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Fertility Differentials of Jewish Women Living in
Israel and The West Bank

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Israel and The West Bank**

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DIFFÉRENTIELS DE FÉCONDITÉ ENTRE LES FEMMES JUIVES D'ISRAËL ET DE LA CISJORDANIE

Israël est l'un des pays développés les plus féconds dans le monde et maintient un taux de fécondité stable depuis 1995. Il a échappé à la chute spectaculaire de la fécondité qui a été observée dans la plupart des pays occidentaux. Le taux de fécondité était de 2,96 enfants par femme en 2009 (*Statistical Abstract of Israel*, 2010, tableau 3.14). Le maintien d'une si forte fécondité pourrait être dû à l'immigration et à la "guerre démographique" qui sévit entre les différentes communautés vivant dans le pays (Sardon, 2006). Toutefois, on observe une différence significative entre les niveaux de fécondité des juifs d'Israël et de Cisjordanie depuis plusieurs années. Les études qui portent sur la fécondité en Israël sont faites au niveau national, ce qui ne fournit aucune explication sur cette différence. Pour ces raisons, l'étude de la fécondité en Israël mérite une attention particulière.

Ce projet vise à identifier les différents facteurs qui ont une incidence sur la fécondité des femmes juives vivant en Israël et en Cisjordanie. Il contribuera à une meilleure compréhension des comportements liés à la fécondité de la population juive de la Cisjordanie et peut fournir des indices sur les mécanismes complexes qui régissent les relations entre Juifs et Arabes dans les territoires occupés.

Grâce aux données recueillies dans l'Enquête sociale générale de 2004 d'Israël,

des analyses descriptives et explicatives ont été produites. Dans un premier temps, les facteurs qui ont un impact sur la fécondité dans chaque région ont été déterminés et par la suite, une analyse de l'importance de ces facteurs sur la fécondité a été produite. Le nombre d'enfants nés de femmes âgées de 20 à 55 ans constitue la variable d'intérêt et les variables explicatives retenues sont les suivantes: religiosité, éducation, revenu familial mensuel, statut d'emploi, pays d'origine, âge et état matrimonial.

Cette étude a montré que les femmes juives qui résident en Cisjordanie ont un nombre prévu d'enfants de 13% supérieur à celui des femmes juives qui résident en Israël lorsque l'on contrôle toutes les variables. Il est notamment montré que la religion joue un rôle important dans l'explication de la forte fécondité des femmes juives dans les deux régions, mais son impact est plus important en Israël. L'éducation joue également un rôle important dans la réduction du nombre prévu d'enfants, en particulier en Cisjordanie. Tous ces facteurs contribuent à expliquer les différents niveaux de fécondité dans les deux régions, mais l'étude montre que ces facteurs ne permettent pas une explication exhaustive de la forte fécondité en Israël et en Cisjordanie. D'autres forces qui ne sont pas mesurables doivent avoir une incidence sur la fécondité telles que le nationalisme ou la laïcisation, par exemple.

Mots clés: Différentiels de fécondité, Israël, Cisjordanie, Variables socio-économiques, Variables démographiques, Religiosité, Nombre d'enfants nés, Régression de Poisson

SUMMARY

FERTILITY DIFFERENTIALS OF JEWISH WOMEN LIVING IN ISRAEL AND THE WEST BANK

Israel is one of the most fertile developed countries in the world and has had a stable fertility rate since 1995. The country avoided the dramatic fall in fertility that has been observed in most Western countries. The fertility rate was of 2.96 children per woman in 2009 (*Statistical Abstract of Israel*, 2010, table 3.14). Maintaining such a high fertility level could be due to immigration and the “demographic war” between the different communities living in the country (Sardon, 2006). However, a significant difference between the levels of fertility of the Jewish population of Israel and the West Bank has been observed for several years. In the literature, studies of fertility in Israel are conducted at a national level, which neither reveals nor explains the difference. Accordingly, Israel’s high fertility deserves a particular attention.

This project aims to identify the different factors that affect the fertility of Jewish women living in Israel and in the West Bank. It will contribute to a better understanding of the fertility behavior of the Jewish population of the West Bank and may shed light on the complex mechanisms that govern the relations between Jews and Arabs in the Occupied Territories.

With data collected in the *General Social Survey* of Israel of 2004, descriptive

and explanatory analyses were produced. In the first part, factors influencing fertility in each region have been determined and an analysis of the importance of each factor on fertility was conducted in the second part. The outcome of interest is the number of children ever born to women aged 20 to 55 and the independent variables are: religiosity, education, monthly family income, employment status, country of origin, age and marital status.

This study showed that Jewish women residing in the West Bank have an expected number of children 13% higher than their counterparts residing in Israel. It is also shown that the intensity of religious interest plays an important role in explaining the high fertility of Jewish women in both regions but its impact is more important in Israel. Education also plays an important role in reducing the expected number of children, especially in the West Bank. All of these factors contribute to explaining the different fertility levels in the two regions but the study shows that these factors do not provide an exhaustive explanation of higher fertility in the West Bank. There must be other forces that have an impact on fertility but which are not measurable such as nationalism or secularization, for example.

Keywords: Fertility, Israel, West Bank, Socioeconomic variables, Demographic variables, Religiosity, Number of children ever born, Poisson regression

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INTRODUCTION

At first sight, studying the fertility behavior of Jewish women in Israel and the West Bank can seem odd considering the fact that the whole population of the country is of 7.3 million inhabitants (*Statistical Abstract* of Israel, 2010, table 2.1) which is less than one percent of the world population. However, it has been noted that this small population is unique in terms of its demography, e.g., Fargues (2000) and Anson and Meir (1996).

It is the most fertile developed country in the world (Sardon, 2006). The country has managed to keep its fertility levels relatively high all throughout its history while most of the other developed countries in the world were experiencing an often drastic fertility transition. The total fertility rate of the population of Israel was of 3.85 children per woman in 1960-1964 and decreased to 2.96 children per woman in 2008 (*Statistical Abstract* of Israel, table 3.13). In contrast, the total fertility rates of other developed countries show a general trend of fertility decrease during the past decades. The TFR in Western European countries was 2.7 children per woman in 1960-1965 and decreased to 1.5 children per woman in 1995-2000 (Guengant, 2002). In the neighboring countries (Western Asia), the fertility transition is even more obvious: from a higher level of 6.2 children per woman in 1960-1965 to 3.9 children per woman in 1995-2000 (Guengant, 2002). In Israel, the change has been of lesser importance and the fertility level was maintained higher than in other developed countries. Over the same time period, fertility declined by only 3.85 to 2.93 children per woman (*Statistical Abstract* of Israel, 2009, table 3.13). It is clear that Israeli fertility differs from that of most

other developed countries in the world and deserves to be studied more extensively.

Looking further into the data provided by the *Central Bureau of Statistics* of Israel, these data show that the high level of fertility of the country is not evenly distributed among the population. There are different levels of fertility among the Jews, the Christians and the Arabs but in this mémoire, we focus on the Jews.

One important characteristic that seems to have an impact on fertility and that is not mentioned above is region of residence. Kesarwani (1989) mentioned that it was difficult to determine a single fertility pattern for Israel as a whole because of possible regional differences in fertility. According to Kesarwani (1989), human fertility is essentially related to environment and culture which are not uniform in all the regions. Indeed, the Jews living in the West Bank clearly have a higher fertility than their counterparts in the rest of Israel. The data from the *General Social Survey* (GSS) of Israel of 2004 shows that Jewish women living in the West Bank had an average number of children of 2.84. When looking at Israel without the West Bank, this number drops to 1.88. The next table presents the basic statistics for the mean number of children per Jewish woman in both regions.

TABLE 0.1. Mean number of children ever born per Jewish woman in Israel and the West Bank, standard deviation and number of observations

Region	Mean CEB	Std. Dev.	N
Israel	1.88	1.71	2,099
West Bank	2.84	1.98	90

Source: *General Social Survey* of Israel, 2004

Most demographic research on fertility is conducted at national level for practical and ideological reasons. The state collects data on the population on a national level and the population is conceived as a national body (Fargues, 2000). There

is no research available which explains fertility differences between Israel and the West Bank. This mémoire addresses this key question, defining which variables are associated with the fertility of Jewish women living in Israel and the West Bank and exploring whether these variables have the same association on both regions.

The literature on fertility differentials is substantial. A number of studies have extensively used a series of socio-economic and demographic variables to explain the differences. Therefore, it is possible to have an idea of which variables will significantly affect fertility. However one variable could be very useful in this kind of study but which has been neglected over the years is religiosity. Indeed, as Zhang (2008) mentions: “The effect of religiosity on fertility appears to have eluded researchers.”

Many researchers have used religion as a variable in their studies on fertility differentials. However these studies have focused on fertility differentials among various religious denominations but not between individuals of the same religious group. In the present study, religiosity, as opposed to religion will be added to our explanatory paradigm as an explicative variable of fertility among people belonging to the same religious group. It has been shown that religious participation influences people’s demographic behavior (Zhang, 2008) and it is known that religion and religiosity are at the heart of the creation of the Jewish state and the cause of many of the wars that the country has been through during its short existence.

As a matter of fact, the Israeli-Palestinian conflict cannot be ignored as it has often been called “the war of the cradles” (Courbage, 1999). Courbage (1999) stipulates that the political future of Jews and Palestinians, for now and for the foreseeable future, will be determined by decisions taken within the family, decisions about having or not having a child, advancing or delaying a birth. From this comment, it appears clear that demography and more precisely, fertility has

a major role in the political arena of the country in maintaining or improving the relative population weight of Israel versus Palestine. Fargues (2000) also mentioned the particularity of fertility in Israel/Palestine:

“(...) the exceptional political history of these populations, in which demography played a major role for both sides in nation-building, sheds a particular light on the political dimension of fertility change, a matter of interest beyond the limits of this small piece of land.”

All this information demonstrates the importance of fertility change as a political issue. Religiosity and not just religion is a key factor in the evolution of fertility and population in Israel and Palestine. Considering the role of religiosity among the other socio-economic and demographic variables in a study on fertility differentials of Jewish women in Israel is of major importance.

There are additional reasons why a study of the high fertility of Israel and of the Occupied territories is important and needs to be conducted. A better understanding of the differences between the fertility patterns of the Jews living in Israel and those living in the Occupied Territories is important. They could be explained by many factors including the socioeconomic conditions of people living in both regions, political views and ideologies. Having a better understanding of their behavior and knowing which factor influences their fertility the most could not only help understanding the mechanisms of Jewish fertility but could also shed the light on the much more complex relationship of the Jews and the Arabs in Israel and the Occupied Territories.

The ultimate relevance of this study is its political contribution to knowledge. The political situation and the living conditions in the Occupied Territories are major preoccupations of the International Community. Their lack of information

on these people prevents them from providing adequate support. The Israeli government is being urged to stop the construction of settlements in the West Bank as it would be the starting point toward a Peace treaty and lead to the creation of a Palestinian state. The Israeli Prime Minister Shimon Peres once said in an interview with Morgan Spurlock¹:

“What is a Jewish state? It’s not a religious definition; it’s a demographic definition. If the Jews will not be the majority we won’t have a Jewish state.”

The Israeli government refuses to freeze the construction of new Jewish settlements in the Occupied Territories justifying its decision with the specific demography of the country. Having an accurate portrait of the fertility patterns of the Jews in Israel and the West Bank would add to our wealth of knowledge about the region and bring greater clarity in the hope of a peace process.

¹Taken from the 2008 documentary: Where in the World is Osama Bin Laden?

Chapter 1

LITERATURE REVIEW

To fully understand the scope of fertility issues in Israel it is critical to understand specific details of the country, its people and its history. Given the enormous cultural and religious diversity within the country and the long-lasting state of belligerence between the Arab Palestinians and the Jews that began over 90 years ago, a brief overview of the country's origins and of the long process that led to the creation of the state of Israel forms the first part of the literature review. Such information is pertinent to the behaviors that influence fertility in the country today. The second part of the chapter reviews previous studies on the fertility of the Jews, and most specifically in Israel, highlighting the main known factors that influence Jewish fertility in the region. A thorough reading of these studies will identify the limitations associated with this type of research. This literature review will help us evaluate which methodology should be employed in this mémoire and hence, understand how the knowledge on the subject will be increased with the analyses.

1.1. CONTEXT OF THE STUDY

1.1.1. A century of Zionism and immigration to Palestine

In the 2,000 years prior to the twentieth century, the Jewish community lived dispersed among the nations of the world, having only their common religious background to unite them. They built several Jewish communities all over the

world but particularly in Europe where they lived in peace for centuries. However, ever since the Babylonian exile¹, many Jews manifested the desire to return to Israel, a movement called *aliya*² (Portugese, 1998). The movement eventually gained momentum and led to the creation of Zionism. It is a term that refers to the ideological and political program of a movement that arose at the end of the nineteenth century in Europe and that had as its main goal the creation of a Jewish state and a homeland for the Jews in Palestine, the historic and spiritual homeland of the Jews (Portugese, 1998). Zionists considered Jewish immigration to Palestine essential for ideological and practical reasons. They considered that the “return to the land of their forefathers” was a duty for every single Jew in the world. Consequently, a massive Jewish presence in Palestine would justify their claim to the land (Laqueur, 1989).

The Zionist movement gained immense popularity among Jews and reached a peak in the 1880’s (Barnavie, 1982). At that time a general negative feeling against the Jews prevailed among people of other nations of the world. Western European Jews had a hard time integrating the newly liberal-democratic norms and rules of their countries of adoption (Portugese, 1998). They were received with suspicion if not downright hostility (Tessler, 1994).

Some Jews believed that they brought anti-Semitism³ on themselves due to their previous transgressions against God and were now being forced to live a life of physical and spiritual exile. Their statelessness gave them an “abnormal status”. Because they lacked a national homeland, they had become inferior and sickly people causing the Gentiles⁴ to despise them (Portugese, 1998).

Motivated by the belief that anti-Semitism would never fade, a number of Jews

¹According to the Encyclopaedia Britannica, many scholars refer to 597 BC as the year of the first deportation of the Jews.

²Literally means “ascend”, the immigration of Jews to Israel.

³A prejudice against or hostility towards the Jews.

⁴A person who is not Jewish.

concluded that the solution to the “Jewish problem” was to create an independent state to which Jews from all over the world would be free to immigrate and put an end to the exile of the Jewish community (Avineri, 1981). The Zionist movement then launched a series of massive waves of immigration.

During the period from 1882 to 1903, between 25,000 and 30,000 Jews immigrated to Palestine, which was under Ottoman control. Despite regulations against Jewish land purchases and settlement, a second wave of immigration took place between 1905 and 1914 in which 35,000 to 40,000 Jews came to Palestine, escaping an escalation of anti-Semitic violence (Wolffsohn, 1987).

From the start of the British mandate of Palestine in 1922 until the start of World War II, more than 360,000 Jews immigrated (Tessler, 1994). This change of government from Ottoman to British control allowed a more permissive policy toward Jewish immigration at a time when anti-Semitism and Nazism kept increasing in Europe. Subsequently, as the native Arabs began to fear their own territorial displacement, they started to protest by staging strikes and revolts. As a result of these manifestations, Jewish immigration was restricted in May 1939 allowing the entry of only 75,000 Jewish immigrants and 25,000 refugees for the next five years after which no further Jewish immigrants or refugees would be allowed without first meeting with the approval of the local Arab population (Portugese, 1998). As a result of this new policy, approximately 70,000 Jews came to Palestine illegally during the war and until the end of the British mandate (Tessler, 1994).

1.1.2. The creation of the state of Israel

As mentioned earlier, Palestine was under Ottoman rule for about 400 hundred years (1517-1917) until replaced by a British colonial mandatory government (Portugese, 1998). Contrary to the Turks, the British followed a pro-Zionist policy. Indeed, they issued a statement on November 2, 1917 outlining their support for the Zionist political program. In the statement, the British Foreign Minister,

Balfour pledged his support to the establishment of a “Jewish national home in Palestine”. Officially starting in 1922, the British Mandate for Palestine formalized the British rule in Palestine from 1917 to 1948 (Portugese, 1998).

Jewish immigration in Palestine increased a lot during the British mandate. As the tension grew between Jews and Arabs, Churchill was urged to clarify the meaning of the Balfour Declaration. This resulted in the preparation of a white paper in 1922 that reassured both Jewish and Arab communities by stating that the Jews were in Palestine “as a right and not on sufferance” and that the allowable number of Jewish immigrants would be limited to the “economic capacity of the country” (Tessler, 1994). It also stipulated that the area east of the Jordan River would be excluded from Jewish settlements. This area was renamed Transjordan (Kramer, 2008).

