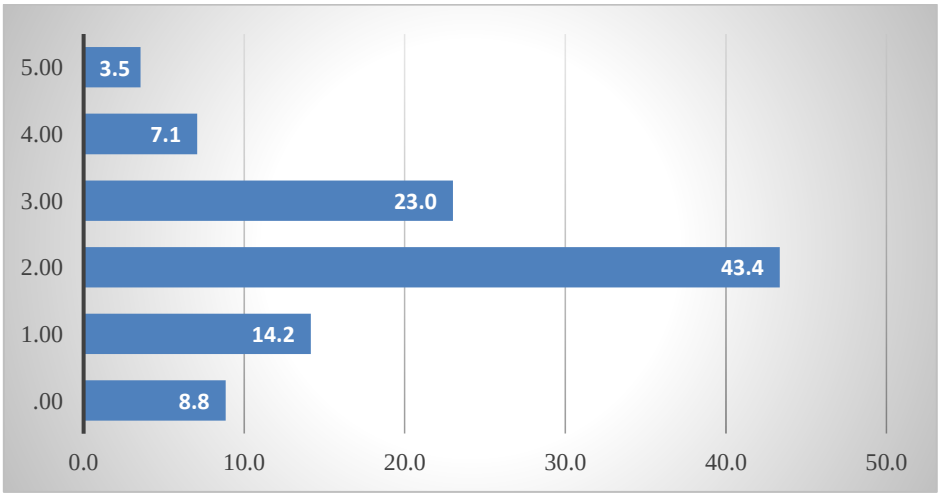
Figure 4-7: Percentage distribution of women 15-39 according to their CEB, Tehran, 2015



Sorce: Fieldwork (2015)

Figure 4-7 and Figure 4-8 demonstrate the CEB in two age groups, 15-39 and 40-49. As expected, the mean CEB of women aged 15-39 is almost one child as this age group still have years to complete their childbearing span. However, the mean children ever born to women aged 40-49, who are at the end of their childbearing period, is more than two children (2.16).

Figure 4-8: Percentage distribution of women 40-49 according to their CEB, Tehran, 2015



Source: Fieldwork (2015)

Figure 4-7 shows that slightly more than 30 percent of women aged 15-39 are yet to have a child. However, the proportion of women with zero parity among women aged 40-49 is less than 10 percent (8.8). According to Morgan (1991) in the past, childlessness was mainly involuntary and occurred within a large family system, therefore there was no reason for concern. However, contemporary childlessness is mostly voluntary and it is occurring in the context of a small family system. Despite the rapid changes in fertility in Iran, there are few attempts to investigate the childlessness in the country. A review of the literature on childlessness in the country reveals that almost all studies have focused on involuntary childlessness or infertility. However, little specific research has been undertaken to study voluntary childlessness in Iran. Razeghi-Nasrabad et al. (2013), using data from the 2000 Iran Demographic and Health Survey (IDHS) and the 1991-2003 survey of Socio-Economic Characteristics of Household in Iran (SECHI), showed that childlessness among women aged 15-39 increased during the period 1991-2003. In contrast, the proportion of childlessness in the last years of the reproductive life, which can be considered as permanent childlessness, has decreased from 3.8 to 2.2 percent. Razeghi-Nasrabad et al. (2013) argue that delaying the first birth appears to be the most important indicator of the increase in childlessness of women aged under 40, which is associated with women's education and marriage age. The results of their study also reveal that only two percent of women remain childless in last years of their reproductive life which probably arises from involuntary childlessness. According to Razeghi-Nasrabad et al. (2013) the improved access to reproductive technologies in Iran may have resulted in the reduction in lifetime (involuntary) childlessness in the country and most women with zero parity ultimately may progress to motherhood. Abbasi-Shavazi and Razeghi-Nasrabad (2010) and Hosseini-Chavoshi (2007) argue that despite the fact that the fertility behaviour of Iranian women has had the ideational change towards a small family size norm, there was little to no preference toward zero parity.

4.4. Socio-economic characteristics of women in Tehran and study sample

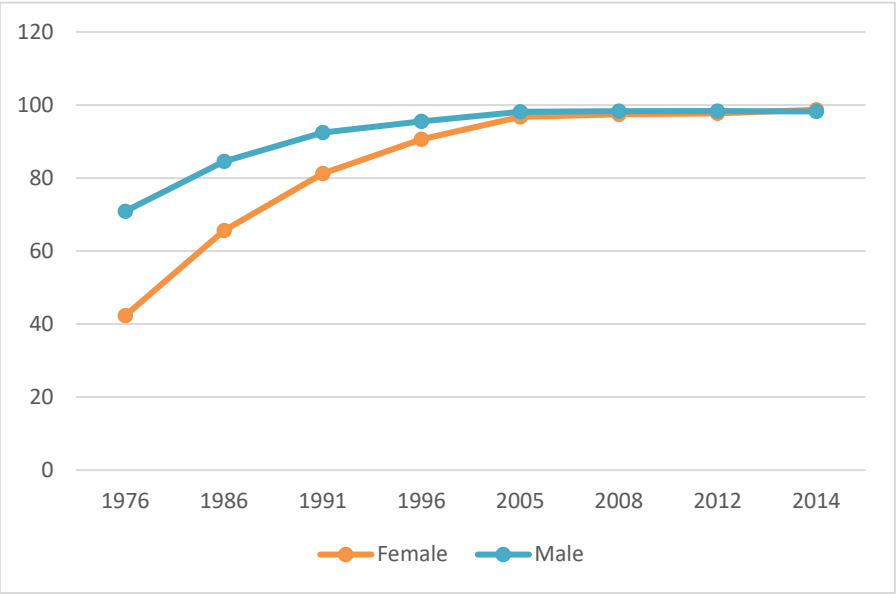
The socio-economic status of a population is best examined by educational achievement and the economic activities of the population. This section presents a discussion on the educational and employment status of women in Tehran city in general and of women in this study sample.

4.4.1. Women's educational attainment

Education is an important tool for assessing relevant information that supports improvements in the lives of women and their families. Female education especially has a powerful influence on various aspects of women's lives (Aslam et al., 2008; Bbaale, 2014; Jejeebhoy, 1995; Kemp, 2013; Malik & Courtney, 2011; Roy, 2011). In recent years there have been striking improvements in female education in Iran (Lutz et al., 2010).

After the 1979 revolution, the post-revolutionary constitution of Iran made the government responsible for providing universal primary education. The availability of schools, even in remote rural areas, and a new perception of the educational system as being Islamic, resulted in a noticeable reduction of cultural barriers against girls' education (Shaditalab, 2005). The *Literacy Movement* was an organisation aimed at instructing all illiterate Iranians above ten years of age. The organisation began its task in 1979 (after the Islamic revolution) by sending volunteer school graduates to the villages as teachers. It contributed a significant improvement in female education in rural areas (Lutz et al., 2010). The female adult literacy rate in Iran increased from 65.6 percent in 1986 (65.2 percent in urban and 36.0 percent in rural areas) to 84.71 percent in 2014 (85.5 percent in urban and 69.0 percent in urban areas) (Abbasi-Shavazi et al., 2009). Figure 4-9 demonstrates the remarkable increase in the literacy rate of Iranian youth over the last four decades in Iran. As can be seen (Figure 4-9), since 2005 the gender gap of the literacy rate is disappearing in the country.

Figure 4-9: Literacy rates among the population aged 15–24 years in Iran, 1976–2014

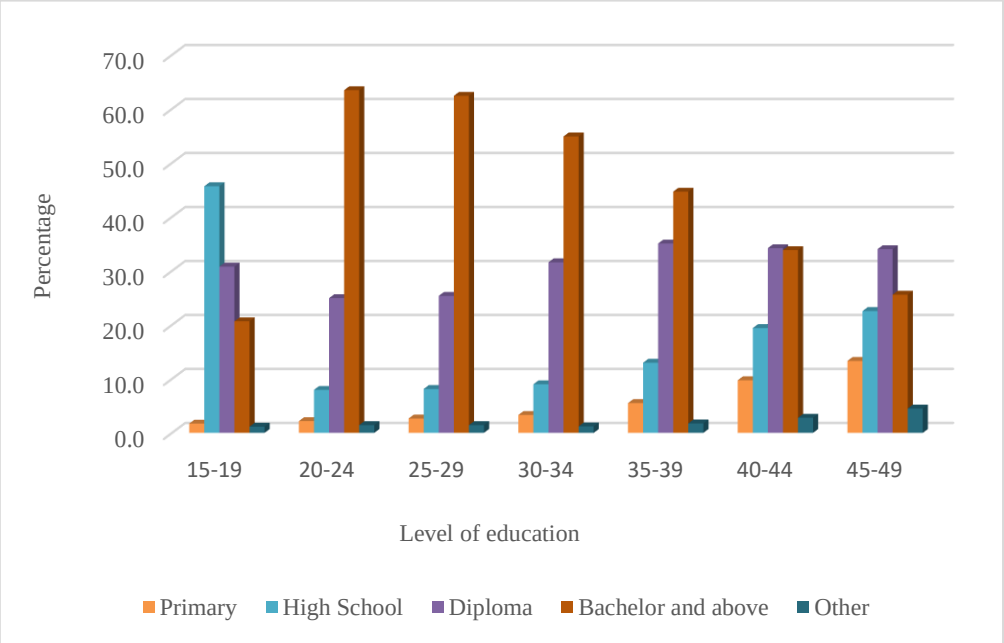


Source: UNESCO (2018)

Figure 4-10 demonstrates the educational attainments of women aged 15-49 in Tehran city in 2016. It's evident there is a negative significant relationship between women's age and their level of education: as women's age increases the proportion of women with primary and high school education increases. Conversely, the proportion of women with university degrees declines as women's age increases. Nevertheless, it should be noted that a significant proportion of women in each age group have higher educational attainments. More than a third of women aged 40-44 and a fifth of women aged 45-49 have attained at least a bachelor's degree, while, the proportion of women with primary education even among the oldest age group (45-49) is only 13 percent. It should be noted that by encompassing the high rank universities, research centres and academic institutions Tehran city has become the destination of the

majority of higher educated women throughout the country (Mahmoudian et al., 2010). Therefore, it's not surprising that a significant proportion of women in each age group have university degrees.

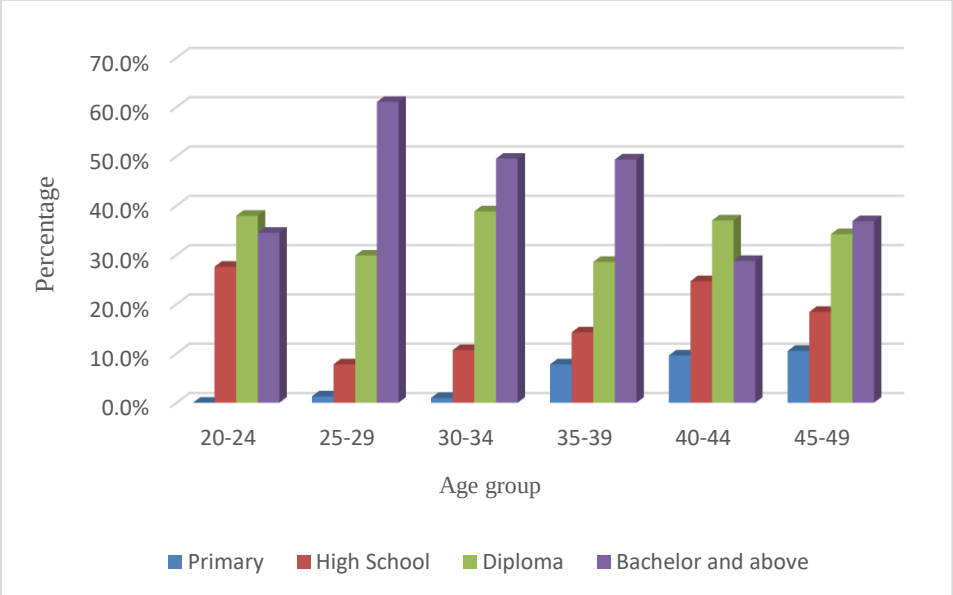
Figure 4-10: Percentage distribution of women aged 15-49 by highest achieved level of education, Tehran city, 2016



Source: Statistical Centre of Iran (2016a)

The educational level of surveyed women is displayed in Figure 4-11. It should be noted that the proportion of women aged 15-19 is very small (almost one percent of the sample size). Therefore, this age group will be discarded in the calculations. As can be seen in Figure 4-11, consistent with the results of the 2016 Census, a significant proportion of women in each age group have a diploma or university degree. The dominant level of education among young age groups is bachelor's degree and higher. The proportion of women with only primary education is very insignificant in this study. Interestingly, almost 10 percent of women aged 45-49 only finished elementary school, however; more than a third of women in this age group have university education (37 percent).

Figure 4-11: Distribution of women by their level of education, Tehran, 2015



Source: Fieldwork (2015)

The relationship between education and fertility has been investigated in a number of demographic publications (Cleland & Rodriguez, 1988; Cochrane, 1993; Holsinger & Kasarda, 1976; Isen & Stevenson, 2010; Jejeebhoy, 1994). Education is expected to impart values, aspirations, and skills which encourage and facilitate women's non familial roles such as increased returns to human capital, improved women's health and access to the labour market. It has been argued that education by enhancing women's position within the family and society has been recognised as a crucial factor in determining fertility patterns. In fact, education was shown to impact on a wide range of behaviour, most of which have a negative impact on fertility (Kohler et al., 2002; Lutz & Samir, 2011; Martin & Juarez, 1995; Rindfuss et al., 1980).

Shaditalab (2005) argues that the higher levels of female education after the Islamic Revolution (1979) in Iran elevated the women's expectations to participate in socio-economic activity outside the home. Moreover, achievement of the higher educational levels has changed perceptions of women regarding

their familial and social gender roles (Hoodfar, 1996). According to Kaveh-Firouz and Abbasi-Shavazi (2004) education as one of the implicit governmental policies, indirectly contributed to the onset of the fertility decline in the 1980s, and undoubtedly helped the success of the family planning program in the

1990s. Moreover, education has had a significant role in contraceptive method use among Iranian couples. The high prevalence of withdrawal use in Iran has been found to be highly associated with women's education (Erfani, 2012) (see more details in Chapter Six).

4.4.2. Employment status of women in Tehran city

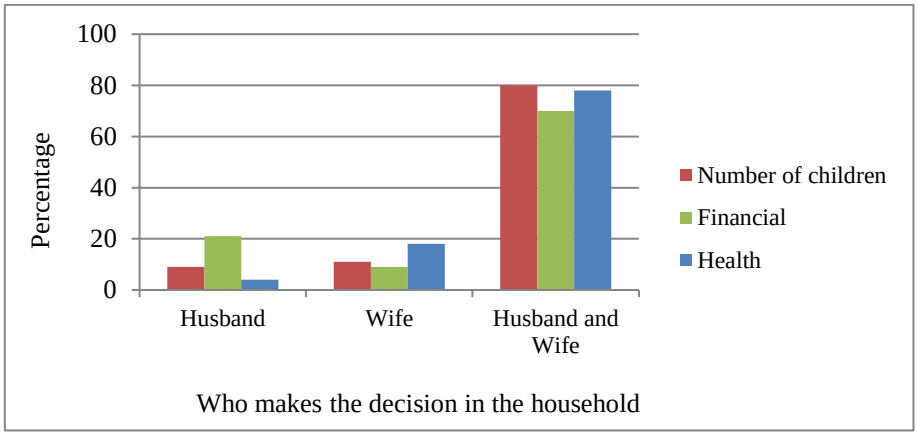
In many parts of the world, higher educational achievement increased women's participation in the labour force and reduced the economic benefits of marriage (Jones, 2007a, 2009). Abbasi-Shavazi and Mandegari (2010) argue that over the preceding decades, due to socio-cultural changes especially in family structure in Iran, women's presence and participation in society and labour force has increased. However, compared to the considerable increase in women's education, women's labour force participation has not significantly increased and has remained low (Rezai-Rashti, 2011; Torabi & Abbasi-Shavazi, 2016). The findings of the 2017 labour force survey in Iran show that men's employment rate in Iran is 4.5 times more than women's (58.9 versus 13.2) (Statistical Centre of Iran, 2017a). A deep-rooted cultural emphasis on differentiated gender roles within the family can partly explain why economic participation of Iranian women (in spite of educational improvement) is low (Torabi & Abbasi-Shavazi, 2016). Despite the fact that younger Iranian women believe that female employment is not a barrier for starting a family, the social acceptability of well-established gender roles is not expected to be either easy or rapid in Iran (Abbasi-Shavazi et al., 2009). Therefore, in the cultural context of Iran in which the man is the breadwinner, men have the bigger chance of a job than women. In this study slightly fewer than half of the respondents are employed (45.2). Intrestingly, a significant proportion of employed women have professional and managerial jobs (76 percent) which can be associated with the high proportion of women with university degrees in this study.

4.4.3. Women's empowerment in their household

Autonomy is defined as the ability of achieving information and making decisions about one's own concerns (Dyson & Moore, 1983). Blood and Wolfe (1960) in "resource theory" assume that, spouses'

autonomy is greatly influenced by their relative resources such as education, occupation, income and to a lesser extent social participation. In their study 'Husbands and Wives', Blood and Wolfe (1960) conceptualised marital power as the "potential ability of one partner to influence the other's behavior . . . manifested through the ability to make decisions". Blood and Wolfe (1960) argue that the marital couple balance the power (in the household) based on the relative resources that each spouse contributes to the union. Therefore, the spouse who contributes the greater resources holds the greater influence in the household decision-making process. According to Blood and Wolfe (1960) it can be concluded that the distribution of power in a family refers to access to relative resources more than traditional gender roles. The result of a study in Iran based on the 'theory of resources' indicates that women have high power in decision-making in the country (Nayebi & Golshani, 2013). This study reveals education, employment and personal property have a strong and positive relationship with women's power in decision-making. According to Abbasi-Shavazi et al. (2005) under the influence of family revolution in Iran, the patriarchal nature of decision-making has reduced, and the gender roles have changed. In this context, the lowest levels of fertility (two children and fewer) appears when women and their husbands jointly make a decision about different aspects of their life such as their number of children, method of contraception and time interval between children in their life (Abbasi-Shavazi et al., 2005). Consistent with Abbasi-Shavazi et al. (2005), the findings of this study in Figure 4-1 reveal that in low fertility context of Tehran (TFR= 1.5 in 2016), a majority of surveyed women make households' decisions along with their husbands (Figure 4-12).

Figure 4-12: Percentage distribution of individuals who makes the decision in family



Source: Fieldwork (2015)

Interestingly, more than 70 percent of women reported that the decisions about the number of children, health and financial issues are made jointly with their husbands which reflect women's empowerment in the household.

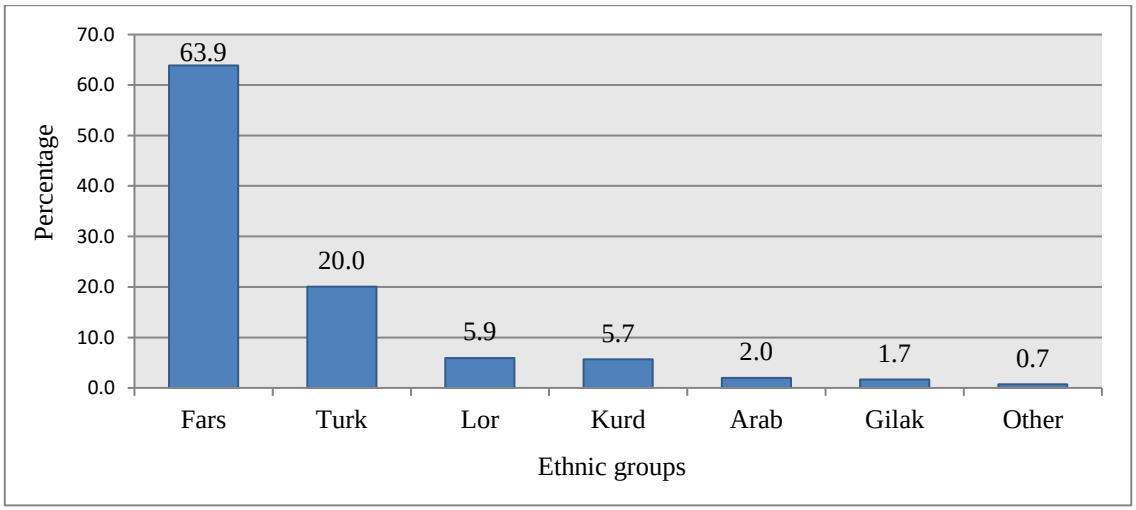
4.4.4. Women's ethnic status

Iran is a multi-ethnic society (Abbasi-Shavazi & Hosseini, 2009). The Population of Iran is composed of a range of different ethnic groups (Abbasi-Shavazi & Jones, 2001; Bashiriyeh, 2017). In addition to the majority Persian group, the main groups are Arab, Baluch, Kurd, Lore, Turk and Tukmen (Abbasi-Shavazi et al., 2005). Although regional dialects are spoken, Farsi the official language, is understood throughout the country (Abbasi-Shavazi & McDonald, 2006).

Examining the fertility behaviour of four major ethnic groups, Persians, Turks, Kurds and Baluch, Abbasi-Shavazi and Hosseini (2009) argue that ethnic groups in Iran have experienced different fertility levels and trends as compared with the national fertility during the fertility transition period. They note that the timing and pace of fertility decline has varied by ethnicity, while the convergence of fertility behaviour has occurred by the mid-1990s in Iran. Abbasi-Shavazi and McDonald (2006) argues that despite the drastic fertility decline in all provinces of Iran, some fertility differentials remain across the country. According to Abbasi-Shavazi and McDonald (2006) provinces located on the borders of the

country have had higher fertility, however, provinces in the central parts of Iran, specifically those close to the capital city, displayed the lower levels of fertility which reflects cultural (both ethnic and religious) differences. Among the different ethnic groups the Baluch ethnic group had the highest fertility. Sistan and Baluchistan province is located in the South-Eastern part of Iran and shares borders with Afghanistan and Pakistan. This province stands out with the lowest levels of socio-economic development (Abbasi-Shavazi & McDonald, 2006). The results of the 2016 Census indicate that the total fertility rate in this province is 3.96 which is the highest in the country. Interestingly, studies have shown that the level of fertility in Pakistan's Baluchestan, where people of the same ethnicity (Baluchi) are living, is higher than other provinces of Pakistan (Arnold & Sultan 1992). Persians and Turks have shown lower fertility levels than the other two ethnic groups (Abbasi-Shavazi & Hosseini, 2009). Tehran city, where one-seventh of Iran's population resides, includes diverse socio-economic and ethno-cultural subgroups (Erfani, 2015). As can be seen in Figure 4-13, consistent with the national level[18], a majority (64 percent) of respondents are Fars, with Turks a fifth of respondents in this study. Each of other ethnic groups encompasses less than six percent of the respondents.

Figure 4-13: Percentage distribution of respondents' ethnicity



Source: Fieldwork (2015)

[18] Fars ethnicity comprises more than half the population of Iran (Abbasi & Sadeghi, 2006).

The fertility behaviour of the major ethnic groups in this study reveals that the mean children ever born to Fars and Turk respondents are 1.30 and 1.50 respectively. This finding is consistent with the findings from a research conducted by Abbasi-Shavazi and Hosseini (2009). The Fars and the Turks have low TFR. Considering the fact that Fars and Turks make up most of the respondents in this study, it is expected that fertility analysis in this research will be very much in a low fertility context.

4.5. Conclusion

Tehran city, where one-seventh of Iran's population resides, comprise diverse socio-economic and ethno-cultural subgroups (Erfani, 2015). Tehran Province and Tehran city, consistent with the fertility decline in the country from the mid-1980s, have had one the lowest[19] total fertility rates (1.56 and 1.52 respectively) along with one of the highest age at marriage (24.2 and 26 respectively) in the country (Statistical Centre of Iran, 2016a). In this context, respondents (married women aged 15-49) on average have given birth to 1.37 children. However, a majority of women (72 percent) are aged 15-39 who still have years to complete their reproductive span. The high level of education among women in this study is consistent with the significant proportion of women in higher education not only in Tehran city but also throughout the country. The high rank universities, research centres and academic institutions have made Tehran city as the destination of the majority of higher educated women throughout the country (Mahmoudian et al., 2010). Despite the considerable increase in women's education, women's employment rate in Iran has not significantly increased (Rezai-Rashti, 2011). According to Erfani (2013a) less than one sixth of married women in Iran are employed. However, the findings of this study shows that slightly less than half of women are employed. It should be noted that this study is conducted in the captial city where the job opportunities (for both women and men) are more than other provinces

of Iran. Although Thran city is a combination of different ethnic groups in the country, consistent with ethnic composition in the country, the Fars ethnic is in majority (64 percent). Therefore, it can be concluded that the fertility behaviour and preferences of surveyed women are shaped in a low fertility

[19] After provinces of Gilan and Mazandaran

context in which two child norm is still prevalent, women have no preference for the sex composition of their children (no sex prefernce), women's educational attainments are high, the employment rate of women is higher than the average (of female employment) in the country and women have empowerment to make the household decisions jointly with their husbands. The next chapter in this thesis provides the analysis of the gap between expected and desired family size.

CHAPTER 5: THE GAP BETWEEN DESIRED AND EXPECTED FERTILITY

5.1. Introduction

Stability and change in fertility desires and expectations of women over time have been studied both for possible population forecasting and for their intrinsic merit as data about attitudes of women concerning their future fertility (Freedman et al., 1980). Factors associated with fertility desires and actual fertility as well as the relationships between them, have been investigated in a number of studies (Hagewen & Morgan, 2005; Monnier, 1989; Roy et al., 2008; Thomson et al., 1990). However, there have only been a few attempts to find out what accounts for the discrepancies between desired family size and actual fertility and their implications for women's reproductive health and well-being. The literature on predictability of reproductive desires, for example (Adsera, 2006; Ibisomi et al., 2011; Morgan & Hagewen, 2005; Quesnel-Vallée & Morgan, 2003) clearly shows that many individuals do not realise their fertility intentions (desired family size) and therefore, there is often a disconnect between desired and actual fertility.

Understanding the gap between desired family size and actual fertility is also important as it focuses on the reasons behind the inability of women to achieve their stated desired family size. In addition, it has implications for policy and program interventions related to family planning (Hagewen & Morgan, 2005; Ibisomi et al., 2011; Pritchett, 1994). According to Bongaarts (1998), in societies in early- and mid-demographic transition, desired family size is usually lower than actual family size, whereas the reverse is often the case in post-transitional societies. As argued by Bongaarts (2001; 2002) and Goldstein et al. (2003), fertility in these post-transitional societies would not be below-replacement level if couples could realise their fertility intentions.

Iran has experienced fertility decline over the last three decades (Abbasi-Shavazi, 2002; Abbasi-Shavazi et al., 2009). By 2011, 22 out of the 31 provinces of Iran had TFRs (total fertility rates) below

replacement level (Abbasi-Shavazi et al., 2013). Despite the fact that findings of the Census 2016 revealed an increase in the total fertility rate in Iran from 1.8 in 2011 to 2.01 in 2016, 14 provinces of the country still had total fertility rates below replacement level (Statistical Centre of Iran, 2016a) in spite of the fact that the *Two-Child Norm* is still prevalent in the country (Abbasi-Shavazi, Hosseini-Chavoshi, et al., 2004; Askari-Nodoushan et al., 2009; Erfani, 2011a; Razeghi Nasrabad & Mirzaei, 2012). A comparison of three birth cohorts of women (born in the 1980_S, 1970_S and 1960_S) shows that Iranian women, even those of the youngest generation, still value having children (Razeghi Nasrabad & Saraei, 2014). Therefore, fertility below replacement level (below two children) despite the desire for two children in some provinces of Iran including Tehran province, implies a disjuncture between desired and actual fertility of Iranian couples.

Studies examining the reproductive behaviour of Iranian couples show that women aged 15-29 and 30-39 years, experience a delay in the birth of their first and second child (Abbasi & McDonald, 2005; Hosseini-Chavoshi et al., 2006). Socio-economic constraints on the one hand and infecundity due to delay at marriage and childbearing on the other (Quesnel-Vallée & Morgan, 2003), affect women's childbearing in their reproductive period. As such, young women may not be able to realise their fertility desires in the future. Razeghi-Nasrabad and Mirzaee (2012), studying the fertility gap in three provinces of Semnan, Kohgiluyeh and Boyer-Ahmad and Hormozgan (date), argue that a majority of women at the end of their childbearing have more children than desired, which is typical of pre-transition society referred to by Bongaarts (1998). However, in the absence of a proper population policy in a low fertility context like Tehran, which has a TFR of 1.56 (Statistical Centre of Iran, 2016a) the younger cohorts may experience further fertility gaps (between their actual and their desired fertility) at the end of their reproductive period.

This chapter examines the patterns and determinants of the difference between desired and expected number of children (unmet fertility desires) among married women aged 15–49 years. It should be noted that some definitions used in this chapter have already been stated in Chapter Two.

5.2. Research Variables

It should be noted that in order to investigate the changes in life cycle (like reproductive behaviour), many authors have emphasised the use of longitudinal panel behaviour (Henke, 1995; Hussain et al., 2000). The longitudinal studies can show the nature of growth, patterns of change, and give a true picture of cause and effect over time (Rajulton, 2001). Smith and Torrey (1996) note:

> Longitudinal data are important for studying individual transitions and the cumulative effects of life cycle transitions on later-life outcome and for studying cultural differences and changes. (Smith & Torrey, 1996, p. 611)

Using longitudinal data and having access to generational data from women who have already completed their fertility increases the accuracy of calculation of the fertility gap. In a longitudinal study women's desired fertility is asked and then at the end of their reproductive period their actual number of children is calculated. The gap can be calculated by subtracting the desired fertility from the actual fertility. In fact, the longitudinal data can show the changes in women's fertility desires and intentions under the influence of socio-economic life events. Therefore, such data measure the changes in fertility preferences with greater precision (than cross-sectional data) (Moser & Kalton, 1961). However, despite the advantages of longitudinal studies, the lack of longitudinal data on individuals' fertility intentions in Iran, or time-series data covering a sufficiently long period from which longitudinal data can be constructed have made longitudinal methods impractical to adopt. This PhD study is based mainly on cross-sectional primary data collected by fieldwork by the principal researcher, and available cross-sectional secondary data because the span of observation time required to generate longitudinal data is impossible for time bound PhD research.

In the present chapter, the research variables consist of the gap between desired and actual number of children ever born (the dependent variable) and a number of socio-demographic variables such as women's current age, their age at first marriage, sex composition of their children ever born, whether they are consanguineously married, women's educational attainment and their employment status (independent variables). These variables are discussed in detail in the following sub-sections.

