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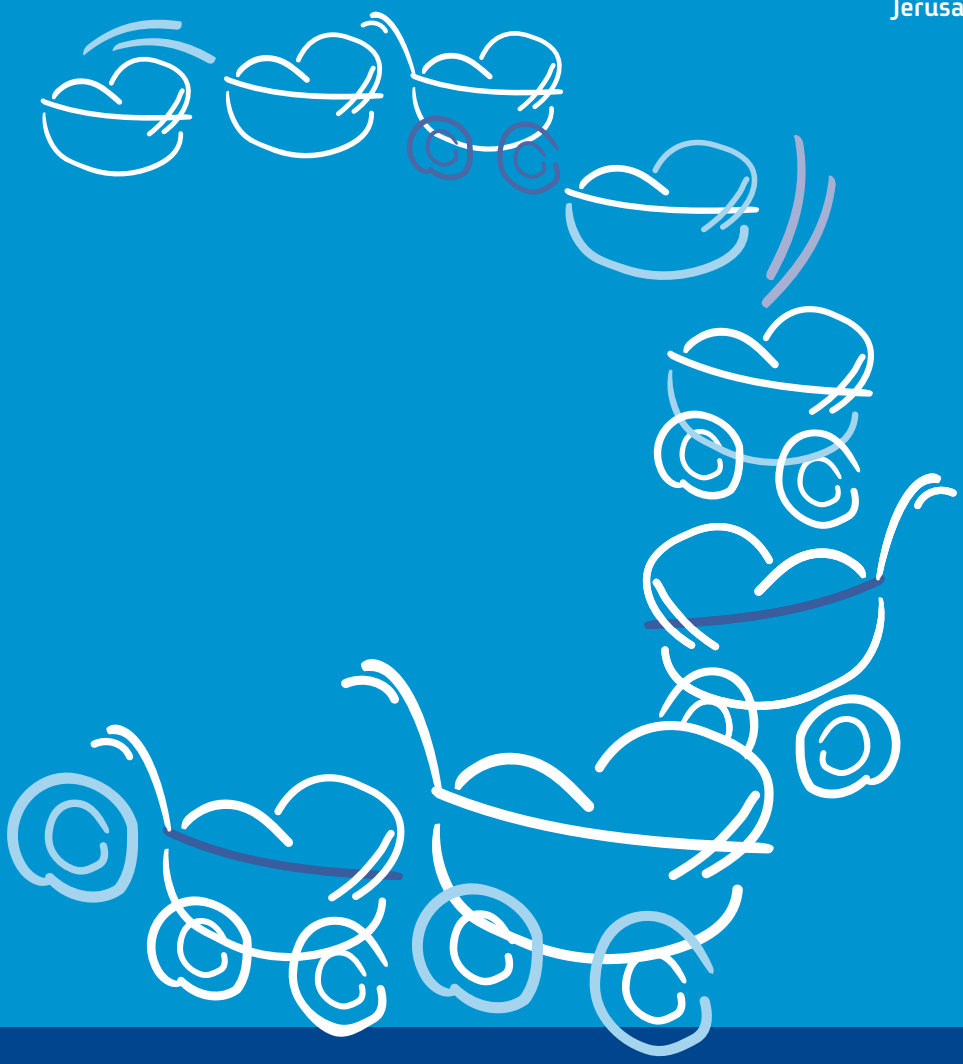

The Effect of Child Allowances on Fertility

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Working Papers **101**

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Abstract

This study examines the effect of child allowances in Israel on fertility in the years 1994–2007, with special reference to the cuts in allowances in 2003. Based on the administrative database of the National Insurance Institute and the significant changes in the allowances, it was found that the effect differed among population subgroups. The average high-order child allowances increased the probability of a married Arab woman giving birth by about 6–7 percent, and of a married ultra-orthodox Jewish woman doing so by about 3 percent. The allowance had no effect on other Jewish or Druze women, bringing the effect on the total population down to less than 2 percent. Older women, those with many children, with a low family income or who grew up in large families generally reacted more strongly to changes in the level of child allowances, *ceteris paribus*.

The study was carried out shortly after the cuts in child allowances, so it is unclear to what extent the resultant decrease in fertility will endure. Furthermore, the cuts took place close to turning points in the business cycle and to reductions in other social benefits, and the estimates may not fully reflect these factors.

A. Introduction

Child allowances are one of the main instruments used by governments to assist families in financing the cost of childrearing. Many Western countries with low birth rates have adopted policies to encourage fertility and to support households with children, such as child allowances, tax deductions/credits for children, grants at birth, paid maternity leave for an extended period, etc.

Fertility patterns have far-reaching effects on many economic variables, such as the stability of the pension system, fiscal policy (particularly, expenditures on health and education and transfer payments), household labor supply and welfare, etc. In short, fertility patterns have a major effect on economic growth.

One of the key questions that occupies economists and demographers is the extent to which financial incentives, including child allowances, affect fertility. Economic theory points to a positive relationship between the size of child allowances and fertility through positive substitution and income effects. However, in general, the empirical literature has found at most a weak positive effect. Research findings in Israel have been mixed. Beenstock (2007) in fact found that child allowances had a negative effect on fertility. Frish (2008) studied the Arab population and found at most a weak positive effect. In contrast, Cohen et al. (2007) identified a strong positive influence for all population subgroups while Schellekens (2007 and forthcoming) found this only among Jews.

During the last two decades, there has been major variation in the structure and size of child allowances in Israel. Thus, in the mid-1990s, the child allowance paid to non-Jews was raised significantly and in 2001 there was a major increase in child allowances for high birth-order children. Finally, in 2002–3 child allowances were cut sharply. In particular, in June 2003, the child allowance for a child born up until that point was gradually reduced while a child born after that point received a significantly smaller child allowance from the outset (equal to that for the first child, regardless of his birth order). As a result, the marginal child allowance (for the next child) in 2007 was lower by three-fifths in real terms than in 2000.

The present study focuses on the effect of child allowances on the fertility of all Israeli women during the period 1994–2007, with emphasis on the reaction to the cut in the child allowance in 2003. The significant variation in the structure and size of the child allowance facilitated the identification of its effect on fertility patterns.

The research population includes all women aged 15–44 during the period 1994–2007. The database, which is based on the administrative files of the National Insurance Institute, includes detailed information on the fertility patterns of the women, as well as their demographic and

socioeconomic characteristics. The research differentiated between various population subgroups – Jews and non-Jews, ultra-Orthodox Jews and traditional Arabs – that are characterized by different total fertility rates (TFR)[1] as a result of the differences in their beliefs, cultural norms and socioeconomic characteristics.

According to the main finding of the research, the size of child allowances during the period 1994–2007 had a positive though differential effect on fertility: The average child allowance for a high birth-order child raised the birth probability of a married Arab woman by 6–7 percent and that of an ultra-Orthodox woman by about 3 percent. There was no effect on non-ultra-Orthodox Jewish and Druze women; The overall effect of child allowances on the population as a whole was less than 2 percent.

In most cases, the size of child allowances had a stronger effect on the fertility of older women, women who already have a large number of children, women in low-income households and women who themselves grew up in large families, *ceteris paribus*. These same women also reduced their fertility to a greater extent following the cut in child allowances in 2003.

The study was conducted a relatively short time after the reduction in child allowances and individuals may still not have decided whether the change was permanent or transitory, particularly against the background of frequent changes in the child allowance. Therefore, it is unclear to what extent the sharp drop in fertility during the period 2004–7 will persist in the long run and thus lead to a decline in completed fertility since in the short run the decrease may – at least partially – reflect the postponement of births (spacing) until a more opportune time in the future.

The possibility cannot be ruled out that part of the decline in fertility in recent years was a reaction to the recession in Israel at the beginning of the decade and the recovery from it, as well as the weakening of the social welfare net, which made it more difficult for low-income families to finance the expenditure involved in childrearing. These factors were probably only partially reflected in the estimation's control variables. In addition, it is possible that long-run social, cultural and religious processes matured during this period, which resulted in a drop in fertility.

It should be emphasized that the study focuses on the effect of child allowances reductions on fertility even though there may also have been effects on mothers' labor supply, family

[1] TFR is defined as a woman's expected lifetime number of children if her fertility pattern was identical to those of all women of childbearing age in a given year (a synthetic cohort). This concept differs from *completed fertility*, which is the number of children actually born to a woman by the end of her childbearing years.

welfare, the health of the newborn (and therefore its life prospects), income inequality, etc. These issues are worthy of their own studies.