FIGURE 1.1. Palestine and Transjordan under the British Mandate, 1922



Source: Mark Tessler, *A History of the Israeli-Palestinian Conflict* ©1994

After an outbreak of the Arab revolution in 1936-1937, the Peel Commission arrived in Palestine to investigate the reasons behind the uprising. The report published in 1937 stipulated that many of the Palestinian grievances were genuine and that the disturbances had been caused by “the desire of the Arabs for

national independence". They also noticed that the causes that brought the disturbances in 1936 were the same as the ones that brought many of the previous disturbances. These findings brought the members of the Commission to issue a recommendation for the future of the state. The British mandate of Palestine should be terminated and in order for each national community to govern itself, the territory should be partitioned (Tessler, 1994). Even though the Peel Commission report was rejected, the partition of the territory has been proposed many times as a solution to the deepening conflict.

In 1947, the British government turned the matter over to the United Nations. The UN formed a Special Committee on Palestine (UNSCOP) to make recommendations concerning the future of the country. They submitted a report in August that contained a majority and a minority proposal. The Arabs rejected both proposals stating that Palestine was an integral part of the Arab world. On the other hand, the Jews were willing to accept the recommendations of the majority proposal. The borders of the Arab and Jewish states recognized after the termination of the mandate differ from those proposed by the UNSCOP (Tessler, 1994).

FIGURE 1.2. United Nations General Assembly Partition Plan, 1947



Source: Mark Tessler, *A History of the Israeli-Palestinian Conflict* ©1994

The independence of Israel was proclaimed about six months after the adoption of the UNSCOP resolution, on May 14th 1948. Many neighboring Arab countries attacked Israel after its creation such as Egypt, Jordan, Iraq and Syria. They were unwilling to recognize the new state but as soon as 1949, many of these countries signed Armistice agreements with Israel (Tessler, 1994).

1.1.3. Israel as a war society

It is clear that the process leading to the creation of the Jewish state of Israel has been long and marked by numerous conflicts within and outside their borders. Israel has fought seven major wars and two prolonged *intifadas*⁵ in a little over 60 years of existence. As a result of the country's focus on so many wars during such a short period of time, many of the most influential members of Israel's political elite come from the military (Richards and Waterbury, 1990). The Israeli army

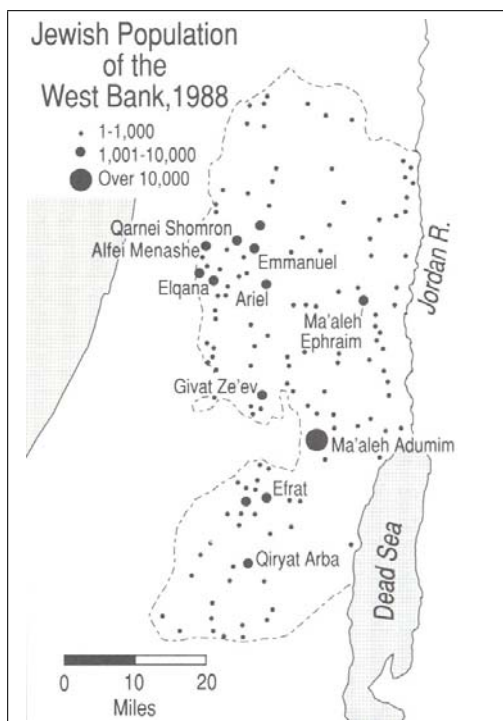
⁵*Intifada* is an uprising among Palestinian Arabs of the West Bank and Gaza strip in protest against continued occupation of these territories. The first one took place from 1987 to 1993 and the second one, from 2000 to 2005.

is one of the primary national symbols of the state itself. As mentioned by Portugese (1998): “(...) the extent of the military’s inroads into and influence upon society is so great that it is possible to use the term “militarized” when referring to it”. National security is the one issue that informs almost all of Israel’s policy decisions (Portugese, 1998). Indeed as Richards and Waterbury (1990) stipulate, Middle Eastern countries have had more than their share of conflicts throughout their existence and as a result, have devoted their human and material resources for defence and war more than most other developed countries of the world. Israel is no exception.

The previous maps show that ever since the creation of a Jewish homeland in Palestine, the definition of the borders of what would be the Jewish and Arab states changed many times and are still a key point in discussions for a future peace agreement. Arab territories have been limited to two regions: the West Bank and Gaza Strip. Israel occupied both territories until 2004 when the settlements in the Gaza Strip have been dismantled. The settlements keep increasing as of today in the West Bank. The very dense Palestinian population is confined to an increasingly small territory.

This research focuses specifically on the Jewish population that lives in the settlements of the West Bank in comparison to these living in Israel. To better understand their behaviour and their attitudes toward fertility, the proceeding discussion describes why they live in these settlements and which key factors pushed them to settle in this kind of environment.

FIGURE 1.3. Jewish population of the West Bank, 1988



Source: Mark Tessler, *A History of the Israeli-Palestinian Conflict* ©1994

1.1.3.1. Jewish settlements in the West Bank

During the Six-Day War of 1967, the Israeli army gained control of many territories that were under Arab control, including the Gaza strip and the West Bank (also called Judea and Samaria). Judea and Samaria are the heartland of the biblical land of Israel. A group of Jews dedicated themselves to the establishment of Jewish settlements in the region. Later on, the government permitted the Jewish settlements in a land that was until then solely populated by Arabs. By the mid-1990s over 150,000 Jews lived in these settlements of Judea and Samaria and the Gaza strip (Ministry of Foreign Affairs of Israel, 2002). The Israeli government dismantled the Gaza strip settlements in 2004 due to persistent pressures from the International Community.

According to the International Community, the Israeli occupation of the Palestinian Territories is illegal due to non compliance with the Fourth Geneva Convention which stipulates that the Occupying Power shall not deport or transfer

parts of its own civilian population into the territory it occupies⁶. With the support of the United States, the International Community pressures Israel to dismantle the settlements in the West Bank because they are considered to be a violation of international law. Israel rejects applying the Convention stating that the territory was captured in 1967 as a result of a defensive war against Jordan and Egypt, countries which had illegally occupied them since 1948. Despite the pressure, there are still, as of May 2009, 280,000 Israeli citizens living in 121 settlements (Statistical Abstract of Israel, 2009).

The Jewish settlements are build by the state. To encourage Israeli citizens to move to the settlements or to encourage those already living there to stay and to solidify Israel's hold on Judea and Samaria, the Israeli government offers a lot of benefits and incentives. Two types of benefits and incentives are offered: support directly granted to the citizens of the settlements and support that grants settlement local authorities that favors them over local authorities in Israel. A description of these benefits and incentives will be provided to take notice of the components of the government policy that influence the *standard of living* of Israeli citizens and might impact on their decision to "immigrate" to the West Bank. They are granted by six government ministries (B'tselem, 2002)⁷ :

- (1) *The Ministry of Construction and Housing* provides generous assistance for people who purchase a new apartment or build a house in a settlement. They provide these individuals with loans that can be converted in grants after a number of years depending on the type of area the settlement is in.
- (2) *The Israel Lands Administration* provides discounts from forty-nine percent to sixty-nine percent (depending on the classification of the area of

⁶Fourth Geneva Convention, article 49, 1949

⁷B'tselem is an Israeli human rights organization (NGO) that was established in 1989 by a group of prominent academics, attorneys, journalists and Knesset members. Its main goal is to document and educate the Israeli public and policymakers about human rights violations in the Occupied Territories.

the settlement) from the value of the land in the payment of lease fees for residential construction.

- (3) *The Ministry of Education* provides teachers in some settlements with promotions and exempts them from various employees' fees. The children's parents in these settlements are granted discounts of ninety percent for tuition fees in pre-compulsory kindergartens. The Ministry also covers all transportation costs for students to school in all the settlements.
- (4) *The Ministry of Industry and Trade* provides grants and income tax benefits in all areas for enterprises that qualify for government support. The Ministry also established new industrial zones for which they grant enterprises significant discounts on land prices.
- (5) *The Ministry of Labor and Social Affairs* provides social workers with packages of benefits similar to those of teachers.
- (6) *The Ministry of Finance* provides residents of some settlements reductions in the payment of income taxes at rates that vary from five to twenty percent. Most settlements benefit of a seven percent income-tax reduction.

There are also benefits and incentives for the local authorities in the settlements. Their advantage compared to local authorities in Israel relies on the channeling of money through the Settlement Division of the World Zionist Organization. Because the Division is not a state body, their function is the good functioning of the public infrastructures of the settlements and to support their development. For an exhaustive description of the benefits and incentives provided by the Israeli government to the settlers of the West Bank, see B'tselem (2002).

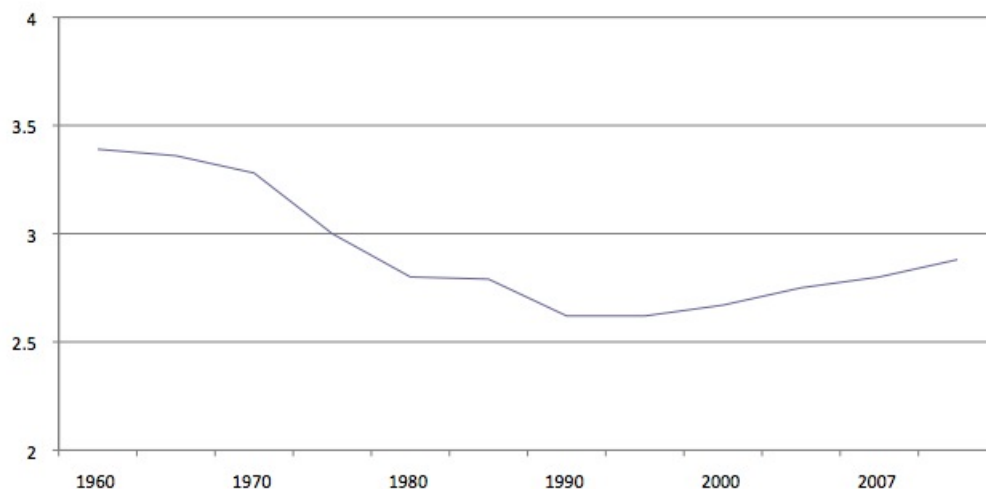
1.2. WHAT WE KNOW OF JEWISH FERTILITY

Despite all the changes that occurred in the past 60 years in the developed world Israel managed to sustain its fertility at a level that is considerably higher than that found in comparable industrialized countries. In 2009 Jewish women in Israel had a fertility rate of 2.90 children per woman (*Statistical Abstract of Israel*, 2010: table 3.13). This TFR is above the replacement level evaluated

at 2.1 children per woman. Finding an explanation of the high fertility level of Israeli women can be complex. However fertility behaviour has been extensively studied by demographers and other social scientists and it has been approached from a variety of perspectives.

Israel's fertility history is complex. While the Israeli TFR described above remains above replacement levels, like all industrialized countries, Israel has experienced a *fertility transition*. The Jewish population of Israel nevertheless experienced a general decline of their fertility in the past century. The classical demographic transition theory highlights economic development as a major influence on declining fertility. In this sense, modernization reduces children's role as security for parents, and the trend toward mass education decreases their availability for work (Okun, 1997). The population has undergone a rapid modernization from the first generation of Israelis who lived in traditional societies prior to 1960 with a regime of high fertility and mortality and low incomes to the subsequent generation of the 1980's and 1990's who lived in a more modern society with lower fertility, lower child mortality and higher incomes.

FIGURE 1.4. Fertility rates of the Jewish population of Israel, 1960-2008



Source: *Statistical Abstract of Israel*, 2009: table 3.13

As seen in Figure 1.4, the total Jewish population of Israel managed to lower its fertility between 1960 and 1990 and fertility rates stabilized during the 1990's

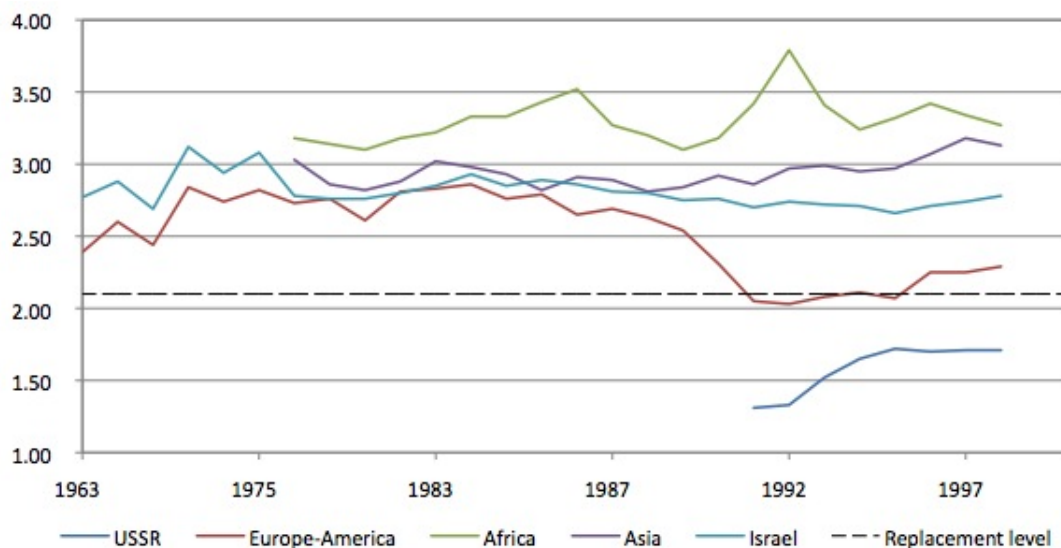
(Sardon, 2006). Jewish Israeli fertility nevertheless remained higher than in most other developed countries. The lowest fertility rate was recorded in the 1990s and since then started to rise again. Manski and Mayshar (2003) describe this Jewish Israeli new trend as a “reverse fertility transition” mainly due to the still very high fertility of ultra-orthodox women. They conclude that this reverse transition arose out of the combination of two key factors: non-continuity in private behavior and social interactions as each woman is influenced by the fertility decisions of other women.

Israel is a country of numerous contrasts notably because of the fact that it was built on massive *immigration*. It has brought to Israel people from all around the world with a great variety of demographic and socioeconomic characteristics and attitudes toward fertility. Ever since the creation of the state about 60 years ago and even before there have been many waves of immigration from various regions mostly from Poland, the former U.S.S.R., Romania, Germany, Austria and later on, from many other countries such as the Arab countries, the United States, Ethiopia, etc.

Upon arriving in Israel, these immigrants discover a society with a distinct fertility behavior. Indirect determinants of fertility such as sexual relations out of wedlock, age at marriage, use of fertility control, etc. are different in Israel than in their country of origin. Having access to a different lifestyle allows them to adapt their fertility levels. Fargues (2000) stresses the extreme contrasts of fertility in Israel between new immigrants and the rest of the population after a few years in the country, the immigrant population has adopted a new fertility behavior that is in between the fertility trend in the new country and the one of their country of origin (as shown in Figure 1.5). Anson and Meir (1996) also noticed the convergence of fertility patterns of Jewish immigrants toward the fertility of Israel born women through the years. They mention that immigrant groups with the lowest fertility (Europe-America and USSR) have substantially higher fertility than the mean fertility level in their country of origin. They are *over-reproducing*

in comparison with the European standard.

FIGURE 1.5. Total fertility rates of the Jewish population by mother's country of birth, 1963-1998



Source: *Statistical Abstract of Israel*, 2009: table 3.15

About 30% of the Jewish population of Israel whose father was not born in Israel was of North African or West Asian origin in 2008 (*Statistical Abstract of Israel*, 2009: table 2.24). These two groups have a recent history of high fertility and high family size norms. Even if their fertility would dramatically drop, they would have higher fertility levels than their counterparts from European or American origin. However Anson and Meir (1996) mention that the high fertility of Jewish women of African and Asian descent cannot explain the high fertility of Israel as a whole because even immigrants with a different cultural background show an inexplicably high fertility compared to their country of origin.

Researchers attempting to explain the factors associated with Jewish Israeli fertility have highlighted religiosity, pro-natalist policies, and belligerence. **Religiosity** is an important factor that influences fertility, especially in Israel. It can be defined as the fact of being religious and the impact of your sensibility on your religious attitude. People who immigrate to Israel are religious in different degrees and religiosity has direct and indirect effects on fertility. Even though

Keysar et al. (1992) mention that religiosity alone is insufficient to explain the changes in fertility behaviour it is sometimes used in studies as an explanatory variable for fertility. Indeed religious people will tend to follow the directives of the religious authorities. In the case of Judaism high fertility is very well praised and the use of contraception or sterilization is discouraged. For that matter people with strong religious values are often associated with higher fertility levels. Manski and Mayshar (2003) show that ultra-orthodox women in Israel have a lot more children than all other groups. In a study on religiosity differences Friedlander (2002) also noted that the orthodox population shows fertility levels above their group averages.