5.2.1. Dependent variable

The dependent variable in this study, as mentioned earlier in Chapter Two, is the gap between desired[20] and expected[21] family size which is achieved by subtracting the desired family size from the expected number of children. Following Quesnel-Vallée and Morgan (2003), the expected-desired fertility gap is categorised into three groups:

i. Underachieved. This happens when the desired family size is more than the expected family size. Therefore, the expected-desired fertility gap is negative (gap<0). In this case women have unmet fertility desires.

ii. Achieved. This happens when the desired family size equals the expected family size. Therefore, the expected-desired fertility gap is zero (gap=0). In this case women have no unmet fertility desires.

iii. Overachieved. This happens when the desired family size is less than expected family size. Therefore, the expected-desired fertility gap is positive (gap>0). In this case women have overshot fertility desires.

5.2.2. Independent variables and research hypotheses

The independent variables in this study, which are selected based on the literature reviewed in Chapter Two (conceptual framework), are the variables that are expected to influence the gap between desired and expected family size. The statistical analysis will attempt to find out how much these independent variables explain the variation in the gap between women's desired and actual number of children.

- **Women's Age**

Younger women are biologically more fertile than the older women (Evers, 2002; Olsen, 1990; Schmidt et al., 2011). However, compared to older women they would have been exposed to pregnancy and

[20] As mentioned in Chapter Two desired family size is defined as the number of children a woman would like to have in the absence of any possible socio-economic obstacle.

[21] Expected family size is defined as the sum of the number of children a woman has already had at the time of the survey and the number of children the respondent still plan[s] to have. For more details see Chapter Two (section 2.2). As mentioned in Chapter Two 'expected' number of children is being used to represent 'actual' fertility.

childbearing for a shorter period of time and still have years to complete their reproductive span (15-49). In addition, the opportunity costs of childbearing are expected to exert a stronger negative effect on fertility during the early stages of young adulthood than later on (Liefbroer & Corijn, 1999). Therefore, it is expected that the younger age of women, combined with increased opportunity costs can result in having fewer children than desired.

The variable women's age is measured in ratio scale and categorised into three groups of 20-29, 30-39 and 40-49. Women aged 15-19 comprise only one percent of respondents in this study; therefore, the proportion of this age cohort is discarded in the calculations.

- **Age at first marriage**

Marriage has long been recognised as one of the proximate determinants of fertility (Bongaarts, 1978). According to Quesnel-Vallée and Morgan (2003) finding a suitable parenthood partner is a precondition for childbearing for many women. This factor is especially important in countries like Iran where childbearing occurs only within marriage. According to Bongaarts (1982) delayed marriage is a principal intermediate variable which reduces fertility rate relative to its maximum (desired family size). Quesnel-Vallée and Morgan (2003) argue that an aggregate underachievement of fertility (relative to intentions) can be explained by a decline in marriage rates.

Similarly, a population in which women marry late is likely to have low fertility because of the reduced length of exposure of the women to the chances of conception (although in some cases late marriage can be compensated for by more frequent childbearing). Likewise, women who are married at older age are more likely to have fewer children than desired (underachieve their fertility relative to their desires). The variable age at marriage is measured in ratio scale and categorised into three groups of less than 19, 20-24 and more than 25 years.

- **Sex composition of children**

When a couple expresses a preference for a particular size of their family, they may also have a specific sex composition of the family in mind. In such cases parents may continue their childbearing even after

reaching their desired number of children if their preferred sex composition is not achieved. Therefore, the existence of a preference for a particular sex of children may lead to higher fertility than initially intended (Arnold et al., 1998; Bongaarts, 2001, p. 269; Clark, 2000; Nag, 1991). Following Quesnel-Vallée and Morgan (2003), in this study it is expected that women who have a specific sex composition of their children (sex preference) are more likely to have more children than they initially desired.

This variable shows the sex composition of currently alive children who both live with the respondent in the same house or live elsewhere and is indicated by the respondent's number of sons and daughters. This is treated as a nominal variable with three categories: more girls than boys, more boys than girls and equal number of boys and girls.

- **Consanguineous marriages between two cousins (cousin marriage)**

Consanguineous marriage refers to unions between individuals who share at least one common ancestor, but the term is conventionally used to describe marriages between persons related as second cousins or closer (Bittles, 1994, 2001). As reviewed in Chapter Two, unlike India, cousin marriage in Iran and some other developing countries like Pakistan, has been associated with higher levels of fertility (Bittles, Grant, et al., 1993; Razeghi-Nasrabad & Mirzaee, 2012). Therefore, it is expected that women who have had cousin marriages experience overachieved fertility (having more children than desired) compared to women who are married to a non-relative. The variable "cousin marriage" is a nominal and dichotomous variable and coded1 for relative spouse and 2 for non-relative spouse.

- **Women's educational attainment**

According to Bongaarts (1978), women's level of education is a socio-economic indicator which is frequently found to be negatively associated with fertility. Socio-economic, cultural and environmental variables indirectly influence fertility through proximate determinants of fertility. In fact, education can affect women's autonomy, preferences for timing and outcomes of fertility, increase contraceptive use, and raise the opportunity costs of childbearing (Goldin & Katz, 2002; Jejeebhoy, 1995; Skirbekk et al., 2004; Westoff & Ryder, 1977).

Consistent with Quesnel-Vallée and Morgan (2003) the higher than expected opportunity costs impact powerfully on whether women and men have fewer children than initially intended. It is expected that women with higher levels of education (and thus higher opportunity costs) will have fewer children than desired (compared to women who are less educated). The variable of women's education is measured in an ordinal scale using the three categories of High school and less, diploma, and bachelor's degree and above.

- **Women's employment status**

Similar with the level of education, a number of studies show that there is a positive and statistically significant relationship between women's employment and their opportunity costs of childbearing (Adsera, 2006; Engelhardt & Prskawetz, 2004; Joshi, 1998). As mentioned earlier, increased opportunity costs of childbearing decrease fertility behaviour relative to desired family size (Quesnel-Vallée & Morgan, 2003). Therefore, it is expected that employed women will have fewer children than desired (to have unmet fertility desires). In this study, women's employment is a nominal and dichotomous variable and coded either 1 for employed women or 2 for not employed women.

- **Women's contraceptive use**

According to Bongaarts (1978) 'any deliberate parity-dependent practice-including abstention and sterilization-undertaken to reduce the risk of conception is considered contraception'. In fact, an increase in contraceptive use, can result in the transition from natural to controlled fertility (Bongaarts, 1982). As mentioned earlier in Chapter Two, contraceptive practice as one of the intermediate determinants of fertility, along with the proportion married, induced abortion and postpartum infecundity, is primarily responsible for differences in the fertility levels within marriage (Bongaarts, 1978, 1982).

Considering the fertility reducing impact of contraception, it's expected that the non-use of contraceptives leads to having more children than desired. The variable 'contraceptive use' is a nominal and dichotomous variable and coded 1 for use and 2 for non-use of contraception.

5.3. Data analysis

In the following section, first, the desired and expected number of children and also the fertility gap among different age groups of women will be examined. Then, using bivariate analysis, the relationship between gap (between expected and desired family size) and explanatory variables will be investigated in terms of Chi-Square values and their statistical significance. Thereafter, because the expected-desired fertility gap may be influenced by more than one variable at a time, a multivariate analysis of the influence of independent variables on the dependent variable becomes necessary. In this case, since the dependent variable (the gap between expected and desired family size) is treated as a nominal variable, the most suitable multivariate analysis is a multinominal logistic regression. In brief, a multinomial logistic regression[22] allows one to examine the relationship between a nominal dependent variable with more than two categories and a set of independent (predictive) variables (Hosmer et al. 2013). The relationship between dependent and independent variables is examined in terms of odds ratios of the occurrence of the dependent variable for each independent variable in comparison with the reference category of each independent variable. The set of independent variables consists of demographic and socio-economic variables such as age at marriage, sex composition of children, consanguineous marriage, women's education, their employment status and contraceptive use. As mentioned earlier, women aged 15-19 years will be discarded in the calculations as their proportion is very small (only one percent).

5.3.1. Bivariate tables of the expected-desired fertility gap

Using the bivariate tables this section shows the association between the expected-desired fertility gap and the demographic and socio-economic variables, taken one at a time.

[22] An extension of binomial logistic regression (Laerd, 2018).

5.3.1.1. The relationship between age and the expected-desired fertility gap

The fertility behaviour and intention of women as well as the estimated gap between women's expected and desired family size (in terms of underachieved, achieved and overachieved) based on different age groups of women are demonstrated in Table 5-1. As expected, the mean number of children ever born to women shows a rising path with age: values go from 0.74 to 2.16 children among surveyed women aged 20-29 to 40-49. This finding is consistent with the fact that older women are exposed to the risk of conception and childbearing for a longer time, therefore they have given birth to more children than younger women. Moreover, regarding the fact that women's fecundity starts to decline by age (Utting & Bewley, 2011), it's not surprising that the additionally intended number of children has a significant negative relationship with women's age (women aged 40-49 have intend to have 0.14 more children in the rest of their reproductive period). However, the youngest age group plans to have around one more child.

Table 5-1: The mean CEB, mean desired fertility, mean expected and mean fertility gap among women aged 20-49, Tehran city[23]

Age group	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and p-value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
20-29	107	0.74	1.01	1.85	2.34	35.5	59.8	4.7	17.45
30-39	181	1.29	0.6	1.99	2.36	41.4	49.2	9.4	
40-49	113	2.16	0.14	2.38	2.62	37.5	42.0	20.5	P<.005

Source: Fieldwork (2015)

Because of the dynamic nature of the children ever born (CEB) and additionally intended numbers of children size, the expected family size[24] varies by women's age. According to Testa (2012) at the beginning of the reproductive span the expected family size reflects mainly the additionally intended number of children. However, at the end of the reproductive span expected family size reflects mainly

[23] The gap has been calculated at individual levels. It means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

[24] As mentioned earlier in Chapter Two expected family size is the sum of the actual (CEB) and the additionally intended number of children.

the actual family size (Testa, 2012, p. 8). The findings of this study show that the expected family size, which is the most proximate determinant of childbearing behaviour (Goldstein et al., 2003), increases with women's age (Table 5-1). Women aged 40-49 expect to have more than two children (2.38) as their lifetime fertility, however the expected family size among women aged 20-29 and 30-39 is 1.85 and 1.99 respectively. Table 5-1 shows that there is a positive relationship between women's age and their desired family size. Considering the fact the three age groups selected in this study represent three different birth cohorts, Table 5-1 reflects changes in desired fertility by generations. Goldstein et al. (2003), using data from the Eurobarometer 2001 survey, show that the younger cohorts are more likely to prefer smaller family sizes than older ones. In fact, the older cohorts grew up in a different time and were surveyed at an older age. It may be that the desires of the younger cohorts, because of life-cycle influences, will approach those of the older cohorts as they age (Goldstein et al., 2003, p. 485). Uddin et al. (2011), investigating the determinants of desired family size in Bangladesh, argue that the desire for children increases with age of women. The experience of child mortality and the fear of old-age insecurity, irrespective of the level of education, are associated with an increase in desired family size with increasing age of women (Uddin et al., 2011, p. 41). Derahaki (2015), investigating the factors affecting the desired number of children in Iran, reveals a positive association between women's age and the desired family size. He argues that women of older cohorts experience a different trend of socialisation and in fact, the desire to have more children among older women is due to the emotional benefits of children to parents.

The findings of this study show that the highest mean desired family size is seen among women aged 40-49, which is 2.62 children per woman (Table 5-1). Interestingly, the desired family size among women aged 20-29 and 30-39 is almost the same (2.3). The marriage and the start of childbearing of these two age cohorts have been coincident with the stability of the total fertility rate below the replacement level (1.8) for almost one decade in the country (from 2000-2006 and 2006-2011) (Statistical Centre of Iran, 2006, 2011). Razeghi-Nasrabad and Saraie (2014), adopting the Fawcett

(1983) model, in a cohort analysis of the value of children argue that the mean value of children[25] among women who were born in 1980s and afterwards is lower than women born in 1960s and 1970s. However, the age cohort 1980s and younger still values the emotional benefits of children. It can be seen that despite the fact these young cohorts grew up and got married when the fertility had dropped to below the replacement level in the country, the desired family size among women aged 20-29 and 30-39 is above two children which is consistent with Bongaarts (1998) who argues that in post-transitional societies the desired family size exceeds the fertility outcomes.

Table 5-1 also demonstrates the gap between expected and desired family size in terms of underachieved, achieved and overachieved. As can be seen in in the table there is a significant relationship between women's age and the gap between their expected and desired family size (Chi-square with $p<.005$). A test of the adjusted residuals (not shown here) indicates that the significant association between women's age and the gap is mostly driven by the cell of overachieved category. Further, as can be seen in Table 5.1, a large proportion of women in each age group achieve their desired fertility. However, it should be noted that one of the components of the gap is the expected family size which depends on the women's future childbearing plans (additionally intended number of children). In case of any lifetime obstacle i.e. primary or secondary infertility or marriage disruption, younger age groups may not be able to reach the additional number of children they have already attained. Again, as mentioned earlier, because of the dynamic nature of the number of children ever born and the additionally intended number of children with respect to age of the women, the fertility gap among the younger women might change as these women grow older, but the gap among the oldest women (aged 40-49 in this case), who have already completed their fertility is not likely to change.

[25] The value of children in their study was calculated in ratio scale and fluctuates from 10 to 40. Achieving number 10 means a respondent gives the least value to children. Conversely, number 40 equals the highest value of children to a respondent.

5.3.1.2. Age at first marriage and fertility gap

Age at marriage is one of the primary proximate determinants of fertility which directly impacts on women's fertility behaviour (Bongaarts & Potter, 2013). It has been argued that delayed marriage reduces fertility compared to what is initially desired (Bongaarts, 1982; Quesnel-Vallée & Morgan, 2003). Consistently, the results of the Chi-Square test in this study show that there is a very significant negative relationship between women's age at first marriage and the number of children ever born to women ($p<0.005$) (Table 5-2). It means the older the women are at the time of their marriage, the fewer would be the number of children ever born to them. Women who married at younger ages are exposed to a sexual relationship for a longer period. Therefore, they are likely to have a higher fertility than women who get married at older ages. Moreover, the age-related declines in fecundity (especially after age 35) (Quesnel-Vallée & Morgan, 2003) should be taken into account as a factor reducing the fertility of women who have delayed marriage. The strong relationship between women's age at first marriage and fertility is more evident in countries in which the extra-marital childbearing is culturally or religiously prohibited. Nishimura (2012), in a study of four developing countries, revealed that in South Korea and Japan the out of wedlock childbearing is low, therefore childbirth is strongly associated with marriage. According to a study by Abbasi-Shavazi et al. (2009) the increase in age at marriage in Iran, which is a result of increases in women's education, has been one of the significant factors affecting the fertility decline in the late 1980s in Iran (see more details about the patterns of age at marriage in Iran in Chapter Four). The expected number of children as a 'lifetime fertility intention' (Testa, 2012) is highly related to the length of women's reproductive period, therefore, follows the same pattern as CEB among women with different ages at marriage.

Table 5-2: The mean CEB, mean desired fertility, mean expected and mean fertility gap based on women's age at first marriage[26]

Age group (age at first marriage)	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and p-value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
<19	117	1.93	0.31	2.34	2.67	39.7	42.1	18.2	12.73
20-24	139	1.47	0.56	2.14	2.42	36.7	51.8	11.5	
>=25	145	0.82	0.88	1.76	2.25	42.0	53.1	4.9	P<0.05

Source: Fieldwork (2015)

Table 5-3: Bivariate table of relationship between women's age and their age at marriage

Women's age at first marriage	Age category (current age)			Number of women	Women's median current age
	20-29	30-39	40-49		
<19	28.2	35.0	36.8	117	36.2
20-24	36.7	37.4	25.9	139	33.6
=>25	16.0	60.4	23.6	145	30.1

Source: Fieldwork (2015)

The findings of this study, using Chi-Square test, reveal that there is a positive and statistically significant relationship between women's age at first marriage and the expected-desired fertility gap (Table 5.2). Interestingly, as can be seen in the table, a larger proportion of women in each category of age at marriage have achieved their desired fertility. Table 5-2 shows that the proportion of women with overachieved fertility in the oldest category of age at marriage (older than 25), is significantly less than the other categories (younger than 19 and 20-24).

Women who have had delayed marriages have significantly higher levels of education (almost 70 percent have university education) than women in other marriage age-groups (see Chapter Four, section

[26] The gap has been calculated at individual levels. This means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

4.4.1). Moreover, a majority (60 percent) of these women are employed and have a professional career (see Chapter Four, section 4.4.2), therefore it can be concluded that these women have more autonomy to restrict their fertility and have more knowledge of contraceptive use to prevent unwanted fertility and consequently prevent overachieved fertility.

5.3.1.3. Sex composition of children and the fertility gap

It is well documented that there exists sex preference for children in many countries, particularly in developing countries (Abrejo et al., 2009; Cleland et al., 1983; Das Gupta et al., 2003; Kent & Larson, 1982; Nanzy & Shylaja, 2014). Some studies argue that sex preference has a marginal influence on fertility; however, others claim that sex preference has augmented fertility rates in the past and would provide a barrier to future fertility declines (Arnold, 1985). Hosseini and Begi (2012) showed that preference for sons can influence a couple's fertility.

A preference for sons has been reported in many Eastern and Southern Asian countries and such preference results from traditional religious beliefs, economic benefits or social reasons (Clark, 2000; Das, 1987; Edlund, 1999). The degree of son preference varies substantially from one country to another depending on the level of economic development, social norms, cultural and religious practices, marriage and family systems, degree of urbanisation, and the nature of social security systems (Arnold & Zhaoxiang, 1986). The influence of sex preference on fertility behaviour in Iran has been investigated in a number of studies. However, Abbasi-Shavazi, McDonald, et al. (2002) argue that sex preference in Iran, even in cities with more traditional values is disappearing gradually. They show that increases in urbanisation and structural changes in agriculture have led to reduced need for manual labour and therefore there is less desire for having sons to strengthen the workforce. With a similar approach, Mahmoodian and Mahmoodiani (2014) argue that although the desire for equal number of boys and girls is common among women and men, the desire for sons is more prevalent than that for daughters in Iran. Erfani and McQuillan (2014) have concluded that birth timing, even among highly educated women, appears to have been influenced by son preference in Iran. Ahmadi et al. (2015), in their study on women with one child, who were referred for sex selection found that the preference toward the male

child was much higher than female sex (55.5 percent for male child, 15.5 percent for female child and 28.5 percent no sex preference).

In this study women were also were asked about their preference for the sex of their next child (if they have any childbearing planned in the future). The percentage distribution of women based on their sex composition of current (surviving) children and their preference for the sex of their next child is displayed in Table 5-4. It may be noted that women with no live birth (CEB=0) have been excluded from the table, because there is no sex composition among women of zero parity[27].

Table 5-4: Parentage distribution of women based on their sex composition of current (surviving) children and sex preference for their next child

	Sex preference for the next child			
Sex composition of surviving children	Boy	Girl	Doesn't matter	Up to God
Boys=Girls (N=63)	20.2	13.7	45.2	21.0
Girl> Boy (N=131)	60.7	8.3	28.6	2.4
Boys>Girls (N=107)	11.4	51.4	34.3	2.9

Source: Fieldwork (2015)

The striking feature of this table is that most of the women who have more girls than boys among their surviving children wish to have a son as their next child and most of the women who have more boys than girls among their surviving children wish to have a girl as their next child. But almost two-thirds of the women who have equal numbers of boys and girls among their surviving children are non-committal about their preference for the sex of the next child (45 percent said it does not matter and 21 percent said it is up to God).

The fertility behaviour and intention of surveyed women based on the sex composition of current (surviving) children is demonstrated in Table 5-5. As before, women with no live birth (CEB=0) have been excluded from this table because there is no sex composition among women of zero parity.

[27] Women of zero parity comprise almost 25 percent (104 women) of the study sample.

Table 5-5: The mean CEB, mean expected fertility, mean desired and mean fertility gap based on the sex composition of children[28]

Sex composition of current (surviving children)	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and P value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
Boys=girls	63	2.06	0.11	2.17	2.73	43.4	54.8	1.8	28.53 P<0.005
Boys> girls	107	1.05	0.39	2.13	2.5	39.6	46.8	13.5	
Girls>Boys	131	1.91	0.41	2.37	2.5	33.9	44.9	21.3	

Source: Fieldwork (2015)

Chi-Square (χ^2) test in Table 5-5 shows a strong and statistically significant association between the sex composition of surviving children and the 'expected-desired' fertility gap, indicating that a majority of women with balanced sex-composition of surviving children achieve their desired family. This finding is consistent with the findings of Table 5-4 which shows that there is an intention to have a balanced sex composition of children among women.

The proportion of women who achieve their fertility desires (gap=0) is almost the same among women who have the unbalanced number of children. However, the proportion overachievement among women who have more girls and boys is much higher than women who have either a balanced number of children or who have more boys than girls. This finding is consistent with the findings of the studies by Mansurian and Khoshnevis (2006) and Razeghi-Nasrabad and Mirzaee (2012) in Iran which show that couples who have more girls (than boys) are more likely to continue their childbearing to get a male child. In order to reach their male child, they may produce more children than they initially desire. The effect of age factor on women's sex composition of children is examined in Table 5-6.

[28] The gap has been calculated at individual levels. It means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

Table 5-6: Percentage distribution of women based on the sex composition of their current (surviving) children and their age group

Sex composition of current surviving children	Women's age group			Number of women	Median age
	20-29	30-39	40-49		
More boys	24.3	43.9	31.8	107	35.8
Equal	15.9	50.8	33.3	63	36.7
More girls	16.9	46.2	36.9	131	37.2

Source: Fieldwork (2015)

Interestingly, Table 5-6 shows almost no difference in the median age of women with different sex composition of children. As can be seen in the table, a majority of women in each group are aged 30-39. It can be concluded that, the age factor has not affected the sex composition of surviving children of women.

5.3.1.4. The relationship between consanguineous marriage and the expected-desired fertility gap

The prevalence of consanguineous marriage in a population depends on demographic, social and religious factors (Bener et al., 1996; Bittles, 1994; Hussain, 1999; Jurdi & Saxena, 2003; Varela et al., 2001). During the 20th century the incidence of consanguineous marriage has significantly decreased in the more developed countries. However, in the developing world, and particularly in West and South Asia, consanguineous marriage remains common (Abbasi-Shavazi et al., 2003; Bittles, 2008; Bittles & Hussain, 2000; Hosseini & Erfani, 2014; Shenk et al., 2016). In these countries the preference for marrying relatives is a deeply rooted cultural trait (Saadat et al., 2004).

A number of studies have shown that consanguineous marriage (especially first cousin marriage) has been reportedly associated with lower levels of education (lower levels of women's autonomy) and higher marital fertility rate (Bener & Hussain, 2006; Bittles, 1990, 1991, 1994; Hamamy et al., 2005; Tuncbilek & Koc, 1994). According to Hussain and Bittles (1999) women in consanguineous marriages are less educated and have a lower age at marriage. Moreover, they may experience higher levels of prenatal and postnatal losses. Bittles et al., 1993 argue that in Pakistan, younger parental age at marriage,

is a significant feature of consanguineous marriage, since it facilitates increased levels of fertility by optimising maternal reproductive spans and concentrating childbearing in the most fertile years. Tuncbilek and Koc (1994), analysing the consanguineous marriage in Turkey, argue that the first cousin marriage is a significant determinant underlying the high total fertility and infant mortality rates in the country. A study of consanguineous marriage in Yemen confirms the negative association between consanguineous marriages and women's education, age at marriage and economic status (Jurdi & Saxena, 2003). This study shows that consanguineous couples have both higher fertility levels and higher infant and child mortality.

In Iran cousin marriage has been very common and a culturally preferred form of marriage. In fact, despite the wide acceptance of modem familial values, norms, and attitudes toward marriage and family formation in recent decades, cousin marriage has remained prevalent in certain parts of the country (Abbasi-Shavazi, McDonald, & Hossein Chavoshi, 2003; Abbasi-Shavazi, McDonald, et al., 2008; Abbasi & Torabi, 2007; Hosseini & Abbasi-Shavazi, 2009a; Hosseini & Erfani, 2014). There is a clear trend in the prevalence of consanguineous marriage across the country, with the highest rates in the South and South-East and lowest in the North (Saadat et al., 2004). Abbasi-Shavazi, McDonald, et al. (2008) argue that education had little significant influence on consanguineous marriage, the effect being only for those with university education. However, across time, ethnicity and cultural factors have had the most important impact on consanguineous marriage. For example, as far as Islam and ethnicity are concerned, the likelihood of experiencing consanguineous marriage was higher among Sunni women in Sistan and Baluchistan province (Iran). Moreover, the Baluch ethnic group had by far the highest level of relative marriage. Therefore, the high prevalence of consanguinity in this province can be associated with ethno-religious in-marriage, however the low level of socio-economic development (i.e. education) in Sistan and Baluchistan could be taken into account (Abbasi-Shavazi, McDonald, et al., 2008). To explain the relationship between consanguinity and development, if modernisation theory holds, it would be expected that provinces with higher socio-economic development would experience a lower level of consanguinity. Nevertheless, Abbasi-Shavazi, McDonald, et al. (2008) argue that Yazd

province, one of the developed provinces of Iran, had a high level of consanguinity which is a result of the specific cultural and social contexts of this province.

Consistent with Abbasi-Shavazi, McDonald, et al. (2008), Hosseini-Chavoshi et al. (2014) show that the lowest prevalence of consanguineous marriages is seen among women who had obtained a diploma or undertaken tertiary studies. In contrast, consanguinity has the highest level among women who were illiterate or had only been enrolled in primary-level education. According to Hosseini-Chavoshi et al. (2014), the age at first marriage and first pregnancy is lower in cousin marriages than among non-relative couples, moreover, first- and second-cousin couples had a higher mean number of pregnancies than unrelated spouses. This pattern was generally replicated with respect to the mean number of children ever born as the lower mean age at marriage of consanguineous parents offers an enhanced opportunity to initiate child-bearing at younger ages. Consistent with conducted studies in Iran and the Middle-East, Table 5-7 shows that consanguinity in this study is associated with higher fertility levels.

Table 5-7: The mean CEB, mean desired fertility, mean expected and mean fertility gap based on the type of marriage[29]

Cousin marriage	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	χ^2 and P value
relative	131	1.64	0.48	2.25	2.47	35.3	47.4	17.3	7.58
non-relative	270	1.26	0.64	1.97	2.42	41.3	50.6	8.2	P<0.05

Source: Fieldwork (2015)

As can be seen in the table, the CEB and expected number of children in a cousin marriage is higher than those in a non-cousin marriage. Considering the fact that non-consanguineous couples have lower CEB, but they want more additional children than consanguineous couples (Table 5-7), women's age

[29] The gap has been calculated at individual levels. This means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

was examined among the two types of marriage (Table 5-8). As can be seen women who married a relative are only one year older on average than women who married a non-relative. Therefore, to examine the differentials in women's fertility behaviour, other socio-cultural variables may be considered.

Table 5-8: Percentage distribution of women's age group and their marriage type

Cousin marriage	Women's age group			Women's median age
	20-29	30-39	40-49	
Relative	31.3	42.7	26	34.4
Non-relative	24.3	46.3	29.5	35.6

Source: Fieldwork (2015)

It should be noted that as childbearing in this study occurs in the same cultural and ethnic[30] context, the ethno-cultural differentials cannot be taken into account to explain the differences of fertility levels among relative and non-relative couples. Considering the effect of women's autonomy on fertility levels, it is found that the proportion of women with only primary education is almost more than double among women who are in a consanguineous marriage. Conversely, a majority of non-relative couples have university degrees. The employment status of women reveals that almost 30 percent of women who are in cousin marriage are employed: in contrast, more than 50 percent of women with non-relative spouses are employed. It can be concluded that the higher opportunity costs of childbearing and higher women's autonomy are the significant factor affecting the lower fertility in the context of non-relative marriages in this study.

The findings of this study in Table 5-8 show that, the fertility gap has a statistically significant relationship with the marriage type in terms of relative and non-relative. However, this relationship is not strong. The data show that the proportion of women with underachieved and achieved fertility does

[30] Chapter Four showed that a majority of respondents in this study are Fars.

not vary by change in marriage type. Nevertheless, the proportion of women with overachieved fertility is significantly higher in relative marriage which is almost double that of women in non-relative marriage. This finding is in line with the findings of Razeghi-Nasrabad and Mirzaee (2012) which show that women in cousin marriage, because of the influence of their family and relatives on their childbearing, will show a different fertility behaviour than women who are married to a non-relative spouse. Therefore, women who are married to their cousins are more likely, than women who are married to a non-relative, to have more children than desired.

5.3.1.5. The relationship between the level of education and the expected-desired fertility gap

Over the past few decades, many developing countries have adopted policies designed to reduce rapid population growth. Educating young women is one of these policies and is considered highly effective in achieving this goal (United Nations, 1995). The inverse relationship between the level of education and fertility is shown in a number of studies (Akmam, 2002; Isen & Stevenson, 2010; Jeffery & Basu, 1996; Jejeebhoy, 1995; Kelly & Elliott, 1982; King & Hill, 1997; Martin, 1995; Martin & Juarez, 1995; Weinberger, 1987). Several explanations for the influences of female education on fertility have been provided by economic theories of fertility. The increased opportunity costs of childbearing and child rearing among educated women was a topic discussed by Becker (1991) and Schultz (1981). Moreover, it has been considered that education may lower fertility levels through improvements in child health and reduced rates of child mortality because women need to have fewer births to meet the same desired number of children (Lam & Duryea, 1999; Schultz, 1994). Female schooling also can affect fertility through increasing female autonomy and empowerment in fertility decision making (Mason, 1986). Improvement in women's knowledge about effective methods of contraception is another impact of female education on fertility (Rosenzweig & Schultz, 1985, 1989). Bongaarts (1978) argues that education is one of the socio-economic factors which indirectly (through the proximate determinants of fertility) has a negative relationship with fertility. For example, among educated women marriage is

relatively late or the use of contraception more frequent, therefore clarifying the relationship between education and fertility.

Despite the fact that education mostly has had an attenuating impact on fertility, in some cases it has the potential to raise it. According to Lesthaeghe et al. (1985) modest improvements in female education in some less developed countries were shown to increase fertility slightly, however, even at low levels of socio-economic development, a negative association emerged after a critical level of schooling. Jejeebhoy (1995), examining women's autonomy and reproductive behaviour in developing countries argues that improvement in women's education results in improvement in their quality of life, productivity, income, and economic development. According to Jejeebhoy (1995) educating women affects mortality, health, fertility, and contraception she argues that despite the fact the influence of educational attainments on women's life varies widely according to socio-cultural development, it is clear that education empowers women, providing them with increased autonomy and resulting in almost every context in fewer children.

