The dynamics of fertility amongst the Jewish population of Israel, the West Bank, and Gaza Strip from 1990 to 2010

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Jewish fertility in the settlements of the West Bank and Gaza Strip has been stable for at least 15 years with a TFR of almost five children per woman while fertility in Israel is about three children per woman (Statistical Abstracts of Israel, ICBS). Their fertility has stalled at a level well above replacement despite some major changes in lifestyle and living conditions. This article uses census data from 1995 and 2008 to examine the changing determinants of fertility amongst the Jewish population living in Israel compared to that of the Jewish population living in the West Bank and Gaza Strip during the stage when aggregated fertility levels reached stagnation. The preliminary results show that the negative effects on fertility of a higher education and participating in the workforce increase at higher parities, especially in Israel. Religiosity has a stronger positive impact on fertility in Israel than in the settlements; its effect increases at higher parities and is higher in 1995 than in 2008. Not being from Asia or Africa decreases fertility much more in Israel than in the settlements and its effect is lightly stronger in 2008 than in 1995. Finally, at higher parities, the effect of education on fertility becomes positive in the settlements in both census years.

1 Introduction

One of the core theories in demographic research is the demographic transition according to which societies modernize through a system of high mortality and high fertility to a postmodern system of low mortality and low fertility (Chesnais, 1986). As most western countries experienced textbook transitions, many countries going through more recent transitions have different experiences. There is a vast range of processes that are not as straightforward or do not have the same thresholds as to what constitutes a completed transition. In the past 20 years, stalls in a number of African countries have been noticed (Ezeh et al. (2009); Moultrie et al. (2008)). Other cases of stalls have been suggested in other regions of the world such as the Middle East and Latin America (Cetorelli and Leone (2012); Gendell (1985)).

Despite its high level of development and a favourable economy, Israel seems to have reached a plateau in its fertility in the past decades. A large number of articles documented the links between its high fertility and the religiosity of its inhabitants according to their religion and/or ethnicity. Maintaining a high fertility level (3 children/woman in 2011, Statistical Abstract of Israel) relative to their European and American counterparts inspired a vast literature about the country's fertility transition(s) ((Friedlander and Feldman, 1993); (Friedlander, 2002); (Bystrov, 2012)). One of the main conclusions of such studies is related to the heterogeneity of its population. The population of Israel is very mixed and the different subgroups are at different stages of the transition (Bystrov, 2012). Regardless of how these population groups are formed (usually by religion, ethnic origin or religiosity), they all seem to maintain a higher fertility than their counterparts elsewhere in the world. Lazerwitz and Tabory (2002) show that "the social environment of Israel reinforces the religiosity of even its highly religious Jewish members", a characteristic often associated with high fertility.

Studying this very heterogeneous population at a national level prevents us from perceiving the magnitude of the differences. One particular Israeli subgroup is known for its higher fertility: the Jewish Settlers. They 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). With an average of two more children per woman than in the rest of the country, they have very different attitudes towards fertility and deserved to be studied separately. Figure 1 show the amplitude of the differential between the settlers and Israel as a whole as well as the stable, even increasing fertility over the past 15 years.