The ultra-orthodox population of Israel has strong political power and receives specific funds allocated to families by their community institutions and secured by governmental authorities. They can finance their own educational system in which men are provided many years of religious education while women are expected to work and support the family. They are characterized by early marriages, the expectation of having a child within the first year of marriage and the encouragement of fertility as a norm throughout the marriage (Landau, 2003).

Friedlander and Feldman (1993) argue that without the participation of the religious section of Israel the fertility would be at or approaching the level found in European countries. Religiosity among other variables affects the total fertility rate. According to the *General Social Survey* of Israel of 2004, a little over 18% of the female population is considered to be religious. A study of Israel's fertility by DellaPergola (2007) highlights the impact of religiosity. He mentions that the attained family size grows in direct relation with self-assessed religiosity. In fact, it is said to be the most important factor in explaining births of parity 5 or more. He concludes by saying that the power of religiosity as an explanatory variable of fertility is related to a comparatively "small minority highly focussed on their ideal life goals". Another study of religiosity by Hartman (1984) came to the conclusion that religiosity has a significant effect on fertility that is not the result

of a “spurious relationship with the main factors of differential fertility in Israel, education and ethnicity”. He also found that this effect prevails not only among the most extremely religious groups but can be observed among other groups as the scale of religiosity increases.

Despite the fact that many studies tend to show that there is a link between religiosity and higher fertility, there is no consensus in the literature. For example, Anson and Meir (1996) argue that previous explanations based on ethnic origin, composition of the population and on religiosity are sociologically incomplete and that arguments that religious groups in Israel have higher fertility than do non-religious groups are not substantiated.

Turning from religion to policy, the importance of Israeli *institutions* and their role in maintaining a high fertility must not be underestimated. In the mid 1960’s a committee had been appointed and charged with advising the government of a future population policy. Their report found that fertility among Jewish women in Israel was extremely low and that at the same time, the fertility of Israel’s Arab minorities, particularly the Muslims, continued to be alarmingly high. Left “unchecked these longterm trends constituted a threat to the political, social, cultural, and security position of the Jewish state” (Schiff, 1981).

Since the 1960’s, Israel has developed a very pronatalist approach (Landau, 2003) with policies focused on reproductive health and family rights. With these policies, the government developed one of the most generous child allowance programs in the world (Manski and Mayshar, 2003). Israel offers monthly payments to families with one or two children; for the fourth child and up the payments become substantial even though it had been demonstrated that the more children a person has, the lower the marginal cost of care for the n^{th} child is (National Insurance Institute Statistical Quarterly and Yearbooks). In addition to the allowance programs, Israel offers free services for pregnant women and infants and women who experience difficulties conceiving (Landau, 2003). All pregnant women have free

access to pre-natal care including all sorts of screenings and ultra-sounds at least three times during their pregnancies. Mothers have access to free developmental examinations and vaccines for their infants (Manski and Mayshar, 2003).

Israel's pro-natalist policies now extent to the use of reproductive technologies. Israel is the country with the highest rate of in-vitro fertilization clinics per capita in the world. Another service which facilitates the creation of families is gestational surrogacy; Israel is the only country in which surrogacy is explicitly legalized (Landau, 2003). There are also programs to ensure that once the baby is born he/she is cared for. These programs provide access to free education and health insurance, generous maternity grants, tax benefits for working mothers and even housing benefits depending on the size of the family (Manski and Mayshar, 2003). The Israeli government devotes much energy and funding to these pronatalist policies. In contrast, no funds are allocated to contraception and sterilization is not a common practice. Abortion is allowed only under very restrictive conditions and has to be approved by a doctor (Population Policy Data Bank, United Nations). Given the fact that these welfare policies were established in the 1970's when the Jewish fertility began to decline, they must have had a certain success in maintaining a high fertility level.

One important and specific characteristic of Israel that has shaped its history is a perpetual state of *belligerence* and the nationalism of its population. Its Jewish character gives the country a specific status in the Middle East. The constant tension with the neighboring countries and with the different communities within the country generates strong nationalist sentiments. As Courbage (1999) said, bearing many children is an insurance policy against the loss of children and men in a situation of conflict. Thousands of Jews and Arabs have died in Israel's many wars. Maintaining a high fertility would make up for the losses suffered during wartime. Conflict can shape ideational changes that are related to fertility, sharpening identities and the vision of the nation thus making natality a corollary of nationalism (McNicoll, 2001). Anson and Meir (1996) commented

on this phenomenon in Israel and stated that the perpetual conflict reinforces the Jewish values in the daily life which translates in an enhanced religiosity. DellaPergola (2007) also links Jewish Israeli's fertility with nationalism by saying that the high fertility levels could be a way of "enhancing the role of Israel's Jewish population vis-à-vis a demographically declining Jewish Diaspora". Portugese (1998) stipulates that "an increase in the militarization of a society tends to be positively correlated with the emergence of pronatalist government policies" (Portugese, 1998).

According to Courbage (1999) this conflict created a "war of the cradles". Indeed, Arab women in Israel maintained a higher fertility level than Jewish women over the years despite a constant decline (3.73 children per Arab woman compared to 2.90 for all women in 2009) (*Statistical Abstract of Israel*, 2009: table 3.13). Jewish Israeli women could be induced to have more children in order to protect their numerical majority in the country. Nahmias and Stecklov (2007) also conclude that the high fertility in Israel is closely related to the state of belligerence:

“(...) the local political environment is one of endemic conflict, with consequent direct impacts on ethno-religious identities and indirect impacts on fertility. A cessation of conflict would modify fertility behavior of all Israelis, possibly dramatically.”

Through this review of the very special context in which Israeli families live, it becomes clear that fertility in Israel has to be studied and understood in a broader view than just by demographic and socioeconomic factors. Their complex reality must always be kept in mind.

1.3. LIMITS OF PREVIOUS STUDIES ON FERTILITY

Studying fertility differentials is a hard task and many researchers have tried the experience with various population groups. However most of these studies

contain many shortcomings. Indeed, there exist many studies that focus on fertility differentials among different population groups. Most of them emphasize the fact that different religious or ethnic groups have a different fertility behavior within the same country or region. Examples of such studies are: fertility differentials of Protestants and Catholics in Ireland (*Minority Group Status and Fertility: The Irish*) by Kennedy (1973) or fertility differentials of Muslim and Non-Muslim populations in Asia (*Muslim and non-Muslim differences in female autonomy and fertility: evidence from four Asian countries*) by Morgan et al. (2002).

The fertility in Israel is well documented. Studies of fertility differentials have even compared the fertility of the Jews, Christians and Muslims (Goldscheider and Friedlander, 1974) on a national level. The existing literature, however, lacks extensive studies of fertility within the Jewish population on a smaller scale, i.e., there is no information on the Jews who decided to leave Israel or to immigrate to the Jewish settlements in the Occupied Territories. The statistics show that it is those Jews that have a different behavior than the ones living in Israel. The heterogeneity of the Jewish population of Israel is regularly mentioned in various researches but very few of them do consider the subgroups within the Jewish population. Even though it is known that there is a lack of knowledge of these populations, no study is made at a community level. One research by Keysar (1992) about the fertility in the Kibbutzim⁸ partially addresses this issue, and is the only research found that does not study the Jewish population of Israel as a whole at a national level. Kibbutzs are not as widespread today in the region as they were at the time of the creation of the state. They were mostly located where the Jewish settlements are located today in the Occupied Territories. It may be pertinent to suggest that this population has characteristics similar to the one studied in this project.

Most of these studies are based on a descriptive analysis. They provide simple

⁸A Kibbutz is a collective community in Israel that is traditionally based on agriculture.

summaries on the fertility of a given population and help figure out which variables have an impact on that population. They fail to give a proper explanation as to why the fertility of the different groups differs and provide no information as to the extent of the impact of each variable. When making an explanatory analysis, it is possible to test hypotheses about the impact that some variables might have on fertility and get a better understanding of the role of the variables in increasing or decreasing fertility.

Another issue related to these researches on fertility is that most of them use the same set of variables while every study has a specific condition that might require a different combination of variables to properly describe the fertility behaviors. Indeed, demographic and socioeconomic variables such as age, marital status, income, level of educations are among the most commonly used. However, as it has been shown in the case of Israel, these variables are most likely not enough to fully comprehend the fertility of Jewish women. The specificity of Israel in terms of religiosity and ideologies requires a wider set of variables that are closer to the reality of the country. In many surveys or censuses, variables of that kind, i.e., on religiosity and/or politics, are not available. Luckily, in the survey used for this research, a question on religiosity is available and will provide added value to the literature on fertility.

Chapter 2

THEORETICAL FRAMEWORK

This chapter will consist of a review of the different existing theories on fertility differentials. Knowing about these theories will allow us to formulate a series of clear objectives of research and hypotheses that will be explained in the later section of the present chapter.

2.1. THEORY ON FERTILITY DIFFERENTIALS

Many researchers have tried to find a proper explanation to fertility differentials for a very long time, starting with the Economist Gary Becker. He argued that women choose the optimal family size in the light of a marginal-cost¹ and marginal-benefit² framework (Becker and Murphy, 2000). However, his theory has been criticized because it fails to explain why the fertility transition has occurred in different places of the world in different economic situations (Manski and Mayshar, 2003). Researchers have felt the need to incorporate sociological elements to the existing economic models explaining fertility, arguing that economic and sociological factors complement each other to produce a more comprehensive model of fertility behavior. In general, both economic and sociological approaches must be considered in a fertility study. Friedlander (2002) argued that Israel's fertility patterns revolve around three major socio-demographic dimensions: religion, ethnicity and socioeconomic structure. The influence of these factors among

¹Change in total cost that arises when the quantity produced changes by one unit.

²The utility gained (or lost) from an increase (or decrease) in the consumption of that good or service.

others on fertility in the Israeli context will be described later.

For that matter, it is important to elaborate a theoretical framework that will present the fundamental relationships among fertility and not only socioeconomic variables but also demographic and religious variables. As mentioned earlier, religious, ethnic and regional fertility differentials have been empirically documented in a large number of countries. Many variables having direct or indirect effects on fertility have also been highlighted. I will now review the different hypotheses that have been formulated as to how these religious, socioeconomic and demographic variables affect fertility.

2.1.1. Religious differences in fertility

The incorporation of religious variables in the study of social systems is becoming more common. Indeed, religion is the most common manifestation of value orientations, especially regarding the family even in contemporary secularized societies. For this reason, social researchers and demographers must find a way to incorporate a variable that measures the expression of religion such as *religiosity* in their studies. There are a few approaches in the literature that have been established as to how to consider the influence of religion on fertility.

2.1.1.1. The characteristics approach

The characteristics approach (*assimilationist*) is based on the argument that religious differentials in fertility are essentially the result of differences in the demographic, social, and economic attributes of the members of the religious or ethnic groups (Chamie, 1981). It is not the fact of belonging to a specific religious group that affects fertility trends as much as the demographic, social and economic characteristics of the individuals in the group that will determine the trend. According to this approach, after having controlled for demographic and socioeconomic statuses in a study, there should not be significant differences in fertility anymore.

The characteristics approach is pertinent to the context of Jewish fertility in

Israel. Even though I am studying individuals belonging to the same religious group, the fact of living in two different regions might expose them to different living conditions. The Jews of Israel and of the West Bank have some different demographic and socioeconomic characteristics. According to the 2004 *General Social Survey* of Israel, women living in Israel are slightly younger than those living in the West Bank. Sixteen percent of women in Israel are aged between 20 and 24 compared to only 12% in the West Bank. There is another major demographic difference between the two population groups: marriage intensity is higher in the West Bank. Despite the younger age of women in Israel, 87% of the Jewish population in the West Bank is married compared to 63% in Israel (GSS, 2004). Nonetheless, women in the two areas also bear similarities. They both are approximately equally educated with about 30% of women having attended University (GSS, 2004). The gross family income per month in Israel including the West Bank has been established at 6972 NIS in 2004, which is equivalent to approximately 1950\$ CAN (*Statistical Abstract of Israel*, 2006: table 12.41). In both Israel and the West Bank, 68% of the families had a monthly income equivalent or under the country's mean (GSS, 2004).

Through this project I will be able to determine if differences in the fertility patterns remain even after controlling for such demographic and socioeconomic variables. If this is the case, one theoretical approach to explaining fertility differentials cannot be used on its own but has to be combined with other approaches to have a broader and more comprehensive understanding of fertility differentials. Moreover all hypotheses regarding religion and fertility have been criticized but are still used because they may supply part of the answer despite the fact that they cannot provide researchers with a complete explanation of the phenomenon. On the characteristics approach, Goldscheider has said that it fails to admit to the vitality of religious group memberships in modern societies (Goldscheider, 1971).

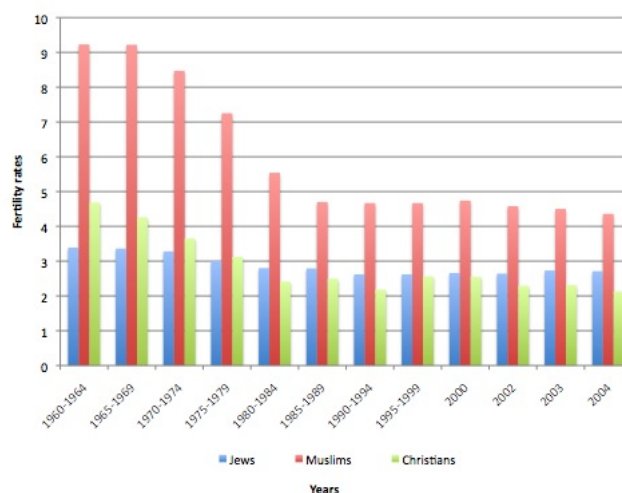
2.1.1.2. *Particularized theology*

If differences persist even after applying appropriate controls for the groups' socioeconomic profile, the use of the particularized theology hypothesis can help provide further explanations of the differences in fertility behavior. Unlike the characteristics approach, the particularized theology hypothesis functions at a macro level. Indeed, according to this hypothesis the religious fertility differentials are due to differences in church doctrines between major faith groups (Chamie, 1981). Consequently precepts and injunctions of religion could influence fertility desires and contraceptive practice (Alagarajan, 2003). To sum up, the fertility level of a religious group could be accounted for by the teachings on questions regarding childbearing by religious leaders.

Researchers have largely criticized this hypothesis and Goldscheider mentioned that the "particularized theology" approach was a naive and limited attempt to capture the religious dimension (McQuillan, 1999). In another research, he concludes that there are substantial net effects of religion and religiosity on the sexual behaviour and contraceptive practices of individuals but they are not theologically derived (Goldscheider and Mosher, 1991). No hypothesis can fully explain the phenomenon but a combination of these two classic approaches (characteristics approach and particularized theology) has almost always been used to interpret Jewish fertility in spite of these critics (Goldscheider, 1971).

Unfortunately, there is no information about the non-Jewish population living in the West Bank in the 2004 *General Social Survey* of Israel. For that matter, a comparison of the fertility levels of the members of the different religions that coexist in the region is not possible. However, such data is available through the *Statistical Abstract* of Israel on a national level. Figure 3.2 will show the different fertility levels of the Jewish, Muslim and Christian population of Israel in the past decades.

FIGURE 2.1. Fertility rates of Jewish, Muslim and Christian women in Israel, 1960-2004



Source: *Statistical Abstract*, 2005: table 3.12

There is a clear difference between the fertility levels of the Jewish and Muslim population all through the period. The fertility of the Christians is closer to that of the Jews. It is known that the Muslim fertility is higher than that of Jews and Christians. Fargues (2000) mentions the hypothesis according to which Islamism encourages fertility while trying to explain their high fertility. Figure 2.1 could support the particularized theology approach because there is a difference in the fertility levels of the different religions. However, the difference shrinks over the years which could be explained with the next hypothesis, the secularization hypothesis.

This approach could also be used by considering the different factions of Judaism as different religions. As they have very different behaviors toward fertility, the rabbis³ of these factions might carry a different set of values from one another to their followers. The different values of the different factions within Judaism will be discussed in the next hypothesis.

³A rabbi is a scholar qualified to interpret Jewish law.