The rest of the study is organized as follows: Chapter B reviews the literature. Chapter C surveys the changes in the size of child allowances over the years. Chapter D describes the database and Chapter E presents descriptive statistics. Chapter F is devoted to the results derived from estimation of birth probability during the period 1994–2007. This is followed by the conclusion.

B. Survey of the Literature[2]

The pioneering theoretical models on the economics of the family and in particular fertility (Becker, 1960 and 1991; Becker and Lewis, 1973; and Willis, 1997) point to the expenditure on childrearing as one of the main factors in the determination of fertility. Child allowances and other forms of support reduce the costs of childrearing and increase fertility, thus reducing the marginal "price" of the next child (the substitution effect) and raising family income through the increase of child allowance to existing children (the income effect, under the assumption that children are a "normal good").

Since childrearing involves the investment of time, fertility is negatively related to the parents' value of time. In addition, parents with a high value of time are interested in "high-quality" children and will wish to have a smaller number of children as a result. Thus, there exists a positive correlation between poverty and fertility (for a survey, see Jones et al., 2008).

Since the development of the theoretical models, there has been substantial growth in the empirical literature on family fertility decisions and in the number of attempts to identify the substitution and income effects.

A number of studies have been carried out in Israel which examined the influence of child allowances on fertility. Mayshar and Manski (2003) showed that the average number of children born to an ultra-Orthodox mother of European/American origin (Ashkenazi) grew significantly as a result of the expansion of child allowances system in the 1970s and that there had been a moderate increase in the fertility of Bedouin[3] women in the South of Israel. Beenstock (2007) found that the size of the child allowance in fact had a weakly negative and significant effect on the probability of giving birth. Schellekens (2007 and forthcoming) showed that on average an increase of about $220 in the monthly child allowance for the

[2] A general description of the econometric methods can be found in Hotz et al. (1997).
[3] Traditional Moslem Arabs, some of whom are fully or partly nomadic and organized by tribe.

marginal Jewish child raised the probability of giving birth by between 3 and 14 percent while no effect was found among non-Jews.

Frish (2008) analyzed the effect of the equalization of child allowances for third and higher birth-order children on fertility in families that do not serve in the military (the treatment group) to those of families that do (the control group) during the period 1994–7. No increase in fertility was found among the Bedouin while among the Druze[4] there was an increase in the fertility of the treatment group relative to the control group (0.12 children in TFR).

Cohen et al. (2007) examined the relationship between the size of child allowances and fertility during the period 1999–2005, during which there had been a sharp reduction in child allowances. The study focused on the fertility of married women with at least two children (at least one of whom was of school age). The results showed a positive and significant relation between the size of the child allowance and fertility: The average marginal child allowance raises birth probability by 7.8 percent according to the preliminary version of the study and by 2.2 or 4.9 percent (depending on the model) in the updated version. The effect is more pronounced among the ultra-Orthodox Jews and Arabs and among low-income families (for further details, see Chapter F).

A number of studies worldwide have directly examined the relationship between child allowances and fertility. Milligan (2005) studied the effect of a generous child allowance in Quebec, Canada during the period 1988–97 by comparing fertility in Quebec to that in other provinces. He found that an increase of C$1000 per year in the child allowance led to an average increase of about 17 percent in fertility (elasticity of 0.107) and that the fertility of those eligible for the maximum child allowance rose by 25 percent.[5] Wang and Parent (2007) showed that fertility increased only in the short run and that at a later stage women reduced their number of births. Thus, completed fertility remained unchanged.

A number of Western European countries have been implementing policies to promote fertility for many years. Gauthier and Hatzius (1997) found that in the industrialized countries an increase of 25 percent in government support for children during the 1970s and 1980s raised total long-run fertility by about 4 percent. Buttner and Lutz (1990) found that there had been a large increase in birth rates in East Germany following a significant lengthening of maternity leave. In Sweden, Bjorklund (2006) found that a policy to promote fertility had a positive effect.

[4] Members of a traditional religious sect that broke away from Shiite Islam.

[5] The average annual family income for a couple with children was about C$51 thousand in 1996 (ibid., footnote 7). The maximum child allowance came to C$8 thousand over five years for the birth of a third or higher birth-order child.

A large number of studies in the US and other developed countries investigated the relationship between transfer payments and fertility.[6] Welfare programs, and in particular Aid to Families with Dependent Children (AFDC), have received a great deal of attention, particularly in cases where the level of support is dependent on the number of children in a family (Family Cap). In general, a positive relation was found in these studies (Acs, 1996; Fairlie and London, 1997; Grogger and Bronars, 2001; Camasso, 2004; and Jagannathan et al., 2004). In cross-section studies of US states, transfer payments were either found to have no effect on fertility (Kearney, 2002 and Levine, 2002) or a negative effect (Joyce et al., 2004 and Horvath-Rose and Peters, 2008). The results were highly sensitive to the methodology used (for a summary of the findings, see Moffitt, 1998 and Joyce et al., 2002).

A few studies examined the effect of a child tax credit or deduction. Some of the studies found a positive and relatively strong reaction (Whittington et al., 1990; Whittington, 1992; Zhang and Meerbergen, 1994; McNown and Ridao-Cano, 2004; and Ridao-Cano and McNown, 2005) while others found only a weak reaction (Baughman and Dickert-Conlin, 2003, 2007). Laroque and Salanie (2008) found that in France tax benefits for children have a sizable positive effect on fertility. For example, a tax benefit of 150 euro per month per child (at a total annual cost of 0.3 percent of GDP) is expected to raise total fertility by 0.3 children.

C. Child allowances in Israel

Child allowances are paid to all families in Israel with children up to the age of 18, regardless of their income. Following is a survey of the main changes in child allowances legislation in chronological order during the period under study.

During the period 1994–1997, the distinction between "military veteran" (including Jews who had received an exemption from military service) and others (the vast majority of whom were Arabs), which was used to determine the size of child allowances for many years, was gradually eliminated and as a result the child allowance for the latter group increased considerably.[7]

[6] Direct identification of the income effect on fertility is problematic due to the endogeneity of earnings and the number of children. Black et al. (2008) solved this problem by showing that the first oil crisis in the 1970s, which significantly improved the incomes of American coal miners, led to a moderate increase in that group's fertility.

[7] As an illustration, prior to the change in legislation in December 1993, the child allowance of a "military veteran" for the third (sixth or above) child stood at NIS 383 (672) per month in average 2007 prices as compared to NIS 240 (240) for other children.
The New Israeli Shekel (NIS)/dollar exchange rate stood at 4.108 in 2007 and the average wage per employee stood at about NIS 7.7 thousand per month.

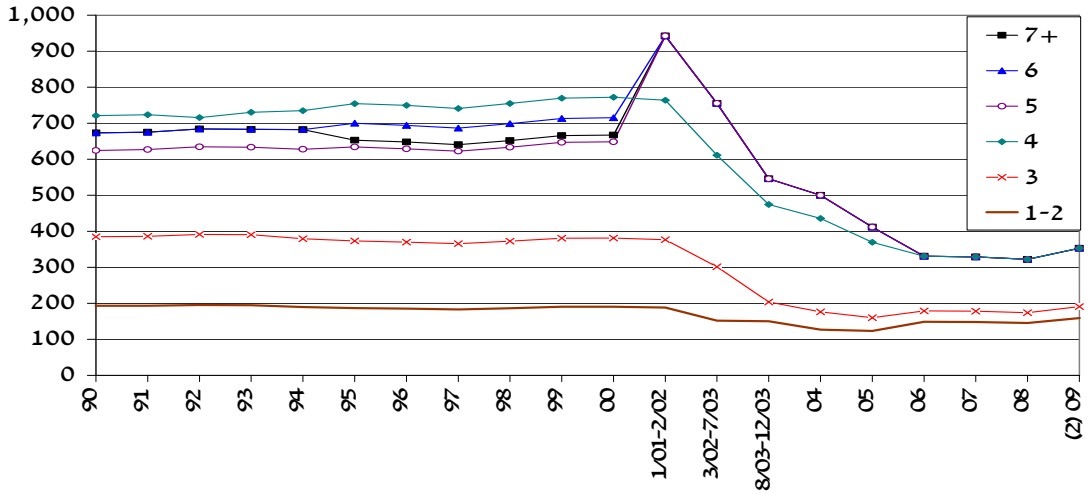
In January 2001, the child allowance was increased significantly for the fifth and above child (see Figure 1). Thus, for example, the child allowance for a family of seven children grew from NIS 3,558 in December 2000 to NIS 4,415 in January 2001 (in 2007 prices) (see Figure 2). As a result, the ratio of the child allowance to the poverty line for such a family rose from about 43 percent to about 51 percent (see Figure 3).