The findings of the present study in Table 5-9 reveal that in line with some previous studies, there is a negative and statistically significant relationship between women's level of education and CEB. The level of women's education is negatively associated with their current age (Table 5-10). This validates the findings of Table 5-1, which shows that younger women, and therefore more educated women have the lowest CEB and the lowest expected family size compared with older women with lower levels of education.

Table 5-9: Level of education and the expected-desired gap[31]

Level of education	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and P value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
Elementary school	88	1.98	0.38	2.4	2.55	35.2	44.3	20.5	
High school and diploma	128	1.54	0.52	2.18	2.53	37.4	53.4	9.2	10.41
Bachelor's degree and above	185	0.97	0.75	1.8	2.29	42.5	49.2	8.3	P<0.05

Source: Fieldwork (2015)

Table 5-10: The relationship between women's level of education and their age

Level of education	Women's age group			χ^2 and p-value
	20-29	30-39	40-49	
Elementary	20	35.3	44.7	20.46
High-Diploma	23.7	46.6	29.8	P<0.005
Bachelor and above	32	49.2	18.8	

Source: Fieldwork (2015)

Some cross-national studies show that the impact of women's education is much stronger than men's in reducing fertility (Barro & Lee, 1993; Schearer, 1983). For example, Summers (1992) argues the importance of female education for reducing fertility through lower fertility desires. According to Summers (1992) increasing female education through expanded access in Pakistan would be an important factor for the fertility decline. Uddin et al. (2011), in a study in Bangladesh, shows that education is an important variable influencing the desired family size. Their study shows that the educational levels of the women and their husbands not only affected the number of children ever born, but also is negatively associated with the mean desired family size. Martin (1995) argues that differentials in the desired family size across educational groups are considerably smaller than differentials in actual fertility. Despite the fact uneducated women typically have more children than educated women, their family size ideals may not be far apart. For example, in the Latin American

[31] The gap has been calculated at individual levels. This means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

region the observed fertility among better educated women is close to their desired family size, but the actual fertility of unschooled women is usually twice their stated ideal family size (Martin, 1995).

Austrian micro-census data reveal that by 2001 the differences in the mean family size intentions among women aged 26–30 with different levels of education had practically disappeared which means all education groups desiring on average 1.7–1.8 children and the low fertility intentions being adopted by all education groups (Sobotka, 2009). Quesnel-Vallée and Morgan (2003), for the United States, argue that more educated women face greater opportunity costs, therefore revise their childbearing downward compared with their earlier intentions. The effect of education is weaker among men than women because the gender roles and the lack of biological constraints may make the opportunity costs competition less intense among them.

In contrast to the reviewed studies which showed that women's education has a depressing effect on the desired family size, some European studies have shown that education may have an augmenting influence on fertility.

A study from West Germany rejects the idea that education educational attainments might have an inverse relationship with the desired number of children (Heiland et al., 2005). This study suggested that the desired family size of highly educated women is on average two or more children, however their actual fertility is very low. Controlling for background and contemporaneous factors, including the actual fertility, Heiland et al. (2005) found that the impact of education on desired number of children was significantly consistent. These findings indicate that the positive relationship between educational attainment and the desired family size found in West Germany may be expanded to Western Europe. Heiland et al. (2005) argue that the additional educational attainment may bring greater confidence for individuals to deal with the family stress. Moreover, the ability to afford a larger family may be attained by education if the income measures in the multivariate analysis only account for differences in resources by education (Heiland et al., 2005). According to data from the Demographic and Health Surveys for nine Latin American countries, Martin and Juarez (1995) conclude that the

desired family size does not differ much by educational attainment, once age and parity are taken into account. In fact, the desired family size among different educational groups varies by only one child or less, therefore less educated women share the same small family norm as educated women, however they are less successful in realising it (Martin & Juarez, 1995).

Abbasi-Shavazi and Askari-Nadoushan (2005) in their study in one of the provinces of Iran argue that growing up in urban areas, the later age at marriage and the higher levels of education are the factors negatively associated with the lower desired family size among women in Yazd province. Abbasi-Shavazi and Khani (2014) in another study in one of the Western provinces of Iran examine the effects of variables such as women's age, place of residence, the level of education and religion on the fertility desires of women. They conclude that women's university education is related to lower levels of desired number of children. They argue that older women with lower levels of education and living in rural areas have the higher desired family size.

Mahmoodian and Mahmoodiani (2014) argue that the level of education has a significant negative effect on desired family size, however, after controlling for other variables like women's age at first marriage, employment status and the sex preference, the impact of education on the desired number of children was found insignificant.

In contrast to reviewed studies in Iran, the findings of Bagheri et al. (2017) in Semnan province (in Iran) rejects the idea that education might have a negative association with the desired family size. They show that women with lower levels of education (illiterate and primary education) have lower desired family size than women who have the university degrees. They argue that less educated women put more value on the economic benefits of children.

The findings of this study in Table 5-9 show that there is no significant relationship between women's level of education and their desired number of children. In fact, the table reveals that the effect of educational attainments on the desired number of children is only observed among women with university degrees. In this study almost 70 percent of women with primary and secondary education are

aged 40-49 and a majority of women aged 20-29 and 30-39 have tertiary education. Therefore, the findings of Table 5-9 are consistent with the results of Table 5-1 which showed that the age groups 20-29 and 30-39 share the same desired family size, although women aged 40-49 desire more children. The age pattern of women based on their level of education confirms the fact that the additional number of children declines with the level of education. Therefore, the expected family size which is the sum of the CEB and the additional (similar with the CEB) has a declining trend with increase in the level of education. Coming back to Table 5-9, using the results of Chi-Square test, indicates that women's educational attainment has a significant relationship with the gap between desired family and expected number of children. It is evident from the table, except for the difference in the proportion of women with overachieved fertility, a convergence can be seen among women with different levels of education in terms of achieving their fertility desires. In fact women with achieved fertility are dominant in each level of education. In terms of the underachieved fertility only women with a university education show slightly higher unmet fertility desires. The higher proportion of women with overachieved fertility among women with the lowest level of education is not surprising as almost 45 percent of these women are at the end of their reproductive span (calculated by the author from the data) and have almost completed their fertility. More interestingly a significant proportion (44 percent) of women with primary education have more girls than boys. Consistent with the discussion in the section of 'sex composition of children', although having a balanced number of male and female children is desired by a majority of women, couples who have more girls (than boys) are more likely to continue their childbearing to get a male child. Therefore, in order to reach their male child women may have more children than they initially desired.

5.3.1.6. Employment status and the expected-desired gap

Women's labour force behaviour has been investigated in most explanations of fertility. The depressing effect of women's employment on fertility is consistent with numerous studies which, at the individual level, have shown that there is a negative association between fertility and women's labour force participation (Brewster & Rindfuss, 2000; Davidson, 1978; Lehrer & Nerlove, 1986; Togunde, 1998).

In fact, both industrialised and developing countries have formulated policies based on the negative association between these two aspects of women's lives (Brewster & Rindfuss, 2000).

The economic theory of fertility (Becker, 1991) hypothesises that, within-country, the negative relationship between work and fertility is a result of the opportunity costs of childbearing and child-raising particularly for highly-skilled women. The rise of women's educational and labour market attachment can result in a fall in women's propensity to have children (Becker, 1991). This negative correlation may also be due to increasing the financial rewards flowing from postponing parenthood (Easterlin, 1976; Easterlin & Crimmins, 1991).

According to D'Addio and d'Ercole (2005), at a cross-national level, women's labour force participation rate was negatively associated with the total fertility rate (TFR) across the developed world in the 1970s. In fact, to reconcile the difficulties balancing work force participation and motherhood, women have often reduced their work hours or exited the labour market during or immediately after a pregnancy (Desai & Waite, 1991; Hynes & Clarkberg, 2005), but after changing women's role, today many women invest in higher education and careers (Oppenheimer, 1994). Nevertheless, during the last few decades, the correlation between employment status and the total fertility rate has switched from negative to positive. The United States and Sweden, with a high TFR and high rate of women's labour force participation are examples of countries that have experienced this change. This switch has also been seen in countries like Italy and Japan which are low on both dimensions (Liu & Hynes, 2012). The empirical evidence on the relationship between fertility and women's employment in modern, industrialised societies shows that although there is generally a negative association between these two, the incompatibility of employment and motherhood would seem to have become seriously weakened (Bernhardt, 1993). Using data from 1960 to 2000 for France, West Germany, Italy, Sweden, the UK, and the USA, Engelhardt et al. (2004) find a negative and significant relationship between employment and fertility until about the mid-1970s, however the correlation became insignificant or weaker negative after this time. According to Engelhardt et al. (2004) changes in the institutional context, such as attitudes towards working mothers, have reduced the incompatibility between child-rearing and the employment of women. It has been hypothesised that where the incompatibility between women's work

and childbearing has been reduced, women can work and fertility rates have remained higher. Instead, in the case of the reduced social and institutional supports for working mothers, they may delay the transition to parenthood and ultimately have fewer children (D'Addio & d'Ercole, 2005; Joëlle, 2003; Rindfuss et al., 2003).

Consistent with studies showing a negative association between women's employment and fertility, the findings of this study in the following table demonstrates the relationship between women's employment status and their fertility behaviour and preferences in Tehran city (Table 5-11). As can be seen the mean CEB is higher among not employed women than the employed women. Despite the fact the additionally intended number of children is almost similar among both employed and not employed women, the expected family size among them follows the same trend as the CEB. Therefore, as can be seen the expected number of children, which is women's lifetime fertility goals, among not employed women is higher than the expected family size among employed respondents.

Table 5-11: The bivariate analysis of the expected-desired fertility gap and the employment status of women[32]

Employment status	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and P value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
Employed	179	1.09	0.66	1.82	2.26	40.1	54.4	5.5	11.18
Not Employed	222	1.62	0.54	2.27	2.58	38.2	45.9	15.9	P<0.005

Source: Fieldwork (2015)

Despite the fact the gains in women's educational attainment in Iran have not been translated into the increase in their labour force participation (Abbasi-Shavazi, Mehryar, et al., 2002)[33] the findings of the National Population and Housing censuses in Iran, particularly Census 2011, show that women's

[32] The gap has been calculated at individual levels. This means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

[33] According to the findings of the 2011 census, women comprised 49.6 percent of population of 10 years old and above, but their economic participation was only 11.4 percent (Statistical Centre of Iran, 2011).

employment and work force participation has always had a significant negative relationship with fertility in Iran. Rezaee (2014) argues that over the past few decades the rate of women's work force participation has increased although it is still low. Indeed, the improvement in women's educational attainments and their economic status, which both are associated with the increase in the age at marriage, have contributed to the drastic fertility decline in Iran since the 1990s (Rezaee, 2014).

Mirzaee and Shams (2014) argue that women's economic participation does not necessarily lead to fertility decline. In fact, the characteristics of their job in terms of work hours, wages, prestige and the type of job contract may cause a decline in fertility. Mirzaee and Shams (2014), examining the relationship between women's job characteristics on fertility, found that having a secured full time job along with a high income not only does not lead to fertility decline, but also can result in an increase in women's fertility as women with more job satisfaction are more confident to raise a child.

According to Mirzaee and Shams (2014) the reason behind the existence of lower levels of fertility among employed women is that in Iran the work places are not family friendly and moreover the job structures have not been defined in a way that women's work and family can be reconciled. Mehdizadeh (2011) argues that the problem of work-family balance has not yet been solved in developing countries as it has been in some developed countries, though work–family tensions are growing in developing countries as well. In this situation, women faced with the difficulties of balancing work and motherhood, and also considering the lack of institutional supports for working mothers, decide to restrict their fertility. According to Afshari (2015) Iran has experienced a rapid shift toward high levels of gender equity in individual institutions such as education, but Iranian women continue to experience low levels of gender equity in family-oriented institutions. The lack of a family-friendly workplace or facilities for couples during pregnancy or childbearing are some of the constraints employed women are facing in Iran.

The findings of this study in Table 5-11 reveal that there is a statistically significant relationship between women's employment status and the fertility gap in terms of underachieved, achieved and

overachieved. Despite the fact employed women, because of the increased opportunity costs of childbearing and the accumulated human capital, were expected to show a larger proportion with underachieved fertility, Table 5-11 shows that an almost equal proportion (40 percent) of women in each group have unmet fertility desires. This table also reveals that although almost a large proportion of employed and not employed women (54.4 and 45.9 percent respectively) would have achieved their fertility desire, the proportion of not employed women with overachieved fertility is almost three times more than employed women. Interestingly, a Chi-Square test (not shown here) did not show any significant relationship between women's employment and their age. Therefore, the age factor cannot be taken into account to explain the higher levels of overachievement among not employed women. The correlation between the sex composition of children (as a factor which was highly associated with the fertility gap) and women's employment status shows that a majority of employed women in this study have a balanced sex composition of their children (almost 50 percent). However, among not employed women the sex composition of children is in favour of girls which may result in overachieved fertility (in order to achieve the male child).

5.3.1.7. The relationship between contraceptive use and the expected-desired fertility gap

Women's contraceptive use and its relationship with the gap between desired and expected family size is examined in Table 5-12. It should be noted that pregnant women have been excluded from the table.

Table 5-12: The mean CEB, mean desired fertility, mean expected and mean fertility gap based on women's contraceptive use[34]

Contraceptive use	Number of women	CEB	Additionally intended number of children	Expected fertility	Desired family size	Gap			χ^2 and P value
						Negative (Underachieved desired fertility)	Zero (Achieved desired fertility)	Positive (Overachieved desired fertility)	
Non-use	83	1.24	0.82	2.22	2.35	32.5	49.4	18.1	4.12
Use	293	1.5	0.5	2.05	2.47	39.4	51.0	9.6	p>0.05

Source: Fieldwork (2015)

As can be seen in Table 5-12, as might be expected the CEB of non-users of contraceptives is lower than that of users, because they have intended to have more children in the rest of their reproductive span. Considering the fact a large proportion (40 percent) of non-users are at the end their childbearing period (aged 40-49) (Table 5-13), their lower CEB and the higher additionally intended number of children among them (than contraceptive users) can be attributed to infertility (primary or secondary) that they have faced during their reproductive life.

Table 5-13: The bivariate analysis of women's contraceptive use and their age

Contraceptive use	Women's age		
	20-29	30-39	40-49
Non-use	21.7	38.6	40.0
Use	26.3	47.4	26.3

Source: Fieldwork (2015)

The Chi-Square test in Table 5-13 did not show any statistically significant relationship between the contraceptive use and the fertility gap.

[34] The gap has been calculated at individual levels. This means the gap is calculated by subtracting the desired CEB from the expected CEB. Therefore, mean gap=mean (Desired CEB-expected CEB**).**

5.3.2. The multivariable analysis of the fertility gap: Findings from the Logistic Regression Model

The bivariate analysis of the relationship between expected-desired fertility gap and the seven explanatory variables such as women's age, their age at marriage, cousin marriage, sex composition of their current (surviving children), women's educational attainment, women's employment status as well as contraceptive use, revealed that all mentioned variables, except contraceptive use, have a statistically significant association with fertility gap, even though in many cases the strength of the association, as measured by χ^2 is not very strong. The bivariate analysis examined the association between the dependent variable and each of the explanatory variables taken one at a time. However, in reality, all the explanatory variables must be simultaneously influencing the dependent variable, which calls for a multivariate analysis of the influence of the explanatory variables taken together on the dependent variable. Further, considering that the dependent variable in this study (fertility gap) has three categories -underachieved, achieved and overachieved, the appropriate multivariate analysis is the multinomial logistic regression, which was conducted to analyse the impact of the explanatory variables taken together, on the likelihood of achieving the fertility goals (Table 5-14). Since, as shown in the bivariate tables, the significant associations between each of the explanatory variables and the dependent variable (the gap between expected and desired fertility) was mostly driven by the cell 'overachieved' fertility gap, the category "achieved fertility" of the dependent variable was set as the reference. The findings of the multinomial logistic regression in Table 5-14 show that all the explanatory variables show statistically significant effects on the likelihood of women overachieving their fertility desires (in comparison to achieved fertility).

In terms of the explanatory variables, it is found that women aged 20-29 are 84 percent less likely than women aged 40-49 to have an overachieved fertility in comparison to achieved fertility (Table 5.14). However, it seems after controlling for other demographic and socio-economic variable the impact of the middle age group (30-39) on the likelihood of overachievement is statistically not insignificant.

The lower likelihood of overachievement (than achievement) among young women after controlling for the socio-economic variables (especially education and employment) can be attributed to their incomplete fertility as they at least have 20 years to complete their reproductive span.

As the Table 5-3 showed, there is an inverse relationship between women's age and their age at marriage, therefore, it is not surprising to find a younger age at marriage to have an enhancing effect on the likelihood of overachieved fertility in comparison to achieved fertility. Table 5-14 shows that women who got married the youngest (under age 19) are 4.5 times more likely than women who got married at ages older than 25 to have the overachieved fertility in comparison to achieved fertility.

Table 5-14: Odds ratios indicating the likelihood of achieving or overachieving fertility in Tehran city, 2015

Demographic and socio-economic variables		Underachieved fertility		Overachieved fertility	
		Sig	Odds ratio	Sig	Odds ratio
Age category					
20-29		n	0.66	P<0.005	0.16
30-39		n	1.02	n	0.49
40-49	(ref)				
Age at first marriage					
< 19		n	1.39	P<0.05	4.49
20-24		n	0.96	n	2.58
>=25	(ref)				
Cousin marriage					
Relative		n	0.84	n	1.77
Non-relative	(ref)				
Sex composition of children					
Girls=Boys		n	1.07	P<0.005	0.10
Boys> girls		n	1.12	n	0.70
girls>Boys	(ref)				
Level of Education					
Elementary school		n	0.64	n	0.64
High school and diploma		n	0.66	P<0.05	0.37
Bachelor's degree and above	(ref)				
Employment status					
Employed		n	0.83	P<0.05	0.40
Not employed	(ref)				

The reference category is achieved fertility gap.

Source: Fieldwork (2015)

The multivariate analysis did not show any significant relationship between cousin marriage and the likelihood of achieving any categories of fertility gap. This finding is not surprising as the bivariate tables showed that the correlation between women's marriage type (relative or non-relative) and fertility gap is weak. After controlling for demographic and socio-economic variables, the effect of cousin marriage on the likelihood of having overachieved fertility disappears (Table 5.14).

After controlling for age, age at first marriage, cousin marriage, women's educational attainment and employment, women who have a balanced number of children are 90 percent less likely to have overachieved fertility, in comparison to achieved fertility than women who have more girls than boys. The bivariate analysis in Table 5.5 showed that there is a tendency among women to achieve a balanced sex composition of children (to have at least one child from each sex). As was shown in Table 5.4 women with more boys tend to have more girls in the future. Conversely, women who have more girls wish to achieve more boys in the rest of their reproductive span. The findings of Table 5.14 confirm this tendency even after controlling for the effect of other socio-economic variables still exist. The higher odds ratios of overachievement among women with more girls than women with a balanced sex composition implies that women with more girls than boys would continue to have children to get a balanced sex composition among their children, and consequently overachieve their fertility desire.

The multinomial logistic regression analysis goes on to show that after controlling for demographic and socio-economic variables, women who have a diploma and high school degree are 63 percent less likely than women with a bachelor's degree to have an overachieved fertility (in comparison to achieved fertility). As was shown in Table 5.9 women with high school and diploma degree and women with a university degree show the same trend in the achievement of the fertility gap. However, after considering the effect of other variables, the middle educated women, in reference to women with university degrees, show a lower likelihood of overachievement (in comparison to achievement). It can, therefore, be concluded that due to some other social and especially economic factors (not considered in the logistic regression table) women with high school and diploma restrict their fertility (more than women with university degrees).

Table 5.14 further shows that the likelihood of having overachieved fertility, in comparison to achieved fertility, is 60 percent less likely among employed women than not employed women. The findings of Table 5.11 showed that there is a large difference in the proportion of overachievement between employed and not employed women. Consistently, even after controlling for the interaction of demographic and socio-economic variables, employment has a depressing effect on the likelihood of overachievement (in comparison to achievement).

5.4. Conclusion

This chapter examined the gap between desired and actual fertility and the socio-economic factors affecting the gap. Expected number of children is being used to represent actual fertility, which is the sum of women's number of children ever born and their intended number of additional children. Desired family size is defined as the number of children a woman would like to have in the absence of any possible socio-economic obstacles. In this chapter the gap between desired and expected family size is obtained by subtracting the desired number of children from the expected number of children. The expected-desired fertility gap was categorised into three groups: underachieved (when the difference is negative), achieved (when the difference is zero) and overachieved (when the difference is positive). The dependent variable in this chapter is the gap and the independent variables are women's current age, their age at first marriage, sex composition of their current (surviving) children, consanguineous marriage, women's level of education, their employment status and women's contraceptive use.

The findings of bivariate analysis, using the Chi-Square (χ^2) test, reveal that except for contraceptive use, all explanatory variables have a significant relationship with the expected-desired fertility gap.

The findings of this chapter show that a large proportion of women in each age group (20-29, 30-39 and 40-49) would achieve their desired family size. It should be noted that the gap among the oldest women (aged 40-49 in this case), who have already completed their fertility is not likely to change. However, because of the dynamic nature of the number of children ever born and the additionally intended number of children with respect to age of the women, the fertility gap among the younger women might change as these women grow older.

The results of the bivariate analysis also reveal that there is a positive statistically significant relationship between women's age at first marriage and the expected-desired fertility gap. These findings also show that a larger proportion of women in each category of age at first marriage (<19, 20-29 and >=25) would achieve their desired fertility. In this chapter it is shown that the proportion of women with overachieved fertility in the oldest category of age at marriage (older than 25), is significantly less than the other categories (younger than 19 and 20-24). The findings of this chapter reveal that a significant proportion (almost 70 percent) of women who have had delayed marriages have significantly higher levels of education than women in other marriage age groups. Moreover, almost 60 percent of women who got married at ages older than 25 are employed and have professional careers. Therefore, it can be concluded that these women have more autonomy to restrict their fertility and have more knowledge of contraceptive use to prevent unwanted fertility and consequently prevent overachieved fertility.

According to the findings of this chapter, there is an intention to have a balanced sex composition of children among women. In fact, women who have more girls than boys among their surviving children wish to have a son as their next child and most of the women who have more boys than girls among their surviving children wish to have a girl as their next child. However, almost a large proportion of the women who have a balanced number of children are non-committal about their preference for the sex of their next child. Consistent with this finding, the bivariate analysis of the relationship between expected-desired fertility gap and sex composition of children showed that a majority of women with balanced sex composition of (current) surviving children would achieve their desired family size. In the line with the studies by Mansurian and Khoshnevis (2006) and Razeghi-Nasrabad and Mirzaee (2012), the findings of this chapter show that the proportion of overachievement among women who have more girls than boys is much higher than women who have either a balanced number of children or who have more boys than girls. It has been argued that couples who have more girls (than boys) are more likely to continue their childbearing to get a male child. In order to achieve the birth of a male child they may produce more children than they initially desire.

The cross tabulation between cousin marriage and fertility gap shows that the proportion of women with underachieved and achieved fertility does not vary too much according to marriage type. However, the proportion of women with overachieved fertility is significantly higher (almost twice as high) in consanguineous (cousin) marriages compared with non-consanguineous marriages.

The bivariate analysis of the expected-desired fertility gap and women's level of education in this chapter shows that a large proportion of women in each level of education (elementary school, high school-diploma and bachelor's degree and above) would achieve their desired family size. It should be noted that the proportion of women who would overachieve their desired family size is significantly higher among women with the least level of education (elementary school). The higher proportion of overachievement among women with the lowest level of education, in addition to the older age of these women in this study, can be attributed to the sex composition of their current (surviving) children. This chapter shows that a significant proportion of least educated women have more girls than boys, in which case they would like to continue their childbearing to make a balanced sex composition of the children. This finding is consistent with what has been mentioned earlier about the sex composition of children and its association with the fertility gap.

In this chapter it was also found that almost an equal proportion (40 percent) of employed and not employed women have unmet fertility desires. Despite the fact almost a large proportion of employed and not employed women would achieve their desired family size, the proportion of not employed women with overachieved fertility is almost three times more than employed women. Interestingly, in this chapter no significant relationship was found between women's employment and their age. The correlation between the sex composition of children (as a factor which was highly associated with fertility gap) and women's employment status shows that a majority of employed women have a balanced sex composition of their children. However, not employed women have more girls than boys which may result in overachieved fertility (in order to achieve the favourite number of male child).

The findings of the multinomial logistic regression in this chapter reveal that women aged 20-29 are less likely to have an overachieved fertility in comparison to achieved fertility, than women aged 40-49. The lower likelihood of overachievement (than achievement) among young women, after controlling for the socio-economic variables (especially education and employment), can be attributed to their incomplete fertility as they at least have 20 years to complete their reproductive span.

The bivariate analysis in this chapter showed an inverse relationship between women's age and their age at marriage, therefore, it is not surprising to find a younger age at marriage increases the likelihood of having the overachieved fertility in comparison to achieved fertility. The findings of this chapter show that women who got married the youngest (under age 19) are 4.5 times more likely, than women who got married at ages older than 25, to have the overachieved fertility in comparison to achieved fertility.

The multivariate analysis in this chapter did not show any significant relationship between cousin marriage and the likelihood of achieving any categories of fertility gap. The findings of the multinomial logistic regression also reveal that women who have a balanced number of children are 90 percent less likely to have an overachieved fertility, in comparison to achieved fertility, than women who have more girls than boys. The finding also confirms that the tendency to have a balanced sex composition of children, even after controlling for the effect of other explanatory variables, still exist.

It was also found that after controlling for demographic and socio-economic variables women with high school and diploma degree, in reference to women with university degrees, show a lower likelihood of overachievement (in comparison to achievement). It should be noted that the middle educated women and women with a university degree show the same trend in the achievement of the fertility gap (in the bivariate analysis). However, after considering the effect of other variables, women with high school and diploma are 63 percent less likely than women with a bachelor's degree to have an overachieved fertility (in comparison to achieved fertility). It can be concluded that due to some other social and especially economic factors (not considered in this chapter) women with high school and diploma restrict their fertility (more than women with university degrees). Finally, according to the findings of

bivariate analysis in this chapter there is a large difference in the proportion of overachievement between employed and not employed women. The findings of the multinomial logistic regression reveal that even after controlling for the interaction of demographic and socio-economic variables, employment has a depressing effect on the likelihood of overachievement (in comparison to achievement).

CHAPTER 6: CONTRACEPTIVE USE AMONG THE SURVEYED WOMEN OF TEHRAN

6.1. Introduction

In the last half century, the reproductive behaviour of couples has changed remarkably with the desire for small families and healthy spacing of births, especially in developing countries. This growing desire, combined with national policies related to curbing population growth, has resulted in an increasing need to adopt family planning and contraception to prevent unintended pregnancies (Darroch, 2013; Darroch & Singh, 2013). In fact, the increased use of family planning methods is considered to be the primary cause of noticeable fertility declines in many developing countries (Bongaarts et al., 1990; Rutenberg et al., 1991).

As mentioned earlier in Chapter One (section 1.2), Iran has experienced a remarkable fertility decline. The total fertility rate in Iran dropped sharply from 6.6 children in 1986 to 1.8 in 2011 (Abbasi-Shavazi et al., 2013; Hosseini-Chavoshi & Abbasi-Shavazi, 2012). Several factors that led to the drastic fertility decline in all provinces and rural and urban regions of Iran have been identified. According to Caldwell et al. (1998) the increase in educational attainment, and the high level of prosperity had created a demand for family planning services, and by the means of the legitimacy and availability of family planning services, the contraceptive prevalence rate has increased, and therefore, fertility remarkably declined. Supporting this idea, Abbasi-Shavazi and McDonald (2006) argue that the reactivation of family planning in the country was a response to societal demand for contraception (Abbasi-Shavazi & McDonald, 2006, p. 231). Moreover, Aghajanian and Mehryar (2007) strongly suggest that the overall fertility decline in the country was primarily due to a decrease in marital fertility resulting from couples' widespread contraceptive use. It is worth noting that although there is a very low level (compared to many other developing countries) of unmet need for contraception in Iran[35](Abbasi-Shavazi et al., 2009,

[35] It's estimated to be around 5 percent (Abbasi-Shavazi et al., 2009).

p. 110), still a large number of pregnancies (16 percent) remain unwanted (Erfani, 2012). Erfani and McQuillan (2008) argue that limited access to legal abortion continues to lead many women whose pregnancies are unwanted or mistimed to undergo clandestine and unsafe abortions.

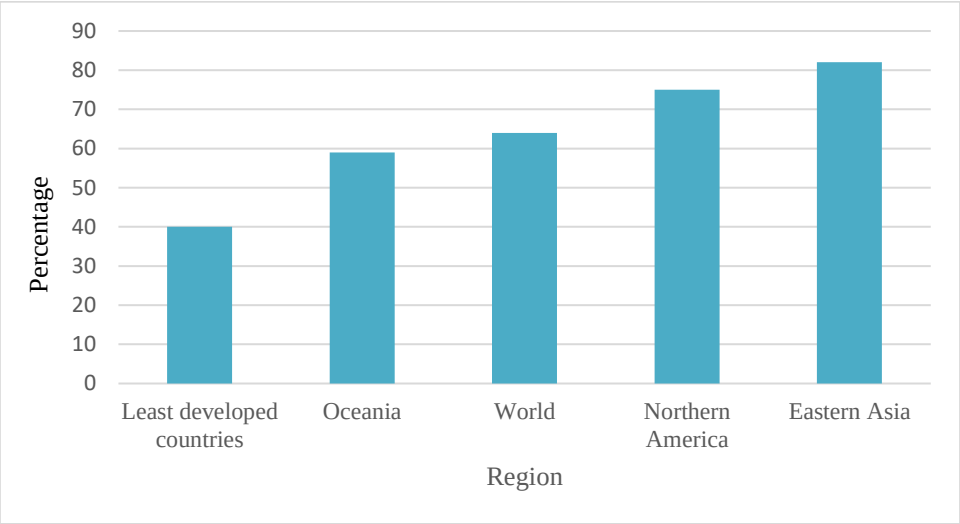
By using the primary data collected through a survey conducted in the capital city of Tehran in 2015, this chapter aims to examine the role of contraceptive use as one of the proximate determinants of fertility among women in Tehran city. It is crucial to understand the successes, failures and patterns of contraceptive use for preventing any unmet need for contraception and unwanted pregnancy, which in turn helps in designing programs and policies for future fertility in the country.

6.2. A snapshot of the levels and trends of contraceptive use in Iran

According to the United Nations (2015b), 64 percent of married or in-union women of reproductive age in the world were using some methods of contraception. Contraceptive use was much lower in the least developed countries (40 percent) and was particularly low in Africa (33 percent) (Figure 6-1). However, among the other major geographic areas such as Oceania and Northern America contraceptive use was much higher (United Nations, 2015b). Eastern Asia had the highest prevalence of contraceptive use[36] (82 percent) of all the world regions in 2015. This high rate of prevalence in eastern Asia is mainly due to the very high level of contraceptive use in China (84 percent). In the other regions of Asia, the prevalence of contraception averaged between 57 and 64 percent (United Nations, 2015b).