2.1.1.3. *Secularization hypothesis*

This theory was first brought up in the literature in the 1960's and refers to the impact that the emergence of ideologies not based on religious teachings had on society. Basically, as modernization progresses, churches and other places of worship serve a narrower function. Simons (1980) suggested that a switch from an "institutional religion" to a "civil religion" had been made in which people may still subscribe strongly to a morality that upholds the functional prerequisites of societal integration and continuity.

In a study on the demographic and cultural changes in Western Europe, Lesthaeghe (1983) mentions that the transition from natural to controlled fertility is the result of the shift in the ideational system to an increasing priority placed on individual goal attainment. Without the more generalized tendency toward secularization, fertility would have remained largely in the domain of the sacred instead of that of individual freedom of choice. For that matter, secularization and fertility are closely linked. A decrease in fertility in the recent decades could easily be associated with the secularization hypothesis. Indeed, Lesthaeghe (1980) highlighted the fact that the degree of secularization accounted independently for substantial portions of the variance in the relative speed of the regional declines in marital fertility. He even states that the most conservative statistical tests underestimate the impact of secularization on fertility.

In the context of Jewish fertility, there are various elements within the Jewish community who are characterized by very different attitudes toward religion. For that matter, the Jewish community is generally considered an ethnoreligious group⁴ rather than solely a religious grouping. For example, on one end there are the *Haredi* Jews who are considered to be the most conservative form of Orthodox Judaism. They consider their belief system and religious practices to extend in an unbroken chain back to Moses and the giving of the Torah on Mount Sinai. As

⁴An ethnoreligious group is an ethnic group of people whose members are also unified by a common religious background

a result, they consider non-Orthodox factions of Judaism to be deviations from authentic Judaism. On the other end, there are individuals who consider themselves as belonging to a secular Jewish culture. Secular Judaism was driven by the values of the European Enlightenment and Jewish communities have seen the development of a cultural identity that is in some sense characteristically Jewish without being at all specifically religious.

There are differences as to how religious people consider themselves to be in the West Bank and Israel. Twenty-seven percent of the people interviewed in the 2004 *General Social Survey* declared being Ultra-Orthodox (*Haredi*) in the West Bank as opposed to 10% in Israel. Similarly, 47% of the population declared being secular in Israel and 27% in the West Bank. Secularization seems to be well established in Israel but still is rather rare in the West Bank.

Despite a certain level of obscurity in Judaism regarding family-size norms and various reproductive behaviors it has been hypothesized that the families who are religious have larger family-size ideals than secular families. It has also been documented that there is a negative relationship between religiosity and contraceptive use. The literature has also shown that the Israeli government has put in place a lot of incentives to encourage individuals to have larger families.

2.1.1.4. *Minority Group Status hypothesis*

The minority group status hypothesis can be engaged with as an alternative to the previous hypotheses. It integrates the analysis of religious differentials in fertility in the social organization ⁵. This hypothesis is especially interesting in the context of this study because it highlights fertility differentials not only among different religious groups, but also among racial and ethnic groups. For this reason, this hypothesis is definitely the most commonly documented in the

⁵The social organization of a group includes how people interact, the kinship system used, marriage residency patterns, division of various tasks, etc.

literature. A minority group is defined in quantitative⁶ and psychological terms. The effect of being affiliated with a certain religious or ethnic group will differ depending on whether this group represents a major or minor subgroup within the whole population. The fertility of the group will be either higher or lower than that of their counterparts in a majority situation depending on different factors such as acculturation and socioeconomic variables.

Studies employing this hypothesis led to different conclusions. According to Goldscheider (1971), a minority group that doesn't have an organized system that reflects their values might have a residual lower fertility resulting from the insecurities associated with the minority group status, e.g., racism or a precarious socioeconomic condition that they do not want to pass on to the next generations. Morgan et al. (2002), while studying the Muslim-Non-Muslim fertility differentials in four Asian countries came to a different conclusion. They concluded that minority groups tend to have a higher fertility than the majority group to assure their survival in the community. They emphasized aspects of family life that are conducive to childbearing or a reduced use of contraception.

It is possible to use this hypothesis to explain the fertility levels of each group separately in their own regional context. In the first case, the Jewish community living in the West Bank constitutes a minority group in the region representing 17% of the total population while Arabs and Christians represent 75% and 8% respectively (Central Intelligence Agency, *The World Factbook*: 2011). It could be hypothesized that the Jewish minority maintains a high fertility compared to their Arab counterparts in the West Bank as a way to maintain their presence in the territory and ensure the future of their cultural group and of the settlements. This would support the "war of the cradles" thesis defined by Courbage (1999).

Inversely, it could be argued that the lower fertility of the Jewish population

⁶A minority group is a distinct group that represents less than 50% of the population (Kennedy, 1973).

living in Israel is due to their majority status in the region. In fact, 2% of the population is Christian, 16% Moslem and 77% Jewish (*Statistical Abstract of Israel*, 2005: table 2.1). Given the fact that they represent the majority of the population, they don't need to *over-reproduce* to ensure the survival of their subgroup in the Jewish nation.

It is important to use this hypothesis with caution. Goldscheider (1971) specifies that the fertility of minority groups must be treated within a broader context of social behavior and organization.

2.1.1.5. *Interaction hypothesis*

Based on the information gathered on the hypotheses presented previously and different studies on the impact of religion on fertility, none of these hypotheses seems entirely adequate to explain the phenomenon. Chamie (1981) proposed another approach to overcome the shortcomings of the previous ones: the interaction hypothesis. It is believed to be more consistent with the observed differentials and provides a broader conceptual framework with which to understand religious differences in fertility. It is believed that religious institutions are a major source of social exposure through which members of a certain religious group adopt their religious doctrines and are impacted by other members' fertility behavior (Zhang, 2008). It implies that fertility behavior cannot be explained solely based on the membership in a particular religious group but it will depend on the interaction of the socioeconomic level of the religious group and the local religious and moral orientations toward procreation and fertility control.

According to Knodel et al. (1999) this hypothesis ignores potentially important interactions among religions, social change and demographic outcomes. In fact, it hypothesizes in a reductive manner that all religious groups eventually respond in a similar manner to the socioeconomic changes associated with the fertility transition. Also, it does not recognize that doctrinal interpretation by theologians or local leaders may change in reaction to the same forces that lead to fertility

transition (Knodel et al., 1999). Despite these shortcomings, recent research is providing increasing confirmation of this hypothesis, including the work of Alagarajan (2003).

Even though I study fertility differences of groups who share the same religion, the interaction hypothesis could be relevant considering that there are many religious subgroups within Judaism and their local orientations may differ more or less depending on the beliefs of each subgroup as mentioned earlier. Also, it is possible that socioeconomic characteristics of each subgroup differ.

2.1.2. Socioeconomic differences in fertility

Fertility is obviously influenced by a number of factors. As mentioned earlier, there are direct determinants of fertility such as age at marriage and use of contraception among others and what John Bongaarts calls indirect determinants: socioeconomic factors such as income, education, occupation and religion. This last factor was largely discussed in the previous section. Because I am interested in finding out which factors have a more important influence on the fertility of the Jews of Israel and of the West Bank, a review of the role of different socioeconomic factors on fertility also has to be conducted.

To facilitate the understanding of the role of the different socioeconomic factors on fertility, a review of the *microeconomic theory of demand* is necessary. Individuals are rational beings who want to maximize their utility function despite being confronted by income restraints. “Utility” is an abstract economic concept used to describe the desire to consume various goods and services as well as the satisfaction derived from that consumption. Given this measure, one may speak meaningfully of increasing or decreasing utility, and thereby explain economic behavior in terms of attempts to increase one’s utility. This theory specifies that the expenditures of individuals are determined by their choices while trying to make the best use of their income given budgetary restraints in terms of time and

opportunity cost⁷. Given the fact that people's desires are unlimited and that the available resources are limited, they have to make choices that allow them to maximize their income. Having children has a cost and when studying fertility in an economic context the cost of a child must be considered. Having higher "quality" children represents a higher cost for each child. A child's "quality" is measured in terms of education and well-being.

2.1.2.1. *Income*

One of the most important socioeconomic variables in the explanation of fertility is income. Indeed the literature highlights that empirical studies on the subject show that increases in the level of income tend to depress fertility in early or later stages of life. A study by Kaur (2000) demonstrates that a high monthly family income reduces the fertility rate by delaying the age at marriage and elevating educational status and the use of family planning devices, thus indicating a smaller family size.

According to the *microeconomic theory of demand*, the fertility behavior of a couple is a function of the family income. Instinctively, a higher income could be associated with a greater number of children. However, the economist Gary S. Becker added a principle to the theory according to which the substitution effect⁸ affects negatively the couple's fertility behaviour. This theory considers children as goods. Because children cost a lot of money to their parents (in time, education, etc.) parents will consider having less children and more of other goods that are comparatively cheaper. Also, as it will be mentioned later, Becker argues that as income increases, parents will invest more in the *quality* of their children rather than the *quantity*.

⁷The opportunity cost is the next-best choice available to someone who has picked between several mutually exclusive choices.

⁸A price change induces a consumer (whose income has remained the same) to buy more of a relatively lower-priced good and less of a higher-priced one.

2.1.2.2. *Education*

Education is another important socioeconomic variable that has an impact on fertility. Education of women is especially important for fertility because it is a powerful indicator of the status of women. Gilbert et al. (1982) note that the traditional view of parenting assumed that the fathers have a minimal role in the development of their children. For that matter, the education of children was mostly the responsibility of women. Just like income, education tends to depress fertility by delaying the age at marriage, fostering a favorable attitude toward small families and family planning and strengthening the propensity for women to be in the labor force. Kaur (2000) has observed that the mean fertility in India decreases as the educational level of the husband or wife moves upward. He also notes that the education of the wife diminishes the fertility rate in a more pronounced way than the education of the husband. He concludes his study by saying that the level of literacy is more effective in controlling the family size than the level of income.

Still according to the *microeconomic theory of demand*, a change in the cost of children will affect on the demand for children. This can be explained by the change of the opportunity cost of the time of the parents, especially of the mother. According to Becker the opportunity cost in time of the mother is influenced by her education. Indeed, the more she is educated, the more her time is worth doing other things than taking care of children. In a study about education and the demand of children, Michael (1973) indicates that educated women have a lower demand for children. They put the emphasis on the *quality* of their children rather than the *quantity*. As a matter of fact there seems to be a positive relationship between the education of the mother and that of her children.

2.1.2.3. *Participation in the workforce*

Income is closely related to the participation in the workforce. One could hypothesize that women's employment status is negatively associated with their fertility. The birth of a subsequent child raises the amount of unpaid family work.

A woman with a full time job would have to lower her number of paid work hours to have another child which would raise the opportunity cost of having that child. Nahmias and Stecklov (2007) state that a woman's participation in the labor force is an important measure of fertility but whose causal relationship is hard to predict due to potential endogeneity with other socioeconomic variables. For that matter, the results of many empirical studies on the relationship between the participation in the work force and the number of children are weak.

2.1.3. Demographic differences in fertility

Even though demographic characteristics are part of Bongaarts socioeconomic model, I decided to separate the socioeconomic and demographic factors in this research for reasons of clarity. Fertility is directly or in some cases indirectly influenced by demographic variables and in such projects, these variables are often used as control variables to ensure that the elements studied are comparable.

2.1.3.1. Age

Age is probably the most obvious and important variable when studying fertility behavior. First of all, women are only fertile during a certain period of their lives, which is more or less between 15 years of age and 49. The later a woman starts her reproductive life, the shorter her reproductive period is. She is then likely to have fewer children than a woman who started earlier. In developed countries like Israel, the age at first birth is very high compared to developing countries. The age at first birth for Jewish women in Israel was 27.92 in 2008 and 24.77 for Jewish women in the West Bank (*Statistical Abstract of Israel*, 2009: table 3.14).

2.1.3.2. Marital status

Considering that fertility mostly happens within the context of marriage, fertility studies often only consider married individuals in countries that still carry traditional values like Israel. Just like with age, the later a woman marries, the less time she is exposed to the risk of having children in a traditional society where there is little or no fertility out of wedlock. It is important to be careful with

this variable because it is influenced by many other variables such as the number of years spent at school and by professional and personal choices. A study by Hou et al. (1996) about the fertility of Canadian women shows that women who married before the age of 20 have a 25.2% ($p < 0.05$) higher likelihood of having a first child than women marrying after age 25. In Israel only, 6% of single women have children. This phenomenon does not seem to exist in the West Bank (GSS, 2004).

2.1.3.3. *Country of birth*

In the context of high immigration and relatively low fertility in developed countries, the role of migrants in overall childbearing patterns in receiving countries is becoming increasingly important. Immigrants manifest different fertility patterns than their native counterparts which makes the portrait of fertility by country of birth heterogeneous. As mentioned in the previous chapter, immigration in Israel comes from various regions with different fertility patterns. The fertility levels in Europe, America and Asia are generally lower than the Israeli national average. Given the fact that most immigrants to Israel come from these regions of the world, it should be expected that migration has a negative impact on the fertility level of the receiving country. However, as seen in figure 1.5 the fertility of these immigrants is much closer to the Israeli average than that of their country of origin whether or not they come from a country with higher or lower fertility. For that matter, the impact of immigration on fertility in Israel might be of less importance than in other countries that have a low fertility and who receive immigrants with high fertility levels.

2.2. PROBLEMATIQUE AND OBJECTIVES

This section will establish the relevance of this study and the research objectives. I'll begin by stating my hypotheses.

2.2.1. Why study fertility differentials in Israel and the West Bank?

As mentioned earlier the Jewish population of Israel has been comprehensively studied. A lot of researchers have tried to identify the various factors that

could explain the high level of the Jewish fertility in Israel. Nevertheless in most of these studies the Jewish population has been studied on a national level even though the population is very heterogeneous. In this case it is more relevant to separate the population groups with different characteristics in order to make an analysis that provides results that are closer to the reality of these people. As a matter of fact, Jews living in the settlements in the West Bank are known to be more rural, have lower wages and to be more religious than their counterparts in urban Israeli cities (Israel Ministry of Foreign Affairs, 2002).

As established earlier, the total fertility rate of the Jews in Israel in 2009 was 2.90 children per woman (all districts of the country including the settlements in the West Bank). When considering the total fertility rate exclusively of the Jewish population living in the settlements in the West Bank, it increases up to 5.06 children per woman (*Statistical Abstract of Israel*, 2009: table 3.14). Needless to say that a difference of over two children per woman is not negligible. It confirms that the two populations have very different attitudes toward fertility and should be studied separately.

2.2.2. Objectives and question of research

The objective of this exercise is to assess and explain fertility differentials of Jewish women living in Israel and the West Bank in the light of the diversity between these two groups in terms of living conditions. To do that, I will learn about the mechanisms that explain their fertility by identifying the religious, socioeconomic and demographic factors that affect on their different fertility patterns. To reach these goals, here are a few questions I will try to answer in the next chapters:

- (1) In what way is the fertility behavior of the Jews living in Israel different from that of the Jews living in settlements of the West Bank?
- (2) What factors best explain the fertility differences of these two groups? Are better fertility differences mostly related to socioeconomic, demographic or religious variables?

- (3) Does the impact of these variables is of similar importance in Israel and the West Bank?

With all the information gathered about the fertility behavior of the Jewish people in the literature review and the theoretical framework, it is relevant to hypothesize that the fertility behavior of the Jews living in Israel and of those living in the West Bank are similar in many points, i.e., they are both impacted by a series of socioeconomic factors. However, it might differ in the way that their fertility is influenced by **religiosity** and by some demographic variables.

The lower fertility of the Jews living in Israel might be partly due to the fact that they **marry later** and hence have a shorter reproductive life than the Jewish women living in the settlements. I also hypothesize that they marry later because they live in more **urban areas**, **study longer** and have **higher paying jobs** which keeps them on the employment market all throughout their reproductive lives. Finally, I hypothesize that Israeli Jews' lower fertility is due to the fact that Jews living in Israel are **less religious** than Jews living in the West Bank.

All religious, socioeconomic and demographic variables affect fertility in both regions but I hypothesize that the impact of religiosity in maintaining a high fertility is less important than the socioeconomic factors mentioned above. However the impact of religiosity is most likely to be stronger in the settlements in the West Bank than in the rest of Israel considering the high percentage of religious people in the region.

Despite the fact that the *General Social Survey* provides a limited set of variables other than on socioeconomic, demographic and religious variables, it is most likely that I will be able to measure a significant impact of these variables to explain the fertility of the two groups. Other variables not measured in the survey or that are not measurable probably also intervene on fertility, e.g., political views, nationalism, personal aspirations, etc.