During the years 2002-3, a reform of welfare policy was carried out which resulted in child allowances being cut drastically. The most dramatic change in the structure of the child allowance took place in June 2003, whereby the allowance for a child born up until June 2003 was gradually reduced while the allowance for a child born after June 2003 was immediately reduced to that for a first child, regardless of his birth order.

The changes in legislation since the beginning of the decade led to a large reduction in the size of the child allowance for the third child and up (in 2007 prices). Thus, for example, the allowance for a seventh child born before June 2003 fell from NIS 666 at the end of 2000 to NIS 353 per month in 2009. The allowance for a child born after June 2003 was reduced immediately to NIS 151 per month (the amount paid to the first child). The total child allowance received by a family with seven children born before June 2003, which stood at NIS 3,558 per month at the end of 2000 (about 43 percent of the poverty line), dropped to NIS 1,755 per month at the end of 2007 (19 percent of the 2007 poverty line) and to NIS 1,016 if all the children had been born after June 2003.

Figure 1. Child allowances[1] according to birth order

(NIS per month in average 2007 prices)



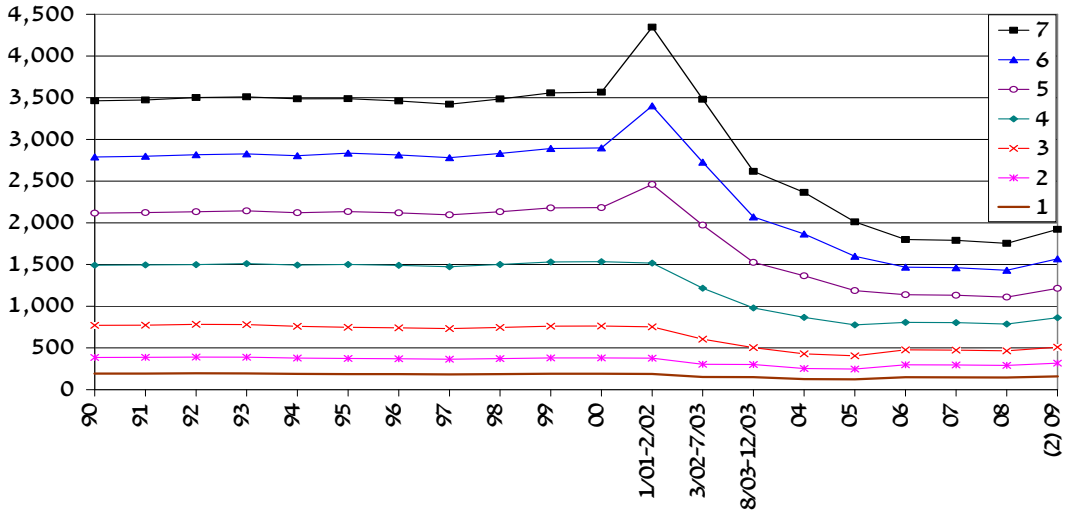
Source: National Insurance Institute and calculations by the authors.

1) Includes child allowances to "military veterans". Children born up until June 2003; children born after that receive the same allowance as a first (and second) child regardless of birth order.

2) On the assumption that the CPI in 2009 will equal that in 2008.

Figure 2. Child allowances[1] per family, according to number of children

(NIS per month in average 2007 prices)

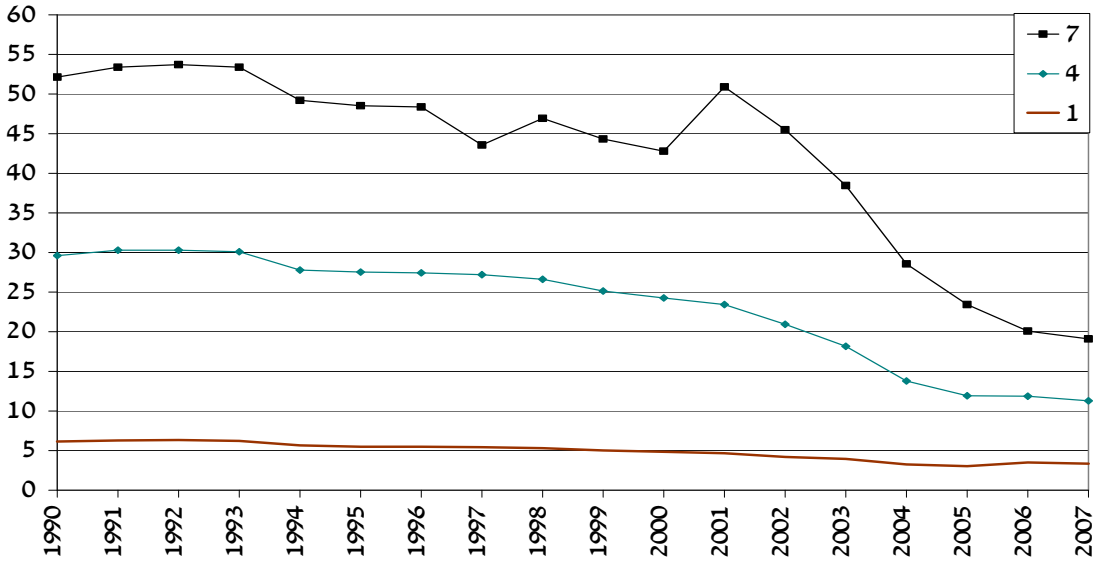


Source: National Insurance Institute and calculations by the authors.

1) Includes child allowances to "military veterans". Children born up until June 2003; children born after that receive the same allowance as a first (and second) child regardless of birth order.

2) On the assumption that the CPI in 2009 will equal that in 2008.

Figure 3. Child allowances[1,2] per family relative to the poverty line, according to number of children[3] (percent)



Source: National Insurance Institute and calculations by the authors.

1) Includes child allowances to "military veterans".

2) For children born up until June 2003.

3) The relative poverty line (defined as half of median per capita disposable income) as calculated by the National Insurance Institute per family with two adults and the number of children as appears in the figure.

D. The database

The database includes all Israeli women born during the period 1950–95 since the goal is to track fertility patterns for women aged 15–44 from the mid-1990s until the end of 2007. The research population totaled about two million women.

Demographic characteristics of the women and of their husbands and children since 1950 were obtained from the Population Register and include date of birth, country of birth, date of immigration, family status, ethnic group, place of residence and zip code and date of death. The rest of the data was taken from administrative files of the National Insurance Institute. Employment and labor income data for the women and their husbands was constructed for each of the years 1993–2007 and included employment status (employee/self-employed), months worked and gross annual salary or gross self-employed income. Data on annual transfer payments to the family for each of the years since 1990 was also collected, including child allowances, income supplements, general disability benefits, alimony and survivors benefits.

We also identified the following statuses for each woman and her husband since 1968: completed compulsory military service/National Service, studied in yeshiva and studied in an ultra-Orthodox seminary. This information was used to identify the ultra-Orthodox Jewish population, as will be described below.

E. Descriptive statistics

The total fertility rate (TFR) for various groups in the population is presented in Table 1 and Figure 4. TFR is defined as the expected average number of children for a woman during the course of her lifetime if her fertility pattern were identical to those of all women of childbearing age in a given year (a synthetic cohort). Distinctions were made between various population subgroups according to ethnic group and fertility patterns. Among Jews, differentiation was made between the ultra-Orthodox and others; among non-Jews, differentiation was made between Bedouins in the South of Israel and in the North, Arabs in East Jerusalem, other Arabs (it was not possible to differentiate between Moslems and Christians) and Druze.

Ultra-Orthodox women generally attend an ultra-Orthodox seminary during and immediately following high school and most ultra-Orthodox men study in a yeshiva for an extended period and do not serve in the army. Therefore, an ultra-Orthodox woman was defined as one who has studied in an ultra-Orthodox seminary and/or whose husband has studied in a yeshiva and did not serve in the army (or only served one year or less). Also included in the definition were

women with the following relatives who were defined as ultra-Orthodox according to the aforementioned definition: at least two siblings, a father and/or mother and at least two children, as well as a woman whose husband has two such relatives.[8]

Table 1. Total fertility rate before and after the cut in child allowances in 2003

Source: National Insurance Institute and calculations by the authors.