[36] Contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used. It is usually reported for married or in-union women aged 15 to 49 (World Health Organization, 2017).

Figure 6-1: Contraceptive use in different regions in the world, 2015



Source: United Nations (2015b)

Levels of fertility and contraceptive use have significantly changed in Iran during the past three decades (Erfani, 2013b). Table 6-1 demonstrates the prevalence of contraceptive use among Iranian women from 1976 to 2005. As can be seen in Table 6-1 which presents the data from Iranian Fertility Surveys (IFS) and also from Iranian Knowledge Attitude Practice (IKAP) surveys, the use of any method of contraception almost doubled between 1976 and 2000. The results of the Iran Fertility Survey (IFS) in 1977 revealed that 36 percent of (currently married) women aged 15-49 were using a method of contraception at the time of survey (Aghajanian, 1994) which can be attributed to implementation of the first family planning program in the country in 1967.

Table 6-1: Percentage distribution of prevalence of contraceptive method use among currently married women aged 15–49, Iran, 1976–2005[37]

	IFS	IKAP	IKAP	IKAP	IKAP	IKAP	IKAP	IKAP	IDHS	IMES
Method	**1976**	**1989**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**2000**	**2005**
Pill	17.3	18.1	22.6	24.5	22	22.8	21.9	20.9	18.4	19.4
Condom	4	5.7	6.4	6.7	6.6	5.7	5.6	5.4	5.9	8.6
IUD	1.4	3.7	7.1	7.2	7.8	7.1	8.3	8.3	8.5	9.1
Female sterilization	-	-	7.6	9.2	11.1	13.7	15	15.5	17.1	17.5
Male sterilization	-	-	0.9	1	1.2	1.3	1.6	1.9	2.7	2.8
DMPA[38] (injection)	-	-	-	-	0.5	1.3	2.5	2.9	2.8	2.8
Norplant	-	-	-	-	0	0	0	0.5	0.5	0.1
Other	3.2	3	-	0.6	1.9	1.7	1.2	0.6	0.1	0
Traditional	10.1	18.4	20	18.6	18.9	19.2	18	16.9	17.8	13.6
All Method	36	48.9	64.6	67.8	70	72.8	73.7	72.9	73.8	73.8
Number of women	4715	8,975	36,000	40,963	40,995	41,082	41,347	42,645	87,400	

Source: Abbasi-Shavazi et al. (2009) ; Hosseini-Chavoshi & Abbasi-Shavazi (2012); United Nations (2002)

IFS also indicated that in 1976 among women using modern contraceptives, the pill was the most widely used method (17.3 percent); however, 10 percent of women still used traditional methods. In this year only about five percent of women used other modern methods such as condoms and IUDs (Table 6-1). In 1989 prior to the revival of the family planning program in the country, the KAP[39] Survey revealed that 49 percent of currently married women were using contraception. The increase in contraceptive use between this and IFS survey was due to increases in both modern and traditional methods. Between 1976 and 1989, the usage of modern methods increased from 26 to about 30 percent; however, the use of traditional methods significantly increased from 10 to 18 percent. According to Abbasi-Shavazi et al. (2009) the increase in contraceptive use is consistent with the onset of fertility decline from the mid-1980s. The increase in the use of traditional methods is consistent with the fact that the government of

[37] It should be noted that in this table and other tables whose findings on contraceptive use are reported in this chapter, in the case of women using more than one method simultaneously, for example, a traditional method with condom, only the most effective method was recorded regardless of whether it was the dominant method or not.
[38] Depot Medroxy Progesterone Acetate
[39] Knowledge, attitudes and practices survey

Iran did not support the usage of modern contraceptives during the 1980s. The relatively high prevalence of traditional methods (prior to 1989) also indicates that Iranian couples had a strong desire to control their fertility few years before the resumption of the family planning program (Abbasi-Shavazi, 2002).

Following the resumption of the family planning program (1989), sterilization was made available by the government (Hosseini-Chavoshi & Abbasi-Shavazi, 2012). It should be noted that Iran is one of the few Muslim countries where male and female sterilization is not only permitted but actively promoted by the national program (Abbasi-Shavazi, Mehryar, et al., 2002) especially in the 1990s and early Twenty first century. The findings of 1992 KAP[40] survey, which was the first survey after the resumption of the family planning program in 1989, revealed that since1989 the proportion of women using a contraceptive method had increased from 48.9 percent in 1989 to 64.6 percent in the year 1992 which means a remarkable increase of around 15 percentage points within a span of three years. As can be seen in Table 6-1, the increase in prevalence of contraceptive use between 1989 and 1992 can mostly be attributed to increased use of modern methods, such as IUD and sterilization (Abbasi-Shavazi et al., 2009).

Between 1992 and 1997, cross-sectional surveys, (with similar sample sizes) were conducted by the Ministry of Health and Medical Education in the spring of every year (Aghajanian & Merhyar, 1999) (Table 6-1) to determine the effectiveness of the family planning program (in fertility decline), and to estimate the prevalence of contraceptive use in the country (Abbasi-Shavazi et al., 2009).

The findings of these annual surveys showed that during the period 1992-1997, contraceptive use increased almost eight percent among Iranian women which undoubtedly is mainly attributed to the continued increase in sterilization. From 1992 to1997 sterilization (female and male)[41] increased from 8.5 percent to 17.4 percent (almost doubled) in Iran. In this period, the proportion of urban women undergoing tubectomy[42] rose from 16.3 to 27.5 percent (Table 6-1). A similar significant upward trend

[40] The 1992 KPA covered 2,000 households in each province of Iran and collected information about contraceptive use among currently married women aged 15–44.
[41] Female sterilization was more popular that male sterilization.
[42] Female sterilization

was also observed for rural women. The prevalence of sterilization among women in rural areas increased from 18.0 to 29.1 percent between 1992 and 1997 (Abbasi-Shavazi, Mehryar, et al., 2002).

In 1993 DMPA[43] , also known as Depo-Provera was introduced to the family planning program and since then pill users were advised to switch to DMPA because by adopting this method women did not have to remember to take the pill every day (Hosseini-Chavoshi & Abbasi-Shavazi, 2012). This shift is evident in Table 6-1 as between 1993 and 1997 the pill use dropped from 24.5 to 20.9 percent while DMPA use increased from 0.5 to 2.9 percent. The prevalence of DMPA increased significantly in rural areas because this method was promoted by "Rural Health Houses" (Abbasi-Shavazi et al., 2009).

Table 6-1 also shows that between 1992 and 1997 the proportion of women using condoms slightly decreased; however, the proportion of women relying on IUDs increased. The reason behind increased reliance on sterilization, IUD and DMPA during the 1990s is that the government attempted to convince women to adopt more reliable (long acting and permanent) methods (Abbasi-Shavazi et al., 2009) to achieve the milestones of the family planning program. It should be noted that among long acting methods "Norplant" was available in the family planning program only for a few years (from 1994 to 1997). In fact, due to a high demand for early removal by women, this method was eliminated from the public sector. The proportion of Norplant users among all contraceptive users never exceeded 0.5 percent (Hosseini-Chavoshi & Abbasi-Shavazi, 2012).

In 2000, the Iran Demographic and Health Survey[44] showed a contraceptive prevalence of 74 percent among married women aged 15-49 years in the country (Table 6-1). In the year 2000, among this proportion, 56 percent adopted modern methods; however, 18 percent still relied on traditional methods. According to 2005 Iran Low Fertility Survey, the average contraceptive use in the country remained stable; however, the use of modern contraceptive methods reached 60 percent and reliance on traditional methods dropped to 13.6 percent (Table 6-1). A report published by NIHR[45] (2012) reveals that in 2010,

[43] A temporary method requiring monthly injections for a period of three months. DMPA has easier follow-up, less risk of use failure, and less risk of method failure (Abbasi-Shavazi et al., 2009).
44 It's Iran's DHS- type survey conducted in 2000 by the Ministry of Health and Medical Education of Iran (Iranian Ministry of Health and Medical, 2002).
[45] National Institute for Health Research

78 percent of married women of reproductive age practised contraception. The proportion of contraceptive users in Iran slightly decreased to 77.4 percent in 2011 (World Bank, 2017a) and 76.6 percent in 2015[46] (United Nations, 2015b).

It has been mentioned in chapter one (Introduction) that the concerns of policy makers, led by the Supreme leader of Iran Ayatollah Seyed Ali Khamenei, regarding the consequences of long term fertility decline in the country, led to a shift towards a pronatalist approach by the government (Karamouzian et al., 2014). Despite the fact that no specific (pronatalist) policy was introduced, serious debates over the necessity of continuing the population policies were initiated among policy-makers and scientists. The emphasis of policy-makers shifted rapidly towards adopting a pronatalist policy by restricting access to contraceptive use and birth limiting surgeries (Karamouzian et al., 2014); however, after many debates, it was not legislated in the Islamic Parliament of Iran (The parliament of Islamic Republic of Iran, 2014). Now, while public access to free contraceptives is not banned, any promotion of sterilization (either male or female) is prohibited in the country. Since 2012, the government of Iran has also eliminated funding for population control programs (Dastjerdi, 2012). The former Minister of Health in Iran, Marzieh Vahid Dastjerdi, announced in an interview that the Ministry was no longer able to provide all the public family planning services through the public health sector (Karamouzian et al., 2014).

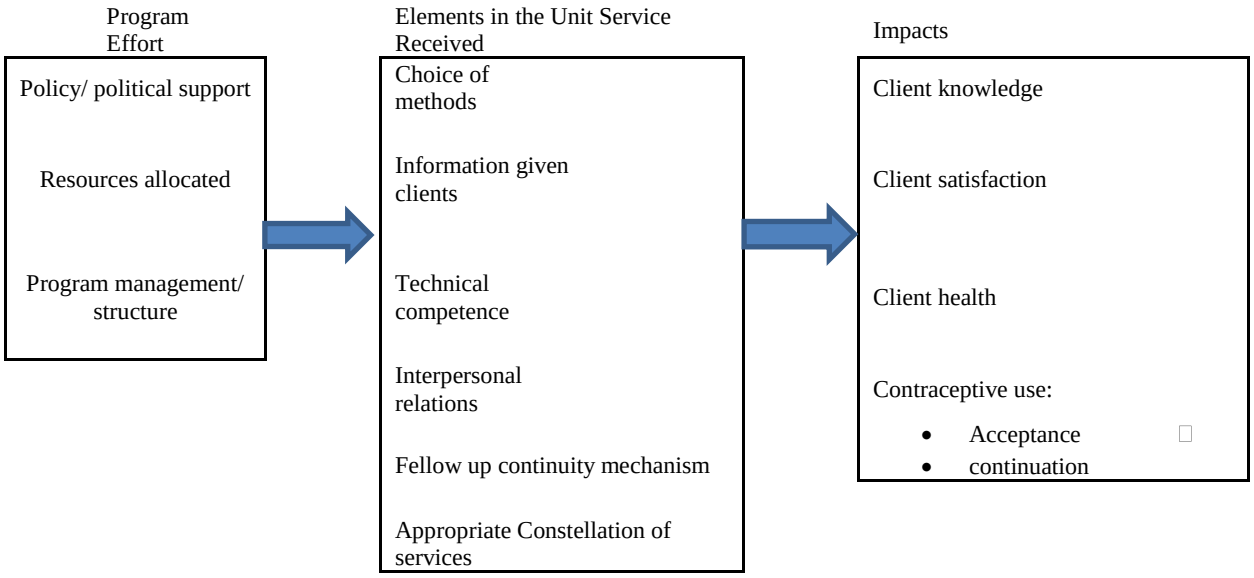
6.3. Determinants of Contraceptive use in Iran

There has been variation in the methods of contraceptive use among women or couples with different social and demographic characteristics in developing countries (Blanc et al., 2009; Blanc & Way, 1998; Darroch & Singh, 2013; Khan et al., 2007; Williamson et al., 2009) and developed countries (Ali & Cleland, 2010; Leridon, 2006; Lucke et al., 2009; Oddens & Lehert, 1997; Oddens & Milsom, 1996). A very important and neglected requirement of the continuation of contraceptive use is the quality of

[46] It's based on median estimation of contraceptive prevalence among married or in-union women aged 15 to 49, 2015.

care. Bruce (1990) proposed the analysis of quality of services in the context of service delivery. Quality of services was defined as six specific elements of the process of service delivery including choice of methods, information given to clients, technical competence, interpersonal relations, mechanisms to encourage continuity and appropriate constellation of services (Figure 6-2). The elements of quality of care are hypothesised to influence on contraceptive use. In fact, by providing a choice of methods and information about their side effects, women will choose to adopt contraceptive methods and to continue to use them.

Figure 6-2: The quality of the service experience-its origins and impacts



Source: Bruce (1990)

Bruce's framework has become the defining conceptualisation in the discussion of quality of care of family planning services in a number of studies (Mensch et al., 1997; RamaRao et al., 2003; Speizer & Bollen, 2000). However, it has been argued that this framework is more useful for formulating policy than studies that look at the effect of people's perceptions about quality on contraceptive use (Arends-Kuenning & Kessy, 2007).

At the individual level Bulatao (1989), examing the factors affecting the method use, argues that people's preference for a specific method of contraception is normally based on attributes such as being

safe, *effective* and *reversible*, and *socially acceptable*. Bulatao (1989), in his conceptual framework identifies four dimensions of choosing a contraceptive method by couples, namely, *contraceptive goals, contraceptive competence, contraceptive evaluation, and contraceptive access* (Table 6-2) (Bulatao, 1989).

Table 6-2: Factors influencing the choice of contraceptive methods

Contraceptive goals	**Contraceptive access**
Stopping or Spacing between births	Access
Intends to put the time interval between births	Services
Goals flexibility	Price and Cost
Contraceptive competence	**Contraceptive evaluation**
Understanding and awareness of method	Self-effects
Attitude toward sex	Be comfortable using method
Partner's ability to use the method	Individual moral preferences

Source: Bulatao (1989)

The main argument regarding the **contraceptive goals** is the difference between stopping and postponement of childbearing. However other aspects of childbearing such as the duration of postponement are also important. **Contraceptive competence** is the ability to practise a specific method effectively, which is partly a function of couples' level of education. According to Bulatao (1989) competence in using a method is somehow cognitive; however, it also comprises affective components, particularly attitudes towards sex and the ability to cooperate in family planning matters (Bulatao, 1989). For example, withdrawal use largely relies on skills and experience, information, understanding, caring and more cooperation from the partner (Hosseini et al., 2014). **Contraceptive evaluation** consists of judgments about the practical and ethical implications of using a particular method. It includes effects on health, as well as issues of convenience and effects on sexual pleasures. **Contraceptive access** includes the extent of availability and affordability of a specific method to the individuals (Bulatao, 1989). Availability of a method of contraception is essential and varies under different conditions. For example, promoting a method through the media, face-to-face communication, health personnel and physicians can substantially expand the method selection (Bhushan, 1997)

Bulatao (1989) mainly considered socio-demographic factors as determinants of the four dimensions mentioned above. In this regard, demographic and socio-economic characteristics such as *women's age*,

number of living children, household wealth index, women's education, religion, desire for more children, a couple's employment status, being visited by a family planning worker, and the *husband's view on family planning* have been found to be significantly associated with contraceptive use in a variety of countries (Dang, 1995; Douthwaite & Ward, 2005; Joesoef et al., 1988; Koc, 2000; Kulczycki, 2008; Mahmood & Ringheim, 1996; Ntozi & Kabera, 1991; Uygur & Erkaya, 2001). In a multicultural society[47] such as Iran, the primary socio-demographic characteristics of "age", "educational attainment", "and number of living children" and "place of residence" have been reported as associated factors with contraceptive use in the country (Abbasi-Shavazi et al., 2009; Aghajanian, 1994; Erfani, 2009; Hosseini-Chavosh et al., 2007; Hosseini-Chavoshi & Abbasi-Shavazi, 2012; Malekafzali, 1992). The following section examines the effect of these specific variables on contraceptive use.

6.3.1. The relationship between women's age and contraceptive use

Contraceptive goals can be considered partly as a function of women's age because women's fertility intentions can change over the time. A study on age patterns of contraceptive use in Turkey, (a Muslim majority country similar to Iran) with 74.2 percent prevalence of contraceptive use, shows that reliance on modern contraceptives is most prevalent among women aged 35-39 years (77.3 percent). However, the prevalence of traditional methods among this age group is 19.5 percent (Uygur & Erkaya, 2001). In every age group of Turkish women, IUD is the most favourite method, while oral contraceptives are prevalent among women younger than 40 years of age. Overall, there is a significant positive correlation between the age of women and their contraceptive preferences towards modern methods in Turkey (Uygur & Erkaya, 2001). Mannan (2002) in Bangladesh (using BDHS[48]) has found that as current age and duration of marriage increases, couples are significantly more likely to use sterilization. Mannan (2002) discusses that with increase in women's current age or their marital duration, women are more likely to reach their desired fertility and prefer permanent methods to prevent pregnancy. Another study

[47] Around one-seventh of Iran's population resides in Tehran, including diverse socioeconomic and ethnocultural subgroups (Erfani, 2015).
[48] Bangladesh Demographic and Health Survey

in Indonesia, the most populous Muslim majority country, shows that between 1997 and 2007 the use of contraception among currently-married women increased with age (R. E. Khan & Khan, 2007). This study indicates that in 1997 and 2007 the highest proportion of long-term method users belong to the older age group (40-49).

In Iran, analysing data from the 2000 Iran Demographic Health Survey (IDHS) revealed that the prevalence of using any method of contraception was the highest (over 80 percent) among women 30-44 (reaching a peak in age group 35–39) (Abbasi-Shavazi et al., 2009). Table 6-3 shows the percentage of women using any contraceptive drops in the age group 45-49 years. The age related infecundity (Quesnel-Vallée & Morgan, 2003) and the less exposure to the sexual relationship (than younger women) (Mackay, 2001) can be associated with the less contraceptive use of women at the end of their reproductive span. In 2000 the proportion of women undergoing sterilization was negligible among women 15-29; however, the proportion of women relying on sterilization increased by age and reached a peak of 41 percent by age group 40–44. Among hormonal methods, the pill is the most popular contraceptive among women; however, along with DMPA the reliance falls off as sterilization rates rise with age (Table 6-3). With a lower prevalence level, the age pattern of IUD usage is similar to that of the hormonal methods. This finding is consistent with the study by Hosseini et al. (2014) and Robey et al. (1992) who show that there is a significant relationship between age and demand for Long acting and permanent contraceptive methods (LAPCMs). In fact, older women usually use LAPCMs, reflecting their intention to stop childbearing.

Table 6-3: Percentage distribution of married women aged 15-49 using contraceptives by age group, Iran, 2000

	Contraceptive use								
Age group	Any method	Sterilization		IUD	DMPA	Pill	Condom	Withdrawal	Number of women
		Female	Male						
15-19	37.4	0.1	0	4.2	0.9	14.4	4.9	12.6	6,182
20-24	60.9	0.3	0.4	10.8	3.1	22.3	5.9	17.1	14,052
25-29	74.3	3.7	1	13.2	3.8	25.6	7	18.9	16,519
30-34	81.6	16.4	3.0	11.1	3.5	21.2	7	18.5	15,569
35-39	86.1	30.5	5.4	6.8	3	16.3	5.8	17.4	13,570
40-44	83.3	36.5	4.7	4.4	2.4	13.2	4.8	16.4	12,059
45-49	68.3	31.7	3.3	2.2	1.5	8.8	4.3	15.5	9,449

Source: Abbasi-Shavazi et al. (2009)

The proportion of condom users does not exceed more than seven percent across all age groups. It should be noted that despite the fact withdrawal is not a very effective method, it's has been historically popular among urban Iranian women (Aghajanian, 1994). As demonstrated in Table 6-3, reliance on withdrawal, which is one of the most favoured contraceptives in Iran, does not significantly vary by age. Previously, Erfani and Yuksel-Kaptanoglu (2012), examining the reason behind the high prevalence of withdrawal use among older women, argued that as a couple's exposure to the risk of pregnancy decreases, the likelihood of withdrawal use will increase. Erfani and Yuksel-Kaptanoglu (2012) also argue that the older women may have less frequent sex therefore, they greater rely on withdrawal. Abbasi-Shavazi et al. (2009) state that the use of condoms and withdrawal was most likely a regular aspect of the couple's sexual behaviour among those that practised these methods.

6.3.1.1. The relationship between age and contraceptive use among women surveyed in Tehran city

In this section the prevalence of contraceptive use is examined among women aged 20-49, because the proportion of participants in the youngest age group (15-19) is negligible (only one percent), therefore, this age group is discarded. The findings of this study show that almost 78 percent of women of all ages were currently using a method of contraception. Table 6-4 shows the percentage of women using

different contraceptives according to their (the women's) characteristics, which is this case is their age. As can be seen in the table, contraceptive prevalence, i.e., the percentage of women currently using contraception is already high (71 percent) among women aged 20-24,[49] then rises further with age reaching its peak in the age group 25–29 years where only 16 percent of women were not using contraceptives. Thereafter, contraceptive prevalence declines with age, but even at its lowest level in the age-group 45-49 years, it can still be considered high at 65.8 percent.

Table 6-4: Percentage of surveyed women using different methods of contraception by age, Tehran city, 2015

	Contraceptive use									
Age group	Any method	Sterilization		IUD	DMPA	Pill	Condom	Withdrawal	Other	Number of women
		Female	Male							
20-24	70.8	0	0	6.7	0	10.1	16.9	33.7	3.4	29
25-29	84.3	0	0	2.7	0	9.3	28.1	44.2	0	78
30-34	82.8	1	0	10	0	9	29.9	30.9	2	104
35-39	78.9	1.3	1.3	11.5	1.3	16.5	15.3	29.3	2.5	77
40-44	71.8	5.1	0	12.8	0	6.4	19.2	28.2	0	75
45-49	65.8	7.9	15.8	7.9	2.6	10.5	5.3	15.8	0	38
All ages	77.9	2.2	1.7	8.6	0.5	9.6	21.2	31.1	2.2	314

Source: Fieldwork (2015)

As shown in Table 6-4, withdrawal is interestingly the most practised method among all age groups (see more details about the withdrawal use in Iran in section 6.5.1). Considering the fact that women at older ages have more demand for long acting and permanent methods (Hosseini et al., 2014), the reliance on withdrawal appears to decline as women get older, but the prevalence of withdrawal is still high among women aged 45-49 years and equals the female sterilization rates (15.8 percent). Among the modern methods of contraception sterilization is rather uncommon under age 40 with less than three percent in the age-group 35-39 and only one percent in the age-group 30-34 using this method. However, as expected and consistent with previous studies in Iran, the percentage of women undergoing sterilization reaches a peak of 24 percent by age group 45-49 years. Consistent with the findings of IDHS (Abbasi-Shavazi et al., 2009), DMPA is the least popular method among surveyed women. The

[49] As only a few number of women (four) are of ages 15-19, we focus on women older than 19.

popularity of condom use increases by age; however, along with withdrawal, the prevalence of condom falls off from its peak (30 percent) among women older than 34 as women start to adopt more reliable methods such as IUD and sterilization. Use of the pill varies little in prevalence across the different age groups, with use ranging from 6 percent among women 40-44 to 16.5 percent among women at ages 35-39 years. In fact, it seems the use of the pill does not follow any specific age pattern among surveyed women. The use of the pill can be attributed to both child spacing and child limiting as this method is used by younger, as well as older women aged 45-49 years. Table 6-4 also demonstrates that condom use is more prevalent among young women.

6.3.2. The relationship between number of living children and contraceptive use

Couples, based on the number of children they want or they currently have, choose a specific method to realise their fertility goals in order to stop or space their births. Survey data from a number of developing countries have consistently shown that a woman's contraceptive use is closely associated with her number of living children (Schoemaker, 2005). A study in Vietnam using data from the "1988 Vietnam Demographic and Health Survey" found that women with three or more children were more likely to use a modern method than were those with fewer children (Dang, 1995). Uygur and Erkaya (2001) argue that in Turkey there is a positive association between the number of living children and contraceptive use. In fact, the more children a woman has, the more likely she is to use contraception. In Indonesia Schoemaker (2005) found that the number of living children strongly influences women's contraceptive use. In fact women with three or four children had higher odds of using modern contraceptives than did women with two or fewer children (Schoemaker, 2005).

Abbasi-Shavazi et al. (2009), using 2000 IDHS, show that there is a significant relationship between the number of living children and contraceptive use among Iranian women. As can be seen in Table 6-5, the proportion of women relying on sterilization increases as a woman's number of children ever born increases. In fact, the percentage of Iranian women undergoing sterilization is very limited until women have two children. Table 6-5 demonstrates that the reliance on sterilization (female and male) is 24 percent among women with three living children which noticeably doubles (increases to 47

percent) among those with five children and more. It is evident from Table 6-5 that at higher parities (three children and more) sterilization has been more popular among women; however, at lower parities (fewer than three children) a balance can be seen between female and male sterilization.

Table 6-5: Percentage of currently married women 15–49 using different methods of contraception, by number of living children, Iran, 2000

	Contraceptive method use								
		Sterilization							
Number of children	Any method	Female	Male	IUD	DMPA	Pill	Condom	Withdrawal	Number of women
0	19.5	0	0.2	0.1	0	3.7	3.1	12.1	11,499
1	74.8	0.2	0.2	13.5	1.9	26.9	8.7	22.4	14,756
2	85.9	3.4	2.7	15.7	3.2	25.5	8.8	25.2	15,398
3	85.3	19.2	4.9	10.3	3.3	19.8	6.9	19.8	11,862
4	85.1	32.4	4.7	6.8	3.4	17.5	5.3	14.4	10,033
5+	80.5	43.1	3.6	2.8	4.3	14.3	2.5	9.1	23,852

Source: Abbasi-Shavazi et al. (2009)

In this study the usage of the pill is high among women with one and two children (27 and 26 percent respectively); however, the reliance on the pill gradually decreases among women with three and more children (Table 6-5). This is consistent with the significant increase in the proportion of women who have more than two children undergoing sterilization as they are looking for more reliable methods to limit their fertility.

The percentage of women using an injectable method is very rare among women who have fewer than two children; however, it varies little by number of children among women with three children and more. The use of IUD is highest among women with two children (15.7 percent) and declines thereafter with the increase in the number of children. According to Abbasi-Shavazi et al. (2009) the patterns of hormonal and IUD use are consistent with these methods being used for the widespread spacing of births. Abbasi-Shavazi et al. (2009) argues that the use of condoms and withdrawal, according to the number of children born, is similar to that of the hormonal methods and the IUD. Therefore, these methods also seem to be used for spacing (Table 6-5).

Moreover, as can be seen in Table 6-5, the pill, condom and withdrawal are used before the first child by a minority of women which according to Abbasi-Shavazi et al. (2009) can be considered as a sign of emerging delay of the first birth in Iran particularly among women in Tehran city.

Finally, a recent nationwide cross-sectional study in six large[50] and two small[51] Iranian cities reveals that the probability of using traditional methods (as opposed to modern methods) is lower among women with more than two children (Motlaq et al., 2013). This finding is consistent with the study conducted by Abbasi-Shavazi et al. (2009), which shows that as the number of children increases, women are more likely to rely on modern/permanent contraceptive methods.

6.3.2.1. The relationship between number of living children and contraceptive use among women surveyed in Tehran city

Table 6-6 shows the percentage distribution of contraceptive use by number of living children among surveyed women. Expectedly, the use of sterilization is not common until women have three children. Among those with three and more living children, 16 percent have undergone sterilization compared to 4.5 percent among those with two children. The reliance on IUD increases from 8.2 percent among women with one child to 18.2 percent among surveyed women with more than two children. This is consistent with the findings of Hosseini et al. (2014) which show that there is a positive relationship between IUD use and number of living children among Iranian women. The current survey indicates that IUD is not common among women who are yet to have a child. Previously, Abbasi-Shavazi et al. (2009) showed that the use of any type of hormonal method or IUD among women with no children is low which may have been due to a perceived fear of the risk of infecundity (Abbasi-Shavazi et al., 2009, p. 111). The reliance on DMPA in the current study is very small. Even among women who have more than three children DMPA prevalence is less than two percent (Table 6-6). The low use of DMPA in the author's data may be related to the urban context of the study (see Page 119).

[50] Tehran, Mashhad, Tabriz, Isfahan, Shiraz, and Ahvaz
[51] Zahedan and Kerman

Table 6-6: Percentage distribution of currently married women 15–49 using different methods of contraception, by number of children ever born, Tehran city, 2015

Number of living children	Contraceptive use									
	Any method	Sterilization		IUD	DMPA	Pill	Condom	Withdrawal	Other	Number of women
		Female	Male							
0	66.7	0	0	0	0	8.1	18.2	37.4	3	104
1	80.2	0	0.9	8.7	0	10.5	26.2	32.3	1.7	116
2	83.6	1.5	3	11.8	0.7	13.3	22.9	30.3	0	130
3+	78.2	12.7	3.6	18.2	1.8	9.1	12.7	20	0	55

Source: Fieldwork (2015)

As can be seen in Table 6-6 unlike its popularity in 1980s and 1990s in Iran, use of the pill has decreased over time. Consistent with the "age pattern" of pill use, adopting the pill as a contraceptive does not change very much by number of living children and it seems this method is adopted for child spacing purposes. Interestingly, the reliance on withdrawal and condom (especially withdrawal with almost 40 percent) is high before the birth of the first child (Table 6-6) which emphasises the fact of delay of first birth in Iran (Abbasi-Shavazi et al., 2009; Erfani, 2015). The peak of condom use is among women with one or two children. Then as the number of children increases (three and more) reliance on condom, pill and withdrawal use decreases. However, withdrawal still has popularity among women with three or more children.

6.3.3. Women's education and its association with contraceptive use

Women's educational attainment has had a strong positive effect on their current use of contraception (Arokiasamy, 2002; Iyer, 2002; Khan & Khan, 2007; Martin, 1995; Rutenberg et al., 1991).

According to Martin (1995), better-educated women are more likely than others to desire smaller families and therefore, their motivation to practise contraception is stronger. Also, in many traditional societies, education plays a legitimizing role which enables women to engage in new patterns of behaviour (Martin, 1995). Beckman (1983) argues that by enhancing women's position within the family authority structure, education improves women's control over their reproductive choices. In addition, educated women have greater knowledge about available contraceptives because of their greater familiarity with formal institutions and health providers (Grady et al., 1981). The effectiveness

of contraceptive use is also higher among educated women. Women with higher levels of education have lower rates of contraceptive discontinuation and failure. In fact, education may alter the risk of discontinuation of a method through its effect on the woman's sense of control over her life. Thus, highly educated women may feel they live in a more rational world and can exert more control over their fertility (Grady et al., 1988, p. 234).