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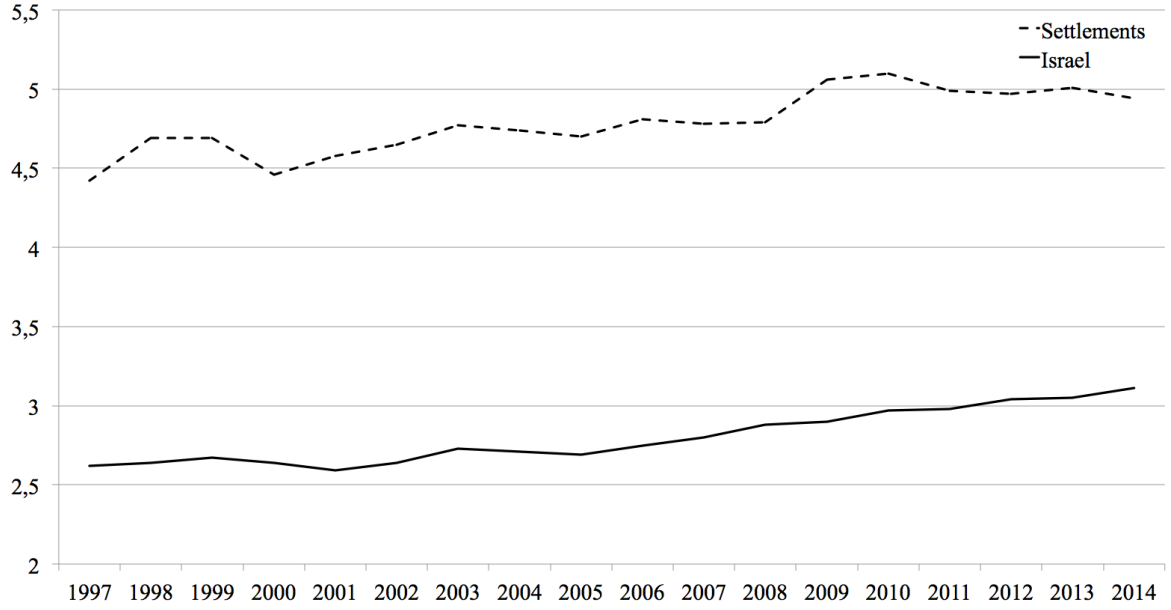
Figure 1: Fertility in Israel and the Settlements, 1997-2014



Source: Statistical Abstract of Israel, different years (1998-2015), Table 3.9, "Live Births, Deaths and Infant Deaths, by District, Sub-District, Area, and Religion." Settlers reside in the district of Judea and Samaria.

Despite their fertility being significantly higher than that of Israel as a whole, DellaPergola (2011) points out a shared undercurrent between all groups that cannot be ignored. For that matter it would be simplistic to reduce the higher fertility of the settlers to higher religiosity and nationalism.

2 Background: fertility in the Jewish settlements

Very few studies have focused on the Jewish settlers although their increasing number now accounts for about 12.5% of the population, that is to say, about 318,700 Jewish settlers in the West Bank in 2011 (Statistical Abstract of Israel 2012: table 2.6). The high growth rate in the region is mainly due to four factors (Courbage, 2012): a low crude death rate, a high life expectancy, a young population and a high rate of immigration. Still according to Courbage (2006), Jewish settlers are more nationalistic and religious than their counterparts in Israel and value large families. By moving in the settlements built by the Israeli government, families benefit from many monetary and fiscal incentives (B'tselem, 2002). These advantages give the settlers a better standard of living than if they were to live in Israel.

For that matter, the very specific subgroup that constitutes the Jewish settlers is often brought up as a potential explanation for their fertility stall. Many researchers have associated their fertility dynamics to their higher religiosity (Courbage, 2006) while others argue that it's not so much religiosity as nationalism that has an impact on their fertility (Anson and Meir, 1996). Their rural lifestyle and lower incomes could also be a part of the explanation for a stalling fertility.

3 Objective, theoretical background and hypotheses

Although many researchers have highlighted many ongoing fertility stalls in a wide range of countries, there is little consensus about their causes and Israel's fertility is different from most other countries experiencing stalls. It is a developed country with a dynamic and diversified economy, low infant and child mortality, and free accessible reproductive health programs. The objective of this article is thus to determine the causes and consequences of the lack of change in fertility through time. For that matter we ask ourselves why is fertility stalling in Israel and especially in the Jewish settlements? To do so we will identify what are the drivers of the stall of the fertility decline and how they vary among the different subgroups of the population and parity.

3.1 Impact of religion on fertility

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). Even though we are interested in individuals belonging to the same religious group, the fact of living in two different regions might expose them to different living conditions and socioeconomic status as shown in Table 1.

The secularization hypothesis refers to the impact of the emergence of ideologies not based on religious teachings on society. 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. On one end of the Jewish community 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. On the other end, there are individuals who consider themselves as belonging to a secular Jewish culture driven by the values of the European Enlightenment without being at all specifically religious.

The minority group status hypothesis integrates the analysis of religious differentials in fertility in the social organization. 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. 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. The Jewish community living in the West Bank constitutes a minority group representing 17% of the total population while Arabs and Christians represent 75% and 8% respectively (Central Intelligence Agency, *The World Factbook*: 2011). The Jewish minority may maintains a high fertility 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" defined by Courbage (1999) as they *over-reproduce* to ensure the survival of their subgroup in the Jewish nation.