I will also compare my results to those of Anson and Meir (1996) in their study on nationalism in Israel ⁹ in which they argue that when controlling for all other variables, the impact of religiosity on fertility is not significant. They conclude by saying that the statistical association between fertility and religiosity is incorrect and that the religiosity measured in surveys is an expression of a deep nationalist sentiment.

⁹Article entitled: "Religiosity, Nationalism and Fertility in Israel".

Chapter 3

DATA AND METHODS

The theoretical framework elaborated in chapter 2 illustrates in the most holistic way as possible the many factors that have an impact on female fertility and the theories that have resulted from studies of fertility. The main objective of chapter 3 is to give a proper description of the data available for this project and, consequently, of the most appropriate methodology to use for the analysis of the data.

3.1. DATA

3.1.1. Origin of the data

The most complete source of information on fertility behavior as well as religious, socioeconomic and demographic characteristics in Israel is the *General Social Survey* (GSS). This survey has been conducted annually since 2002. Its main purpose is to provide up-to-date information on the welfare of the *de jure* population of Israel and on their living conditions. The 2004 edition will be used in this research. The Israel *Central Bureau of Statistics* (ICBS) has made the full edition available for this project.

The questionnaire contains two parts: a core questionnaire containing about 100 items covering the main areas of life such as health, housing, employment, economic situation, etc. and a variable module devoted to a different topic every year in order to investigate in greater details a certain aspect of life in Israel that cannot

be addressed by the core questionnaire. In 2004 the variable module was on non-compulsory educational framework for children aged 0-13 and their connection with parent's employment. This will not be used in the present research. With questions about religious beliefs and religiosity, income, education, participation in the workforce, age, country of birth, marital status, number of children and region of residence, it will be possible to assess the importance of each factor with respect to fertility behavior of Jewish women in Israel and the West Bank in 2004.

The questionnaires of the GSS are administered by interviewers of the ICBS using laptops to conduct computer-assisted personal interviews (CAPI) based on Blaise software developed by Statistics Netherlands. The interviews have been conducted in Hebrew, Arabic and Russian and they lasted for about an hour.

The survey population comprises the permanent non-institutional population of Israel aged 20 and older, as well as residents of non-custodial institutions. New immigrants are included in the survey population if they have been present in Israel for at least six months. The population excluded from the survey include Israelis abroad for more than a year without interruption at the time of the survey, diplomats, Bedouins and other persons living outside the boundaries of localities. The Population Registry has been used as a sampling frame.

The desired final sample size was 7,200 persons aged 20 and older. The first stage of sample design involved defining groups based on combination of three demographic variables:

- (1) Five population groups: Arabs in East Jerusalem, outside of East Jerusalem, immigrants who arrived in 1990 or later, immigrants who arrived by 1989 and Israeli-born Jews;
- (2) Seven age groups: 20-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75+;
- (3) Men and women.

The expected size of each design group was to be proportional to its size in the population under the constraint of a final sample of 7,200 completed interviews.

In some of the design groups, the sample size of parents of children aged 0 to 13 has been oversampled in order to increase the potential number of respondents in the variable module. In the final analysis, the boosting increased the percentage of parents of 0 to 13 year olds to 34% of the sample.

The final sampling probability for each person varies by design group and sometimes even within a design group and reflects a-priori assumptions regarding the proportion of non-response for each group. The average sampling probability was 1:485, the maximum sampling probability was 1:305, and the minimal sampling probability was 1:920.

Persons listed in localities from which it was expected to obtain sample sizes of at least 15 persons were sampled in a single-stage stratified sample, with each design group comprising a stratum. A systematic random sample of persons was drawn from each stratum after it was arranged according to the geographic characteristics of the localities it contained. Altogether, about 83% of the sample was drawn in single-stage sampling. Because of practical constraints, localities having fewer than 7,400 listed residents aged 20 or older were sampled in a two-stage procedure.

TABLE 3.1. Results for the fieldwork for the 2004 GSS of Israel

2004		Absolute numbers	Percentages (%)
Total sampled		9,528	100
Included		9,008	94.5
Excluded		520	5.5
Thereof:	Deceased	119	1.2
	Abroad for over a year	296	3.1
	Institution	70	0.7
	Other (living outside the localities)	35	0.4
Responded		7,616	84.5
Did not respond		1,392	15.5

Source: *Social Survey Table Generator Help*, ICBS, 2004

It is important to keep in mind that the data in table 3.1 contains all the respondents to the survey regardless of their religion. Because this research only focusses on the female Jewish population of Israel, all the non Jewish respondents were removed from the sample as well as male respondents. For that matter, more information on how to define a Jewish person is necessary. Defining who belongs to the Jewry on the basis of conceptual or normative criteria is not an easy task. In Israel, personal Jewish status is subject to the rulings of the Ministry of the Interior, which relies on criteria established by rabbinic authorities and by the Israeli Supreme Court. In this way, the core Jewish population¹ does not simply express subjective identification as elsewhere in the world but reflects definite legal rules. It entails matrilinear Jewish origin, or conversion to Judaism, and not holding another religion (DellaPergola, 2010)

3.1.2. Limits of the data

The sampling frame of this survey is the Population Registry. The quality of the sampling frame depends on the degree to which it covers the survey population. Unfortunately, the Population Registry suffers from undercoverage of tourists and temporary residents living in Israel for more than a year (Israel Central Bureau of Statistics, 2004b). They should have been included in the survey, but in practical terms, were not. Undercoverage can lead to biased estimates. Fortunately, the extent of undercoverage is minimal in this survey.

Another issue related to the use of the Population Registry is the fact that about 500,000 persons (Kamen, 2005) no longer live in Israel but are still listed in the Registry. Such persons represent about 7% of the total number of people listed in the Registry. The General Social Survey excludes individuals who have been abroad for over a year but the overcoverage of emigrants who should not have been counted in the Registry affects the survey sample.

¹All persons who, when asked in a socio-demographic survey, identify themselves as Jews; or who are identified as Jews by a respondent in the same household, and do not have another monotheistic religion (Kosmin et al., 1991).

One last problem with the use of the Population Registry is related to the fact that it completely misses an important group. Indeed the Population Registry misses those people without an Israeli ID number², whether they are in the country legally or illegally. These people are not considered in the survey and may represent individuals with characteristics that differ from the rest of the population. Certain types of people might have been left out of the survey and are not represented in the sample.

There is also a selection bias because the survey only represents the people who avoided a certain number of disruptive events such as migration or death at the time of the interview. The elderly cohorts and the groups heavily touched by immigration are not as well represented as the other groups. Most of the time, this bias is considered to be negligible at the time of the analysis. Still, it is important to mention it because in a study of fertility, the most active groups are the young professionals who are amongst the most touched by migration (professional migration). As for the elderly, it is of lesser importance because they represent a small amount of the population given the fact that the Israeli society is rather young. Also, in this project, I focus on individuals aged between 20 and 54.

I am using survey data to study fertility differentials between two population groups: Jews living in Israel and Jews living in the West Bank. There are obviously a very small number of Jews living in the West Bank compared to all of those living in all of the remaining regions of Israel. Indeed, in 2008, 5,1% (284,100 thousand people) of all the Jews of Israel that were living in the West Bank (*Statistical Abstract of Israel*, 2009: table 2.6). In this situation, survey data is not the ideal source of information for this kind of research because I have to deal with small numbers for the residents of the West Bank (90 observations). Having to deal with this situation, I must take into consideration the fact that the results will have less precision and bigger confidence intervals. This limit will be

²An *Identity Number* is issued to all Israeli citizens at birth by the Ministry of the Interior. Temporary residents are assigned a number when they receive temporary resident status.

considered throughout the analysis of the results. If I had designed a survey for the specific purpose of this research, I would have oversampled the respondents of the West Bank to have more reliable data. Also, given the small number of observations, it is difficult to test for interaction between the independent variables. For that matter, there could be a relationship between two independent variables such as age and duration of marriage or work status and family income, which could result in under-estimating the effect of these variables on the outcome of interest, the number of children ever born. We must always keep these possible interactions between the independent variables in mind when looking at the results.

3.1.3. Evaluating the quality of the data

Comparing some variables of the *General Social Survey* of Israel with the corresponding variables in the Census data of Israel can help evaluate how close the data of the survey is to the actual population to assure that the results of the research will adequately represent the total population of Israel. The data from the *General Social Survey* of 2004 have been compared to the data from the most accurate source of information on Israeli individuals, that is the 1995 Census. The changes that occurred in the population after the Census are corrected yearly with the information in the Population Registry. For the comparison, the most recent estimates used were for 2004.

TABLE 3.2. Age distribution (%) of the Israeli females aged 20 and over observed in the General Social Survey of 2004 and in the Population Registry

	GSS 2004	Population Registry	Difference (%)
20-24 years	11.42	12.77	10.57
25-29 years	12.13	12.63	3.96
30-34 years	11.82	11.38	3.87
35-44 years	20.06	18.44	8.79
45-54 years	18.20	17.26	5.45
55-64 years	11.02	11.83	6.85
65-74 years	7.97	8.56	6.89
75 + years	7.37	7.12	3.51
Mean age	46.64	46.72	0.17

Source: *General Social Survey of Israel, 2004 and Population Registry, ICBS, 2004*

Table 3.2 shows that the observed age distribution of the female individuals in Israel in the 2004 GSS are commensurate with that in the 1995 Census. As expected, the oldest and youngest age groups are harder to represent. The women aged 25-59, have relative distances of approximately 5%, which is not very important. This overestimation can be accounted for the fact that the Population Registry wasn't properly adjusted at the time of the survey and that this age group is very mobile (migrations for work) and are hard to track properly. As for the three oldest population groups with the biggest difference from the Census data, the lack of precision is not an issue because the oldest population group that will be used in this projet is people aged up to 54. Finally, when comparing the mean age of women aged 20 and over from the survey data and from the Population Registry there is a very small difference, which assures us that the survey data is reliable.

3.2. METHODOLOGY

The data available with the *General Social Survey* of Israel provides information about the fertility of its people in 2004 and of their socioeconomic, demographic and religious characteristics for that year. Because it is a cross-sectional survey with a limited set of questions on fertility the types of analyses that can be conducted to develop a better understanding of fertility behavior in Israel and the West Bank are limited. There is however enough information to produce some interesting results that can be analysed and thus help answer the questions asked in the first chapter.

I will first start by describing the outcome of interest: the number of children ever born. After that I will determine what is the best methodology to use with this type of variable. Finally, a brief description of the explanatory variables chosen for this project will be done.

3.2.1. Outcome of interest: number of children ever born

Because fertility is the main subject of this thesis, the dependent variable used to measure this phenomenon will be the number of children ever born (CEB) to all female respondents aged 20 to 54. Women older than 54 were dropped from the sample to limit a bias caused by generational differences. The data available in the *General Social Survey* of Israel (2004) allows us to measure the CEB with these two questions: “Have you given birth to children?” and “How many children have you given birth to (including children not living today)?”. With these two questions, one derived variable is created that identifies the number of children ever born to all women in the survey. The answers are given in the form of a count variable ranging from 0 to 7 children ever born per woman.

Manual X (1983) defines the number of children ever born to a particular woman as an aggregate measure of her lifetime fertility experience up to the moment the data are being collected. This data conveys no information about timing, whether on a personal scale, such as age or duration of marriage, or on an external scale,

such as calendar years.

It also reports the main strength of data on children ever born. No dating is involved so that the data cannot be distorted by dating errors. Some weaknesses of such data have also been reported. First, the fact that the information is collected in the form of numbers can induce greater errors than is information derived from questions that require a simple “yes” or “no” answer. Another problem with this kind of data is related to omission. Women tend to omit mentioning some live-born children who do not live in their household and those who have died. It has been noticed that this kind of omission tends to increase with the age of the mother. Inversely, some mothers include stillbirths and late foetal deaths among live-born children. This kind of declaration is rather rare but it should be stressed to include only live-born children. Finally, this data doesn’t consider the effects of mortality and migration on women fertility. While the first one is rather negligible, it has to be considered when comparing different generations of women who may have experienced different mortality levels. The second one could be more serious than mortality on a subnational level. Indeed, if fertility is influenced by the place of residence, data classified by place of birth wouldn’t represent adequately the current region fertility differentials that are of greatest interest.

Despite such shortcomings, data collected on the number of children ever born is still widely used since it is one of the most widely available sources of information on fertility in cross-sectional surveys.

3.2.2. Choice and description of the methods

With basic descriptive statistics for each independent variable available, I will be able to see which variables have a different impact from one region to the other. This will help to evaluate which variables play a role in explaining the differences.

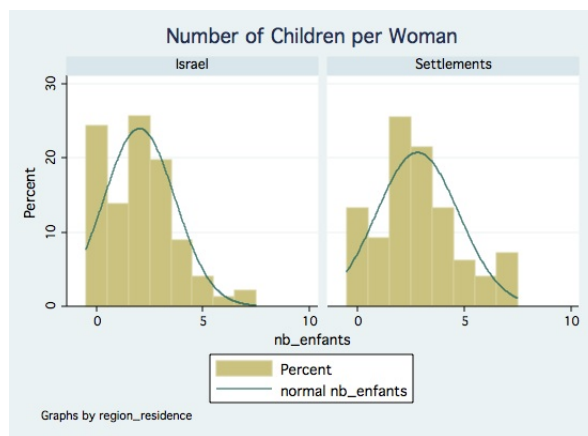
I will then use a log-linear model to produce Poisson regressions to analyze the

differences in the number of children ever born between Jewish women living in Israel and the West Bank.

3.2.2.1. *Poisson regression*

To determine the influence of a certain number of individual characteristics and behaviors on the outcome of interest, I will use a multivariate regression analysis. Specifically because the outcome of interest is a count variable, Poisson regression is the most appropriate procedure used to conduct this analysis. When the dependant variable is a count like the number of children ever born, it is often heavily skewed with a long right tail (the right tail can be seen in figure 3.1).³

FIGURE 3.1. Distribution of the number of children per Jewish woman in Israel and the West Bank, 2004



Source: Data combined from the *General Social Survey* of Israel, 2004

Such a tail is usually especially visible in low fertility populations because of the observed distribution of data with a low mean, which is due to the fact that many women desire few children and very few women want many children. The Poisson model is then superior to ordinary least squares (OLS) or other linear models. Long and Freese (2006) warn us about linear models by saying that the

³Both samples do not exactly follow a normal distribution because it underestimates or overestimates the number of observations in some categories. However, by looking at the kurtosis of each sample (3.28 for Israel and 2.64 for the West Bank) we can assume that it is very close to a normal distribution. Indeed, a normal random distribution has a kurtosis of 3 irrespective of its mean or standard deviation.

use of a linear regression model to count outcomes is not appropriate and could cause “inefficient, inconsistent, and biased estimates”.

The Poisson regression is a particular case of the generalized linear model in which the conditional distribution of the dependant variable follows a Poisson law and the link function is logarithmic. Poisson regression estimates the effects of explanatory variables on rates. The logarithmic form of the model is such that the exponents of the regression coefficients represent the relationships between the fertility rates of different groups of women (Schoumaker, 2004).

In this study, the dependent variable is the number of children (y_i) per woman (i). The probability that the random variable Y_i is equal to y_i is assumed to follow a Poisson distribution with mean μ_i :

$$P(Y_i = y_i | \mu_i) = \frac{e^{-\mu_i} \mu_i^{y_i}}{y_i!} \quad (3.2.1)$$

The mean number of births (μ_i) can be decomposed into the product of a fertility rate (λ_i) and a length of exposure (t_i):

$$\mu_i = t_i \lambda_i \quad (3.2.2)$$

The logarithm of the mean (μ_i) is equal to the sum of the logarithms of the lengths of exposure (t_i) and the fertility rate (λ_i):

$$\ln \mu_i = \ln t_i + \ln \lambda_i \quad (3.2.3)$$

The logarithm of the length of exposure is the offset, and the logarithm of the fertility rates is modeled as a linear function of k explanatory variables:

$$\ln \lambda_i = \sum_{k=1}^K \beta_k x_{ki} \quad (3.2.4)$$

From which:

$$\ln \mu_i = \ln t_i + \sum_{k=1}^K \beta_k x_{ki} \quad (3.2.5)$$

By exponentiating equation 4, we see that the explanatory variables have multiplicative effects on the rate (λ_i), since:

$$\lambda_i = \exp \sum_{k=1}^K \beta_k x_{ki} = \prod_{k=1}^K \exp(\beta_k x_{ki}) \quad (3.2.6)$$

The exponent of the regression coefficient (β_k) for an explanatory variable (x_k) expresses the relationship between the fertility rate of women for which the explanatory variable has a given value and the fertility rate of women for which the variable has that value minus one, all other things being equal. For example, for a dichotomous variable, the exponent of the coefficient of this variable is equal to the ratio of the fertility rate of women in a category to the fertility rate of women in the reference category (Schoumaker, 2004).