Larsson and Stanfors (2014) argue that in Sub-Saharan Africa (Ghana, Kenya, Madagascar, and Zambia) education is positively associated with contraceptive use. However, education matters more for deciding between use versus non-use than it does for the choice of method effectiveness. Studies conducted in Muslim majority countries (Indonesia, Pakistan and Turkey) imply a positive relationship between level of women's (or spouse's) education and contraceptive use. A study in Turkey (using data from the 1993 Turkish Demographic and Health Survey) indicates that women's education is a stronger predictor of contraceptive use and method choice than that of their husbands (Koc, 2000). This study also reveals that increase in women's educational attainment may be the most effective way of advancing family planning acceptance and increasing the demand for contraceptive services in Turkey. In Bangladesh, Ullah and Chakraborty (1993) argue that the other factors such as husband's occupation, urban residence, visits by family planning workers and desire for more children are also positively associated with the use of contraception (Ullah & Chakraborty, 1993).

Women's education also plays an important role in relation to contraceptive use in Pakistan, as literate women are more likely to use contraceptives than illiterate women (Khan & Khan, 2007). The same trend is seen in Indonesia which indicates that women's education is one of the most important factors related to contraceptive use in both 1997 and the 2007 Indonesia Demographic and Health Survey (IDHS) (Rahayu et al., 2009).

In Iran, Aghajanian (1994) argues that the levels of contraceptive use rose in the country with increasing the levels of education among both women and their husbands. Despite the fact that 28 percent of women with no schooling were using contraception at the time of the 1976 Iranian National Survey, the proportion of contraceptive use among women with one to five years of schooling was 53 percent, and

among women with at least a high school or diploma degree reached 77 percent. Similarly, women whose husbands were uneducated, were significantly less likely (26 percent) to be using any method of contraception than those whose husband had graduated from high school (72 percent) (Aghajanian, 1994).

Hosseini-Chavosh et al. (2007) using data from "The 2000 Iran Demographic and Health Survey" show the association between women 's level of education and their contraceptive use. They conclude that women with a primary level of education are two times more likely than illiterate women to use contraception. The likelihood of contraceptive use among women with secondary education is higher again, however contraceptive use is most prevalent among women with higher educational attainments (diploma or university degrees) (Table 6-7). According to Hosseini-Chavosh et al. (2007), there is an inverse association between the likelihood of using modern contraceptive methods and increasing levels of education. Women with diploma or university degree are 60 percent less likely to use modern contraceptives in comparison to illiterate women.

Table 6-7: Odds ratios of current use of any contraceptives among currently married women aged 15–49, and using a modern method among contraceptive users by level of education, Iran, 2000

Level of education	**Any method users vs. non-users**		**Modern method users vs. traditional users**	
Illiterate (ref)				
Primary	**	2.14	**	0.58
Secondary	**	2.95	**	0.48
Diploma or University	**	3.49	**	0.40

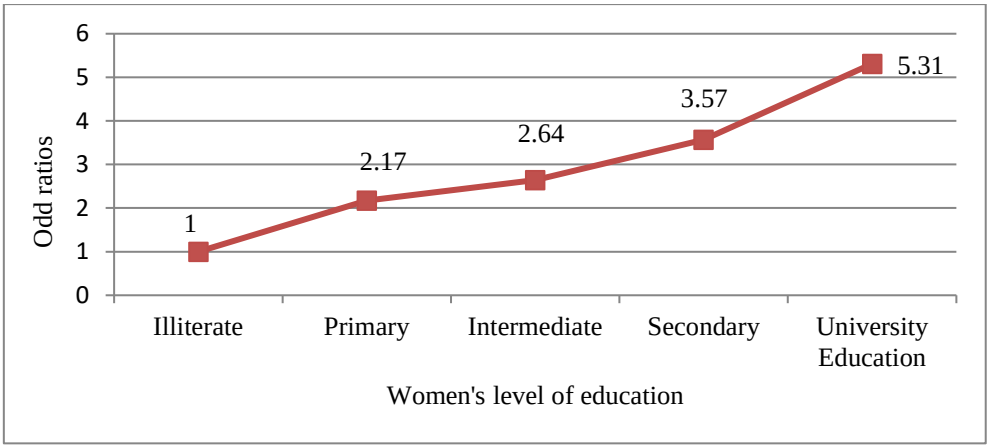
Source: Hosseini-Chavoshi et al. (2007)

As Erfani (2012) argues the effectiveness of some methods like withdrawal relies largely on the user's skills and experience and require more information, understanding, care, and spousal cooperation. If education means better information, it could be assumed that more educated women have more contraceptive competence than illiterate or less educated women (Erfani, 2012, p. 303).

A study conducted by Hajian et al. (2003) reveals the fact that reliance on withdrawal and male sterilization is popular among young women with higher levels of education. A study in Tehran city, using data from 'The Study of Contraceptive Practice' (Sadat-Hashemi et al., 2007), shows that the

more educated women are, the more likely they are to use traditional methods in the capital city (Figure 6-3). This study also argues that since modern methods available in Iran are designed for women's use, the wide prevalence of traditional methods may be due to perceived side effects of some modern contraceptives, as well as health concerns.

Figure 6-3: Odd ratios for using traditional contraceptive methods, Tehran city, 1999-2000



Source: Sadat-Hashemi et al. (2007)

Bulatao (1985) argues about the reasons behind reliance on traditional contraceptives by more educated women. He suggests that the relationship between higher education and higher levels of traditional contraceptive use is a result of better information about side-effects of modern methods among more educated women. According to Palmore and Bulatao (1989) traditional methods may be used with greater confidence by more educated women, who may have more contraceptive competence than less educated women.

6.3.3.1. The impact of educational attainment on contraceptive use among surveyed women

Consistent with previous studies (section 7.3.3) this study too has found a significant relationship between women's educational attainment and their contraceptive use (Table 6-8). In this study, contraceptive use among women who only have primary education is 63 percent; however, it reaches its peak among women who have diploma and university degrees (81.3 and 80.5 percent respectively).

Table 6-8: Percentage of currently married women 15–49 using different methods of contraception by level of education, Tehran city, 2015

Level of education	Contraceptive use									
	Any Method	Sterilization		IUD	DMPA	Pill	Condom	Withdrawal	Other	Number of women
		Female	Male							
Elementary school	63.2	8.3	0	16.7	0	41.7	8.3	25	0	19
High school	70.5	4.4	2.2	17.8	0	15.6	44.4	15.6	0	64
Diploma	81.3	3.5	1.8	14.9	1.8	10.5	20.2	45.6	1.8	137
Bachelor	80.5	1.4	2.9	5	0	7.1	30	44.3	9.3	181

Source: Fieldwork (2015)

Interestingly in this study there is a significant relationship between women's level of education and contraceptive method use. As can be seen Table 6-8, withdrawal or condom use are more prevalent among educated women; conversely, modern methods such as sterilization (women and men), IUD and the pill are less popular. These findings are consistent with the findings of Abbasi-Shavazi et al. (2009) at the national level and with the study by Sadat-Hashemi et al. (2007) in Tehran city which showed that the proportion of women undergoing sterilization is smaller among educated women. This finding is also in the line with the findings relevant with women's age and contraceptive use in the section 6.3.1.1. It was shown earlier that younger women are more inclined to use traditional methods (for spacing), and older women, who have attained their fertility goal are more inclined to use modern methods (for stopping). Therefore, as this study shows a positive significant relationship between women's age and their level of education, it can be concluded the reliance on traditional methods is higher among more educated women.

6.3.4. The association between region of residence and contraceptive use

A number of studies have investigated the impact of "region of residence" on contraceptive use (Erfani & Yuksel-Kaptanoglu, 2012; Goldberg & Toros, 1994; Kamal, 2000; Koc, 2000; Mahmood & Ringheim, 1996; Njogu, 1991; Tawiah, 1997; Tehrani et al., 2001). According to Erfani (2009), regional

differentials in contraceptive use within a multicultural society, such as Iran, may reflect differences in religious, ethnic and cultural characteristics of contraceptive users, and possibly differences in contraceptive access. In studies conducted in Iran the region of residence has mostly been categorised based on urban-rural, provincial and geographical place divisions. For example, Abbasi-Shavazi et al. (2009), on a national scale have categorised the provinces of Iran into eight groups based on the geographic units sharing religious and cultural characteristics. In all regions, withdrawal was much more likely to be used in urban areas than in rural areas. The urban areas in the North and Tehran City region had an extraordinarily high level of withdrawal use (27 percent) and contraceptive prevalence (79.5 percent).

In another study in Iran conducted by Erfani (2012), region of residence was categorised into five regions: *West*, *South*, *Central*, *North*, and *East*. In this study the five regions were developed based on geographical locations of Iran's provinces, which reflect the socio-economic and cultural characteristics of different parts of the country (Erfani, 2012, p. 304).

The different regions or suburbs of a city also can also be considered as a variable associated with contraceptive use. Erfani (2015) in his in "Tehran Survey of Fertility" categorised the 22 regions of Tehran city into three major regions -- *high*, *middle* and *low* and investigated fertility behaviour and patterns of contraceptive use among women in these classified regions.

6.3.4.1. The association between region of residence and contraceptive use among surveyed women

The distribution of contraceptive use according to region of residence in Tehran city is shown in Table 6-9. As mentioned earlier in chapter three (methodology), the selected regions in Tehran city: 3, 6, 8, 10 and 20 are respectively representative of regions with *high*, *medium* to *high*, *medium*, *medium* to *low* and *low* socio-economic development. The results of Chi-square tests do not show any significant relationship between contraceptive use and place of residence. As can be seen in Table 6-9 women in region 20, which has the lowest socio-economic development, have the highest levels of contraceptive

use (85.4 percent). However, inhabitants of region 3, with the highest level of development in Tehran city, have the lowest usage of any method of contraception in this study.

Table 6-9: Percentage distribution of currently married women 15–49 using different methods of contraception, by region of residence, Tehran city, 2015

Region	Level of development	Any method	Sterilization		IUD	DMPA	Pill	Condom	Withdrawal	Other	Number of women
			Female	Male							
3	High	71.9	6.3	2.1	10.4	0.0	4.2	12.5	37.5	27.1	69
6	Medium to high	75	2.8	0.0	19.4	0.0	19.4	16.7	41.7	0.0	50
8	Medium	80	3.5	7.1	7.1	0.0	4.7	52.9	23.5	1.2	106
10	Medium to low	72.2	1.7	0.0	12.1	3.4	22.4	20.7	39.7	0.0	80
20	Low	85.4	1.1	0.0	11.5	0.0	9.2	19.5	57.5	1.1	100

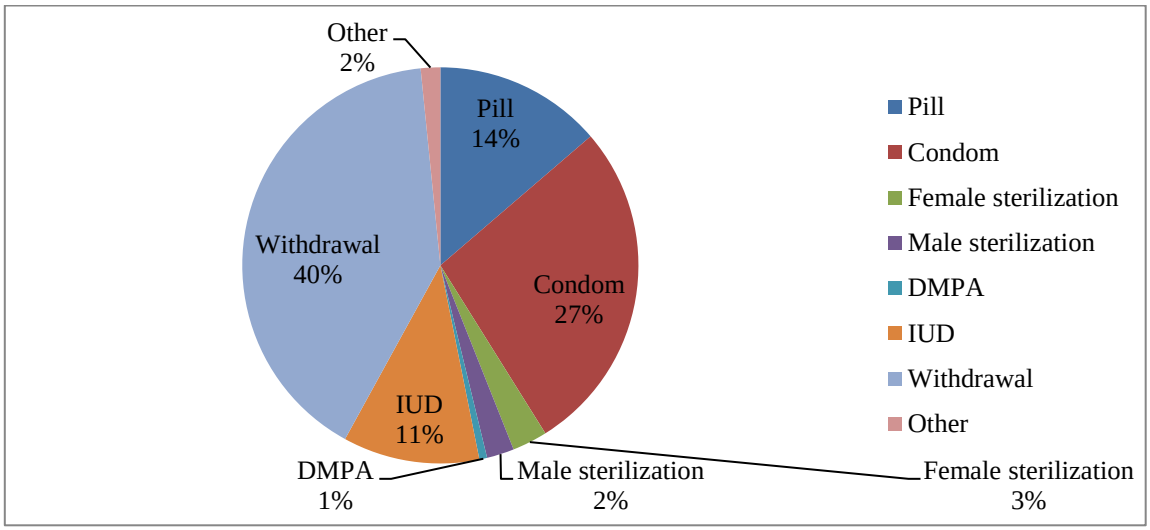
Source: Fieldwork (2015)

Interestingly, withdrawal is the most prevalent method among contraceptive users in region 20 (57.5 percent); however, injection (DMPA) and sterilization have negligible prevalence in this region. Conversely, women in region 8 (with medium development) have the lowest reliance on withdrawal among the other five selected regions (23.5 percent). Unlike other regions where withdrawal is the most prevalent method, in region 8, half of contraceptive users rely on condoms to avoid pregnancy. It should be noted that condom is also used for avoiding sexually transmitted infections (STIs). However, despite the fact that in Iran data on the prevalence of STIs is sparse with very limited generalisability to the general population, the effect of this factor on prevalence of condom use in region 8 cannot be examined.

6.4. Overview of contraceptive use among surveyed women

In this study the proportion of women using any method of contraception is found to be 78 percent. The study reveals that withdrawal, with 40.4 percent, is the most prevalent method among women (Figure 6-4). With regard to modern methods, condom use is the most popular contraceptive (27 percent). The contraceptives like the pill and IUD are respectively the second and the third prevalent modern methods. The proportion of women relying on sterilization (female and male) and DMPA comprise only five percent of contraceptive users in this study. In addition, a very small proportion of women practise other methods like rhythm.

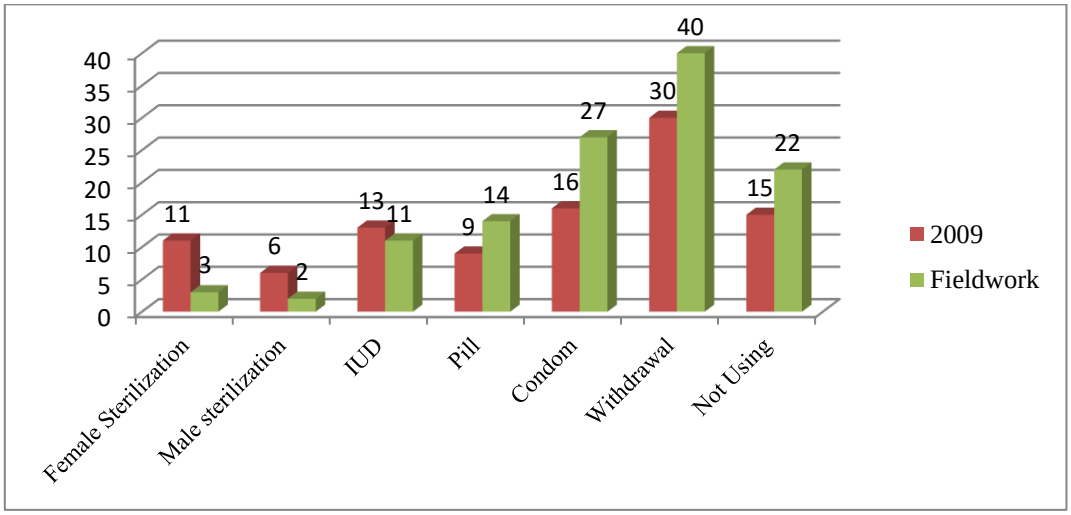
Figure 6-4: Contraceptive use among surveyed women, Tehran city, 2015



Source: Fieldwork (2015)

Figure 6-5 demonstrates a comparison of prevalence of different contraceptives methods used in Tehran city in 2009 and 2015. The data for 2009 are taken from '2009 Tehran Survey of Fertility', while the data for 2015 are taken from the fieldwork conducted by the author. As can be seen in Figure 6-5 between 2009 and 2015 the use of male-initiated contraceptive methods (condom and withdrawal) increased in the capital city. As it's shown in the table the condom use has increased from 16 to 27 percent and the withdrawal use has risen from 30 to 40 percent between 2009 (Tehran Survey of Fertility) and 2015 (this study). Figure 6-5: Percentage of current contraceptive use by major methods among married women aged 15–49, Tehran city, Iran, 2009 and 2015 also shows that the use of permanent methods such as sterilization (both female and male) and IUD have significantly decreased in Tehran city. This is consistent with the findings of Erfani (2017) who shows that the use of long-acting contraception, namely sterilization and IUDs, declined from 34 percent in 2000 to 20 percent in 2014, and the prevalence of male methods (withdrawal and condoms) increased from 33 percent to 55 percent in the same period in Tehran city.

Figure 6-5: Percentage of current contraceptive use by major methods among married women aged 15–49, Tehran city, Iran, 2009 and 2015



Source: Erfani (2013); Fieldwork (2015)

As mentioned earlier in section 6.3.3, in the context of Iran and Tehran city there is a positive significant relationship between women's education and the traditional (withdrawal) method use. Therefore, an increase in the use of male-based contraceptive methods can be explained by increases in women's educational attainments in capital city (see Chapter four section 4.1.1). It should be note that as education brings more autonomy for women, educated women have more knowledge on practising the traditional methods and will be more powerful negotiating the method, with less side effects, with their husbands. In the following sections more details about factors affecting contraceptive use and methods used among surveyed women will be examined.

6.5. The necessity to focus on withdrawal method

The high prevalence of withdrawal as a method among surveyed women which is consistent with high prevalence of this method in Iran (17 percent) (United Nations, 2015b), certainly calls for some in-depth analysis of the same. Despite the high prevalence of contraceptive use in Iran[52] (76.6 percent)

[52] According to the United Nations (2015b), the prevalence of withdrawal in Iran is 16.9 percent, however, modern methods include pill (15.6), female sterilization (14.8), male condom (13.7), IUD (8.4), injection (3.6) and male sterilization (2.9) have less prevalence.

(United Nations, 2015b) and also a small proportion of unmet need for contraception (around 5 percent) (Abbasi-Shavazi et al., 2009, p. 110), the occurrence of a large number of unwanted pregnancies in Iran can be attributed to the withdrawal method (Abbasi-Shavazi & Khademzadeh, 2004; Erfani, 2011b). Moreover, the failure of the withdrawal method leads to half of induced abortions that take place annually in developing countries, including Iran (Bankole et al., 1998; Erfani, 2010a; Erfani & McQuillan, 2009). It should be noted that in countries where abortion is legal, induced abortion as an alternative method can offset contraceptive failures associated with a high rate of withdrawal method (Erfani, 2012). Despite the fact that in Iran access to legal abortion is limited,[53] many women undergo clandestine abortions (Erfani, 2011b; Erfani & McQuillan, 2008). Therefore, a special focus is required on factors associated with "withdrawal use" and its determinants to reduce the occurrence of unsafe abortion. The following section examines the background of withdrawal use in the world and Iran.

6.5.1. Background of withdrawal use in the world and in Iran

Withdrawal or coitus interrupts is one of the oldest methods of contraception which has been known and used by couples in many societies (Himes et al., 1970; Rogow & Horowitz, 1995; Santow, 1993, 1995). In fact, before the introduction of modern methods of contraception, withdrawal played an important role in fertility transition in the currently developed countries (Santow, 1993, 1995) and it continued to be extensively adopted in South-Eastern Europe and the Near East (McLaren, 1990). Santow (1993) argues that in Southern Europe, withdrawal tended to persist even after the introduction of modern methods. In fact, the survival of the method among Southern European emigrants suggests that the continued use of withdrawal cannot only be attributed to a lack of alternative methods (Santow, 1993). According to the United Nations (2015b), withdrawal is still widely practiced in Southern Europe and selected countries in Western Asia. In Armenia, Azerbaijan, Bahrain and Turkey in Western Asia, Iran in Southern Asia; Bulgaria, Romania in Eastern Europe; and Albania, Bosnia and Herzegovina and

[53] In Iran, induced abortion is strictly prohibited except when a woman's life is endangered, or her foetus is diagnosed with a disease or defect that is recognized as an exception by the country's Legal Medical Organization (Erfani, 2010a).

Serbia in Southern Europe, withdrawal has been reported as the most prevalent method among all methods of contraception (United Nations, 2004a, 2015b). Withdrawal use also has been reported more specifically in the Islamic World. In fact, withdrawal (referred to as *Nazdiki-e monghata* in Persian references or *Al-azl* in Arabic, is one of the oldest documented methods of avoiding pregnancy among Muslims. The use of this method can be traced to the time of "Prophet Mohammad"[54] (Abbasi-Shavazi et al., 2009; Cebecı Save et al., 2004; Mussalam, 1982; Omran, 1992; Oztürk et al., 2002). Withdrawal also is considered to be a male-controlled method, demonstrating male participation in family planning (Karra et al., 1997); however, this method requires both male and female participation and trust between spouses (Kulczycki, 2004). A number of studies have investigated the factors associated with the practice of withdrawal use. The most addressed factors are 'the fear of side effects of modern methods of contraception' (Abbasi-Shavazi & Khademzadeh, 2004; Goldberg & Toros, 1994; Hacettepe Institute of Population Studies, 1998; Myntti et al., 2002; Rahnama et al., 2010; Ramezanzadeh et al., 1995; Turkistanl, 1998; Westoff & Bankole, 1998; Yurdakul & Vural, 2002), 'lack of knowledge about contraceptive methods' (Akbarzadeh & Khorsandi, 1999; Kulczycki, 2004; Rahnama et al., 2010) and 'husband's preference' (Goldberg & Toros, 1994; Kamau et al., 1996).

In Western Asia, withdrawal still ranks as the most frequently practised contraceptive method in Turkey (25.8 percent of all contraceptive users), in contrast to its declining importance in most western societies (United Nations, 2015b). In Turkey, in addition to the belief and fear of side effects, factors such as unwillingness of men to use modern methods, the cost of modern contraceptives and religious concerns, are associated with withdrawal use (Akin, 1999; Okun, 1997; Santow, 1993; Turkistanl, 1998; Yurdakul & Vural, 2002). Kulczycki (2004), using the 1998 Turkish Demographic and Health Survey, investigated the husbands' attitudes toward withdrawal use. He argues that withdrawal users generally hold favourable opinions of withdrawal, believe in its efficacy and safety, and state that both they and their wives prefer to use it. According to Kulczycki (2004), the decision to use withdrawal often reflects husbands' preferences, but it also helps meet women's desires to avoid possible side-effects associated

[54] The National Conference of Islamic Child Spacing concluded that no conflict exists between Islamic law, Al-Sharia, and child spacing. This conclusion was based on the information that companions of the prophet used coitus interrupts (International Islamic Center of Population Study (IICPS), 1990).

with modern methods and for men to share responsibility for contraception. In fact, husbands more inclined to agree with male privilege in decision making, are more likely to practise withdrawal than other methods. Cindoglu et al. (2008) investigating determinants of choosing withdrawal in Turkey, argue that urban women, the more educated, those with better socio-economic status, and those living in less crowded households are less likely to rely on withdrawal. In fact, experience and empowerment are positively linked to modern contraceptive use among women in Turkey. In Lebanon, despite the availability of a variety of contraceptive methods throughout the country, withdrawal remains a widely practised method of family planning (Myntti et al., 2002). According to the United Nations (2015b), one in six Lebanese couples adopt the withdrawal method. The Bekaa Reproductive Morbidity study, conducted by the American University of Beirut in 1998, showed that over 70 percent of withdrawal users reported to have used either the pill or IUD in the past; however, the vast majority (80 percent) said that they switched because withdrawal is healthier and safer, or because they did not like the side effects of the previous method.

In Iran, despite the fact that the 1989 family planning program provided Iranian couples with a wide range of modern contraceptives (Aghajanian, 1994; Aghajanian & Merhyar, 1999), withdrawal remained among the most practised contraceptive methods in the country (Erfani, 2012; Erfani & Yuksel-Kaptanoglu, 2012). It has been argued that withdrawal played an important role in the sharp fertility transition (decline) in Iran[55] (Aghajanian et al., 2007). During the 1980s, when family planning was suspended in the country, the Ministry of Health continued to offer modern contraceptives as pills, IUDs, and condoms through its Maternal and Child Health clinics.

Moreover, couples were able to obtain contraceptives from the private sector. Nevertheless, these services did not meet the needs of all Iranian couples. Thus, it is speculated that withdrawal must have been the major method of contraception during this period (Aghajanian et al., 2007).

[55] In 1976, 17 percent of urban, and a very small proportion of rural Iranian couples (three percent) were practising withdrawal. It's argued that the high rate of withdrawal among urban couples was the reason behind the gap between the population of urban and rural areas when public family planning programs did not exist (Aghajanian et al., 2007).

more especially as mentioned earlier, fertility in Iran begun to decline a few years before the resumption of family planning program. According to Abbasi-Shavazi et al. (2009) there has always been a sub-group who have always relied on traditional methods even after revitalisation of the national family planning program and promoting the use of modern methods (Abbasi-Shavazi et al., 2009, p. 98). It is interesting to note that withdrawal has been reported to be very popular among couples in more advanced provinces of Iran: Tehran, Gilan, Mazandaran, Semnan, and Isfahan, particularly among highly educated couples. These provinces have the lowest levels of fertility (Abbasi-Shavazi & Khademzadeh, 2004). The frequency of using traditional methods in Gilan is the highest in Iran (30 percent), and about one third of contraceptive methods in Gilan include withdrawal. The proportion of unwanted pregnancies is high among those who use withdrawal in this province as well. Abbasi-Shavazi and Khademzadeh (2004) reveal that in Rasht city (the capital of Gilan province), 38.3 percent of married women aged 15-49 were practicing withdrawal. Couples in Rasht city adopted withdrawal in order to avoid any side effects of modern contraceptives. According to findings of Abbasi-Shavazi and Khademzadeh (2004) withdrawal use in Rasht can be attributed to the husbands' understanding of the health situation of their wife. This study also indicates that although abortion is illegal in Iran, induced abortion is a common act in compensation for the failure of withdrawal use in Rasht city. It should be considered that the proportion of unwanted pregnancies is high among those who use withdrawal in this province (Abbasi-Shavazi & Khademzadeh, 2004). Ahmad-Shirvani and Omidian (2007), in their study in Mazandaran province, one the provinces with high levels of withdrawal use (37.8 percent), argue that women prefer to practise withdrawal because of "fear of side effects of modern methods (50.6 percent)", "being easy to practice (36.5 percent)" and "their husband's preference (32.6)". The duration of marriage, age and number of living children has had a negative association with withdrawal use in this study. Ahmad-Shirvani and Omidian (2007) argue that young couples, who have not experienced different contraceptives, mostly choose traditional methods because of lack of knowledge and based on the advice of informal sources. A qualitative study in Tehran city shows that a majority of women have negative attitudes toward modern contraceptives (Rahnama et al., 2010). Respondents believe that modern methods have side effects which may affect their reproductive health. They also reported that the modern methods are not efficient and there is the risk of pregnancy by adopting these methods.

Moreover, social pressures were other factor affecting method choice. Women also apparently stated that they finally selected their method of contraception based on preferences of their husbands, relatives and friends. Their inability to practise modern methods of contraception such as the pill, IUD and condoms was another factor influencing their method choice. Difficulty to access health clinics, contraceptives or family planning centres have not reported by women in this study as difficulties to prevent them from adopting modern methods (Rahnama et al., 2010). Authors of this study conclude that negative attitudes by women toward modern contraceptives and their side effects is the result of wrong information from informal sources. Improving women's education has been considered as a way to increase their status and autonomy (Jejeebhoy, 1995; Jejeebhoy & Sathar, 2001; Mason, 1986). In addition, women's autonomy has considerable impact on reproductive behaviour. Thus, women with higher autonomy are more likely to be involved in their marriage arrangements, to achieve information regarding family planning methods and their method of contraception and so to control their fertility (Jejeebhoy, 1996). Therefore, educated women will be more powerful negotiating the method of contraception with their husbands and as the findings of previous studies (Abbasi-Shavazi & Khademzadeh, 2004; Rahnama et al., 2010; Ramezanzadeh et al., 1995) show, women choose withdrawal because they prefer to avoid the side effects of modern methods. It can be concluded from this section that the health concerns, side effects of modern methods and the method failure are cited by most of the women as the reasons for making their decisions whether to choose a method of contraception or not. Also, the demographic variables such as education, women's age, residential region and number of living children are found to have a major influence on contraceptive use in Iran.

6.6. Contraceptive users versus non-users, withdrawal versus modern use

Table 6-10 presents the results of a logistic regression in two parts: (i) On factors affecting the use of any method of contraception, and (ii) on factors affecting the use of withdrawal among all the contraceptive users. The reference category in the first model is non-use (of contraception), and that in the second model is modern methods (of contraception). The findings of logistic regression analysis (controlling for the number of children, level of education and region of residence) shows that women

aged 15-29 were 3.9 times more likely than women aged 40-49 to use contraception (Table 6-10). Also, the likelihood of adopting any contraception among women aged 30-39 was 2.4 times more than those aged 40-49. The age-group 40-49 has been taken as the reference category. This is consistent with the study by Abbasi-Shavazi et al. (2009) which showed that the likelihood of using any method of contraception is higher among younger age cohorts than older women who are at the end of their reproductive period. In fact, In the current stage of fertility transition and fixed goals about the number of desired children, the younger women would probably more inclined to use contraceptives. Moreover, According to Mackay (2001), older women possibly have infrequent sex and lower fecundity rates. The results (Table 6.5) of chi-suare test didn't show any significant relationship between age and method used (wihdrawal/modern). When withdrawal users were examined versus modern users, after controlling for other variables in Table 6-10, no significant relationship was found between age and likelihood of withdrawal use. This is because withdrawal is almost equally prevelant throughout all age groups (Table 6-4). Table 6-6 further shows that there is a significant relationship (p=0.03) between adopting any contraceptives and the number of children among surveyed women. Nevertheless, after controlling for age, education and region of residence, this relationship was significant only among women with no children. In fact, women who are yet to have a child are 82 percent less likely to use any method of contraception than women with more than three children. While, after controlling for age, education and place of residence, the likelihood of using any contraceptives (versus non-use), does not change among women with one or two children, than women with three children (Table 6-10). Despite the significant inverse relationship between the withdrawal method and number of children in bivariate analysis (Table 6-6), after controlling for age, education and region of residence, no signifacant association was found between likelihood of withdrawal use (opposite to modern method use) and number of children per se. This is because although the withdrawal use decreases by increase in number of children, but as it was shown in Table 6-6 there is no significant differnce in practice of withdrawal among women with different number of children. In fact, because of the higher autonomy and knowledge about family planning among women, withdrawal use is the most prevalent method of contraception even among women with more than two children.