Population subgroup (proportion of women aged 15-44 in 2007, %)		1996-1999	2001-2002	2006-2007	First difference	Second difference
		(1)	(2)	(3)	(3)-(2)	[(3)-(2)] less [(2)-(1)]
Jews	Ultra-Orthodox (7.3)	7.50	7.24	6.74	-0.51	-0.25
	Others (72.1)	2.22	2.13	2.20	0.07	0.02
Arabs	Bedouins – South (2.2)	7.08	6.76	5.62	-1.14	-0.82
	Bedouins – North[1] (0.7)	4.06	4.04	3.25	-0.79	-0.77
	Jerusalem (3.4)	4.05	3.97	3.56	-0.41	-0.34
	Other (12.4)	3.71	3.70	3.08	-0.62	-0.61
Druze (1.8)		3.30	2.85	2.52	-0.34	0.11
Total (100.0)		2.81	2.78	2.77	-0.03	0.03

1) Arab women living in the following villages: Aramsha, Basmat Tab'un, Bir El-Maksur, Bu'eine-Nuyeidat, Demeide, Hamam, Hussniyya, Ibtin, Ka'abiyye-Tabbash-Hajajare, Kamane, Khawaled, Mansiyyet Zabda, Rumat Heib, Sallama, Sawa'id (Hamriyye), Shibli-Humm Al-Ghanam, Tuba-Zangariyye and Zarzir.

Table 1 and Figure 4 show that TFR among the ultra-Orthodox Jews declined up until the early 2000s (to 7.2 children), just prior to the sharp cut in the child allowance. Subsequently, there was a clear drop in TFR (first difference) to 6.7 children in 2006–7, which was below the rate predicted by its downward trend (second difference). Among non-ultra-Orthodox Jewish women, whose TFR was only a little over two children, fertility remained constant and even rose slightly during the period following the cut in child allowances.

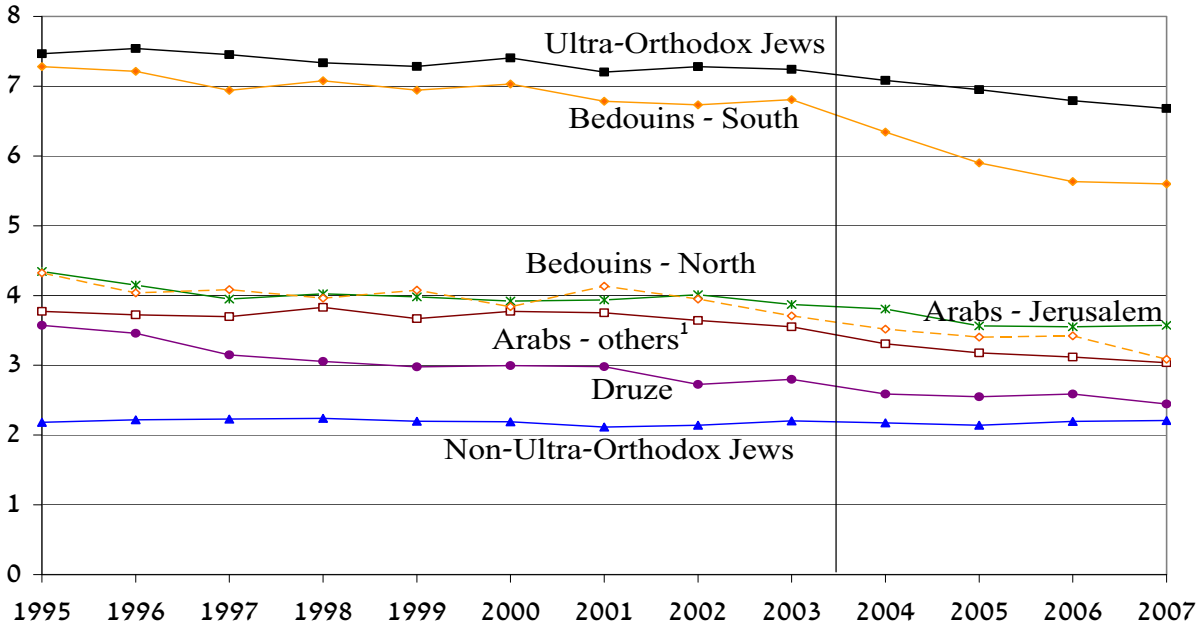
The decline in fertility among the Bedouin in the South was of a much larger magnitude. Thus, while prior to the cut in child allowances TFR among the Bedouin stood at about seven children (after a long period of decline), following the cut it declined sharply and during the years 2006–7 reached 5.5 children, which was well below its trend. There was a drop in fertility also among Bedouins in the North but it was consistent with the trend that had already appeared in 2002–3. The lion's share of Arabs in Jerusalem are Moslem Palestinian residents

[8] Other definitions of an ultra-Orthodox woman were examined but the research results were not particularly affected. The most commonly used alternative is a narrow definition by which a Jewish woman is ultra-Orthodox if she has studied in an ultra-Orthodox seminary and/or her husband has studied in a yeshiva and did not serve in the army (or only served one year or less).

who are eligible for child allowances. Although their total fertility declined slightly (to about 3.9 children) prior to the cut in child allowances in 2003 – which is likely explained by the difficult economic conditions as a result of the Palestinian uprising (the Second *Intifada*) – there was a clear drop in fertility (to a level of 3.6 children in 2006–7) during the subsequent period. Among other Arabs (non-Bedouin Israeli citizens), there was a moderate decline in fertility from 2002 onward, though in 2004 it increased in intensity. Finally, among Druze, there was no clear change in the downward trend in TFR, which in any case is at a low level and is approaching that of non-ultra-Orthodox Jews.

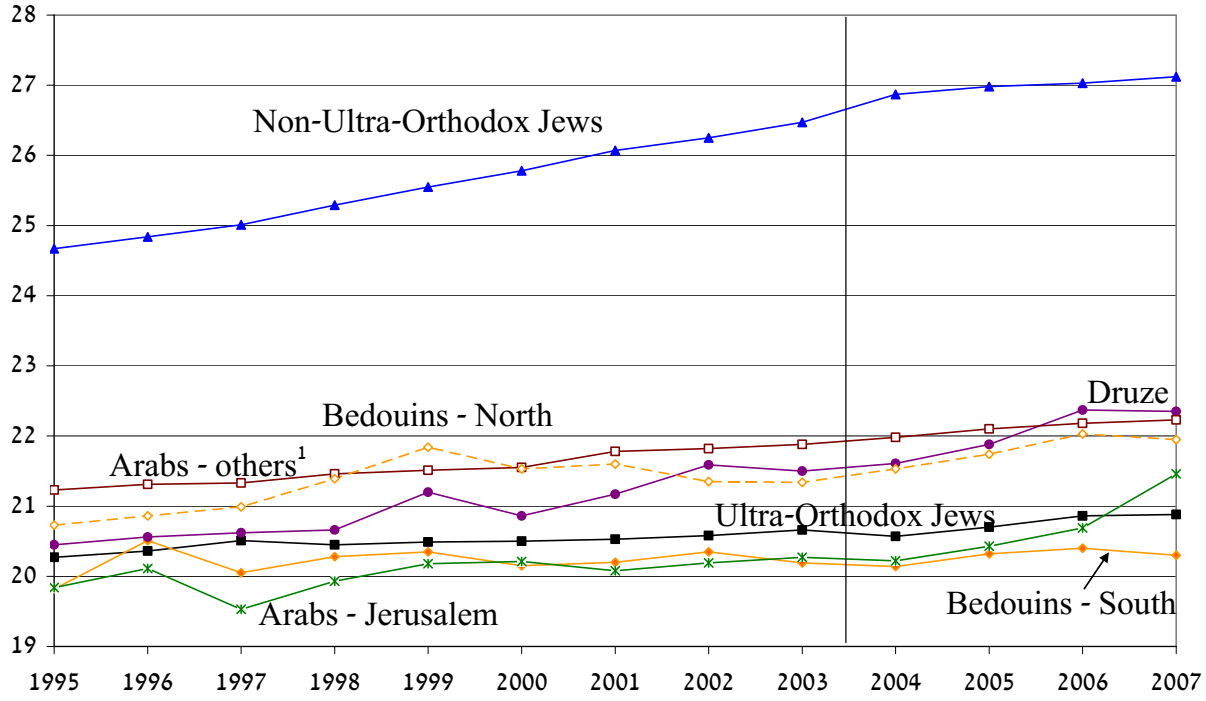
Fertility is influenced by, among other things, age at marriage, particularly in the religious and traditional communities in which, with few exceptions, women do not give birth outside of marriage. Therefore, an increase in the age at marriage can be expected to reduce total fertility in those communities. Figure 5 presents the median age at first marriage according to the various population subgroups. It can be seen that during the period 2004–7, there was a slight increase in the median age at marriage among the ultra-Orthodox Jews, a significant increase among Jerusalem Arabs, Bedouins in the North and Druze and a continuation of the upward trend among other Arabs. The long-run upward trend in the age at first marriage among non-ultra-Orthodox Jewish women leveled off during this period.