3.2 Impact of socioeconomic status on fertility

One of the most important socioeconomic variables in the explanation of fertility is income. The literature highlights 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.

Education is another important socioeconomic variable that affects 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 as 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.

Income is closely related to the participation in the workforce. It is hypothesized that women's employment status is negatively associated with 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.

3.3 Impact of demographic characteristics on fertility

Age is probably the most obvious and important variable when studying fertility as women are only fertile during a certain period of their lives, which is more or less between the ages of 15 and 49. The later a woman starts her reproductive life, the shorter her reproductive period is. 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).

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 fertility of Canadian women shows that women who married before the age of 20 have a 25.2% 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).

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.

4 Data and methods

The Israeli Census data for 1995 and 2008 used in this article are provided by the Israel Central Bureau of Statistics. The dataset contains information on religion, demographic, and socioeconomic characteristics of Israeli households. Our subsample only includes households with ever-married Jewish women aged 15 and up who declared a number of children ever born and distinguishes households in Israel and those in *Judea and Samaria* (settlements). In the 1995 dataset the Jewish settlements include the West Bank and Gaza Strip while the 2008 edition only includes settlements in the West Bank [2].

To capture fertility of Jewish women we used the number of children ever born (CEB) that ranges from 0 to 8 children or more. The Census data also allows us to control for age, family income, religiosity (measured with the number of years of schooling in a Yeshiva [3] either by the female respondent or her spouse), years of schooling, ethnic background, and female participation in the workforce.

Because the number of CEB is aggregated in the 5% sample and is of ordinal nature, it is best to use an *ordinal regression model*. We cannot make the assumption that the relationship between each pair or outcome group is the same. To free all variables from the proportional odds constraint, we fit a less restrictive *generalized ordered logit model* expressed as follows:

$$P(Y_i > j) = \frac{exp(\alpha_j + X_i\beta_j)}{1+[exp(\alpha_j + X_i\beta_j)]}, j = 1, 2, ..., M-1$$

where M is the number of categories of the ordinal dependent variable. Our analyzes are done using the *gologit2* package in STATA 12 written by Richard Williams from the University of Notre-Dame. It provides similar results to running a series of logistic regressions, where first it is category 1 versus all others, then categories 1 & 2 versus all others, then 1, 2 & 3 versus all others, etc. The probabilities that Y will take on each of the values 1, ..., M are equal to (Williams, 2006):

$$\begin{gathered} P(Y_i = 1) = 1 - g(X_i\beta_1) \\ P(Y_i = j) = g(X_i\beta_{j-1}) - g(X_i\beta_j), j = 2, ..., M-1 \\ P(Y_i = M) = g(X_i\beta_{M-1}) \end{gathered}$$

The actual values taken on by the dependent variable are irrelevant except that larger values are assumed to correspond to "higher" outcomes.

5 Preliminary results

The data from Table 1 provides demographic and socioeconomic characteristics of Jewish women living in Israel and the settlements of the West Bank and Gaza Strip in 1995 and 2008. The next figures show the results for the generalized ordered logit models for Israel and the settlements.

[2] Up until 2005, there were Jewish settlements in most Palestinian governorates of the West Bank and Gaza Strip. After this date, the settlements were dismantled due to international pressure

[3] A Yeshiva is a Jewish institution that focuses on the study of traditional religious texts, primarily the Talmud and Torah study.

Table 1: Characteristics of Jewish women living in Israel and the settlements in 1995 and 2008