Table 6-10: Odds ratios indicating the likelihood of current use of any form of contraception among currently married women 15–49, and using a withdrawal method among contraceptive users by selected factors, Tehran city, 2015

Variables in the equation			**Any method use vs. non-use**		**Withdrawal use vs. Modern use**	
Number of women			**N_1=293**		**N_2=126**	
Age category	15-29		**	3.87	n.	1.1
	30-39		**	2.36	n.	0.8
	40-49	(ref)				
Number of children	0		**	0.18	n.	3.1
	1		n.	0.44	n.	1.2
	2		n.	0.86	n.	1.7
	3+	(ref)				
Level of education	Less than Diploma	(ref)				
	Diploma		**	2	**	4.39
	Bachelor's and above		**	3.04	***	5.11
Region of residence	3	(ref)				
	6		n.	0.38	n.	0.43
	8		n.	0.4	**	0.38
	10		n.	0.71	***	0.36
	20		n.	0.44	***	0.17

*** Significant at level p<0.01 ** Significant at level 0.01<p<0.05

Source: Fieldwork (2015)

As presented in Table 6.7, there is a very small positive impact of education level upon contraceptive usage. However, after controlling for age, and number of children and region of residence, education level has a significant relationship with contraceptive use (p=0.01) (Table 6-10). The usage of contraception positively increases with level of education. Women with diploma and university degrees are respectively two and three times more likely than women with less education (primary and high school) to use any method of contraception. Moreover, there is a positive relationship between the level of education and the likelihood of using withdrawal versus modern methods. Among contraceptive users, women with diploma degree are 4.4 times more likely than women with less educational attainment to adopt withdrawal (as opposed to a modern method), and the likelihood of using

withdrawal increases further among women with university education. In fact, women with university or postgraduate degrees are five times more likely to use withdrawal (than modern methods) than women who have experienced less than 12 years of schooling (Table 6-10). It worth noting that women's autonomy has considerable impact on reproductive behaviour. Thus, women with higher autonomy are more likely to be involved in their marriage arrangements, to achieve information regarding family planning methods and their method of contraception and so to control their fertility (Jejeebhoy, 1996). Therefore, educated women will be more powerful to negotiate about the method of contraception with their husbands and as the findings of previous studies (Abbasi-Shavazi & Khademzadeh, 2004; Rahnama et al., 2010; Ramezanzadeh et al., 1995) show, women choose withdrawal because they prefer to avoid the possible side effects of modern methods. It should be noted that the use of withdrawal, like that of condom depends very much on the cooperation and efficiency of the male partner, i.e., the husband. Unfortunately, this survey didn't collect information on husbands' education. However, according to studies conducted by foroudastan et al. (2008) and Samani (2007) Iranian women intend to get married to men who have at least the equal or higher educational attainments. Therefore, it can be concluded that husbands of women in this study have the knowledge of practising male-based methods.

Table 6-10 shows that after controlling for age, level of education and number of living children, there is no significant relationship between region of residence in Tehran city, classified based on zoning (socio-economic) development, and contraceptive use, while there is a strong relationship between region of residence and withdrawal use (versus modern method use) ($p<0.01$). Table 6-10 also indicates that surveyed women in Regions 8, 10 and 20 are respectively 62, 64 and 83 percent less likely to use withdrawal than women in Region 3.

6.7. Reasons for not using contraception

Around 22 percent of surveyed women were not using any method of contraception at the time of interview. Reasons for not using contraception among women who were not pregnant at the time of the survey can be categorised into two main groups as shown in Table 6-11.

- Fertility-related reasons include primary infertility, secondary infertility, because of infrequent or no sexual relationship with husband, being in a state of post-partum sexual abstinence or lactation amenorrhea and trying to become pregnant.
- Health concern reasons.

Table 6-11: Percentage distribution of surveyed women not using contraception

Age-group of women (years)	Percentage of women by reasons for non-use						
	No or irregular sexual relationship	Postpartum abstinence and breastfeeding	Hysterectomy (Removes Ovaries and Uterus)	Secondary infertility	Primary infertility	Wanted to get pregnant	Total (N)
15-29	0	14.3	0	4.8	9.5	71.4	100.0 (N=21)
30-39	6.3	6.3	3.1	6.3	12.5	62.5	100.0 (N=32)
40-49	6.5	3.2	19.4	25.8	29	16.1	100.0 (N=31)
Total	4.8	7.1	8.3	13.1	17.9	47.6	100.0 (N=84)

Source: Fieldwork (2015)

Table 6.11 shows the surveyed women's reasons for not using any contraception according to age of the women. In this study a majority of women not using contraception aged 15-29 and 30-39 do not use contraception because of intention to have a child. This finding is not surprising as women aged 15-29 and 30-39 have at least 20 and 10 years respectively, to complete their reproductive span. This can be clearly seen from the fact that the average CEB of these women aged 15-29 is 0.54, and that of these women aged 20-39 is 0.95.

Among women aged 15–29, intention for pregnancy comprised almost 71 percent of the reasons for not using contraception. 14 percent of women in this age group reported that because of postpartum

abstinence and breastfeeding they do not use any contraceptive. Primary infertility accounts for almost a tenth of non-users aged 15-29. In the middle age range, 30-39, a large proportion (62.5 percent) of non-users stated that they wanted to become pregnant. Primary infertility among women in this age group, which is slightly higher than the younger age group (15-29), accounts for 12.5 percent of all reasons for non-contraceptive use. The other reasons cited by non-users aged 30-39, include secondary infertility, postpartum abstinence and breastfeeding and no or irregular sexual relationship with husband, have the same (small) proportion (6.3 percent each). Removing ovaries and uterus has a negligible proportion (3.1 percent) among women aged 30-39 years.

Not surprisingly, the intention to have a child comprises only 16 percent of the reasons for non-contraceptive use among women aged 40-49, who are almost at the end of their reproductive period. The proportion of women reporting primary and secondary infertility (as their reasons for non-use of contraceptive) has interestingly increased by women's age. As can be seen in Table 6.11, 26 and 29 percent of women aged 40-49 have sated secondary and primary infertility respectively as their reasons for not using any method of contraception. The increase in prevalence of primary infertility by age in this study is consistent with the study by Barouti et al. (1999) and Vahidi et al. (2009) which show that the lowest prevalence of primary infertility is observed among young age groups (less than 30) in Iran. The increase in prevalence of primary and secondary infertility in this study is also in the line with the findings of a national wide study by Safarinejad (2008) which shows that the oldest cohort of women (age 40–50 years) are more likely to experience fertility problems in comparison with women aged 15–24 years. It is also consistent with the findings of Mohammad and Ardalan (2009), which show that women with the youngest ages at first marriage, in other words women with oldest current ages (if one can assume that older women got married earlier than younger women) have the highest infertility.

Hysterectomy with the removal of ovaries has been reported as a reason for not using contraceptives by slightly less than a fifth of women aged 40-49, however postpartum abstinence and breastfeeding are reported by only a minority of women in this age cohort. A small proportion of women in each age group has referred to no or irregular sexual relationship with husband as a reason for non-use of contraception. It is worth noting that none of the factors, such as husband's opposition, religious

reasons, lack of knowledge and lack of accessibility due to cost or distance were reported by surveyed women as a reason for not using contraception. A mentioned before, one of the most important steps taken in the implementation of the family planning was to make contraceptives available free of charge (in the public sector) throughout the country (Tehrani et al., 2001). Despite the fact that the pronatalist policy of the government in Iran had limited the access to free contraceptives through the public sector, some public health centres still provide them (Mehrkhane, 2012). In addition, mobile providers (public sector) service remote locations and cost is rarely an access issue for Iranian women (Abbasi-Shavazi et al., 2009).

6.8. Conclusion

This chapter has found that 78 percent of surveyed women were using some method of contraception at the time of the survey. This study also reveals that withdrawal is the most prevalent method of contraception (40.4 percent), while DMPA and sterilization (female and male) are the least practised methods among surveyed women in Tehran city. Among the modern contraceptives, condom is the most popular method (27 percent); followed by pill (14 percent) and IUD (11 percent).

The results of logistic regression in this study reveal that there is a positive relationship between the level of education and the likelihood of using withdrawal versus modern methods. In fact, women with higher levels of education are more likely than women with lower levels of educational attainment to adopt withdrawal (as opposed to a modern method). Indeed, the likelihood of using withdrawal increases further among women with university education. Moreover, the odds of withdrawal use (versus modern methods) are higher among women living in regions with higher levels of socio-economic development. Therefore, the likelihood of withdrawal use is the highest among the residents of Region 3 in Tehran city with the highest socio-economic development.

The high prevalence of withdrawal as a method of contraception among surveyed women, certainly calls for some in-depth analysis. Because, while couples across the country are provided with a range of methods to meet their diverse contraceptive needs (Erfani, 2012), withdrawal still remains among the most used contraceptive methods. Therefore, given that in Iran (compared to other developing

countries) the proportion of unmet need for contraception is small (around 5 percent) (Abbasi-Shavazi et al., 2009, p. 110), the occurrence of a large number of unwanted pregnancies can be attributed to withdrawal use (Abbasi-Shavazi & Khademzadeh, 2004; Erfani, 2011b). The high failure of withdrawal use, and also the intention of educated women to use withdrawal, highlights the necessity of educating young women in high schools and universities about the risks of adopting withdrawal as a method of contraception and consequently the risk of unwanted pregnancies. It is worth noting that in countries where abortion is legal, induced abortion can act as an alternative to compensate for contraceptive failures to cope with a high rate of withdrawal use. In Iran, however, abortion is illegal and strictly prohibited (Erfani, 2012) except when a woman's life is endangered or her foetus is diagnosed with a disease or defect (Erfani, 2011b). Therefore, young educated women should also be aware of the consequences of undergoing clandestine abortions and they should be informed about the use of emergency contraceptive pills[56] in the case of withdrawal failures. Moreover, young educated women should be encouraged to use more effective contraceptives such as pill, IUD or Norplant. The findings of this study also reveal that the non-use of contraceptives among women in Tehran city is mainly associated with their intention to have a child and infertility (both secondary and primary).

Interestingly, none of the factors such as religious reasons, husband opposition, lack of knowledge and lack of accessibility of contraceptives due to cost or distance were reported by women as a reason for non-use. Indeed, more than a fourth of women aged 35-49 in this study stated that because of the intention to have a child they were not using any method of contraception. This is consistent with the findings of previous studies in Iran (Abbasi-Shavazi et al., 2009; Erfani, 2015) which show that late childbearing and delay of first and second birth is a new emerging phenomenon in recent decades in the country. The findings of the latest census in Iran (Statistical Centre of Iran, 2016a) also confirmed the fact that the fertility of women aged 35-39 years has had a significant role in the increase in the total fertility rate in the country (from 1.8 to 2.01).

[56] Emergency contraceptives are available in pharmacies (over the counter) all over the country.

CHAPTER 7: POPULATION POLICIES IN IRAN AND THE GLOBAL CONTEXT

7.1. Introduction

According to the United Nations (1973, p. 632) there is no universally accepted definition of population policy. However, all deliberate government actions such as laws, regulations, and administrative programs which influence population growth, size, distribution, and composition can be defined as population policy. Stycos (1977; 1982) defines population policy as 'a statement of important goals, accompanied by a specific set of means to achieve them. A well-elaborated set of means constitutes a program'.

Since the late 1960s, antinatalist ideas have dominated in many Western countries, largely because the natural population increase was considered to be adequate enough to future manpower requirements. Population control was advocated as a response to the fear of the shortage of resources, caused by the population explosion (Heitlinger, 1976). However, since the 1970s most developed countries have experienced below replacement level fertility. The anticipated future aging of these populations is based on the assumption of continued low fertility (Uhlenberg, 1992). In macro-economic terms, very low fertility leads to serious future labour shortages, especially a shortage of young skilled workers at a time when populations are aging rapidly (McDonald, 2006). The current and future age structure of a population is determined by fertility, mortality, and migration patterns. Therefore, the policies to alter the aging of the population must consider the possibility of altering each of these demographic variables that directly influence the age structure (Uhlenberg, 1992). Policies to reverse aging of population generally take two forms: policies to encourage births (pronatalist policies), and immigration policies that can also directly reduce labour shortages (Martin, 1991). The immigration policy will affect the total size of the population and the racial/ethnic composition of the old and non-old population (Arthur & Espenshade, 1988). However, encouragement of higher immigration as a strategy to reduce population aging has received little attention. It has been argued that the impact of increasing the number

of young immigrants would increase the size of the labour force, however, in the long term the immigrants and their children also get aged (Uhlenberg, 1992).

McDonald (2006) argues that despite the fact migration can provide a partial solution to labour shortages at young ages, especially in the shorter term, it is not a long term solution to the future labour shortages which is predominantly a result of very low fertility (McDonald, 2006, p. 488). Moreover, in some very low fertility countries immigration has been subjected to strong political debate. Therefore, it can be concluded that in the long run, increasing the fertility levels must be part of the solution for countries with very low fertility (McDonald, 2006). However, the experience in many countries has shown that reversing the low fertility rate is extremely difficult because fertility behaviour is closely associated with overall socio-economic conditions. Consequently, McDonald (2006) argue that the different aspects of economy and society should be addressed in government efforts in order to increase the fertility levels.

This chapter provides a brief history of government measures to implement population policies (more specifically the pronatalist population policies) in Europe, advanced East Asian countries and Iran. The reasons behind success and failure of these policies will also be critically examined in this chapter. A discussion on population policies in both these regions (Europe and Asia) where fertility levels are currently below replacement level, should provide some critical insights into Iran's recent attempts to introduce pronatalist policies. The first section is about the fertility decline in Europe over the first and second demographic transition as well as the economic recession. The policy initiatives to reverse the fertility decline in Europe will also be examined. In subsequent sections, the low and ultra-low fertility rate and the relevant pronatalist policies will be investigated in advanced East Asian countries such as Japan, South Korea, Singapore, Hong Kong[57] and Taiwan. In addition, this chapter will have a special focus on Iran's unique experience[58] with implementation of a national antinatalist family planning

[57] It should be noted that Hong Kong is a special administrative region (SAR) that exists as part of the People's Republic of China. Hong Kong has its own independent pillars of power (executive, legislative and judiciary) in all aspects except military, defence and foreign affairs (Investopedia, 2018).

[58] Iran has had one of the most successful family planning programs in the developing world (Vahidnia, 2007).

program. At the same time the recent attempt at adopting a new pronatalist approach by the government of Iran will also be examined.

7.2. Fertility decline in Europe (from demographic transition to economic recession)

The first (classic) demographic transition refers to the declines in mortality and fertility. The transition which was first seen in several European countries (from the eighteenth century) has continued to the present in most developing countries. The stable population corresponding with replacement fertility, zero population growth, and life expectancies higher than 70 years are the characteristics of the end point of the first demographic transition (Lesthaeghe, 2007).

In the late 1960s the changes in fertility, family formation, and partnership behaviour occurred in Western and Northern Europe (Van de Kaa, 2002, p. 9). These changes, which were associated with the fundamental shifts in family life values and children, and also weakening of the 'traditional' family, were named as the idea of the second demographic transition (Van de Kaa, 1987, p. 4). A substantial postponement of parenthood, facilitated by the widespread use of modern contraception, is one of the consequences of the second demographic transition (SDT). This enables couples to pursuit other goals in their personal lives (Lesthaeghe & Neidert, 2006). Moreover, as a result of increase in cohabitation and union instability, the SDT leads to a drastic rise in the proportion of non-marital births. The second demographic transition also leads to 'structural long term sub-replacement fertility'. Despite the fact the second demographic transition brings a substantial demographic change, low fertility (below replacement level) is often perceived as a main symptom of this transition (Sobotka, 2008). The sharp fertility decline in the 1960s and 1970s left fertility of around 1.7 children per woman in 1990-1995 in Europe, North America, and Australia/ New Zealand (Bongaarts, 1999). In the 1990s, total fertility rate (TFR) fell below 1.3 in Eastern and Southern Europe and also in East Asia (Goldstein et al., 2009). Fertility below 1.3 children per woman, which is called the lowest-low[59] fertility, was first seen in Italy

[59] Defined as TFR below 1.3 (Kohler et al., 2002).

and Spain. Following this trend at the end of the 1990s, the TFR in 14 countries in Southern, Central, and Eastern Europe dropped below 1.3 (Kohler et al., 2002).

Goldstein et al. (2009) argue that the prediction of Kohler et al. (2006) regarding the spread of lowest-low fertility, particularly to Austria, Germany, Switzerland, and selected countries of Central and Eastern Europe, did not come true as since 2000, fertility in most low and lowest-low fertility countries has been steadily increasing. The TFR in Bulgaria, the Czech Republic, Latvia, Ukraine, and East Germany[60] (Central and Eastern Europe) reached 1.4 or above by 2008. TFRs have also exceeded 1.4 in Italy, Spain, and Greece (in Southern Europe). The fertility increase also has been seen in the European countries with higher fertility rates like Sweden, the United States, the United Kingdom, France, and the Netherlands. It should be noted that in the German-speaking countries the fertility has remained unchanged (Goldstein et al., 2009, p. 664).

Despite a trend of reversal in fertility over the decade through to 2008, changes in the number of live births in the Europe suggest a close association between the recession (2009) and fertility trends (Sobotka et al., 2011). Increase in unemployment rate, economic uncertainty and also a decline in financial incentives which were received by families with children are the consequences of the recession that could affect fertility. According Eurostat (2010) in 2009, 15 European countries experienced a decline in the number of births, with the EU-wide total down by 1.1 percent over 2008. In Greece, for example, in 2009 when the economy started to collapse, the TFR decreased from 1.5 in 2010 to 1.4 in 2011 (Figure 7-1). A similar reversal in fertility trends occurred in Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Romania and Spain (Goldstein et al., 2013).

[60] The former German Democratic Republic.

Figure 7-1: TFR and unemployment, Greece, Bulgaria, Czech Republic and Spain, 2001-2011

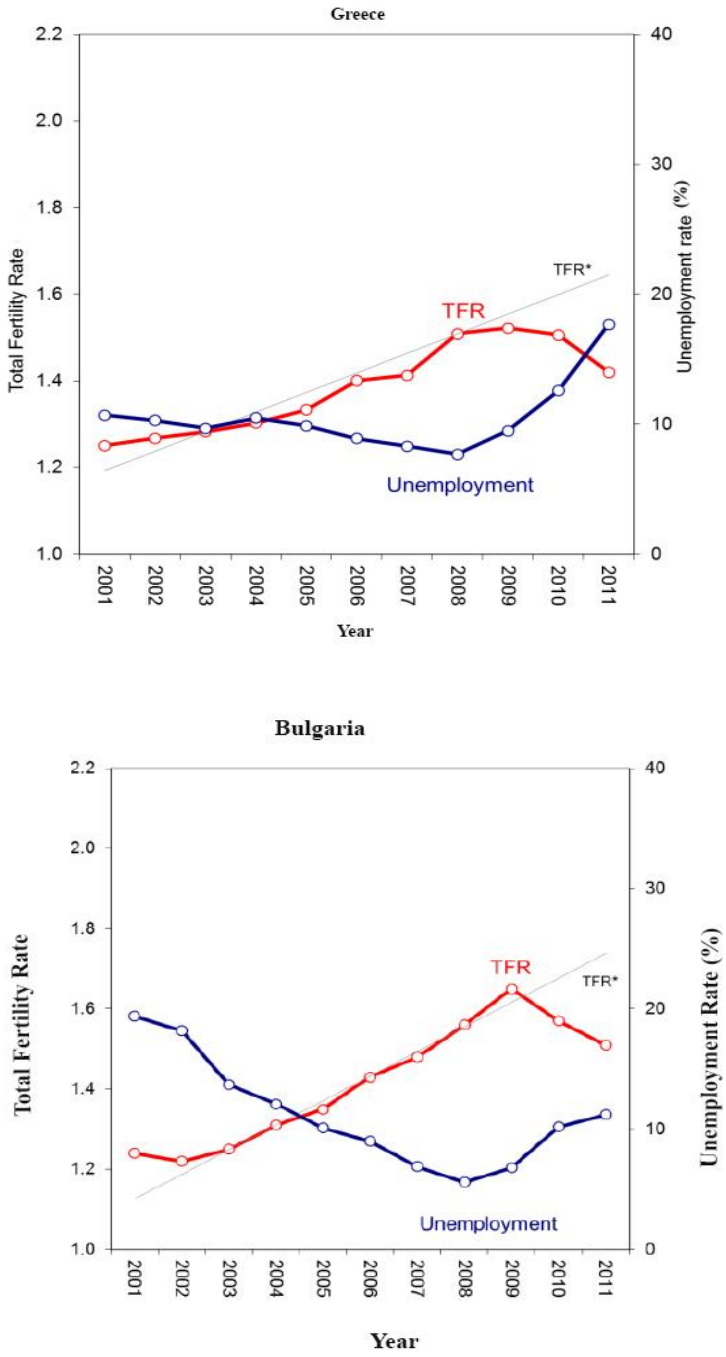
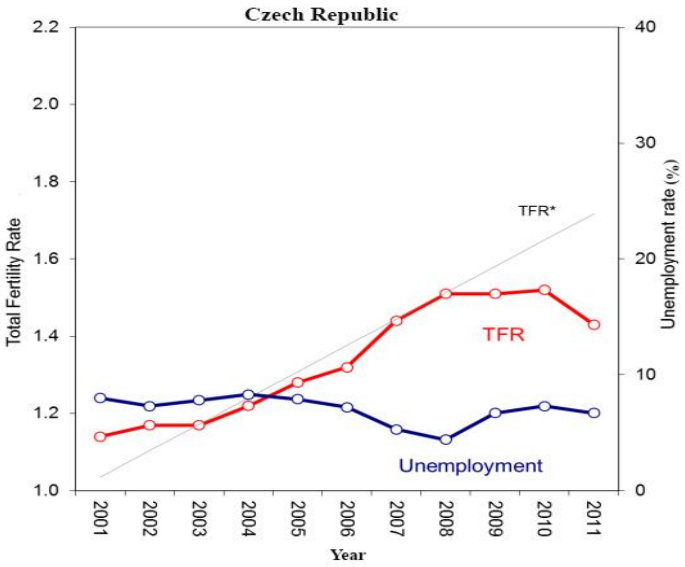
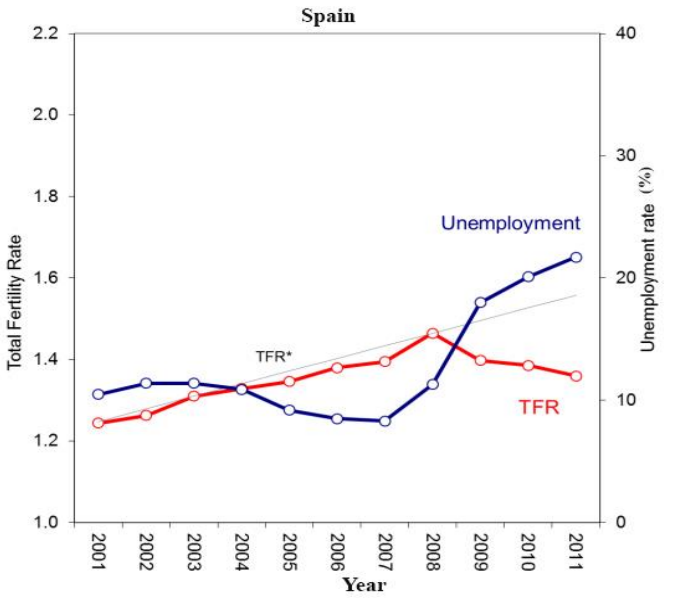


Figure 7-2: (Continued)



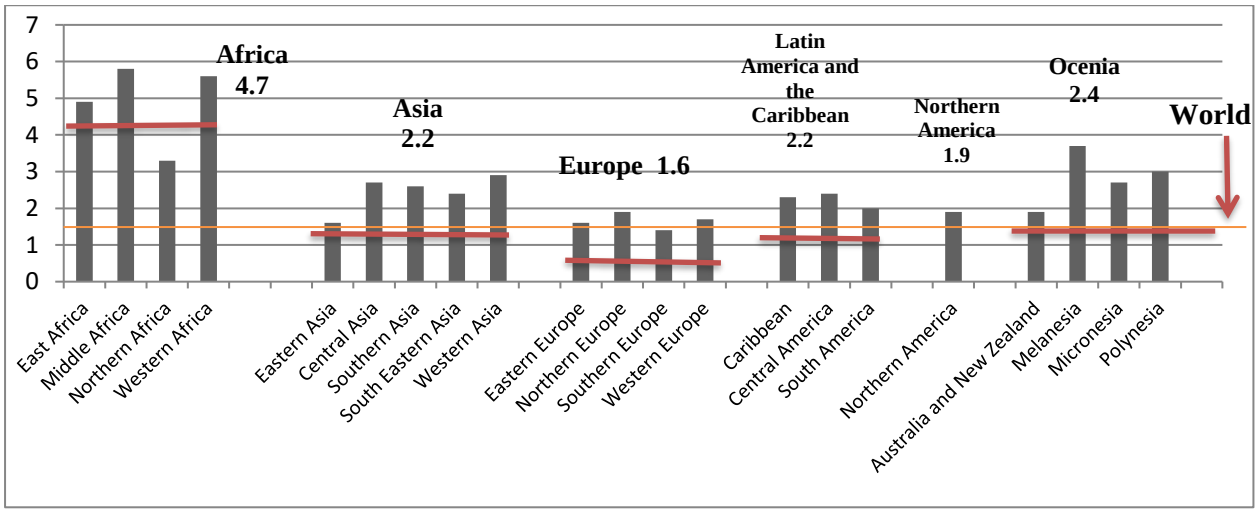


Source: Goldstein et al. (2013)

7.2.1. Pronatalist initiatives in low fertility European countries

According to the 2015 United Nations Revision of World Population Prospects, Europe has the lowest TFR (1.6 children per woman) in the world (Figure 7.2). It should be noted that low fertility has become a concern in many European countries because of its negative consequences such as slowing economic growth and decline in total population (European Commission, 2005; Sobotka, 2011). Therefore, several industrialised countries have adopted 'pronatalist' policies as an effort to reverse low fertility and raise the fertility level (Goldstein et al., 2009; Lee et al., 1991; Neyer, 2003; Uhlenberg, 1992).

Figure 7-3: Total Fertility Rate by region and major area, 2010-2015



Source: United Nations (2016)

McDonald (2002, p. 435) classified the pronatalist population policies into three groups: financial incentives, support for parents to combine work and family and broad social change supportive of children and parenting. Jones et al. (2008) argue that European countries are different with respect to the level of support for the pronatalist policies provided to parents, largely based on the kind of welfare regime they follow. Universalistic welfare states (the Nordic countries), conservative welfare states (continental European countries), the liberal welfare state (Anglo-Saxon countries) and Southern European welfare states are common categories of welfare state regimes in European countries. In conservative welfare states, which rely on familialism, family is considered as a provider of welfare. A higher degree of familialism can be seen in Southern European countries.

The reconciliation between family and work is a part of policies adopted by many European countries (with higher rates of female employment) to increase the fertility levels (Ahn & Mira, 2002; Francesco Billari & Kohler, 2004; D'Addio & d'Ercole, 2005). Compensation for child rearing costs, maintenance of child well-being and support for female employment and gender equity are the components of family friendly policies. Denmark and Iceland are examples of European countries which have adopted population policies to increase employment of parents and to reduce gap between ideal and actual family size (ESHRE Capri Workshop Group, 2010).

The results of a study by Kalwij (2010) in 16 western European countries show that increased expenditure on family policy programs aimed at empowering women through opportunities to reconcile their family and work. Therefore, the opportunity costs of childbearing have been reduced which generates positive fertility responses. According to Kalwij (2010) childcare subsidies have a positive impact on the number of births (second and higher-order), however these subsidies have no effect on the timing of births. It has been argued that child care allowance and extending maternity and parental leave causes women to have more children and early in their lives. Kalwij (2010) argues that over the recent decades, the considerable expenditure on family policy in Western Europe has resulted in the considerable fertility responses.

In another study, Luci-Greulich and Thévenon (2013), using data from 18 OECD[61] countries between 1982 and 2007, examine how family policy programs influence the fertility levels. Their study confirms that all policy instruments such as paid leave, childcare services and financial incentives have a positive impact on fertility. It suggests that supporting families, especially working parents, during early childhood is likely to facilitate childbearing. However, policy measures do not have the same influence on fertility. Luci-Greulich and Thévenon (2013) argue that the effect of each policy measure varies with the welfare state contexts which support households making childbearing decisions or to combine their family and work. Their findings reveal that cash benefits policy can have quantum effects on fertility.

[61] The Organisation for Economic Cooperation and Development

For example, parents do not only change the timing of childbirth, however they decide to have more children.

Goldstein et al. (2009), examining the impact of policy initiatives on fertility in Spain, the Czech Republic, Estonia, and Russia, argue that the increased fertility in some countries (like Russia [2007] and Estonia [2004]) is likely to be associated with pronatalist measures. Nevertheless, in some cases, fertility has increased in the absence of any change in population policy (Spain before 2007, Russia 2000-4), or policy change had no explicit impact on the initiation of fertility increase (the Czech Republic). However, in some relatively higher fertility developed countries including the United Kingdom, the pronatalist policy has been effective as it was introduced prior to significant fertility increase (Goldstein et al., 2009). Ermisch (1988) found that more generous child allowances in Britain not only increased the likelihood of higher parity births, but also encouraged the lower age at childbearing.

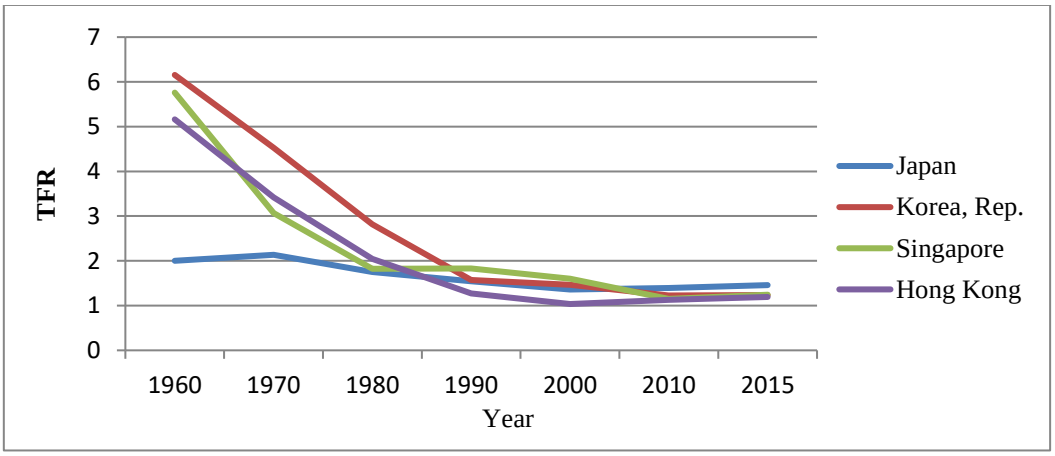
It is worth noting that in most of the very low fertility European countries there is an opposition against direct government interference into couples' private decisions about their family size. Therefore, European policy makers have not yet decided whether the level of the birth rate should be an explicit objective of government policies (ESHRE Capri Workshop Group, 2010).