Figure 4. Total fertility rate according to ethnic group, 1995–2005



Source: National Insurance Institute and calculations by the authors.
1) Arab women other than Bedouins or Jerusalem residents (also not including Druze women).

Figure 5. Median age at first marriage according to ethnic group, 1995–2007



Source: National Insurance Institute and calculations by the authors.
1) Arab women other than Bedouins or Jerusalem residents (also not including Druze women).

We now focus on two population subgroups with especially high fertility rates: the ultra-Orthodox Jews and Bedouins in the South.

The main explanation for the high rates of fertility among the ultra-Orthodox is the Biblical commandment of "Be fruitful and multiply". Other explanations include the expansion of the child allowance system during the 1970s, the exemption of the ultra-Orthodox from military service if they are studying in a yeshiva and not working, the financial support provided to yeshiva students and apparently the growth in the ultra-Orthodox movement. Berman (1999, 2000) suggested an explanation based on the club model, according to which the meticulous observance of the commandments, including studying in a yeshiva and having a large family, reinforces the family's status in the community since it provides evidence of, among other things, the willingness to make sacrifices and to be satisfied with one's lot.

The high fertility rates in Bedouin society have three sources (according to Meir and Ben David, 1994 and Ben David, 2004): religious, economic and sociopolitical. According to the prevailing attitude in Islam, fertility is determined by the will of God and should not be regulated, an attitude which is particularly prevalent among the rural population. From an

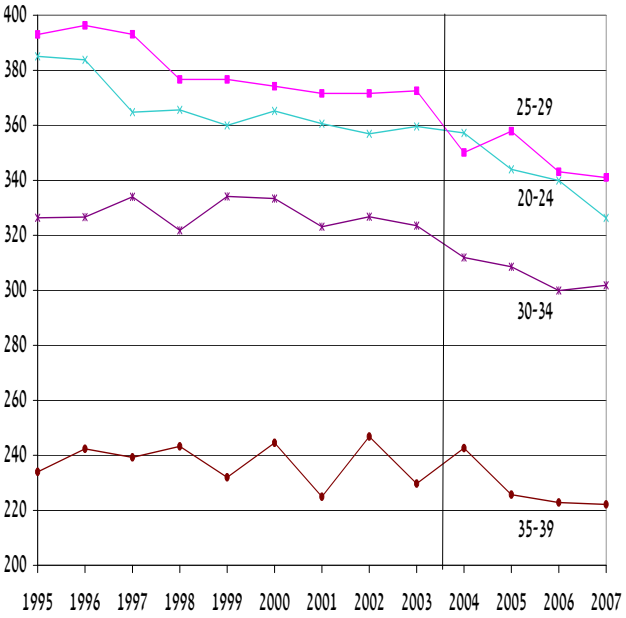
economic viewpoint, children in a nomadic society help in tending the flocks and in the household chores; they are eligible for the child allowance and as adults take care of their parents. Thus, children can be viewed as a source of income while the costs of bringing them up are relatively low. Since a woman joins the family of her husband and does not support her parents, having a large family ensures that there will be enough sons to take care of the parents in old age. From a sociopolitical viewpoint, the Bedouin are organized according to clans and tribes and therefore the size of the group partly determines its power (as expressed in its extent of control in the community, its advantage in the settling of conflicts, the creation of networks, municipal leadership, etc.). In this study, differentiation was made between Bedouins in the North of the country and those in the South since the latter community is much more traditional and their fertility rates are significantly higher.

The reduction in child allowances in 2003 was larger for high birth-order children and therefore it is of interest to examine how the fertility of the ultra-Orthodox and the Bedouin according to age behaved over time. One would expect that older women, who in general already have a number of children, will be more affected by the sharp reduction in the marginal child allowance and in any case the reduction in income for a large family is significantly greater for them than for younger families with fewer children. Figure 6 indicates that the age-specific fertility rates for the ultra-Orthodox declined for all age groups following the reduction in child allowances, except among younger women and among older women, who in any case are near the end of their lifetime fertility. A similar pattern can be observed among the Bedouins in the South (Figure 7).

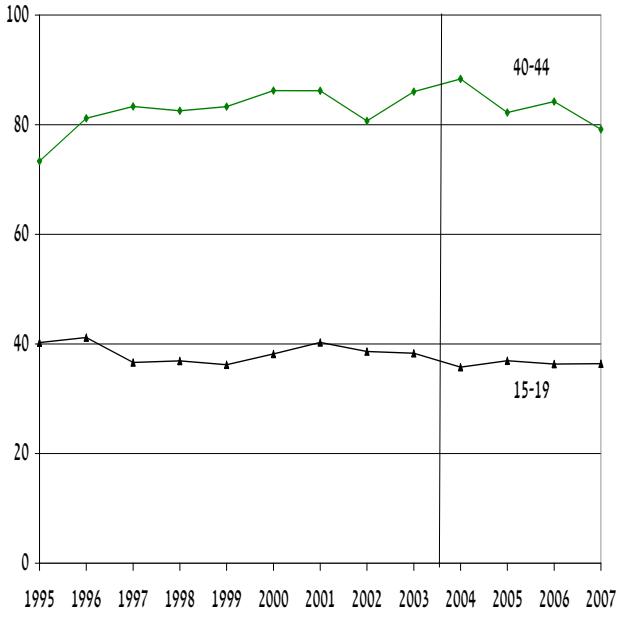
Figure 6. Age-specific fertility rates among the ultra-Orthodox Jews, 1995–2007

(births per thousand women)

a. aged 20-39



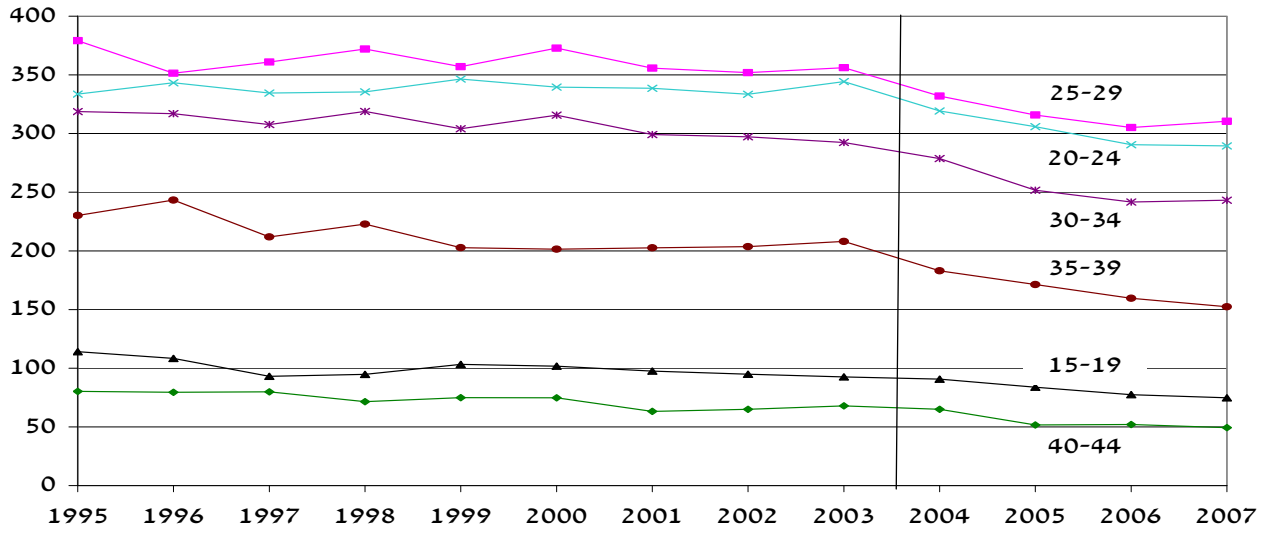
b. aged 15-19, 40-44



Source: National Insurance Institute and calculations by the authors.