3.2.3. Independent variables

The use of a series of independent variables is essential to a comprehensive socioeconomic, religious and demographic study of fertility. The following independent variables were chosen using the existing literature on the subject in order to test the hypotheses mentioned in the first chapter. These independent variables were created with the available information given out by the *General Social Survey* of Israel of 2004.

When conducting such a study on fertility behavior, it is important to always take into account the economic and political context of the region where the study is being conducted. In the previous chapters, it has been shown how the economic and political climate of a country can affect people's choices and individual behaviors regarding fertility. Contrary to economic prosperity or certain

pro-natalist family policies, a slowdown in economic activity may temporarily reduce fertility through the influence of the purchasing power of individuals and the perceived value of consumer goods (Ducharme, 2001).

3.2.3.1. *Religious variables*

(1) Religiosity

Among the many explanatory variables of the fertility differentials, religiosity is a rather important one. Indeed, Lehrer (1996) noted that the relationship between religion and fertility is generally mediated by religiosity. As mentioned earlier strong religiosity is usually marked by strong daily influence of religious beliefs on individual decisions and frequent participation in religious activities (Zhang, 2008). Marchena and Waite (2000) observed that religious participation among young people is strongly linked to more positive attitudes towards marriage and having children.

Religiosity is measured by one variable: “Do you consider yourself as being: ... ultra-religious (“haredi”), ... religious, ... traditional but religious, ... traditional but not so religious, ... non religious (secular)?” This variable has been reclassified as a set of three dummy variables: “religious”, “traditional”⁴ or “non-religious”. Note that only people who answered the question have been included (9 observations have been dropped for not providing a response).

It would be ideal to have information about the respondents’ religiosity all throughout their lives to be able to evaluate if changes in religiosity

⁴A traditional Jew will observe a certain amount of “light” and “heavier” commandments such as attending synagogue on the High Holidays, fasting on Yom Kippur, keeping a Kosher kitchen or avoiding any work (including using a car) on Saturdays (Shmueli, 2006).

impact the number of children a woman is bound to have during her reproductive life. Unfortunately this information is not available in the survey.

3.2.3.2. *Socioeconomic variables*

(1) Family income

As shown in the second chapter, there is a relationship between the household income and fertility. It is in fact one of the most important socioeconomic variables in the explanation of fertility.

The *General Social Survey* of Israel contains information about both the individual and the household monthly income. However, an individual's income is closely related to his/her education and since education is also an important socioeconomic variable, using this variable could create multicollinearity⁵ in the Poisson regression. There is also a number of women who do not do paid work but take care of their children during the day. These women rely on somebody else's income. By using the individual's gross monthly income, these women would be categorized as "living without any income", which would be misleading. For that matter, the household income will be used instead of the individual income.

The question: "Last month, what was the total gross income of all members of the household, from all sources: work, pensions, support payments, rents, etc.?" was used. Given the fact that the gross monthly income of households in Israel was of 11, 220 NIS (Israel Central Bureau of Statistics, 2004a) in 2004 (more or less 3,000 CAD) and the fact that the variable had already been categorized a certain way, a set of two dummy variables has been created: "10,000 NIS or less" and "10,001 NIS or more".

⁵Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. The coefficient estimates may change inconsistently in response to small changes.

Because the number of respondents in the West Bank is small, I had to make broad categorizations for many variables in order to have enough observations in each category. This will also be done for some of the other variables.

(2) Education

The level of education is one of the most largely used indicators to measure socioeconomic disparities. Education level is often used as a determinant of women's salary to estimate the effect of the opportunity cost of a woman's time on her fertility. Considering the opportunity cost of her time, high education should have a negative impact on fertility. Raising children requires a lot of a mother's time that could be used making money. This relationship has been widely studied in the literature. Also, a woman's education is more frequently used to evaluate fertility because the impact of a man's education is not as clear. Most studies on fertility don't consider the man's education.

The questions in the GSS allow to trace the respondent's level of education easily with the question: "What is the highest education certificate or degree that you have received?" Respondents can answer from elementary or middle school up to the obtention of a PhD. Once again, because of the small amount of observations in the West Bank, three variables have been created: "secondary school diploma or less", "post secondary non-academic diploma" and "university degree". The "secondary school diploma or less" category includes respondents who do not have any diploma, have completed elementary or middle school or have completed secondary school. The "post secondary non-academic diploma" category includes respondents who have received their baccalaureate certificate, or

a post-secondary, non-academic certificate. The “university degree” category includes respondents who have received a certificate, a bachelor degree, a master’s degree or a PhD.

(3) Participation in the workforce

Participating in the workforce (being employed at a job or business or not) is another interesting socioeconomic variable for two major reasons. First, because a lot of people are reluctant to give out information about their income in surveys and censuses but information about their participation in the workforce can be a way to get more information on these people. It is a good complement to the variable about income. This variable is also interesting when studying women because it allows to evaluate their commitment toward the job market and consequently, the opportunity cost of their time if they had to leave the workforce, let’s say, because of a pregnancy.

Many studies tend to show that there is a real link between a woman’s participation in the workforce and her fertility level. This relationship is not surprisingly negative. An additional birth increases the amount of unpaid work and decreases the amount of time for other activities such as being active in the workforce. To explore whether this variable has a significant impact on Israeli women’s fertility, I created a variable indicating whether a woman is working at a job or business or not. The variable has been derived from the question: “Which of the following best describes your main activity during the past 12 months?” From this question, two dummy variables have been produced: “currently working at a job or business” and “not currently” working at a job or business”.

This variable does not allow us to trace a woman’s entire professional curriculum but can indicate whether or not she has been taking care of

children instead of working in the past year.

3.2.3.3. *Demographic variables*

(1) Country of origin

Studies have shown that there are many demographic variables that play an important role in the explanation of fertility. One of these variables is the country of origin. Indeed, as it has been mentioned in the previous chapters, individuals do not experience the same fertility trends depending on where they have been born and/or raised. A study by Caron-Malenfant and Bélanger (2006) has put forward the hypothesis that the fertility of immigrants in Canada is higher during the first years following immigration and tends to reach the fertility of native Canadian over the years. An individual coming from a country where fertility levels are high is more exposed to the risk of having a high fertility than an individual coming from a country where the fertility is low. For that matter, the country of origin can be considered a good indicator of the cultural variation observed between the different ethnic groups of the study population. Figure 1.5 has shown that the immigrants have a fertility behavior that differs from that of their country of origin and that of Israel. than the natives in Israel. For that reason the fertility of the country is very heterogeneous.

The data collected in the GSS provide information about the country of origin of the respondents. The questionnaire asks: “Country of birth (according to current boundaries)”. The possible answers to this questions in the questionnaire are: Israel, Europe-America, Asia or Africa. From this questions, two dummy variables have been created: “Israel” and “abroad”. This variable will allow us to evaluate if the fact of being an immigrant in Israel has a significant impact on the fertility of these women and its

extent, if any.

(2) Age

Many demographic variables are used as control variables because they influence fertility, such as age. Women do not have the same fertility levels depending on their age. Indeed, women who have had their first child at a young age are most likely to have subsequent births than a woman who started later. For the analysis, I have kept all women aged 20 to 54 for the reasons mentioned in the beginning of the chapter.

(3) Marital status

The variable “marital status” is rather important in studying fertility. Indeed, one of the main objectives of marriage is starting a family. For that matter, a married woman will more likely have more children than a single woman especially in a Jewish society where religion is still important for a large part of the population. It has however been noted in the database that a certain amount of women that were not married had children. Also, by only considering married women, we would not be able to measure the fertility of separated, divorced and widowed women. For this reason, it has been decided not to limit the study population to married women.

The dynamics between the formation of marital unions and fertility has largely been transformed in the past decades. With the generalization of the use of contraception, the rise of divorce and of common-law unions among younger generations, fertility can no longer be restricted to married couples. Although marriage is still one of the most stable types of unions, women can choose other avenues to have their families. In the GSS questionnaire, respondents were being asked: “For persons 15 years or older, are you: ... married, ... separated, ... divorced, ... widowed or ... single?”

People who answered being married or separated were asked the number of years of their marriage. With these possible answers, a variable with the possible labels as follow was created: “not married or married in the past year”, “married for 2 to 10 years” and “married for 11 years or more”.

(4) Region of residence

A variable “region of residence” has been created from the information about the respondents addresses. This variable will be used to separate the Jewish people who live in the settlements of the West Bank from the ones who live in the other regions of Israel.

As mentioned in the previous chapters, people residing in the settlements benefit of many incentives that people living elsewhere do not have access to. This will help evaluate if their higher fertility is mostly due to these socioeconomic incentives, their demographic characteristics or their religiosity.

3.2.4. Background characteristics of women interviewed in the 2004 *General Social survey*

The data from table 3.3 provides information about the variables in the way they were categorized for the explanatory analysis with the exception of *age* that has been categorized to give an idea of the age distribution. The variable is continuous in the analysis.

The next table will present a few of the basic characteristics of the respondents to have an idea of their profile and a preview of the similarities and differences in the two regions.

TABLE 3.3. Demographic, socio-economic and religious characteristics of Jewish women

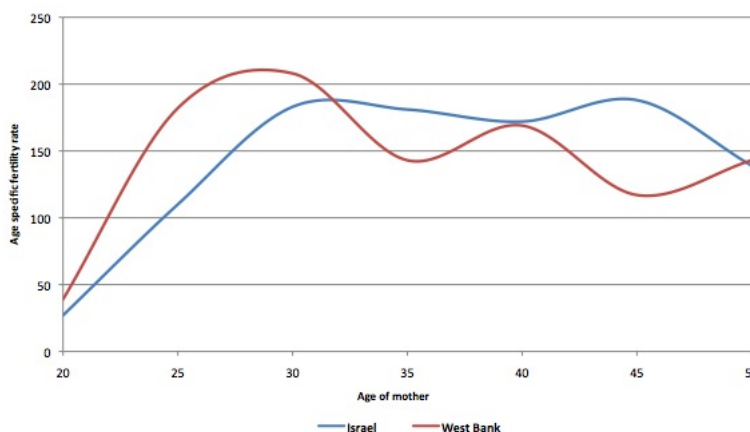
Characteristics		Israel (%)	West Bank (%)
Age groups	20-24	16.1	12.2
	25-39	47.0	51.1
	40 and over	36.9	36.7
Religiosity	Not religious	46.6	26.7
	Traditional	36.6	18.9
	Religious	16.8	54.5
Education	Secondary or less	23.0	17.8
	Post secondary	48.2	51.1
	University degree	28.8	31.1
Work status	Is currently working	65.0	64.4
	Is not currently working	35.0	35.6
Monthly family income	10,000 NIS or less	67.9	67.8
	10,001 NIS or more	32.1	32.2
Country of birth	Israel	72.6	75.6
	Abroad	27.4	24.4
Years married	Not married or less than a year	37.9	15.6
	2-10 years	23.6	34.4
	11 years or more	38.5	50.0
N		2,099	90

Source: Our calculations from the *General Social Survey* of Israel, 2004

With the information provided in table 3.3 it is possible to see that the age distribution is roughly similar in both regions. Almost 40% of all women in the study population are 40 years old and over. There are a little more young women in Israel than in the West Bank (16% vs. 12%). Because an important part of the women in the survey are over 40, I can assume that they have finished or almost finished their reproductive lives. Despite the fact that the dominant age group in both regions is women aged 25 to 39, an important proportion of women is not married or has been married in the past year; 38% in Israel and 16% in the West Bank. More women in

the West Bank have been married for a long time: around 35% of them had been married for 2 to 10 years and 50% for over 10 years compared to 24% and 39% in Israel.

FIGURE 3.2. Age specific fertility rates in Israel and the West Bank, 2004



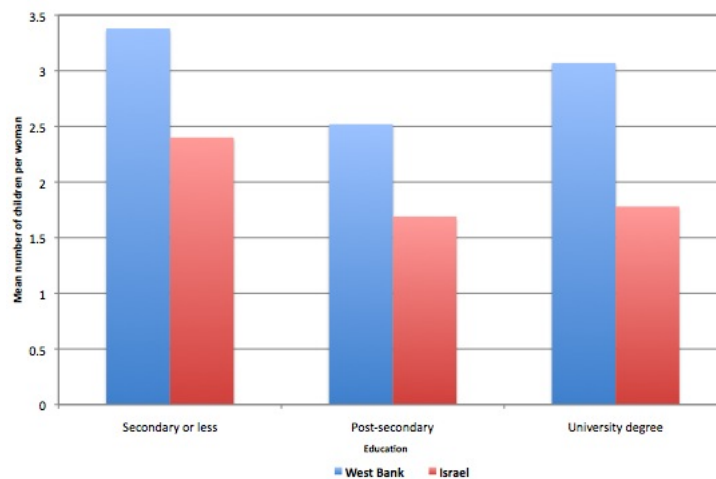
Source: Our calculations from the *General Social Survey* of Israel, 2004

Figure 3.2 clearly shows the different age specific fertility patterns of women from Israel and the West Bank. Indeed, women in the West Bank start their reproductive life much younger than in Israel and reach higher fertility rates. The fact that they start having children early allows them to have a longer reproductive life which entails them to have more children throughout their lives.

The table also shows that in both regions, about 30% of women have a university degree and half of the female population has a post secondary non-academic certificate. Figure 3.3 shows that there exists a relationship between education and the mean number of children in Israel but it is not as clear in the West Bank. As far as their level of education goes upwards, they tend to have fewer children. In fact, women with a secondary school diploma or less have a higher mean number of children than women with a post secondary non-academic diploma and women with a university degree but the relationship is not as clear between women with a post secondary

non-academic diploma and women with a university degree. For the same level of education, Jewish women in the West Bank have more children than their counterparts in Israel.

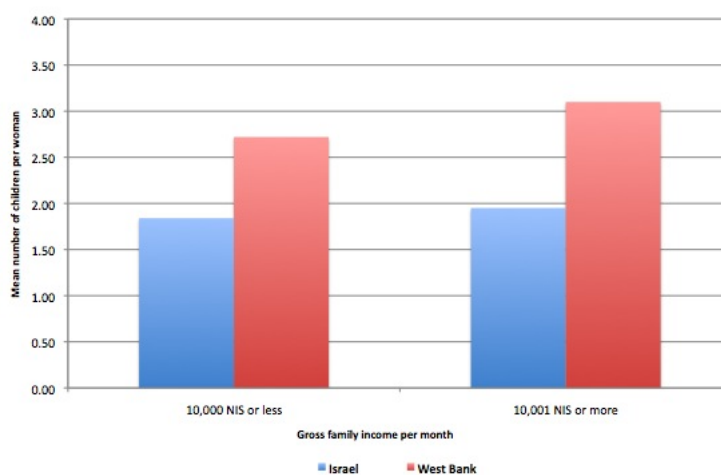
FIGURE 3.3. Number of children per woman by the highest level of education attained in Israel and the West Bank, 2004



Source: Our calculations from the *General Social Survey* of Israel, 2004

Almost 70% of all women declared having a gross family income inferior to 10,000 NIS per month, which represents less than 2,800\$ CAN. The relationship between the number of children and the gross monthly family income shown in figure 3.4 does not appear to go in the direction predicted in the theory. The families of both regions have been separated into two categories according to whether their income is below or above the average wage in the country. It seems as if families with higher income have more children than families with lower incomes in both regions. However the difference appears to be stronger in the West Bank than in Israel. The analyses that will be conducted in the fourth chapter will tell if the relationship between income and the number of children in Israel is significant or not.