7.3. Very low fertility and pronatalist policies in (East) Asia

Following the (first) demographic transition in Europe, the fertility decline has spread, first, to Asian countries in neighbouring Japan and also to some countries in Latin America. Subsequently, fertility has started to decline in the whole developing region (Atoh et al., 2004). Fertility decline has become the norm in East and South-East Asia (Cleland, 1996). In a majority of Pacific Asian countries, the fertility decline to the replacement level and below used to be favourable outcome encouraged by the government in the region and countries like South Korea, Taiwan, Singapore and Hong-Kong. These countries were pioneers in adopting population policies to reduce fertility in the 1960s and 1970s (Robinson & Ross, 2007). By the mid to late 2000s these countries had the lowest total fertility rates in

the world and if these levels of fertility continue over a long period, many East Asian countries will face accelerating population decline not very far into the future (Jones et al., 2008). As can be seen in Figure 7-4, from the 1960s onwards, TFR has drastically declined in Hong Kong, Taiwan, Singapore and South Korea (it's been already low in Japan) and reached below 1.4 children per woman in these advanced Asian countries.

Figure 7-4: The Total Fertility Rate in ultra-low fertility Asian countries, 1960-2015



Source: World Bank (2017b)

The increasing old-age dependency ratio, financing old age and old age health care, continuing financial support of the elderly, the decline in size and changing age structure of the workforce, and the declining attention paid to the needs and interests of children and young people are the socio-economic prospects raised by ultra-low fertility and change in age distribution in the low fertility Asian countries (Jones et al., 2008). Despite the fact that governments in very low fertility Asian countries have emphasised raising the birth rate for national survival and welfare, the current and future effectiveness of pronatalist policies in Pacific Asia, as in Europe, is in doubt (Yip et al., 2013). The following section will examine the population policies and their implications in Japan, South Korea, Singapore, Hong Kong and Taiwan.

7.2.2. Population policies to tackle the low fertility in Japan

The total fertility rate in Japan has been around the replacement level since the late 1950s after going through the fertility transition from high to low fertility (Makoto, 2001). The fertility remained stable at this 'replacement level' to the mid-1970s. However, after that time, childbearing experienced further decline. Subsequently, since 2000, the TFR in Japan has fluctuated between 1.3 to 1.4 children per woman (Tsuya, 2017). The fertility in Japan has declined as the result of the rise in the proportion never married, the rise in the age at marriage and postponement of childbearing (Makoto, 2001; Tsuya, 2015). Tsuya (2015) argues that improved education and labour force participation for young women, combined with decreasing regular employment for young men, would result in postponement or avoidance of marriage. In addition, the persistence of strong gender differences in housework and childcare also make the 'marriage package' unattractive for Japanese women. Over the years, concerned about very low fertility and rapid population aging, the Japanese government has introduced various family policies and programs. Since the early 1990s policy initiatives encouraged young Japanese to marry and have children. The population policies in Japan consist of three major components: (1) childcare services; (2) parental leave schemes; and (3) monetary assistance in the form of child allowances (Tsuya, 2015, 2017). In 1989 Prime Minister Toshiki Kaifu expressed his willingness to encourage a higher birth rate, therefore the Ministry of Health and Welfare tried to design a more pronatalist child allowance system (Kojima, 1990). The population policy in Japan has had two main aspects including direct subsidies for child-bearing and child-raising; and changing the institutional framework to facilitate marriage and child-raising (Jones et al., 2008). The child allowance scheme, which was first introduced in 1972, covered third and higher order children in low-income households in Japan. After 1990, pronatalist concerns led to large increase in allowances; however, an eligibility criterion remained: today the scheme is still income tested, but it has expanded to include first and second children (Tsuya, 2017). In 1991, unpaid leave for childcare was introduced, though part-time workers were not included. Three years later the 'Angel Plan' was introduced in order to facilitate the expansion of childcare centres, with eligibility criteria varying by locality (Jones et al., 2008). Income compensation was added in 1995 (Tsuya, 2017). In 2001, the proportion of salary received by an

employee spent on childcare leave was increased from 25 percent to 40 percent, and this was further raised to 50 percent in late 2007(Jones et al., 2008). The income compensation is now paid at 50 percent of the monthly salary prior to the beginning of leave (Tsuya, 2017). Despite all the pronatalist efforts, Japan's family policy appears to have had a very little impact, and fertility has remained very low (Tsuya, 2015). Making the workplaces more flexible and family friendly, expanding the coverage of parental leave and changing the Japanese work culture which emphasises on long work hours and obligatory afterhours socialising with colleagues, can reconcile the family and work place in Japan and encourage employed couples to have (more) children (Tsuya, 2017).

7.2.3. Pronatalist efforts to reverse the fertility decline in Singapore

In the early 1960s, the Singapore government introduced a national family planning program in order to reduce fertility. This program, along with rapid socio-economic development in the country, caused a significant decline in TFR from 6.56 in 1957 to near replacement level (2.08) in 1975 (Saw, 1990). The Singapore family planning and population program were well known for the antinatalist policies and success in providing incentives for small families/disincentives for large families (Yap, 2003). However, after two decades of being the pioneer in the Third World for birth control and economic development programs, Singapore abandoned its earlier population policies in favour of encouraging population growth in the country (Palen, 1986). The demographic objective changed from antinatalist to selectively pronatalist (Yap, 2003).

Singapore's former Prime Minister, Lee Kuan Yew, first suggested a pronatalist policy in 1983 because the 1980 census showed that the marriage and fertility rate of more educated women were less than women with lower levels of education (Martin, 1991; Yap, 2003). These policies, which were adopted in the interests of improving the genetic quality of the population, were not popular and did not target below replacement fertility. Since the better educated and the lesser educated resented this policy, the government reverted to the old registration system (Saw, 1990). Therefore, negative public reaction to this population quality or eugenic arguments resulted in the policy being repackaged as a way of addressing population aging and labour shortages (Martin, 1991). However, in 1987, Singapore further

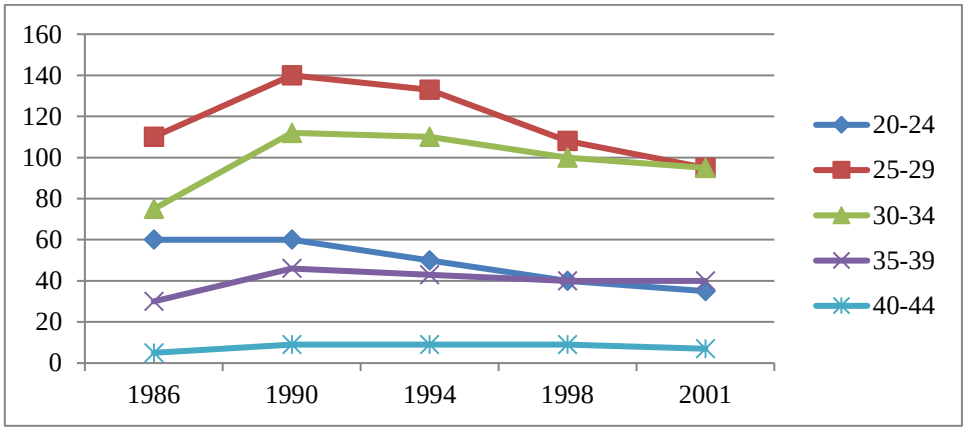
relaxed some former antinatalist measures and reversed its fertility objectives: a number of limited pronatalist measures were introduced for having three or more children in the country (Jones et al., 2008; Martin, 1991). However, the policy didn't target all women to have three children, but to increase the average to 2.1 children per woman and attached the 'affordability' aspect to decide whether to have a higher family size or not (replacement level) (Martin, 1991). The slogan of the new population policy was 'Have Three or More Children if You Can Afford It' (Wong & Yeoh, 2003). According to Perry et al. (1997), the new policy approach attempted to set a new 'criterion' of 'affordability', which repealed the emphasis on educational qualifications. The accomplishment of the new policy provided a comprehensive package of benefits and policy changes (Jones et al., 2008). The 'Graduate mother scheme', 'Increased enhanced child relief for better-educated women for up to three children', 'Sterilization cash incentive to discourage the poor and lowly-educated from having more children', 'Graduate marriage matchmaking', 'Medisave' and 'Public Housing' are among the population policies and incentives introduced in 1984 (Yap, 2003). Despite all government incentives, in August 2000, Prime Minister Goh Chok Tong expressed his concern about low fertility (1.48) in the country which had fallen below the TFR in 1987 (1.62) (Prime Minister's National Day Rally Speech, 2000). He states that:

> As PM, I have to be concerned about the impact of low fertility rates on the future of our society…our current fertility rate stays at 1.48, without immigration, in 50 years; our resident population will fall from 3.2 million to 2.7 million. The resident labor force will decrease by more than a quarter. (Prime Minister's National Day Rally Speech, 2000, p. 34)

The Prime Minister also understood that if fertility rates fall further, for example to 1.2 similar to Spain and Italy, the country would face population decline to 2.4 million in 50 years (by 2050). In response to speculations about recruiting foreign workers to ease the labour shortage, Goh Chok Tong states that although the foreigners and new immigrants complement the needs of the country, they cannot replace the Singaporean population (Prime Minister's National Day Rally Speech, 2000). The PM argued that the financial incentives must be coupled with programs that address the issues of finding a balance between family and work. He acknowledged that by reducing the obstacles, such as finance and

childcare arrangements, the government must create a total environment conducive to raising a family. In April 2001, the Children Development Co-Savings Scheme (also known as the Baby Bonus scheme) was implemented by the Singapore government in order to reduce the financial obstacle of raising children. In addition, the government paid for the third child maternity leave of working mothers. Moreover, the Singapore government has set up a Work-Life Unit under the Ministry of Community, Development and Sports (MCDS) to promote family friendly practices among employers (Yap, 2003). The fertility trends in Singapore by age group from 1986 (implementation of the new population policy) to 2001 indicates that in spite of an initial rise in fertility following the new population policy, fertility rates among the population younger than 30 years old have decreased to below the 1986 level which was a result of the further postponement of marriage and childbearing postponement (Figure 7-5).

Figure 7-5: Fertility Trends by Age, Singapore, 1986-2001



Source: Yap (2003)

However, fertility rates among Singaporean aged 30 and older, while lower than in 1990, rose by 2001 as compared with 1986. Despite the fact that older women were having more children, the median birth order of their births declined somewhat which indicates the continued delay in childbearing (Yap, 2003). Fertility in Singapore has been very low (TFR= 1.3) since 2003 (Chuan, 2010). Examining the cohort fertility using official administrative data, (Chuan, 2010) shows that low period fertility in Singapore can be attributed to quantum rather than tempo effects. Therefore, in the absence of any substantial value changes in the near future, the period fertility in Singapore is not likely to exceed

levels higher than a TFR of 1.5. Various studies have examined the effectiveness of pronatalist policies in Singapore (Drakakis-Smith et al., 1993; Graham, 1995; Graham et al., 2002; Jones & Hamid, 2015; Sun, 2012; Teo & Yeoh, 1999; Yap, 2003). During the first few years of implementation of the pronatalist policy in Singapore, Drakakis-Smith et al. (1993), found there was a low level of agreement among their survey sample on the positive impacts of the policy on family size. Martin (1991) states that the below replacement fertility of the 1980s was a result of delayed marriage among Singaporean women rather than less marital fertility. Moreover, Wong and Yeoh (2003) argue that short-term fluctuations of fertility have had a confusing impact on long term population trends in Singapore. For example, a 13.6 percent increase in fertility rates in 1988 (after inauguration of the new population policy) have largely been attributed to its coinciding with the traditionally auspicious Year of the Dragon, which is believed to be the most auspicious animal in the Chinese twelve animal zodiac cycle (Martin, 1991; Saw, 1990). In the same way, an 11.1 percent fall in fertility in 1986, is explained by the fact that it was the Year of the Tiger, believed to be particularly inauspicious for births. According to Wong and Yeoh (2003), attenuation or increase in fertility fluctuates each time when the twelve year zodiac signs (of Tiger and Dragon) come especially among Chinese who comprise 77 percent of the population of Singapore. Sun (2012) in the book 'Population Policy and Reproduction in Singapore' explains factors that caused pronatalist policies to fail, in spite of being underpinned by generous incentive schemes. Sun (2012) argues that while the pronatalist policies came in different modes which included income tax relief, tax rebates, childcare subsidies etc., the evidence shows that all these attempts have failed to influence the fertility behaviour of Singaporean women. For instance, policies to enhance work-family balance are inadequate to attract a career woman to give birth to more children by taking time off from work. Moreover, considering the fact that these benefits are offered by employers rather than the state, there is a debate that recipients won't experience career advancement because of resentment by employers of such a cost (Sun, 2012).

Makiwane (2012) criticises the bias among women of different socio-economic status in receiving pronatalist incentives in Singapore. He states that:

> There is a general perception of class bias. The strategies employed to encourage childbearing have a differential appeal to members of various economic strata. For instance, the tax breaks are clearly meant to raise fertility among the upper class, as none of the poor classes will benefit from these. (Makiwane, 2012, p. 199)

Wen (2013) has addressed the fact that pronatalist measures have insignificant influence on fertility decline. Wen (2013) argues that these policies exclude singles or non-heterosexual couples who wish to have children. He argues that the government of Singapore accomplishes its pronatalist policies within the context of 'traditional' family values and norms.

Jones and Hamid (2015), using data from the Marriage and Parenthood Survey (2012), argue that the financial costs of raising children and difficulties in combining childrearing and work are the factors with depressing effect on fertility decision making in Singapore. Therefore, the government higher financial incentives such as increasing baby bonus payments and providing universal childcare, may be essential if fertility levels are to be raised significantly. According to McDonald (2006), despite the fact the government in Japan and Singapore attempts to reverse the fertility trend, fertility has continued to fall in these two countries. In an assessment discussed by McDonald (2006), the failure of pronatalist policies in Japan and Singapore can be attributed to targeting particular types of women, such as single women and higher educated women, rather than to reform societal institutions. Moreover, in both countries, the government has failed to meet the needs of parents and especially mothers in the workplace.

7.2.4. The history of high fertility, antinatalist and pronatalist policies in South Korea

Demographic transition in South Korea took place simultaneously with the rapid economic growth and social change between 1960 and 2000 occurring in the country. Women's educational attainment greatly improved and mortality declined rapidly as well (Choe & Park, 2006). The total fertility rate in South

Korea which was 6.0 children per woman in 1960, dropped extremely quickly to below 1.3 in 50 years. By 2012, South Korea has become one of the very low fertility countries in the OECD (Rindfuss & Choe, 2015). As can be seen in Table 7-1 fertility in South Korea has remained at a very low level for 12 years.

Table 7-1: Number of years, as of 2012, with TFR at less than 1.3 children per women, selected OECD and Asian countries

Country	Years with TFR less than 1.3	Time period
South Korea	12	2001-2012
Italy	11	1993-2003
Slovenia	11	1995-2005
Spain	10	1993–2002
Singapore	10	2003–2012
Taiwan	9	2004–2012
Greece	8	1996–2003
Slovak Republic	8	2000–2007
Germany	4	1992–1995
Poland	4	2003–2006
Japan	3	2003–2005

Source: Lee & Choi (2015)

The first National Family Planning Program in South Korea began in 1961 when Korea was facing rapid population growth (2.9 percent annual growth rate) and this rapid growth was regarded as a serious barrier for economic growth. Therefore, programs were aimed at slowing population growth and reducing the rate of natural growth by one-tenth of one percent each year through to 1976. Over the first decade the family planning program was successful in achieving families' ideal fertility and preventing further childbearing; however, the desired family size did not change and was still high during the 1960s (Choe & Park, 2006). The population policy in South Korea was an entire part of the national economic development plans during the 1970s. By the end of the 1970s the prevalence of contraceptive use reached 66 percent. In addition, socio-economic factors such as the rapid economic growth, decreases in infant and child mortality, increased female educational attainment and labour force participation, and rising age at first marriage, have resulted in a decline in both ideal and total family size (Choe & Park, 2006, p. 5). Despite the fact that during the 1970s having two children was being promoted, in 1986, the family planning program in South Korea began to promote one-child

policy with the slogan ‘Even two children for a family is too many for over-crowded Korea’. As a result of this policy, by 1990s, TFR fell below replacement level, which prompted a debate on the population policies (Choe & Park, 2006). In order to respond to this trend, in 1996, the government of South Korea adopted a new population policy emphasising population quality (Cho & Lee, 2000): however, a decade later fertility further declined and dropped to 1.2 children per woman for the five years preceding 2006 (Frejka et al., 2010). The focus of this policy was on imbalance in sex ratio at birth, reducing the high prevalence of sex-selective abortions (because of son preference among Koreans), better reproductive health, and the rapid pace of population aging. In 2006, the South Korean Government introduced its ‘Vision 2030 for Economic Growth and Welfare’ which included a social investment approach for a ‘Korean type welfare state’ which could better address problems of the aging society. In parallel, the low fertility rate in Korea called for policymakers' attention, therefore the government adopted the ‘Basic Plan for Low fertility and Aged Society for the period 2006-10’. While the first plan focused on child care, the second ‘Basic Plan for Low fertility and Aged Society (2011–2016) focused specifically on the work-life balance policy (Lee & Baek, 2014). The government has adopted three strategies to increase the fertility rate in South Korea which include improving support for childbirth and child-rearing; fostering a family friendly and gender-equal culture and society; and raising a healthy future generation. Moreover, the South Korea government has provided facilities to promote income security, healthcare, and an active lifestyle for the elderly (Lee & Choi, 2015).

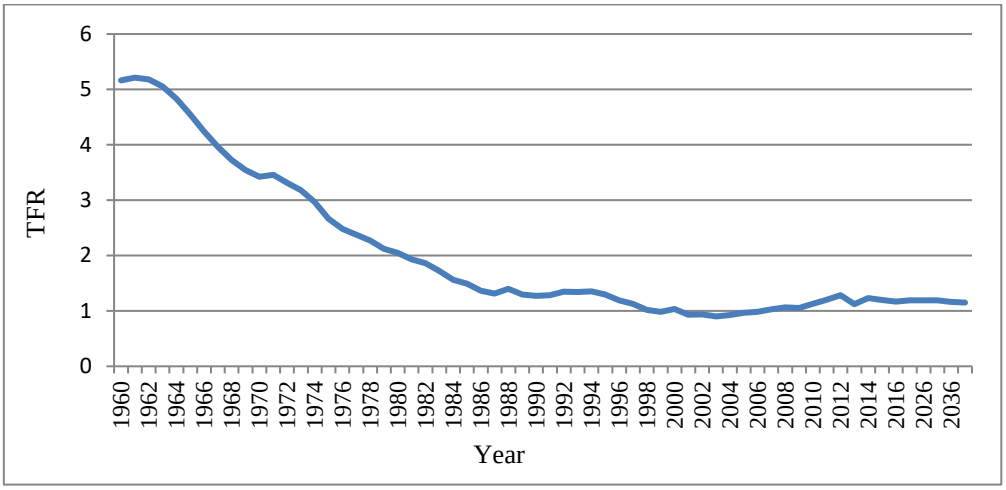
Chin et al. (2014) argue that although over the last decade Korea has experienced significant progress in its family planning program, policy measures should be developed. Family policy in Korea should encourage Korean men to be more involved in family life and also should shift the strong Korean work-oriented culture to a more family-oriented one.

7.2.5. Policy initiatives to reverse the fertility decline in Hong Kong

As with many Asian countries, in the mid-1950s the TFR in Hong Kong was as high as four children per woman (Basten, 2015). Hong Kong has since experienced a drastic fertility decline from 5.16 children per woman in 1960 to 1.2 children per woman in 2011 and then rebounded (Figure 7-6). Basten

(2015) argues that there has been a notable increase in total fertility rate in Hong Kong since 2003, which like many East Asian and European countries, is associated with a rise in the postponement of childbearing and increase in fertility rate among older women. According to the Census and Statistics Department of Hong Kong, the total fertility rate is projected to decrease from 1. 20 in 2011 to 1.15 in 2041, which is well below the replacement level (Census and Statistics Department, 2012).

Figure 7-6: Trends in Total Fertility Rate in Hong Kong, 1960-2041



Source: Census and Statistics Department (2012); World Bank (2017b)

In 2007-2008 a number of policies were introduced in Hong Kong, which according to Basten (2015), could be described as family friendly policies. The incentive with 'child allowance under salaries tax' was an example of explicitly pronatalist policy in the region. This incentive which was increased from HK$40,000 to HK$50,000 (US$5,161 to US$6,451) per child per year was only applicable for the third to the ninth child. Despite the fact the number of women aged 15-49 with more than three children was extremely low in the country; this policy would have a limited impact. This allowance later extended to first- and second-born children and, from the 2013/14 tax year, was increased to HK$70,000 (US$9,032) per child per year (Basten, 2015, p. 79).

During 2007-2008, a number of family policy programs were accomplished in Hong Kong. As a result of these programs direct school-fee subsidies were provided for pre-primary education by the

government. From the following year, senior secondary education was also provided free of charge for all students in public-sector schools (Hong Kong Government, 2009).

In order to increase the fertility rate the government in Hong Kong has started to implement policies consist of financial incentives, together with support for parents to reconcile their work and family (i.e. child care allowances, parental leave, and child care facilities) (Frejka et al., 2010). Explicit family friendly population policy as well as increasing male involvement in the household, change in working hours and educational performance, and adopting new strategies to manage the pressures caused by the living costs can facilitate 'broad social change supportive of children and parenting' in Hong Kong (Basten, 2015, p. 82). According to Frejka et al. (2010) changing the fertility rate in Hong Kong requires a radical change in current conditions and developing family, child friendly environments.

7.2.6. Pronatalist policies in Taiwan

In 1964, a family planning program was introduced by the Taiwan government aimed at reducing the birth rate and pace of rapid population growth. In 1984, when fertility reached below replacement level (Lee & Lin, 2016) demographers became concerned about population aging and called for a modification of the government's birth control program (United Nations, 2015c). The new population policy was introduced in Taiwan in 1992, aiming at maintaining fertility rate at replacement level and ending the family planning program (Jones et al., 2008). In 2002, the Gender Equality of Employment Law was passed by the Legislative Yuan in Taiwan. Under the law, employers should provide enough maternity and parental leave for mothers and female workers who have children younger than three years old. Employers should also adjust working hours of female workers according to their needs (Chen, 2012).

Until 2006, no specific pronatalist policy was introduced in Taiwan (Frejka et al., 2010). In 2008, the Population White Paper was introduced by the Minister of the Interior and amended in 2012 and 2013 (Chen, 2012; United Nations, 2015c). In the 2013 revision, the government set a goal of 180,000 births

per annum over the following decade. Regarding the pronatal policy, the White Paper for Population Policy has set seven measures for increasing the fertility rate as follows:

1. Building up comprehensive childcare institutions;
2. Financial assistance for families with dependent children;
3. Creation of family friendly workplaces;
4. Revision of maternity protection;
5. Improvement of the reproductive health care system;
6. Creating child safe environments; and
7. Expanding opportunities to meet marriageable partners and promoting the public goods value of children (Chen, 2012).

Since 2011, the White Paper has provided working mothers with free of charge preschools for five year old children and since 2012, a system of public-private partnerships has encouraged the establishment of non-profit kindergartens, day-care centres and afterschool care services in the country (United Nations, 2015c). In terms of financial incentives, a cash benefit was introduced in 2012 for families with children under age two and also the Income Tax Act was modified to include a means-tested tax deduction for parents with preschool-age children.

In terms of parental leave, since 2002, the government of Taiwan has provided up to two years unpaid parental leave for parents of children under age three; however, more recently, the government has added compensation of 60 percent of the previous salary for the first six months of parental leave (United Nations, 2015c). However, despite all efforts to tackle the fertility decline in Taiwan, the effectiveness of the policy initiatives is questioned. The rapid increase in educational attainment among youth and especially among females has resulted in an increase in the number of women who delay marriage and childbearing. At the same time this increase is perhaps a result of the lack of a balance in women's working and family lives (Yu, 2009). Also, because of financial difficulties and the inconsistency in organisations and institutions, a variety of policies and measures are implemented at the national level and/or local level, therefore according to Chen (2012) the declining fertility and

marriage have hardly changed in Taiwanese society. Moreover, despite the fact that the government of Taiwan has introduced some policy initiatives, there are several obstacles influencing young people making decisions about marriage and childbearing. The insecure and uncertain economic status of recent graduates is a major problem in this regard (United Nations, 2015c). Jones et al. (2008) argue that the general consensus about pronatalist policies in East Asian countries (including Taiwan) seems to have failed because there is no evidence that the increased fertility in these countries is a result of their policy. It's been argued that fertility may have fallen further if pronatalist policies had not been introduced in these countries. Jones et al. (2008) state that the success or failure of pronatalist policies is the matter of time as some policies have not gone as far as they might, and in many cases, pronatalist policies have been strengthened recently.

7.4. The fertility transition and population policies in Iran

According to the second national census of population and housing conducted 1966 in Iran the total fertility was estimated 7.7 children per woman with average annual population growth rate of 3.1 percent (Bulatao & Richardson, 1994). In order to respond to this heightened growth rate, the first family planning program, with explicit health and demographic targets, was implemented in 1967(Abbasi-Shavazi, 2001b). The results of the 1976 census which partly reflected the impact of the 1967 population policy, implied that the annual population growth rate had slightly decreased to 2.7 percent (Abbasi-Shavazi, Mehryar, et al., 2002) and TFR had dropped to around six children per woman (Abbasi-Shavazi, 2002). Despite the approval of the family planning methods by Ayatollah Khomeini, after a major political shift from a monarchy to the Islamic Republic in 1979, the new government suspended the family planning program immediately after the revolution and the new government adopted a pronatalist ideology with encouragement of early marriage and high fertility (Abbasi-Shavazi, 2002; Hosseini-Chavoshi & Abbasi-Shavazi, 2012). In this context the legal minimum age at marriage for girls and boys was reduced from 15 and 18 to 13 and 15 years, respectively (Azimi, 1981).

7.4.1. The war between Iran and Iraq and its impact on population

As mentioned earlier in chapter One (Section 1.2), with the initiation of the war between Iran and Iraq (1980-88) a pronatalist atmosphere was created in Iranian society. As the war with Iraq continued, the supply of all imported foods and other necessities declined. Therefore, a rationing system was introduced in the country. This included not only basic food items but also locally produced or imported modern consumer goods like television sets, refrigerators, carpets and so forth. The rationing system was introduced on the basis of family size and operated as an incentive for having more children. Under the rationing system, larger families were entitled to a better share of both the basic commodities and highly prized modern consumer items (Abbasi-Shavazi, Mehryar, et al., 2002; Aghajanian, 1991). The pronatalist policies were continued even after the release of the 1986 census which showed TFR had reached 6.8 children per woman. Moreover, primary schools were moving to two and three shifts to accommodate the baby boom of the early 1980s (Abbasi-Shavazi et al., 2002; Salehi-Isfahani et al., 2010).

7.4.2. The impact of the government policies on fertility

It's It has been speculated that the pronatalist approach adopted by the post-revolutionary government has been responsible for the possible, though not proven fertility increase between 1976 and 1986. Abbasi-Shavazi, Mehryar, et al. (2002) argue that the widespread campaign in favour of early marriage and large families had a temporary effect, because despite the pronatalist ideology, the high fertility regime was short lived (Hosseini-Chavoshi et al., 2006) and census own-children estimates (Abbasi-Shavazi, McDonald, & Hosseini-Chavoshi, 2003) show that TFR declined from its peak (6.8) in 1984 (five years before the official inauguration of the anti-natalist family planning program in 1989) to 6.2 in 1986 (Abbasi-Shavazi, 2001b, 2002; Abbasi-Shavazi, Mehryar, et al., 2002). Total fertility rate further declined to around 5.5 in 1988. The fertility decline in the mid-1980s was slow until the population policy was reversed by the government and a new (antinatalist) family planning program was officially implemented in December 1989 (Abbasi-Shavazi, 2002). According to Caldwell et al.

(2000), the rise of education, and the high level of prosperity had all created a demand for family planning services in Iran. The drastic fertility decline has also been attributed to modernisation factors such as urbanisation, the high cost of child raising and falling family income in the 1980s, and the high prevalence of contraceptive use in the country (Abbasi-Shavazi, 2002; Mehryar & Tabibian, 1997). The family planning program can be considered to have facilitated and accelerated a pattern of behaviour that had already been demanded by parts of society in the mid-1980s (Hosseini-Chavoshi et al., 2006; Salehi-Isfahani et al., 2010). After official inauguration of the family planning program, the total fertility rate fell sharply from around 5.5 in 1988 to around 2.8 in 1996 and reached replacement level in 2000. The TFR further decreased to 1.8 children per woman in 2006 and 2011(Statistical Centre of Iran, 2006, 2011). The drastic fertility decline in Iran attracted policymakers' attention to the long term consequences of fertility decline (such as a possible aging crisis and the shortage of working-age population) in the country. However, as discussed in chapter one (section 1.2), these concerns were not based on evidence based scientific analysis. Interestingly, with the successful experience of the family planning program, Iran's approach to fertility control has changed since 2012. The former president Mahmoud Ahmadinejad, first highlighted the need to increase the country's population (Karamouzian et al., 2014). Shortly after this the Supreme Leader of Iran, Ayatollah Seyed Ali Khamenei, also expressed his concern and opinion about the population control strategies and the fertility decline (below replacement level) in the country (The Office of Supreme Leader of Iran, 2013). Ayatollah Khamenei stated that family planning control policies should have been stopped in the late 1990s and emphasised that Iran could support a population of up to 150 million people (The Office of Supreme Leader of Iran, 2013). Therefore, serious debates regarding the necessity of continuing the population policies were initiated by policy-makers and scientists. The emphasis of policy-makers shifted rapidly towards a pronatalist approach by restricting access to contraceptive use and birth limiting surgeries (Karamouzian et al., 2014); however, after many debates, it was not legislated in the Islamic Parliament of Iran (The parliament of Islamic Republic of Iran, 2014). Now, while public access to free contraceptives is not banned, any promotion of (either male or female) is prohibited in the country. Also, since 2012, the government has eliminated funding for population control programs (Dastjerdi, 2012). In this regard, the former Minister of Health in Iran, Marzieh Vahid Dastjerdi, stated that the

Ministry was no longer able to provide any public family planning services through the public health sector (Karamouzian et al., 2014).