Figure 7. Age-specific fertility rates among Bedouins in the South, 1995–2007

(births per thousand women)



Source: National Insurance Institute and calculations by the authors.

The effect of the reduction in child allowances on fertility is likely to have had a differential impact according to household income since for low-income earners the child allowance constitutes a larger proportion of family income.

Trends in fertility were examined for women who were already married in the year 2000 and subsequently, according to their husband's labor income that year. The choice of the year 2000, prior to the large reduction in child allowances, was intended to reduce the endogeneity of labor supply and fertility. For the same reason, the analysis focuses on the husband's income rather than the woman's. The husbands in each age group were divided into three equal groups according to their gross labor income in 2000, and the higher and lower groups were selected. The division was made for each age group since labor income changes over an individual's lifetime.

Figure 8 presents TFR for women aged 25–44[9] according to the husband's income for three sufficiently large groups with high fertility rates: the ultra-Orthodox Jews, Bedouins in the South and other Arabs (who are not Bedouins, Jerusalem Arabs or Druze). The results show that TFR is higher among low-income individuals and, contrary to what one would expect, fertility declined after the reduction in child allowances to the same extent among both high- and low-income earners (fertility among low-income earners fell by a greater extent only among Bedouins in the South).

The above results should not in fact be attributed to the income effect since the husband's income may be evidence of his level of religious observance. Thus, for example, one can surmise that ultra-Orthodox men with relatively high incomes are less religious than low-income earners, who tend to remain in yeshiva for extended periods. Evidence of this can be found in Figure 9, which presents the changes in TFR for women aged 25–44 according to number of siblings,[10] an indicator of the parents' fertility patterns which is negatively correlated with the income of the women and their families. TFR among the ultra-Orthodox and other Arabs increases with number of siblings (which constitutes additional evidence of the effects of culture, religion and the like) and in both cases fertility declined by the same extent following the reduction in child allowances.[11]

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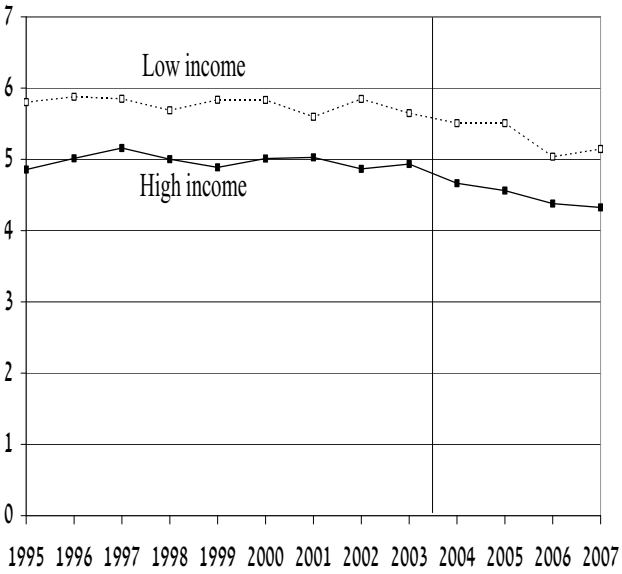
[9] The fertility rates of women under the age of 25 were not included due to the requirement that the women be already married in the year 2000.

[10] The fertility rates of women under the age of 25 were not examined since it was required that in 2007 their mothers had completed their lifetime fertility. Bedouin women in the South are not included in the analysis since there was no data on number of siblings for many of them in the Population Register.

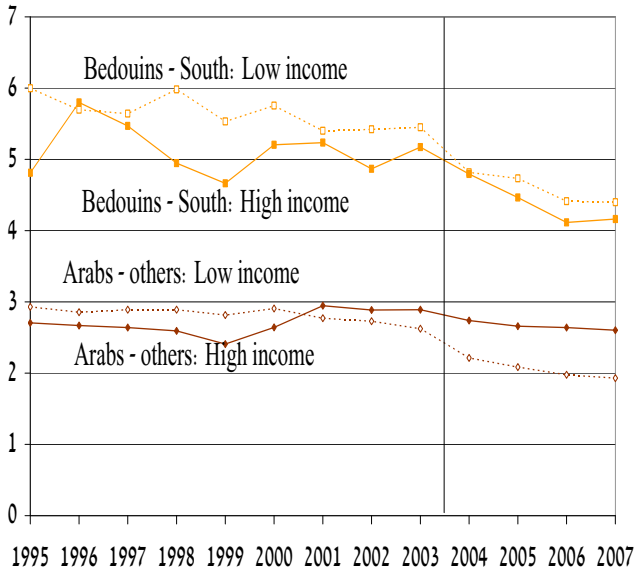
[11] Beenstock (2007)'s estimation results indicated that the number of siblings has a strong positive influence on fertility rates in Israel, as do the results of the present research presented below.

Figure 8. Total fertility rates for women aged 25–44[1] according to husband's income,[2] 1995–2007

a. Ultra-Orthodox Jews

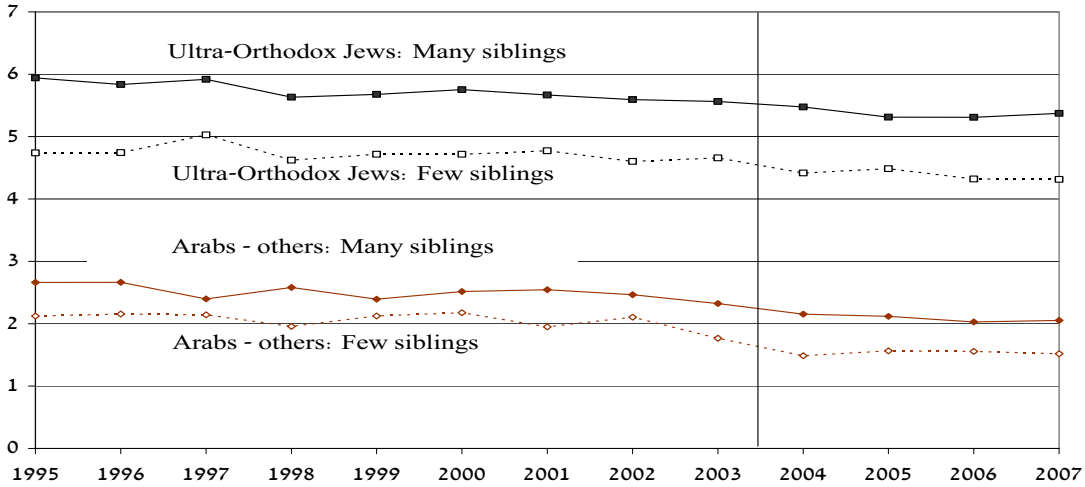


b. Bedouins (South) and Arabs (others[3])



Source: National Insurance Institute and calculations by the authors.
1) Women who were already married in the year 2000 and subsequently.
2) Husband's gross annual labor income in 2000, whether salaried or self-employed.
Low income – in the lower third of the distribution of income for men in the same ethnic group and born in the same year. High income – in the upper third of the distribution.
3) Arab women who are not Bedouins or Jerusalem residents (not including Druze either).

Figure 9. Total fertility rates for women aged 25–44 according to number of siblings,[1,2] 1995–2007



Source: National Insurance Institute and calculations by the authors.
1) Number of siblings in 2007 when their mothers were aged 43 or older and the vast majority had completed their lifetime fertility.
Few siblings: women in the lower third of the distribution of number of siblings by ethnic group. Many siblings: women in the upper third of the distribution.
2) Arab women who are not Bedouins or Jerusalem residents (not including Druze either).

F. Estimation results

This chapter presents the results for the estimation of birth probability during each of the years 1994–2007 using binary logit estimation. It should be noted that since an average pregnancy is 38 weeks long and about one-half of women conceive within three months of making the decision to do so, the period of time from the moment of the decision to conceive until the birth is about one year. Therefore, the explanatory variables in the estimation are in general lagged by one year.