		Israel		Settlements	
		1995	2008	1995	2008
Age	15-24	20.40	19.59	24.56	30.00
	25-34	17.45	18.14	26.39	24.00
	35-49	28.18	23.40	36.24	26.29
	50-69	22.15	25.90	10.20	16.81
	70+	11.82	12.97	2.61	2.90
Education	8 years or less	18.11	8.50	4.57	1.65
	9-12 years	48.86	42.08	48.15	37.37
	13 years or more	33.03	49.42	47.28	60.98
Work status	Do not work	43.35	39.66	28.21	30.72
	Work	56.65	60.34	71.79	69.28
Household monthly income	Less than 7,000 NIS	43.10	24.67	36.86	21.06
	7,000-9,999 NIS	19.34	13.23	20.72	12.75
	10,000 NIS or more	37.56	62.10	42.42	66.19
Region of birth	Israel	48.45	61.49	63.23	74.23
	Asia	10.19	4.86	4.51	1.89
	Africa	9.63	7.30	4.65	3.69
	USSR	29.06	23.27	20.09	13.51
	America/Oceania	2.67	3.08	7.52	6.69
Place of residence	Urban	83.65	77.93	0.00	26.35
	Rural	16.35	22.07	100.00	73.65
N		278,555	288,209	6,815	13,774

Source: Our calculations from the 1995 and 2008 Israeli censuses

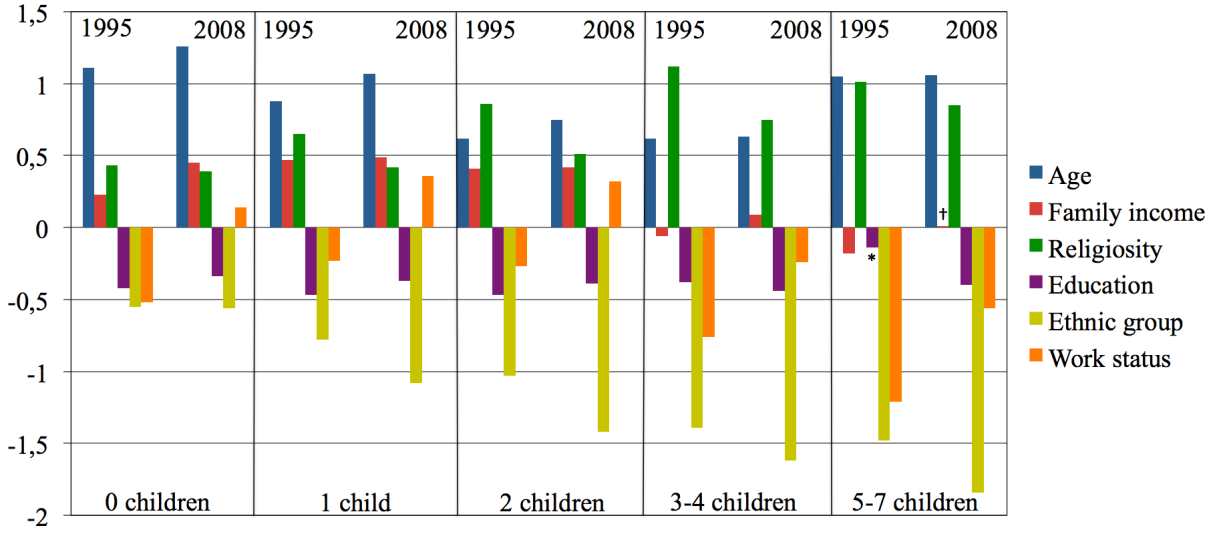
Table 1 indicates that the female Jewish population in the settlements is younger than in Israel. In 1995, 66% of the women living in Israel were of reproductive age (under 50) compared to 87% in the settlements. Women are generally more educated in 2008 than in 1995 and even more so in the settlements as 61% of women have a higher level of education compared t 50% in Israel. We can also notice that a higher proportion of women in the settlements participate in the labour force as they are about 10% more present on the market. Household incomes are also higher in the settlements, especially in 2008. The female population in Israel is also much more heterogeneous than in the settlements as about two thirds of the Jewish population of the settlements was born in the country compared to a little over half in Israel. There is a greater proportion of women who originate from Asia, Africa, and the USSR in Israel while more women in the settlements declared having been born in America or Oceania. Finally, even though the population of the settlements is becoming more urban, most of the population has been rural over the period while the population of Israel has always been predominantly urban.

Figure 2 shows that in Israel, ethnicity, more precisely not being born in Asia of Africa, has an important negative impact on fertility that increases with parity at all times. Its effect is not as clear or strong in the settlements. The effect of having had a higher education is also negative in Israel but its impact is not as strong as ethnicity. The situation in the settlements is different as it has a negative impact on fertility at first parities. Its impact becomes positive starting at the third child and up. A higher monthly family income also has a positive impact on fertility at first parities in Israel. The situation is reversed at the third parity and its effect is much less important. Family income also has a positive impact on fertility in the the settlements at all parities and its effect seems to be stronger.