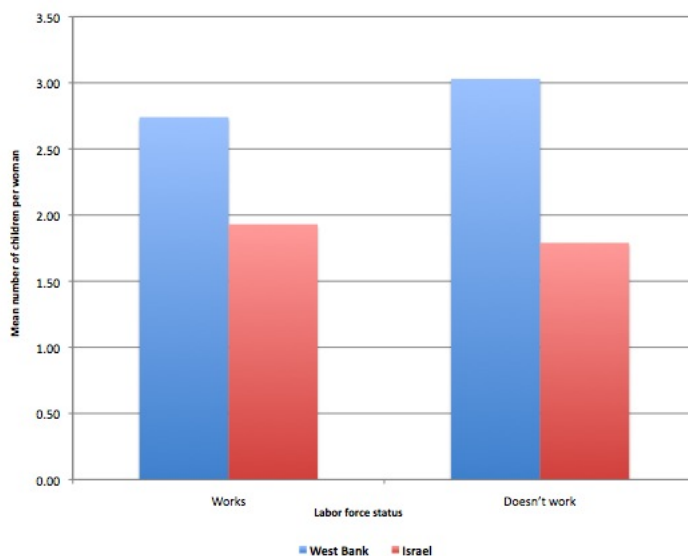
FIGURE 3.4. Mean number of children per woman and the gross family income per month in Israel and the West Bank, 2004



Source: Our calculations from the *General Social Survey* of Israel, 2004

The survey data shown in table 3.3 shows that there are about the same amount of employed women in both regions (about 65% of them are currently working). Women working at a paid job or business in Israel have slightly more children than women who do not as shown in figure 3.5. The difference is very small but in the opposite direction than that expected. In the West Bank it is the other way around. Women not working have more children than women working at a paid job. The figure also shows that whether they have a paid job or not, women in the West Bank have more children than their counterparts in Israel.

FIGURE 3.5. Number of children per woman by labour force status in Israel and the West Bank, 2004



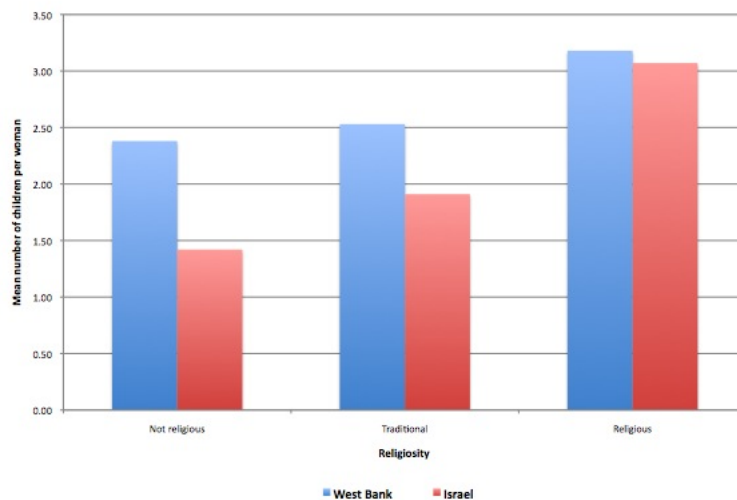
Source: Our calculations from the *General Social Survey* of Israel, 2004

It is interesting to note that the socioeconomic variables presented here for Israel and the West Bank show tendencies that go against the theory presented in chapter 2. Indeed, variables like income, education and work status usually have a negative association with fertility. It is said that the fact of having a higher income, being highly educated and/or working at a job or business decreases fertility. However the relationships are not as clear in both regions. More often than not, when respondents have characteristics that are normally associated with lower fertility at an inferior scale, their fertility is equal or higher. This situation might reflect the importance of having children in the Jewish culture and the success of the country's fertility policies. The analyses in the fourth chapter will tell if these surprising relationships are significant or not.

The differences between the two regions become more obvious when it comes to the religious variable. Indeed, religiosity varies a lot. One quarter of the women in the West Bank declared not being religious as opposed to 50% of the women in Israel. 19% of the women of the West Bank and

37% of the women in Israel declared being traditional. The difference is even more apparent among religious people. 17% of the women in Israel are religious as opposed to 55% in the West Bank. This clearly is the variable that changes the most from one region to the other.

FIGURE 3.6. Number of children per woman by religiosity in Israel and the West Bank, 2004



Source: Our calculations from the *General Social Survey of Israel*, 2004

Figure 3.6 shows a clear relationship between religiosity and the number of children. Religious women follow the traditional values associated with their religion no matter what their region of residence is. In this sense, the effect of the religious doctrines is larger among the more religious people because they are more likely to be influenced by the religious teachings. Even the non-religious and traditional women of the West Bank have more children than their counterparts in the rest of Israel.

To sum up, despite the fact that the respondents live in two different regions, most of their socioeconomic and demographic characteristics are similar. The main difference relies in their religiosity. Because of this big difference, it could be tempting to assume that this is the main reason for their different fertility behavior. The next chapter will allow us to verify if the relationships just found are significant or not and to determine the

amplitude of their impact on Jewish fertility in Israel and the West Bank.

Chapter 4

DESCRIPTIVE AND EXPLANATORY ANALYSIS

The first part of this chapter will be dedicated to the descriptive analysis. In this section, the religious, socioeconomic and demographic characteristics of each group will be compared to see where differences can be observed between the two groups. Once these differences in terms of children ever born are highlighted, I will proceed to the explanatory analysis that will provide more information as to which variables influence the fertility behaviour of the women of Israel and the West Bank and to what extent they have an impact.

4.1. DESCRIPTIVE ANALYSIS

4.1.1. Bivariate analysis

As seen in the introduction the mean number of children ever born among Jewish women aged 20 to 54 in Israel is 1.88 and 2.84 in the West Bank. There is a series of religious, socioeconomic and demographic variables that interfere with the number of children ever born (CEB).

I have analysed the mean number of children ever born for each category of the independent variables in both regions to examine the association

between children ever born and women's religious, socioeconomic and demographic characteristics.

TABLE 4.1. Mean number of children ever born to Jewish women by demographic, socio-economic and religious characteristics

Characteristics		Israel			West Bank		
		Mean CEB	SD	F-Value	Mean CEB	SD	F-Value
Age group	20-24	0.19	0.61	1001.48***	0.36	0.67	37.89***
	25-39	1.65	1.52		2.59	1.64	
	40 and over	2.91	1.57		4.03	1.82	
Religiosity	Not religious	1.42	1.32	250.16***	2.38	0.97	3.07
	Traditional	1.91	1.49		2.53	1.70	
	Religious	3.07	2.40		3.18	2.37	
Education	Secondary or less	2.40	1.81	31.18***	3.38	2.16	0.03
	Post secondary	1.69	1.76		2.52	1.79	
	University degree	1.78	1.45		3.07	2.16	
Work status	Is currently working	1.93	1.55	3.56	2.74	1.90	0.44
	Is not currently working	1.78	1.97		3.03	2.15	
Monthly family income	10,000 NIS or less	1.84	1.82	1.81	2.72	2.07	0.73
	10,001 NIS or more	1.95	1.44		3.10	1.80	
Country of birth	Israel	1.82	1.74	5.40*	2.74	1.94	0.84
	Abroad	2.02	1.62		3.18	2.13	
Years married	Not married or less than a year	0.63	1.13	1652.98***	1.43	1.95	35.66***
	2-10 years	1.67	1.17		1.87	1.38	
	11 years or more	3.23	1.45		3.96	1.72	
N		2,099			90		

Source: Our calculations from the *General Social Survey* of Israel, 2004

4.1.1.1. *Israel*

In Israel, women barely start their reproductive lives before 25. Indeed, the mean CEB for women aged 20-24 is 0.19. Women aged 40 and up have a significantly higher CEB than women aged 25-39. They have about one more child. Religiosity also has a significant impact. Religious women have about twice the CEB than do non-religious women (3.07 vs. 1.42). They also have about one more CEB than traditional women (1.91). Women who went to university have a significantly lower number of CEB than women who stopped after secondary school (1.78

vs. 2.40). However, women with a post secondary non-academic certificate appear to have about the same number of children (1.69). Women born abroad also have significantly more CEB than native Israelis (2.02 vs. 1.82). There is a significant increase in the mean number of CEB throughout the years of marriage. Indeed, women who have been married for over 10 years (3.23) have five times more CEB than those not married or married for less than a year (0.63). They also have twice as many children as women who have been married for 2 to 10 years (1.67). Considering that the longer the duration of a marriage is, the older the woman gets, this results is in the normal order of things. Finally, being employed and having a higher monthly family income appear to have a positive impact on the mean CEB but the results are not significant.

4.1.1.2. *West Bank*

The situation is similar in the West Bank but amplified for many variables. Indeed, women seem to start their reproductive lives a little earlier than their counterparts in Israel. They already have 0.36 CEB before the age of 25 and the CEB increases significantly with age. Women aged 25-39 already have a mean CEB of 2.59 and those aged 40 and up have a mean CEB of 4.06. At this age, it represents 1.12 more CEB than in Israel. Religious women also have a higher mean number of CEB than non-religious and traditional women but the difference is not as important as in Israel. The differences are also not significant but important to mention anyway. Religious women have an average of one more child than non-religious women. Also, non-religious women in the West Bank have a higher mean number of CEB than traditional women in Israel. As for marriage, women follow a similar pattern in both regions. Women married for over 10 years have a little more than twice as many children as women who are not married or married for less than a year and about one more child than women married for two to 10 years. The difference of the mean number of CEB for the education, work status and income variables is

not significant in the West Bank ¹. However, the results show that women with a university degree have slightly more children than women with a post secondary diploma and almost as many as women with a secondary education or less. The relationship seems curvilinear in both regions. It also shows that women who are not currently working at a job or business have more children than women who do. Finally, women with a higher monthly family income have more children.

4.2. EXPLANATORY ANALYSIS

This section contains the results of the explanatory analyses done with a Poisson regression model. For each regression, 3 models have been designed:

- (a) The first model includes the religious variable and demographic characteristics as the control variables;
- (b) The second model includes the socioeconomic variables and demographic characteristics as the control variables;
- (c) The third model includes both religious and socioeconomic variables and demographic characteristics as the control variables.

These models were designed so that it is possible to measure the impact of each category of variables independently and then measure their combined impact. The first regression has been made with the complete sample that contains the information on the Jewish women of both Israel and the West Bank. This regression was made to evaluate the impact of the region of residence on the fertility of each group. To do that, an extra model was tested that only includes the variable on region of residence and does not have any control variables. The next two regressions have been conducted for Jewish women of Israel and the West Bank separately to evaluate the role of each independent variable on the fertility.

¹The fact that there are only 90 observations in the West Bank gives a lot less statistical power to the tests produced

The coefficients that are presented in the next three tables are incidence rate ratios (IRR). An incidence rate is the measure of the frequency with which an event occurs. It is obtained by exponentiating the poisson regression coefficient. For example, in table 4.2 the coefficient obtained for the region of residence from the Poisson regression in the first model is 0.4151406. The IRR is : $e^{0.4151406} = 1.52$.

4.2.1. Israel and the West Bank

TABLE 4.2. Poisson regression of CEB for religious, socioeconomic and demographic variables for all Jewish women living in Israel and the West Bank

Characteristics		Model 1	Model 2	Model 3	Model 4
Religious variable					
Religiosity (ref. = Non religious)	Traditional		1.24***		1.17***
	Religious		1.91***		1.81***
Socioeconomic variables					
Monthly family income (ref. = 10,000 NIS or less)	10,001 NIS or more		0.84***		0.95
Education (ref. = Secondary or less)	Post secondary		0.87***		0.88***
	University degree		0.79***		0.82***
Work status (ref. = Is currently working)	Is not currently working		1.06		1.00
Demographic variables					
Country of birth (ref. = Israel)	Abroad		0.96	0.93*	0.97
Age (continuous)			1.22***	1.21***	1.22***
Years married (ref. = Not married or less than a year)			2.58***	2.94***	2.65***
	11 years or more		3.04***	3.49***	3.08***
Region of residence (ref. = Israel)	West Bank	1.52***	1.10	1.32***	1.13*
N		2,189	2,189	2,189	2,189

Note: *p<0.05; **p<0.01; p<0.001

Source: Our calculations from the *General Social Survey* of Israel, 2004

Table 4.2 presents the Poisson regression results analysing the combined dataset with all female respondents from Israel and the West Bank. When looking at **Model 1** that only controls for the region of residence, it appears clear and strongly significant that women residing in the West Bank see their expected number of children increased. Indeed, these women have a 52% higher expected number of children when no control is made for religious, socioeconomic or demographic background. When only looking at religiosity in **Model 2**, it shows that it strongly increases the expected number of CEB. Traditional and religious women have respectively 24%

and 91% more CEB than secular women. It also shows that age and duration of the marriage are strongly significant and have a very important impact on the expected number of CEB. When considering religiosity in this model, the region of residence is no longer a significant variable in the explanation of fertility. This might show that religiosity and the region of residence are closely related. As mentioned earlier, most of the religious people live in the West Bank. In **Model 3**, when considering the socioeconomic variables, the region of residence is back to being significant but a little less strong. All socioeconomic variables significantly decrease the expected number of CEB but the work status. Indeed, they lower the expected number of 15 to 20%. Regardless of religiosity, socioeconomic and demographic conditions in **Model 4**, the fact of being a Jewish woman living in the West Bank multiplies the number of expected children by a factor of 1.13 which means that their expected number of children is 13% higher than that of their counterparts living in all other regions of Israel. It is of lesser importance than in the previous models but still significant.

4.2.2. Israel only

TABLE 4.3. Poisson regression of CEB for religious, socioeconomic and demographic variables for all Jewish women living in Israel

Characteristics		Model 5	Model 6	Model 7
Religious variable				
Religiosity (ref. = Non religious)	Traditional	1.23***		1.17***
	Religious	1.93***		1.82***
Socioeconomic variables				
Monthly family income (ref. = 10,000 NIS or less)	10,001 NIS or more		0.84***	0.94
Education (ref. = Secondary or less)	Post secondary		0.88***	0.88**
	University degree		0.79***	0.82***
Work status (ref. = Is currently working)	Is not currently working		1.06	1.00
Demographic variables				
Country of birth (ref. = Israel)	Abroad	0.96	0.92*	0.97
Age (continuous)		1.23***	1.21***	1.22***
Years married (ref. = Not married or less than a year)	2-10 years	2.64***	3.01***	2.72***
	11 years or more	3.05***	3.54***	3.10***
N		2,099	2,099	2,099

Note: *p<0.05; **p<0.01; p<0.001

Source: Our calculations from the *General Social Survey* of Israel, 2004

Looking at the results of the Poisson regression for all women living in Israel in table 4.3 shows that the results are fairly similar to those of table 4.2. This is due to the fact that most of the observations of the full sample are from Israel. There are only 90 observations in the West Bank.

When looking at religiosity with a control for demographic variables in **Model 5**, the results show that being traditional or religious multiplies the expected number of CEB by a factor of 1.23 and 1.93; that is, they have a number of CEB that is 23% and 93% higher as compared to non-religious women, all other things being equal. when there is no control for religiosity in **Model 6**, being educated and having a high family income are two socioeconomic factors that significantly decrease the expected number of CEB. It decreases by 16% when the gross monthly family income is over 10,001 NIS and by 12% and 21% when a woman has more than a secondary school diploma. The work status doesn't have a significant impact

on the expected number of CEB. Only in this model, the country of origin is lightly significant and has a negative impact on the expected number of CEB. Not being born in Israel decreases the expected number of CEB by 8%. The demographic variables also have a rather considerable impact on fertility. When controlling for all other variables in **Model 7**, the expected number of CEB increases by 172% and 210% when a woman has been married for two to 10 years and 11 years or more. The importance of religiosity and socioeconomic factors are slightly diminished but remain important and significant factors but the monthly family income becomes insignificant. Indeed, from Model 6 to model 7, the monthly family income loses all of its significance. This might be due to the fact that there exist a relationship between the income and religiosity. One would assume that as religiosity increases, the income decreases because more time is dedicated to religious studies instead of paid work. A woman employed at a job or business doesn't significantly reduce the expected number of CEB in Israel. Also, religiosity clearly has a more important impact on the expected number of CEB. Nevertheless, education is the socioeconomic factor that has the biggest impact on fertility by reducing the expected number of CEB by 12% and 18% as education increases.

4.2.3. West Bank only

TABLE 4.4. Poisson regression of CEB for religious, socioeconomic and demographic variables for all Jewish women living in the West Bank

Characteristics		Model 8	Model 9	Model 10
Religious variable				
Religiosity (ref. = Non religious)	Traditional	1.45		1.44
	Religious	1.74***		1.82***
Socioeconomic variables				
Monthly family income (ref. = 10,000 NIS or less)	10,001 NIS or more		0.81	1.00
Education (ref. = Secondary or less)	Post secondary		0.82	0.73
	University degree		0.84***	0.67
Work status (ref. = Is currently working)	Is not currently working		1.07	0.99
Demographic variables				
Country of birth (ref. = Israel)	Abroad	0.97	0.98	1.03
Age (continuous)		1.16***	1.19***	1.19***
Years married (ref. = Not married or less than a year)	2-10 years	1.47	1.61	1.50
	11 years or more	2.30***	2.19***	2.20***
N		90	90	90

Note: *p<0.05; **p<0.01; p<0.001

Source: Our calculations from the *General Social Survey* of Israel, 2004

Table 4.4 presents the results of the Poisson regression for the women living in the West Bank. There are fewer significant results because there are only 90 observations. Such a number of observations decreases the statistical power² of the regression. It is however possible to observe a trend and derive some interesting results.