The main explanatory variable used in the various estimation equations is the size of child allowances (in annual terms). Various indexes were considered for the size of the child allowance, such as the child allowance for high birth-order children – the fourth or seventh child – and the marginal child allowance for the next child (as in Cohen et al., 2007). The child allowance for the fourth/seventh child reflects the long-term perspective of families who are planning to have the number of children that is prevalent in their population subgroup, where the child allowance for the seventh child is the marginal child allowance for high birth-order children. In any case, there is a close similarity between the three indexes and therefore we focus on the child allowance for the fourth/seventh, for which the estimates had the highest levels of significance. Another possibility was to use the proportion of family income from child allowances, which should provide an indication of the income effect; however, it is closely correlated with number of children in a household, which in any case is included as an explanatory variable in all the estimation equations, and therefore it was not used.

Another possible index is the capitalized value of the child allowance for the next child from the date of his birth until he reaches 18 (as in Cohen et al., 2007), the calculation of which requires the age of each child in the family. Although this index takes into account the present value of the child allowance (in contrast to the contemporaneous child allowance), which is important in evaluating the family's wealth and future income, it has a number of disadvantages: a. Individuals need to implicitly assume that the child allowance will not change over time, which is hardly a reasonable assumption given the frequent changes in the size of the child allowance. b. Many individuals do not perform complicated present value calculations or are unable to do so and in addition the discount rate is liable to differ according to the family's preferences regarding number of children. c. There is a positive correlation between the age of the woman and the age of her children, such that the present value of the child allowance is correlated with the age of the woman. Since the age of the woman itself influences fertility, the present value estimator of the child allowance may be biased. In view

of these disadvantages, present value was not used as an index of the size of the child allowance.

Before estimating the effect of child allowances on fertility, it is of interest to examine the trend in fertility over the years. Table 2 presents the estimates of dummy variables for each of the years 1994–2006 relative to 2007 or alternatively a dummy variable for the period following the cut in child allowances (2004–7).

In each of the population subgroups (apart from non-ultra-Orthodox Jews), the probability of birth has fallen over the years. This became even more pronounced following the reduction in child allowances, particularly among the Bedouins in the South. Among non-ultra-Orthodox Jews, there was in fact an increase in the probability of birth in all the years. The estimates of the dummy variable for the period 2004–7 point to a sharp decline in fertility during this period, while among non-ultra-Orthodox Jews and Druze there was no significant change beyond that predicted by the trend.

Table 3 presents the effect of the *size of child allowances* and the control variables on the probability of *married* women giving birth, according to population subgroup. It is worth mentioning that the estimates for the child allowance for *all* women are similar to those for only married women (see Table A1 in the appendix). An exception is the case of non-ultra-Orthodox Jewish women for whom the estimates are significant and positive in the case of married women and are not significant for all women. Therefore, the case of non-ultra-Orthodox Jewish women will be deferred until the end of the chapter.

The last line of Table 3 presents the change in birth probability for a woman who receives the average child allowance in comparison to one who does not receive any allowance.[12] Following is the effect of child allowance for each subgroup: Arabs (not including Bedouins, Jerusalem Arabs and Druze) – more than 7 percent; Bedouins and Jerusalem Arabs – about 6 percent; and the ultra-Orthodox – about 3 percent.

The effect of the child allowance on the fertility of the Druze was not significant. Separate estimations for distinct groups according to geographic location and for all Druze women, including unmarried ones, did not detect any significant effect either. A similar result was found for the changes in fertility patterns during the period 2004–7 relative to the preceding

[12] In the logit estimation, the marginal effect of child allowances on birth probability, in percentage points, is calculated as follows: $\frac{\partial E(birth)}{\partial CA} = P(1-P)\beta\overline{CA}$ where CA is the child allowance ($\overline{CA}$ is the average child allowance), P is the average birth probability and β is the estimated coefficient for the child allowance variable. The change in birth probability in percent is obtained by dividing the marginal effect by the average birth probability.

years (Table 2). These findings are consistent with the trend in fertility among the Druze (see Figure 4) and with the fact that a Druze woman gives birth to less than three children on average, such that the size of child allowances is in any case expected to have only a small influence on her fertility pattern.

Table 4 presents a sensitivity analysis of the effect on fertility for various child allowances, i.e. the fourth child, the seventh child and the marginal child. It appears that although there are certain differences in the estimates for the various child allowances for each population subgroup on its own, the general picture remains unchanged. Thus, the ranking of the various population groups according to the magnitude of the effect of child allowance on the fertility of married women is as follows (in descending order): Arabs, Bedouins in the South, Jerusalem Arabs, Bedouins in the North and the ultra-Orthodox, who trail well behind the others.

A comparison of the estimated effect of the reduction in child allowances during the period 2004–7 to that of the dummy variables for that period[13] (Table 4) indicates that the reduction explains a major portion of the decline in fertility. This conclusion is reinforced by Figure 10 which shows that most of the decline in the fertility of non-Jews (apart from the Druze) during the period 2004–7 occurred as a result of the reduction in child allowances.

The following demographic factors increased the fertility rates of married women, as one would expect (Table 3): getting married in the previous year (except among non-ultra-Orthodox Jewish women), giving birth in the previous year and having only daughters (except among the ultra-Orthodox). Being employed and a high wage increase fertility among ultra-Orthodox Jewish women, *ceteris paribus*, which may be explained by the need to provide income, particularly if the husband does not work which is an indication of strict religious observance and therefore preference for many children.[14] In Arab society, being employed and a high income reduce the probability of giving birth since this apparently reflects a modern lifestyle. The size of the income supplement positively affects fertility among all population subgroups (apart from the ultra-Orthodox)[15] since it is an indicator of a poor household that is usually characterized by a tendency towards large families. Receipt of alimony reduces fertility since it indicates a divorce in the past and apparently a lack of support from the ex-husband in

[13] For the estimation equations in which the child allowance was replaced by dummy variables for the years 2004–7 as explanatory variables.

[14] Since being employed and income (for both the women and their husbands) are liable to be endogenous to fertility, even when they are lagged by a year, these variables were estimated with a longer lag and as multi-year variables for the various population subgroups. However, there was no change in the estimated effect of child allowance.

[15] Only a small minority of the ultra-Orthodox receive an income supplement since many of the yeshiva students receive support from the State, for which we do not have data.

childrearing. The disabled have fewer children, *ceteris paribus*. The husband's age has a positive but decreasing effect on fertility rates, given the age of the woman. The higher the husband's wage, the lower will be fertility since it is an indirect indicator of level of education/modern lifestyle and apparently a lower level of religious observance as well.

Cultural variables also affected fertility in the expected direction. Thus, the number of a mother's siblings is positively correlated with fertility and among the ultra-Orthodox so is the TFR in the zip code area since these are indicators of the level of religious observance.

The national rate of unemployment had no significant effect on fertility (apart from a negative effect among the Druze) and a similar results was found in separate estimations (not presented), in which the real change in GDP was included.

Two variables, among others, that may contribute to the explanation of fertility were not included in the estimations: age at marriage and the woman's education. Age at marriage can have conflicting effects on fertility. Thus, on the one hand, marriage at a young age is likely to indicate a traditional lifestyle, which implies a tendency towards a large number of children, while on the other hand marriage at a later age increases the birth probability of married women given a fixed number of desired children. However, it is possible that age at marriage itself is dependent on the size of child allowances, particularly in traditional societies (such as the ultra-Orthodox Jews and Arabs), in which deferring marriage is one of the methods of birth control.

We do not possess information on the woman's education (although employment status and wage level are usually highly correlated with education). Therefore, the proportion of high school graduates among all women in a population subgroup and birth cohort (obtained from the Labor Survey) was attributed to each non-Jewish woman (hereafter referred to as average level of education).

The results of the estimations that included age at marriage and average education (not presented) indicated that the birth probability for married women increases with age at marriage. In contrast, the effect of average education on fertility was not significant, apparently because the proportion of high school graduates has increased over the years and this is already reflected in the estimated trend that is part of the baseline estimation. In any case, the data in Table A2 indicate that the estimated effect of child allowances is in general greater when age at marriage (and average education) is included in the estimation; however, it should be remembered that age at marriage may be dependent on the size of child allowances, an issue that deserves further investigation.

The next stage of the research examined the question of whether the decline in fertility during the period following the reduction in child allowances varied according to the woman's socioeconomic characteristics (Table 5).