The effect of work status seems to have changed over the period in Israel. Up until the second child, participating in the workforce had a negative impact on fertility in 1995 and a light positive one at the next census in 2008. At higher parities, the effect is more strongly negative in both census years. The effect of work status is less often significant in the settlements. Finally, a higher level of religiosity always has a positive impact on fertility at all parities and in both census years in both Israel and the settlements. In Israel, its positive effect becomes stronger at higher parities. Religiosity does not seem to be as important in the settlements.

At higher parities in the settlements, most demographic and socioeconomic variables no longer have a significant impact on fertility.

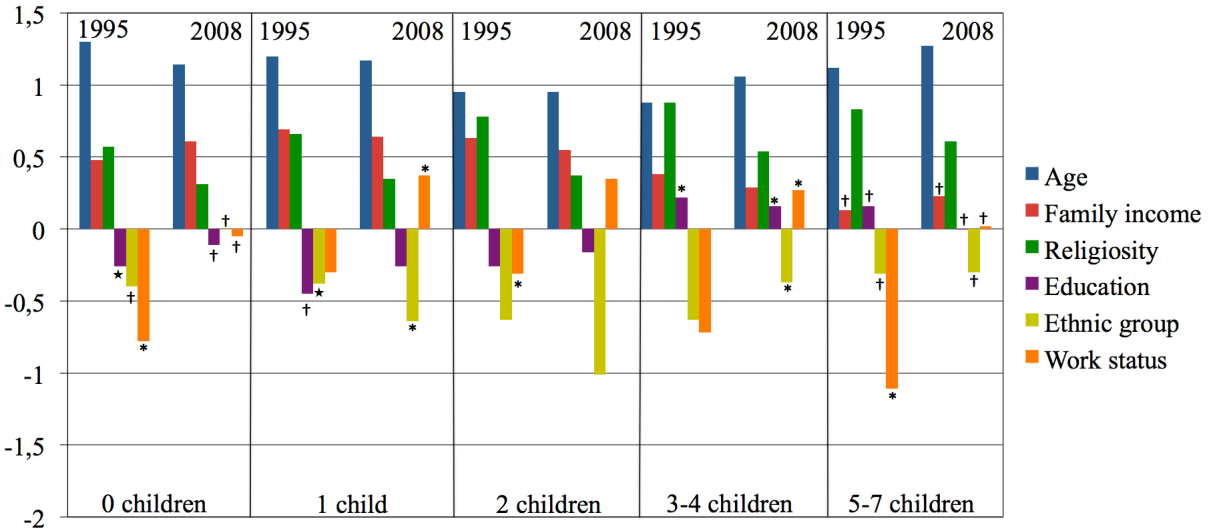
Figure 2: Coefficients of the Generalized ordered logit model for Israel, 1995 and 2008



Notes: All results are significant to the 0.001 level except for those with an * that are significant at the 0.01 level. Results with a † are non significant.

The different impact of these variables on fertility in Israel and the settlements as shown in Figures 2 and 3 confirm that the Israeli settlements in the West Bank and Gaza Strip should be studied separately as the drivers of fertility are clearly different.The very special context in which the settlements have been built and their emplacement in the Middle East lead us to believe that the usual factors used to explain fertility behaviour do no apply in the expected direction in this region of the world. For that matter, there is a need to understand fertility in a broader context and to take into account the potential contextual effects that may explain the high Israeli fertility in the settlements.

Figure 3: Coefficients of the Generalized ordered logit model for the settlements, 1995 and 2008



Notes: All results are significant to the 0.001 level except for those with an * that are significant at the 0.01 level and those with a ⋆ at the 0.05 level. Results with a † are non significant.

It is often said that to complete the fertility transition, one must reach replacement level. Jews in Israel and the settlements seems to have had a stable fertility of around 3 and 5 children per woman for quite a while now and is starting to show signs of the second demographic transition. Has fertility in Israel really stalled or has it reached a stable fertility level for the future?

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