As in the case of Israel, the fertility of Jewish women in the West Bank is strongly influenced by religiosity. Even though the results for traditional women are not significant in any model, these women seem to have a number of CEB that is 45% higher than non religious women in **Model 8** when there is only control for demographic variables. The difference between

²The power of a statistical test is the probability that the test will reject a false or null hypothesis.

non-religious and religious women is even more important and significant. Being religious increases the expected number of CEB by 74%. In **Model 9**, the only socioeconomic variable that has a significant impact on the expected number of children is education and its effect is strongly significant. A woman with a university degree will see her expected number of CEB multiplied by a factor of 0.84 (when controlling for demographic variables) which means that she is expected to have 16% less children than a woman who has a secondary school diploma or less. Even though the result is not significant for women with a post secondary non-academic diploma, their expected number of CEB is decreased by 18%. Besides the fact that the other two socioeconomic variables did not turn out to be significant, the work status has a very limited positive impact on the expected number of children just as in the other two regressions and a higher monthly family income reduces the expected number of CEB by 19%, which is a little more than the 16% observed in Israel. When considering religiosity and socioeconomic conditions in **Model 10**, the role of some demographic variables in the explanation of fertility is highlighted and goes in the same direction as in the previous two models. They are of slightly lesser importance than in Israel but the impact is similar. The expected number of children increases by 19% every year and being married for 11 years or more increases the expected number of CEB by 120%. Unlike in Israel, the country of birth has a very light positive impact on the expected number of CEB in the West Bank but is not significant either. Contrary to the other regressions, in the case of the West Bank, being religious increases the expected number of CEB more when controlling for all variables than when only controlling for demographic variables. Indeed, religious women increase their expected number of 82% when controlling for all variables compared to 74% when only controlling for demographic variables.

4.3. SUMMARY OF RESULTS

In table 3.3 at the end of the previous chapter, I have found some relevant information about the background characteristics of the respondents of Israel and the West Bank. It shows that the age distribution of women is equivalent in both regions. As mentioned in the previous section and in the table, most of the socioeconomic and demographic characteristics of the respondents in both regions are distributed in similar ways. Indeed about 30% of women have a university degree and 50% have a post secondary non-academic diploma. 65% of them are working and almost 70% live on a monthly family income under 10,000 NIS. Finally, about three quarters of the women were born in Israel. There are differences in the length of the unions. Almost 40% of Israeli women are not married or got married in the past year as opposed to 15% in the West Bank. Half of the women in the West Bank have been married for over 10 years. It comes down to a little under 40% in Israel. The most important differences are seen in their religiosity. Women in the West Bank are much more religious than their counterparts in Israel. Almost half of the respondents in Israel declared being non-religious as opposed to only one quarter in the West Bank. 55% of the women in the West Bank declared being religious and only 15% in Israel.

Despite such similar background socioeconomic and demographic characteristics considerable differences in the mean number of CEB remain. As women age, their mean number of CEB increases but on a much shorter period among Israeli women because they start having children later than women in the West Bank. Table 4.1 also allows us to see that difference in the mean number of CEB between religious and non-religious women is much more important in Israel than in the West Bank. Religious women in Israel have more than twice as many children than non-religious women compared to only 1.3 times more children in the West Bank. No matter the region of residence, religious women have about the same mean number

of CEB (3.07 in Israel and 3.18 in the West Bank). There is a significant difference in the mean number of CEB of native born and immigrants in Israel. Immigrants have a slightly higher mean number of children. The relationship goes in the same direction in the West Bank but is not significant. Women married for 11 years or more obviously have a lot more children than women that are not married or married for less than a year and that, in both regions.

The Poisson regressions in the second part of the chapter were produced to shed the light on the factors that have the greatest impact on the fertility of Jewish women in the two regions. The results show that even though people are proportionally a lot more religious in the West Bank religiosity has a bigger impact on fertility in Israel than in the West Bank. The small minority of religious people living in Israel are known to be very orthodox and their fertility is very high compared to the rest of the Israeli population. Being religious as opposed to non-religious increases the expected number of CEB by 93% in Israel and by 74% in the West Bank. Education comes out as the socioeconomic variable with the greatest impact on fertility in both regions. Indeed, the monthly family income has a marginal impact in both regions and is not significant. The impact of the work status is also not significant in any of the regions and has no impact when controlling for all other variables. Education however significantly reduces the expected number of CEB in both regions but its impact is stronger in the West Bank for women with a post secondary non-academic diploma³; it decreases of 18% as opposed to 12% in the rest of the country. Having a university diploma decreases the expected number of CEB by 21% in Israel and 16% in the West Bank. Most demographic variables impact fertility in a similar matter in both regions. Still, it has been noted that

³As seen in table 3.3 a post secondary non-academic diploma is the most common diploma attained in both regions.

the duration of the marital union has a greater impact on fertility in Israel. This might be due to the fact that marriage is not as automatic in Israel compared to the West Bank considering that more people are religious in the WestBank. Indeed, women who have been married for 11 years or more in Israel see their expected number of CEB increased of 210% compared to women who are not married or married for a year. In the West Bank, the impact is of 120%.

In sum, the most important variables in the explanation of the high Jewish fertility in Israel and the West Bank are as expected religiosity, education and marital status. It was however not expected that they would impact on the regions the way they do. Because the West Bank is home to many religious people, it was expected that religiosity would have a much bigger impact in the West Bank than in Israel. Also, given the religious nature of its population, it wasn't expected that education would have such an important role in decreasing the mean number of CEB in the West Bank. This study allowed to clarify some of the preconceptions on the mechanisms that regulate fertility in Israel. However, having access to a survey with a limited amount of information about the behaviours of Jewish Israelis, does not allow a thorough understanding of the phenomenon. There must be other factors that influence fertility that are not possible to capture and measure in this study.

DISCUSSION AND CONCLUSIONS

The data of the 2004 *General Social Survey* made available by the *Central Bureau of Statistics* of Israel allowed us to study a very small population; the Jewish population in the West Bank that represented 4% of the total population of Israel in 2008 (*Central Bureau of Statistics* of Israel, 2010). Comparing such a small population group with the rest of the population causes many difficulties on a methodological level. Consequently, the types of analyses were very limited. Nevertheless, the data allowed us to produce some statistical analyses that helped answering the initial questions of research.

The first objective of this project was to confirm that the fertility of the Jewish women living in Israel was indeed significantly different from the fertility of Jewish women living in the West Bank. With the data and with the appropriate statistical test, I have been able to confirm that the difference of 1.88 mean number of CEB in Israel was significantly different from the 2.84 mean number of CEB in the West Bank. With the first Poisson regression in table 4.2 I have been able to confirm that the fact of living in the West Bank rather than in Israel increases the expected number of CEB by 13%. Once this is established, I have been able to pursue the analyses.

The descriptive analysis has allowed to evaluate in what ways the fertility levels were different in the two regions. In table 3.3 I was able to

see that the socioeconomic and demographic characteristics of the respondents were roughly similar in the two regions. Later on, table 4.1 shows that there are also many similarities in the way Jewish women of Israel and the West Bank experience fertility. Despite the fact that for most variables used, the women of the West Bank had a higher mean number of CEB than those of Israel, the patterns were in most cases the same. When a woman has access to higher levels of education, has a job, a high family income, is secular or is born in Israel, the least children she will tend to have and vice-versa. In spite of these similar trends, some differences in their behavior remain. I have seen that Israeli women seem to start having children later than women in the West Bank and have fewer children in the end. The most striking difference is related to religiosity. I have discovered that religious women have the same mean number of CEB in the two regions but there are a lot less religious people in Israel. Also, non religious women have a much greater mean number of CEB in the West Bank compared to that of their counterparts in Israel (2.38 vs. 1.42). This means that religiosity alone cannot explain the fertility differences in the two regions even though it is the variable with the greatest impact. In sum, the fertility behaviors don't really differ from one region to the other; they more or less follow the same patterns. The religious, socioeconomic and demographic variables used in the study influence the fertility of all Jewish women in the same direction. The difference resides more in the intensity with which the variables affect fertility.

Even though most variables seem to affect fertility downward or upward in the same way for all women, it cannot be denied that some variables have a greater impact on the fertility of women in some regions than others. As expected the results from the Poisson regressions show that religiosity has a strong impact on fertility which echoes other studies made on the subject. Zhang (2008) brings out the fact that the positive effect of

religious beliefs on fertility must have something to do with the role of religion in guiding the human behaviour in terms of sexuality, cohabitation, marriage and family. However religiosity seems to have a greater impact on fertility in Israel than in the West Bank (1.93 vs. 1.74). Given the fact that there are much more religious people in the West Bank, it would have been expected that religiosity impacts more there. It has also been noted that education in the most common education group has a bigger impact in decreasing the expected number of CEB in the West Bank than in Israel. Not working at a job or business doesn't have a significant impact in Israel or the West Bank. Having a higher monthly family income doesn't significantly impact on fertility either but it seems to slightly increase the expected number of CEB in Israel. The country of origin has a very small negative impact on fertility on a national level and in Israel only. Israeli women born abroad have a number of CEB 3% lower than natives. The situation is opposite in the West Bank; it increases fertility by about 3%. Looking back at Anson and Meir (1996) statement that immigrant women in Israel are *over-reproducing*, this finding shows that they still don't have enough children to reach the level of fertility of native Israeli women but it is not the case in the West Bank. They have more children than the natives. Finally, the results show that marriage has a bigger impact on fertility in Israel than in the West Bank. Given the fact that the respondents in the West Bank were way more religious than those in Israel, fertility outside marriage must be pretty rare so for that matter, marriage has a lesser impact on fertility than in a community where religion takes less place such as Israel.

To sum up, the data allowed to successfully attain my objectives of research. I can conclude that Israel and the West Bank are essentially influenced by the same religious, socioeconomic and demographic variables that is mainly: religiosity, education, age and marital status. The impact of these variables on fertility is the same for the women in the two regions

studied but the impact varies in intensity. Indeed, religiosity, age and marital status have a stronger impact on fertility in Israel but the impact of education on fertility is greater in the West Bank.

When looking back at religious theories of fertility differentials, it is now clear that some hypotheses work better in the context of this study than others. The *minority group status* hypothesis seems to be the most appropriate when considering the historical and political context of the country. The legitimacy of the Jewish settlements in the West Bank is disputed by the International Community and Israel is devoting great effort to justify their presence. For that matter it seems as if their minority status is the cause of many insecurities and they may be maintaining high fertility to ensure their presence in the future on the territory. To pursue this analysis further, it would be necessary to collect data on the Palestinian Arabs living in the West Bank. That way, their fertility could be compared and give a broader analysis of the fertility behavior of the Jewish population of the West Bank. This hypothesis could even be used in a broader context to explain the generally high fertility of the Jewish population of Israel on a national level. The Jewish population could be considered a minority group relative to the neighbouring Arab countries.

Even though I have been able to highlight the impact of a certain number of variables on the fertility of Jewish women living in Israel and the West Bank, it is clear that the data available didn't allow to measure the whole phenomenon. Indeed, if both groups have a similar socioeconomic and demographic background and are influenced by the same variables and the results show that religiosity itself is not enough to explain the differences, we must look elsewhere for further answers. The series of questions asked in the *General Social Survey* of Israel in 2004 were of a very general order and limited the amount of variables that could be used. For that matter, there must be other factors that cause such a substantial gap in the

fertility of the two regions. Anson and Meir (1996) added an interesting variable in the puzzle in order to make a more holistic analysis: nationalism. They tried to explain the high fertility of Israel as a whole compared to its European counterparts. In this article, they argue that:

“(…) Israel’s high fertility needs to be explained not in terms of the internal qualities of particular parts of the population, but rather in terms of Israel’s special position in the Middle East and in the world-economy as a whole, and the nationalist sentiment which this engenders in the *conscience collective* (the set of symbols, meanings and ideas which are more or less common to all members of society).”

To support their assumptions they used census data and voting returns for Jewish urban statistical areas in the early 1980’s to provide the evidence that high fertility is directly associated with nationalism. They noted that women living in religious areas had on average 21.5% more children in the five years prior to the census than did women in non-religious areas. They also noted that the effect of nationalism is far greater than that of religion and that women in nationalist areas had 35% more children than did women in conciliatory areas. The conclusion of their article states that much of the religiosity recorded in fertility surveys is an expression of a strongly felt nationalist sentiment.

Perhaps the key to explaining the part of the fertility of Jewish women in Israel and the West Bank that we cannot perceive resides in the expression of their nationalist feelings. Anson and Meir (1996) use this argument to compare Israel with other countries but it may be even more relevant inside Israel’s boundaries because there are such fertility differences within the different regions of the country. As mentioned earlier, the West Bank

is a disputed territory and the Israeli government is putting a lot of efforts to encourage its population to live there. One could hypothesize that the individuals who choose to live there have some strong nationalist sentiments and want to have a greater number of children to ensure their perennality in the territory. This hypothesis could be supported by some results in this thesis that show that immigrants that arrive in Israel have a lower number of CEB than natives but immigrants that arrive in the West Bank have a higher number of CEB than natives. Others could argue that since there are such great incentives for people to move to the West Bank, those who chose to live there are the ones with lower incomes who want to improve their living conditions. These people with lower living conditions tend to have more children than highly educated people with high paying jobs as shown in this thesis.

One thing is for sure, to prove any of these hypotheses, a comprehensive survey on the Jewish people living in the West Bank has to be conducted. It would require questions about their political views, the frequency of religious service attendance and their children. The small amount of people living in the West Bank recorded in the 2004 GSS resulted in a lack of statistical power in the analysis of their results compared to that of those living in Israel. A bigger survey would allow researchers to have more flexibility in their choice of methods and variables that would allow better results and a better understanding of the high fertility of Jewish women living in the West Bank.

Appendix A

TABLE A.1. Distribution of the independent variables before and after categorization

Independent variables	Before			After		
	Categories	Israel (%)	West Bank (%)	Categories	Israel (%)	West Bank (%)
Religiosity	Ultra-Orthodox	9.58	26.67	Religious	16.82	54.44
	Religious	7.24	27.78	Traditional	36.59	18.89
	Traditional but religious	10.34	7.78	Not religious	46.59	26.67
	Traditional but not so religious	26.25	11.11			
	Non religious, secular	46.59	26.67			
Education	Elementary or middle school	2.19	1.11	Secondary or less	22.96	17.78
	Secondary school	19.77	13.33	Post-secondary	48.17	51.11
	Baccalaureate certificate	27.35	22.22	University degree	28.87	31.11
	Post-secondary, non academic	20.82	28.89			
	BA, academic certificate	20.34	15.56			
	MA, MD or similar certificate	7.91	15.56			
Work status	PhD or similar certificate	0.62	0			
	Working	65.03	64.44	Working	65.03	64.44
Monthly family income	Not working	34.97	35.56	Not working	34.97	35.56
	NIS 2,500 or less	5.86	7.78	NIS 10,000 or less	67.89	67.78
	NIS 2,501 - 4,000	7.91	10	NIS 10,001 or more	32.11	32.22
	NIS 4,001 - 5,000	6.67	7.78			
	NIS 5,001 - 6,500	8.19	7.78			
	NIS 6,501 - 8,000	9.72	14.44			
	NIS 8,001 - 10,000	11.86	15.56			
	NIS 10,001 - 13,000	11.39	11.11			
	NIS 13,001 - 17,000	8.77	11.11			
	NIS 17,001 - 24,000	6.86	6.67			
	More than NIS 24,001	5.10	3.33			
	Not declared	17.68	4.44			
Country of birth	Israel	72.61	75.56	Israel	72.61	75.56
	Europe-America	21.06	20	Abroad	27.39	24.44
	Asia	1.72	1.11			
	Africa	4.62	3.33			
Years married	Not married	36.87	13.33	Single or in the last year	37.92	15.56
	Last year	1.05	2.22	2 - 10 years	23.63	34.44
	2 - 5 years	12.01	15.56	11 + years	38.45	50
	6 - 10 years	11.62	18.89			
	11 + years	38.45	50			

Source: *General Social Survey of Israel, 2004*

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