7.4.3. Some highlights from current survey in Tehran city

The attitudes of women towards the new pronatalist approach in the country have been investigated along with other research objectives in this study. Among the minority (20 percent) of women who agreed with the new pronatalist approach (adopted by the government), a majority stated that the country needs more youth (working age population) and more children to strengthen the family bonding and support. A tenth of women who agreed with this approach had religious reasons to support the government pronatalist approach, however, the rest of the women who agreed believe that a powerful country is a populous one. Nevertheless, the results of this study reveal that half of the women disagree with adoption of the new pronatalist approach in the country and a third of women have neutral opinions. Among those who disagreed, more than a third referred to the high unemployment rate, with the current population, in the country. The rest of women in this group cited the disadvantages of overpopulation for society, the economy and the environment (Fieldwork, 2015). Despite the fact that a majority of women (51 percent) in this study disagreed with the new population policies, the results of the latest census (2016) in Iran show that the total fertility rate has increased to almost replacement level (2.01) over the period 2011-2016 (Statistical Centre of Iran, 2017b). It should be noted that as the release of the results of the 2016 Census were delayed (December 2017) (Statistical Centre of Iran, 2017b), the impact of recent pronatalist approaches on increased fertility have not been investigated. Nevertheless, according to the Statistical Centre of Iran (2017), the change in the age pattern of fertility, especially the delayed fertility of women aged 35-39 years, has had an important role in fertility increase in the country.

7.5. Conclusion

This chapter has provided empirical evidence linking pronatalist policies and fertility behaviour in European, industrialised Asian countries and Iran. The findings of studies in Europe show that the relatively large changes in expenditure on family policy instruments (paid leave, childcare services and financial transfers) over recent decades, especially in Western Europe, have generated considerable positive influence on fertility responses (Kalwij, 2010; Luci-Greulich & Thévenon, 2013). It should be noted that supporting families, especially working parents, during early childhood is likely to facilitate parents' choice to have children: however, policy levers do not all have the same weight in different countries. It has been argued that in most of the very low fertility European countries there is an opposition to direct government interference into couples' decisions about their family size. Therefore, European policy makers have not yet decided whether the level of the birth rate should be an explicit objective of government policies (ESHRE Capri Workshop Group, 2010) (ESHRE Capri Workshop Group, 2010).

The general consensus in advanced East Asian countries shows there is no evidence that the increased fertility is a result of policy initiatives, but there are two general responses to this consensus. First, the fertility may have fallen further if pronatalist policies had not been introduced in these countries. Second, the success or failure of pronatalist policies is a matter of time as some policies have not gone as far as they might, and in many cases, pronatalist policies have been strengthened recently (Jones et al., 2008, p. 15). In general, the failure to meet the needs of parents and especially mothers in the workplace, the lack of an explicit family friendly policy, financial difficulties and uncertain economic status for youth, are the obstacles identified as the contributors to the failure of the pronatalist policies in advanced Asian countries.

The history of population policies in Iran, as a country with the most successful family planning program among developing countries (Vahidnia, 2007), shows that the influence of socio-economic developments especially improvements in women's education on fertility, has been more effective than the government efforts. For example, adopting the pronatalist population policy after the Islamic revolution only contributed a 15 percent increase in TFR because women decided to restrict their

fertility in the mid-1980s, almost five years prior to the official implementation of the family planning program in the country. It should be noted that although the results of the latest census (2016) reveal an increase in TFR in Iran, the extent to which the government's new pronatalist approach contributed to this increase, has not been investigated. The findings of this study (in Tehran city), which are mainly based on the fieldwork conducted one year before the 2016 Census showed that half of women disagreed with government interference in people's childbearing decisions. Regarding the new pronatalist population approach adopted by the government, the women stated in response to open-ended questions during the interviews that the total fertility rate should be determined by the decision of individual couples as to how many children they want based on their individual need assessment rather than what the government wanted them to do.

CHAPTER 8: CONCLUSION

8.1. Introduction

This chapter provides the conclusion to the thesis. Its foremost aim is to summarise the findings of this research, explain the value of the research, and its potential contribution for policy, as well as to draw attention to its limitations. The chapter also raises issues for further research.

8.2. Recapitulation

This thesis has examined the demographic behaviour of married women aged 15-49 years in Tehran city (the capital of Iran) in terms of the gap between women's actual and desired fertility and the demographic and socio-economic factors influencing the gap. The Islamic Republic of Iran has experienced one of the fastest fertility declines in the world (Abbasi-Shavazi, Lutz, et al., 2008; Vahidnia, 2007), as a result of which by 2011, the total fertility rate in 22 out of the 31 provinces of Iran dropped to below replacement level (1.8). However, several studies all over the country show that the *Two-Child Norm* is still prevalent in Iran (Abbasi-Shavazi et al., 2004; Askari-Nodoushan et al., 2009; Erfani, 2011a; Razeghi-Nasrabad & Mirzaee, 2012) and even the younger cohorts of Iranian women still value having children (Razeghi Nasrabad & Saraei, 2014). The discrepancy between women's fertility intentions and behaviour implies the couples' failure to fulfil their fertility desires in relation to their number of children and it can be concluded that there is a gap between a couple's desired and actual fertility in Iran.

Based on these findings, the present study investigated the gap between actual and desired family size in a sample of 400 married women aged 15-49 in Tehran city. Tehran city comprises one-seventh of Iran's population but represents well the country's diverse socio-economic and ethno-cultural subgroups (Erfani, 2015). Tehran Province and Tehran city, consistent with the fertility decline in the country from the mid-1980s, have had one the lowest[62] total fertility rates (1.56 and 1.52 respectively)

[62] After provinces of Gilan and Mazandaran.

along with one of the highest ages at marriage (24.2 and 26 years respectively) in the country (Statistical Centre of Iran, 2016a).

The study sample in Tehran city was selected through a two-stage stratified random sampling from the 22 regions of Tehran city, making sure that a region was selected from each of the five levels of development into which the various regions were classified. Samples of household were selected by random sampling with probability proportional to size from each of the selected regions and a woman aged 15-49 was interviewed in each selected household. The number of women thus interviewed was 400. A structured questionnaire for gathering detailed quantitative information was designed through which women were interviewed face to face. Prior to conducting the fieldwork, before the actual interviews with the selected women, a pre-test of the questionnaire (pilot test) was conducted by the research team among 50 eligible women in order to evaluate the effectiveness of the questionnaire in terms of logical sequence, consistency of questions and time. Bivariate analysis, mainly using the Chi-square test (χ^2), and binary and multinomial logistic regressions were adopted as the tools for statistical analysis of the data collected in this study.

8.3. Major findings

The primary objective of this present study was to review the trends of the fertility transition and emergence of below replacement fertility in recent decades in Iran. This objective is addressed in Chapter Four. The present study has shown that in the context of Tehran city, respondents (married women aged 15-49) on average have given birth to 1.37 children. However, a majority of these women (72 percent) are aged 15-39 who still have several years to complete their reproductive span. The high level of education among women in this study is consistent with the significant proportion of women in higher education not only in Tehran city but also throughout the country. The high rank universities, research centres and academic institutions have made Tehran city the destination of the majority of higher educated women throughout the country (Mahmoudian et al., 2010). Despite a considerable increase in women's education, women's employment rate in Iran has not significantly increased (Rezai-Rashti, 2011). According to Erfani (2013a) less than one sixth of married women in Iran are

employed, however the findings of this study show that close to half of the women are employed. It should be noted that this study was conducted in the captial city where job opportunities (for both women and men) are greater than those in other provinces of Iran. Although Tehran city comprises a combination of different ethnic groups which is consistent with the ethnic composition of the country, the Fars ethnic group is the majority (64 percent) in the study sample.As mentioned before, the *Two-Child Norm* is prevalent in Tehran. Based on the findings of this study fertility behaviour and preferences of surveyed women are shaped in a low fertility context, but in which the two child norm is still prevalent, women's educational attainments are high, the employment rate of women is higher than average (of female employment) in the country and women have empowerment to make the household decisions jointly with their husbands.

The second major objective of this thesis was to study the gap between women's desired and actual fertility and the socio-economic factors affecting the gap. Actual fertility is indicated in this case by the women's expected number of children, which is the sum of their number of children ever born and intended number of additional children. Desired family size is defined as the number of children a woman would like to have in the absence of any possible obstacles.

In this study the gap between desired and expected (proxy for 'actual' number of children) family size is obtained by subtracting the desired family number of children from the expected number of children. The expected-desired fertility gap was categorised into three groups: underachieved (when the difference is negative), achieved (when the difference is zero) and overachieved (when the difference is positive). The dependent variable in this study is the gap and the independent or explanatory variables are women's current age, their age at first marriage, sex composition of their surviving children, consanguineous marriage, women's level of education, their employment status and women's contraceptive use. The findings of bivariate analysis, using the Chi-Square (χ^2) test, reveal that except for contraceptive use, all variables have a significant relationship with the gap between desired and expected family size.

The findings of this study further show that a large proportion of women in each age group (20-29, 30-39 and 40-49) would achieve their desired family size. However, because of the dynamic nature of the number of children ever born and the additionally intended number of children with respect to age of the women, the fertility gap among the younger women might change as these women grow older, but the gap among the oldest women (aged 40-49 in this case), who have already completed their fertility is not likely to change. The results of the bivariate analysis also reveal that women's age at first marriage is positively associated with the expected-desired fertility gap. These findings also show that a larger proportion of women in each category of age at first marriage (<19, 20-29 and >=25) would achieve their desired fertility. Consistent with the fact that women who married the earliest are the oldest women in this sample, the proportion of women with overachieved fertility among women who married at ages older than 25 is significantly less than the other women with the different ages at marriage. Women who have had delayed marriages have significantly higher levels of education (almost 70 percent have university education) than women in other marriage age-groups. Moreover, a majority (60 percent) of these women are employed and have professional careers. Therefore, it can be concluded that these women have more autonomy to restrict their fertility and have more knowledge of contraceptive use to prevent unwanted fertility and consequently prevent overachieved fertility. According to the findings of this study, there is an intention to have a balanced sex composition of children among women. Consistent with this finding, the cross tabulation between sex composition of children and fertility gap showed that a majority of women with balanced sex composition of surviving children achieve their desired family size. The findings of this study also show that the proportion of overachievement among women who have more girls than boys is much higher than women who have either a balanced number of children or who have more boys than girls. This finding is consistent with the findings of the studies by Mansurian and Khoshnevis (2006) and Razeghi-Nasrabad and Mirzaee (2012) in Iran which show that couples who have more girls (than boys) are more likely to continue their childbearing to get a male child. In order to reach achieve the birth of a male child they may produce more children than they initially desire.

This study also reveals that that the proportion of women with underachieved and achieved fertility does not vary too much according to marriage type, however, the proportion of women with overachieved fertility is significantly higher (almost twice as high) in consanguineous marriages compared with non-consanguineous marriages. This finding is in line with the findings of Razeghi-Nasrabad and Mirzaee (2012) which show that women in cousin marriage, because of the influence of their family and relatives on their childbearing, will show a different fertility behaviour than women who are married to a non-relative spouse. Therefore, women who are married to their cousins are more likely to have more children than desired, than women who are married to a non-relative.

Findings also reveal that a large proportion of women in each level of education (elementary school, high school diploma and bachelor's degree and above) would achieve their desired family size. Moreover, among the women with underachieved fertility the proportion shows only a slight increase with improvement in women's educational attainment. It should be noted that the percentage of women who would have more children than desired (overachieved fertility) is significantly higher among women with the least level of education. The higher proportion of women with overachieved fertility among women with the lowest level of education, in addition to the older age of women in this study (45 percent of these women are at the end of their reproductive span), can be attributed to the sex composition of their current (surviving) children. This study shows that a significant proportion of these women have more girls than boys, in which case they would like to continue to make a balanced sex composition of the children: this is consistent with what has been mentioned earlier about the sex composition of children and its association with the fertility gap, and therefore it is not surprising.

Employed women, because of the increased opportunity costs of childbearing and the accumulated human capital, were expected to show a larger proportion with underachieved fertility. However, the findings of this study show that almost an equal proportion (40 percent) of employed and not employed women have unmet fertility desires. The findings also reveal that despite the fact almost a large proportion of employed and not employed women would achieve their fertility desire, the proportion of not employed women with overachieved fertility is almost three times more than employed women.

Interestingly, in this study there is no significant association between women's employment status and their age. The correlation between the sex composition of children and women's employment status shows that a majority (almost 51 percent) of employed women have a balanced sex composition of their children. However, among not employed women the sex composition of children is in favour of girls which may result in overachieved fertility (in order to achieve the favourite number of male child).

The findings of the multinomial logistic regression used to examine the influence of each of the explanatory variables[63] on the likelihood of the fertility gap, reveal that women's younger age at marriage increases the likelihood of having overachieved fertility compared to having achieved fertility. However, women's younger age (compared to being at the end of reproductive span), having a balanced number of children (compared to have more girls than boys), having the degree of high school and diploma (compared to have university degrees) and also being employed, decreases the likelihood of having overachieved fertility among women than having achieved fertility.

The third major objective of the present study is to examine the factors affecting contraceptive use in Iran as well as among women in Tehran city, and to investigate the reasons for high prevalence of withdrawal use in Iran. It was found that 78 percent of surveyed women were using some method of contraception at the time of the survey. The study also reveals that withdrawal is the most prevalent method of contraception (40.4 percent), while DMPA and sterilisation (female and male) are the least practised methods among surveyed women in Tehran city. Among the modern contraceptives, condom use is the most popular method (27 percent); followed by the pill (14 percent) and IUD (11 percent). The results of logistic regression in this study reveal that there is a positive relationship between the level of education and the likelihood of using withdrawal versus modern methods. In fact, women with higher levels of education are more likely than women with lower levels of educational attainment to adopt withdrawal (as opposed to a modern method). Indeed, the likelihood of using withdrawal increases further among women with university education, moreover, the odds of withdrawal use

[63] The contraceptive use is excepted because in bivariate analysis it did not have any significant association with the expected-desired fertility gap.

(versus modern methods) are higher among women living in regions with higher levels of socio-economic development. Therefore, the likelihood of withdrawal use is the highest among the residents of Region 3 in Tehran city with the highest socio-economic development.

The high prevalence of withdrawal as a method of contraception among surveyed women certainly calls for some in-depth analysis. Because, while couples across the country are provided with a range of methods to meet their diverse contraceptive needs (Erfani, 2012), withdrawal still remains among the most used contraceptive methods. Therefore, given that in Iran (compared with other developing countries) the proportion of unmet need for contraception is small (around 5 percent) (Abbasi-Shavazi et al., 2009, p. 110), the occurrence of a large number of unwanted pregnancies can be attributed to withdrawal use (Abbasi-Shavazi & Khademzadeh, 2004; Erfani, 2011b).

Interestingly, in this study none of the factors such as religious reasons, husband opposition, lack of knowledge and lack of accessibility of contraceptives due to cost or distance were reported by women as a reason for non-use of contraception. Indeed, more than a quarter of women aged 35-49 in this study stated that because of the intention to have a child they were not using any method of contraception. This is consistent with the findings of previous studies in Iran (Abbasi-Shavazi et al., 2009; Erfani, 2015) which show that late childbearing and delay of first and second birth is a new emerging phenomenon in recent decades in the country. The findings of the latest census in Iran (Statistical Centre of Iran, 2016a) also confirmed the fact that the fertility of women aged 35-39 years has had a significant role in the increase in the total fertility rate in the country (from 1.8 to 2.01).

The fourth objective of this study is to review the history of the (population) pronatalist policies in Europe, Asia and Iran and examines the implications of the newly pronatalist approach by the government of Iran. The findings of studies in Europe show that many countries with high female employment rates have policies to reconcile work and family life which may increase the fertility rates (Ahn & Mira, 2002; Francesco Billari & Kohler, 2004; D'Addio & d'Ercole, 2005). The policies supporting families in Europe aimed at empowering women through opportunities to combine family and employment (Kalwij, 2010). These policies would include compensation for child rearing costs,

maintenance of child well-being and development and support for female employment and gender equity. It has been argued that supporting families, especially working parents, during early childhood is likely to facilitate parents' choice to have children. However, in most of the very low fertility European countries there is fundamental opposition against direct government interference into private decisions in the field of family size (ESHRE Capri Workshop Group, 2010).

The general consensus in advanced East Asian countries (Japan, Singapore, South Korea, Hong Kong and Taiwan) shows there is no evidence that the increased fertility is a result of policy initiatives. In fact, the fertility may have fallen further if pronatalist policies had not been introduced in these countries. Moreover, the success or failure of pronatalist policies is a matter of time as some policies have not gone as far as they might, and in many cases, pronatalist policies have been strengthened recently (Jones et al., 2008, p. 15). The failure to meet the needs of parents and especially mothers in the workplace, the lack of an explicit family friendly policy and child friendly environment, financial difficulties and uncertain economic status for youth, are the obstacles identified as the contributors to the failure of the pronatalist policies in advanced Asian countries (Basten, 2015; Frejka et al., 2010; McDonald, 2006; United Nations, 2015c).

Iran has had the most successful family planning program among developing countries (Vahidnia, 2007). The history of adopting a pronatalist approach in Iran shows that the influence of socio-economic developments especially improvements in women's education on fertility, has been more effective than the government policies. For example, adopting the pronatalist population policy after the Islamic revolution only contributed a 15 percent increase in TFR because women decided to restrict their fertility in the mid-1980s, almost five years prior to the official implementation of the family planning program in the country. Although the results of the latest census (2016) reveal an increase in TFR in Iran, the extent to which the government's new pronatalist approach contributed to this increase, has not been investigated. The findings of this study (in Tehran city), which are mainly based on the fieldwork conducted one year before the 2016 Census showed that half of the women disagreed with government interference in people's childbearing decisions. Consistent with David (1992), women in Tehran city believe that TFR is determined by the decisions of individual couples as to how many

children they want based on their individual need assessment rather than what the government wants them to do.

8.4. Directions for future research

This research invites future potential research in a number of areas. First, in order to have an accurate estimation of the gap between actual and desired family size conducting a longitudinal study can better examine the changes in fertility intention and behaviour of a generation of women over time (Liefbroer, 2009). Second, despite the fact men are involved in fertility surveys at the national level, such as the DHS (Demographic and Health Survey), the attention of family planning program planners in some regions like Sub-Saharan African countries have focused largely on women's fertility preferences and behaviours. In fact, the reproduction and the social roles of men have been ignored (Kim et al., 1996), however recent surveys have started incorporating the fertility desire of men as well. Men's opinion about the number of children a couple wish or plan to have, and the method of contraception they choose, are examples of the roles of men in couples' fertility decision making and reproductive behaviour. It should be noted that most family planning programs offer a certain contraceptive method, such as the pill and IUD and injection (DMPA) to be used by women. However, the effectiveness and continuous use of contraception require men's cooperation and approval. For example to practise a method like withdrawal, the knowledge of a woman's partner is vital to success or failure of the method. In this study because of the time and budget constraints husbands were not included. Therefore, for future studies investigating the fertility intention and reproductive behaviour it is recommended that men be involved in the sample selected for investigation.

Third, this study was conducted in Tehran city which, as noted previously has a composition of different socio-economic and ethno-cultural subgroups (Erfani, 2015). Therefore, despite the fact that the findings of this study, to some extent, can be generalised for the whole country, some further research needs to be conducted in the provinces of Gilan and Mazandaran which already have the lowest levels of TFR in the country (1.38 and 1.51 respectively) and also in Sistan and Baluchestan with the highest

TFR (3.96). Studying the desired and actual fertility of the women in these provinces can be helpful in examining the changes in women's fertility preferences and fertility outcomes especially in the situation when after a decade the TFR in Iran has increased from 1.8 in 2006-2011 to 2.01 in 2011-2016. Conducting surveys in the mentioned provinces would require additional time and budget that was beyond the allocated time and budget for a PhD project.

Fourth, women's economic constraints are a factor which may affect their fertility outcomes. Despite the fact that in this study women were asked about their monthly income and their other economic conditions like home ownership, just a minority of respondents answered the economic questions. As mentioned in Chapter Three the lack of social trust among respondents was one of the limitations of conducting this study. Although respondents were convinced by interviewers that their questionnaire responses will remain anonymous, they avoided answering the economic questions. Therefore, a focus on women's (couples) economic conditions and the relationship with fertility is recommended.

8.5. Policy implications

The findings of this study suggest specific policy directions.

- **Increase the awareness of women regarding the use of withdrawal**

The high failure of withdrawal use (Abbasi-Shavazi & Khademzadeh, 2004; Erfani, 2011b), and also the intention of educated women to use withdrawal (Abbasi-Shavazi & Khademzadeh, 2004), highlights the necessity of educating young women in high schools and universities about the risks of adopting withdrawal as a method of contraception and consequently the risk of unwanted pregnancies. It is worth noting that in countries where abortion is legal, induced abortion can act as an alternative to compensate for contraceptive failures to cope with a high rate of withdrawal use. In Iran, however, abortion is illegal and strictly prohibited (Erfani, 2012) except when a woman's life is endangered or her foetus is diagnosed with a disease or defect (Erfani, 2011b). Therefore, young educated women should also be aware of the consequences of undergoing clandestine abortions and they should be informed about the

use of emergency methods in the case of withdrawal failures. Moreover, young educated women should be taught about the low effectiveness of withdrawal use and also be encouraged (convinced) about the usage of more effective contraceptives such as the pill, IUD or Norplant.

- **A policy that respects individual rights (specially women's rights) in reproductive decision making**

The findings of this study discussed in Chapter Five showed that if women can realise their expected fertility, women in all age groups can achieve their fertility desires. Interestingly there was a convergence in desiring more than two children among women with different demographic and socio-economic characteristics. Therefore, if women can achieve their expected family size, fertility would increase to the levels of above replacement level. The findings of the 2016 Census, which was conducted one year after this survey, acknowledges that the TFR has increased in all provinces of Iran. Therefore, it should be considered that adopting any official pronatalist policy would lead to a decline in the current economic capacity of the country especially in the less developed provinces such Sistan and Baluchestan, North and South Khorasan in which TFR is already high (3.96, 2.84 and 2.85 respectively). As was mentioned earlier in the previous chapters the postponement of the antinatalist policy in the early 1980s and adopting the pronatalist policy, (however it was short term) in the country in mid-1980s resulted in a huge population increase (baby boom) in the country. This situation encouraged the policy makers to resume the antinatalist population policy to prevent any further population increase. It should also be noted that as mentioned in Chapter One, the window of opportunity is still open in the country and a majority of the population of Iran is in the working age 15-64. According to Abbasi-Shavazi (2012) currently Iran is in a favourable demographic situation in terms of the annual population growth rate and the age structure. Therefore, regarding the challenges and negative consequences of long term fertility decline below replacement level, relevant policies should be adopted to prevent further fertility decline in the country and sustain the total fertility rate at 2.1 children per woman (replacement level) in the whole country. The fertility decision of a couple is an individual human right and whether the country's policy is pronatalist or antinatalist, it should not be at the cost of their rights. As laid out by the ICPD Programme of Action, adopted in 1994, a far-

sighted plan for advancing human well-being places the human rights of individuals, rather than numerical population targets, at the centre of the global development agenda. In tune with this strong message from the ICDP, this thesis calls for increase in investing in women and girls, both as an end in itself and as a key to improving the quality of life for everyone (United Nations Population Fund, 2018).

APPENDIX I

Questionnaire
(The riginal questionnaire was in Farsi)

SURVEY INSTRUMENTS

INDIVIDUAL IDENTFICATION DETAILS	*Code*
Region/Suburb:	☐
Serial Number of the Questionnaire: ……	☐☐☐
Interview Date: ……	☐☐☐☐☐☐
Signature and Name of the interviewer: ……..	

Section A: Respondent's background

Q NO.	QUESTIONS AND FILTER	CODING CATEGORIES
Q 1	In what month and year were you born?	Month……Year……
Q 2	Is your place of birth an urban or a rural area?	1-Urban ☐ 2-Rural ☐
Q 3	How old are you?	……years old (compare with answer to Q1 and correct if necessary)
Q 4	What is your marital status?	1.Currently married ☐ 2.Separated ☐ END 4.Divorced ☐ END 5.Widowed ☐ END
Q 5	How many times have you got married?	……. times
Q 6	Date of your first marriage:	Month……, Year……
Q 7	How old were you at your first marriage?	.....Years old
Q 8	Was your husband related to you before marriage? If yes clarify	1. Your cousin (your uncle's son from your father's side) ☐ 2. Your cousin (your uncle's son from your mother's side) ☐ 3. Your cousin (your aunt's son from your father's side) ☐ 4. Your cousin (your aunt's son from your Mother's side) ☐ 5. non-relative ☐ 6.Other (Specify):

Q 9	Education: What is the highest grade you completed?	0-Illiterate ☐ 1- Elementary School ☐ 2-High School ☐ 3-Diploma ☐ 4-Bachelor's degree and above ☐ 5-I have not attended school yet, but I can read and write ☐ 6- Other (Specify):
Q 10	What is your mother language?	1-Farsi ☐ 2-Turkish ☐ 3-Kurdish ☐ 4-Lori ☐ 5-Arabic ☐ 6- Baluchi ☐ 7-Other(specify):
Q11	What is your religion?	1-Islam (Shia) ☐ 2-Islam (Sunni) ☐ 4-Christian ☐ 5-Jewish ☐ 6-Other (specify):
Q 12	What is the total income in your family (MONTHLY average)?	…….Rial
Q 13	How is the ownership of your accommodation?	1-Private home ☐ 2-Rental ☐ 3-Government housing by payin ☐ ent 4- Government housing without paying rate ☐ 5- Parents's home by paying rent ☐ 6- Parents'home without paying rent ☐ 7-Other(Specify):
Q 14	Aside from your housework, are you currently working for pay or profit or did you work for pay or profit in the last 12 months?	1-Yes ☐ 2-No ☐ Skip to Q17

Q 15	What type of work do/did you mainly do?	1-Professional/managerial ☐ 2-Service industry ☐ 3-Labour work ☐ 4-Agricultural work ☐ 5-Services ☐ 6-Other (Specify):
Q 16	Are you paid for this work? Is the payment in cash or kind	1-Cash Only ☐ 2- Cash and Kind ☐ 3- Kind only ☐ 4-Not paid ☐
Q 17	Do you have adequate access to health care facilities like hospital or clinics?	1-Yes ☐ 2-No ☐

Section B: Reproduction

Q 18	Have you ever got pregnant?	1-Yes ☐ 2-No ☐ Skip to Q25
Q 19	Have you ever given birth to a live child?	1-Yes ☐ 2-No ☐ Skip to Q23
Q 20	How many live children have you given birth to? If none record '00'	1- Son/s …... 2- Daughter/s ….
Q 21	How many sons and daughters live with you? If none record '00'	1-Sons at home: ☐ 2-Daughters at home: ☐
Q 22	How many sons or daughters do you have (to whom you have given birth) who are alive but do not live with you? If none record '00'	1-Sons: ☐ 2-Daughters: ☐
Q 23	Are you currently pregnant?	1-Yes ☐ 2-No ☐ Skip to Q25 3-Not sure ☐ Skip to Q25
Q 24	Have you or your husband ever used any method of contraception to delay or avoid getting pregnant?	1-Yes ☐ 2-No ☐ Skip to Q27
Q 25	Are you or your husband currently using any method of contraception to delay or avoid getting pregnant?	1-Yes ☐ 2-No ☐ Skip to Q27

Q 26	Which method (were) are you using?	1-Pill ☐ 2-Condom ☐ 3-IUD ☐ 4-Female sterilization ☐ 5-Male sterilization ☐ 6-Injection ☐ 7-Rhythm ☐ 8-Withdrawal ☐ 9-Norplant ☐ 10-Other (specify): ***After answering this question , go to "Section c"***
Q 27	Why (were) are you not using any method of contraception?	1-I am pregnant now ☐ 2-Just had a baby …month(s) ago ☐ 3-Removing Ovaries with uterus ☐ 4-Primary infertility ☐ 5-Secondary infertility ☐ 6-Intention to have child ☐ 7-Not having sex with husband or husband is away ☐ Other (specify):

Section C: Fertility preference

Q 28	For you personally, what would be the number of children you would like to have in absence of any possible obstacle (economic, health…)?	……. children
Q 29	In addition of the number of children you already have, how many (more) children you have intended to have in the rest of your childbearing period?	……. children

Q 30	Control question: Number of her alive children……	**0**0-No child ☐ 1.Sons ☐ 2.Daughters ☐
Q 31	What's your preference for the sex of your next child?	1.Boy ☐ 2.Girl ☐

Section D: Division of household labour

Q 32	Who makes the financial decisions in your household?	1. Husband only ☐ 2. Wife only ☐ 3. Both together ☐ 4. Someone else (specify):
Q 33	Who makes the health decisions in your family?	1. Husband only ☐ 2. Wife only ☐ 3. Both together ☐ 4. Someone else (specify):
Q 34	Do you discuss about family planning with your husband?	1-Yes ☐ 2-No ☐
Q 35	Who decides how many children you should have?	1. Husband only ☐ 2. Wife only ☐ 3. Both together ☐ 4. Someone else (specify):
Q 36	Does your husband contribute in housework?	1-Yes ☐ 2-No ☐ Skip to Q 39
Q 37	How many hours does he spend for housework?	……hours

Q 38	What does he often do as housework?	1-Cleaning ☐ 2-Cooking ☐ 3-shopping ☐ 4-teaching the children ☐ 5-other(specify)

Section E: Marriage and Family

Now I want to ask some questions about marriage:		
Q 39	In your opinion what is the ideal age at marriage?	Ideal age at marriage for girls is … Ideal age at marriage for boys is …
Q 40	Which item do you more agree with?	1-Girls and boys should be able to choose their spouse freely. ☐ 2-It would be fine if parents select the spouse for their children. ☐ 3-It would be fine if girls and boys choose their spouse by their parents' advice/consultation. ☐

Section F: Policy related

Q 42	Do you consider that family size matters in happiness?	1-Yes ☐ 2- No ☐ 3-Doesn't matter ☐
Q 43	A happy family is the one which is	1-Big ☐ 2- Small ☐
Q 44	Have you heard about government pronatalist approach to promote producing more babies?	1-Yes ☐ 2-No ☐
Q 45	Do you support that the government should encourage producing more babies?	1-Yes ☐ 2- No ☐ Skip to Q47

Q 46	Why do you support that the government should encourage producing more babies? *(After answering to this question skip to Q48)*	1-Good for the society ☐ 2-Need more young people ☐ 3-Good for the economy ☐ 4-Good for the family ☐ 5-Need more people in the country ☐ 6-A powerful country is populous ☐ 7-Religious reasons ☐ 8-Other (specify):				
Q 47	Why do you think that the government **should not** encourage producing more babies?	1-Not good for the society ☐ 2-Not good for the economy ☐ 3-Already too many people ☐ 4-Not good for the environment ☐ 5-Already too many unemployed ☐ 6-It's a personal decision that should be made inside the family not by the government ☐ 7-Other (specify):				
Q 48	Do you think financial reward or other forms of incentives for producing more babies are good policies?	1-Yes ☐	2- No ☐			
Q 49	What is your opinion if the Government gives the contraceptives freely to following people?	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
	49-1-Married women above 35 with at least two children					
	49-2- All married women in reproductive age group (15-49).					
	49-3- All singles					

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