The decline in fertility among the *ultra-Orthodox Jews* did not vary with the age of the woman nor with the number of children, which tends to indicate that this is not just a matter of increased spacing since women towards the end of their lifetime fertility who are interested in additional children will not defer births. The fertility for families with total (or per capita) income less than the median declined to a greater extent than for other families. Meanwhile, the results with respect to cultural/religious factors were mixed. Thus, during the period 2004–7, fertility among mothers who grew up in large families was affected to the same degree as that of mothers who grew up in small families. On the other hand, the larger the proportion of the ultra-Orthodox in the zip code area, the larger was the decline in fertility following the reduction in child allowances.

The decline in fertility among *Arabs*, *Bedouins in the South* and *Jerusalem Arabs* during the period 2004–7 was of a greater magnitude among older women and those who already had a large number of children (which is an additional indicator that completed fertility is expected to decline), as well as women in low-income families and those who grew up in large families. Among *Bedouins in the North*, no difference was found in the effect of socioeconomic characteristics on fertility during the period 2004–7.

The results of a parallel analysis of the differential impact of the child allowance for the fourth/seventh child on birth probability according to the woman's socioeconomic characteristics (Table 6) are consistent for the most part with the corresponding results for the period 2004–7 according to those same characteristics.

We will now focus on the effect of child allowances on fertility among *non-ultra-Orthodox Jewish* women. Estimation results appear to show that the child allowance for the fourth child had a small positive and significant effect on fertility among married women (see Table A1 in the appendix); however, this finding is not consistent with the fact that these women have an average of slightly more than two children in their lifetime and that the changes in the corresponding child allowances have been negligible over the years (Figures 1 and 2). As proof, it can be seen that the total fertility rate of non-ultra-Orthodox Jewish women has been stable over time (Figure 4) and is characterized by a slight upward trend for married women (not presented). A possible explanation for the effect of child allowances is related to the steep and prolonged upward trend in the age at marriage and the leveling-off of this trend since 2004 (Figure 5). Since completed fertility remained almost unchanged and the number of fertile

years during marriage has declined over time, the birth probability for each year during marriage increased until it leveled off during the years following the reduction in child allowances. No similar phenomenon was found among other population subgroups and therefore there are no major differences between them in the effect of child allowances on the fertility of married women relative to total women in the group (Table A1 in the appendix).

The effect of various child allowances (the fourth/seventh child and the marginal child) on the fertility of non-ultra-Orthodox Jewish women (married or otherwise) is not significant nor is it significant for subgroups according to socioeconomic background (not presented). Finally, separate equations were estimated for non-ultra-Orthodox Jewish women who did National Service, the vast majority of whom are religious or traditional[16] and have much higher fertility than other non-ultra-Orthodox Jewish women. It appears that child allowances did not have any effect on fertility among these women, as was the case for the rest of the group.

Comparison to Cohen et al. (2007)

Our research is quite similar to that of Cohen et al. (2007) and therefore it is worthwhile comparing the results. Cohen et al. (2007) examined the effect of child allowances on the probability of conceiving[17] during the period 1999–2005 (more or less equivalent to the period 2000–6 with respect to birth years), which was characterized by significant changes in the size of child allowances. The authors examined the effect on various population subgroups: secular Jews, religious Jews, ultra-Orthodox Jews, Moslem Arabs, Christian Arabs and Druze. The determination of the level of religious observance among Jews was based on the type of school attended by the children (when the oldest child had already reached school age). For this reason and since there have been no major changes in the size of the child allowance for the first and second children during the period studied by the authors, they chose to focus on married women with two children or more. In the first version of Cohen et al. (2007) in December 2007, the authors related to the child allowance for the marginal (next) child while in the updated version in May 2009 they focused on the present value of the child allowance for the marginal child from birth until the age of 18 (when the payment of the child allowance stops).[18]

[16] According to the Social Survey (published by the Central Bureau of Statistics), the distribution of non-ultra-Orthodox Jewish women who did National Service by level of religious observance, for the period 2005–7, is as follows: religious – 52 percent; traditional-religious – 22 percent; traditional but not so religious – 17 percent; and not religious/secular – 9 percent.

[17] The date of conception was calculated as the date of birth less 39 weeks.

[18] The updated version did not include Arab Christians in the research population.

The present research differs from Cohen et al. (2007) in several ways: a. The research population includes all women, whether married or not and regardless of number of children. b. The period being studied is longer, i.e. 1994–2007, which makes it possible to control for longer-term trends in fertility. c. Differentiation was made between population subgroups in the Arab sector, i.e. Bedouins in the North, Bedouins in the South, East Jerusalem Arabs and other Arabs (who have different fertility patterns); however, in the absence of data on religion, it was not possible to differentiate between Moslems and Christians who are characterized by relatively low fertility. d. The identification of the ultra-Orthodox population is based on whether the woman has studied in a seminary and whether her husband has studied in a yeshiva and whether he served in the army. We do not have the ability to distinguish between non-ultra-Orthodox/religious Jews and secular Jews. e. The explanatory variables include, among others, various transfer payments (income supplements, etc.) which were reduced significantly during the same period in which the child allowance was cut. On the other hand, information on parents' education, which was used by Cohen et al. (2007) and is an important variable in explaining the level of fertility, was not included in our data.

The present research indicates that the effect of the average marginal child allowance on the birth probability of all married women, without differentiating between the various population subgroups, is about 1.8 percent, which is close to the lower estimate obtained in the updated version of Cohen et al. (2007, Table 3) (2.2 and 4.9 percent, depending on the model). Meanwhile, the earlier version of Cohen et al. (2007, Table 3) found an effect equal to 7.8 percent. The difference between our study and Cohen et al. (2007) may be explained by the different time periods and populations used in each of the studies, as described above, and the differences in the explanatory variables. However, even when we estimated the birth probability for married women for the same period and population as in Cohen et al. (2007) using similar explanatory variables and the same probit model, there were differences in the results whose explanation is unclear.

The comparison of the results of the current study to those of the earlier version of Cohen et al. (2007, Table 4) with respect to the effect of the average marginal child allowance on the birth probability of married women in different population subgroups can be summarized as follows:[19] According to our results, the effect of the child allowance on the fertility of non-ultra-Orthodox Jewish women was not significant while in Cohen et al. (2007) the child allowance increased the fertility of secular Jewish women by about 8 percent and that of

[19] The analysis in the updated version of Cohen et al. (2007) relates only to the present value of the marginal child allowance.

religious women by about 7 percent. Among ultra-Orthodox women, our study showed that the child allowance increased fertility by about 3 percent while in their study, which as mentioned used an alternative definition of the ultra-Orthodox, the child allowance raised fertility by about 7 percent. With respect to non-Jews (apart from the Druze), the current study found a positive effect of about 6-7 percent, while Cohen et al. (2007) found that the child allowance raised the birth probability of Moslems by about 9 percent and that of Christian Arabs by about 16 percent. Among Druze women, we did not find that the child allowance had a significant effect on fertility while Cohen et al. (2007) found a positive and significant effect (at a 10 percent level of significance) in the vicinity of 8 percent.

Table 2. The effect of the year on birth probability of married women according to population subgroup, 1994–2006 (in comparison to 2007)[1]

		Non-ultra-Orthodox Jews	Ultra-Orthodox	Arabs[2]	Bedouins South	Bedouins North	Jerusalem Arabs	Druze++++
1994	Increase in child allowances to Arabs (cancellation of "military veteran" criterion)	-0.248**	0.270***	0.186***	0.350***	0.383***	0.226***	0.467***
1995		-0.250***	0.271***	0.184***	0.298***	0.389***	0.224***	0.438***
1996		-0.199**	0.261***	0.163***	0.313***	0.244***	0.199***	0.449***
1997		-0.156	0.246***	0.152***	0.222***	0.300***	0.121***	0.331***
1998		-0.174***	0.180***	0.191***	0.302***	0.256***	0.112***	0.270***
1999		-0.172***	0.196***	0.136***	0.283***	0.242***	0.134***	0.216***
2000		-0.176***	0.173***	0.167***	0.325***	0.191***	0.130***	0.230***
2001 – Increase in child allowances ("Halpert Law")		-0.194***	0.153***	0.171***	0.272***	0.304***	0.119***	0.227***
2002		-0.144**	0.149***	0.153***	0.269***	0.252***	0.177***	0.108***
2003 – Reduction in child allowances		-0.101	0.148***	0.124***	0.257***	0.176***	0.091***	0.107***
2004		-0.092	0.099***	0.048***	0.169***	0.072	0.063**	0.044
2005		-0.092	0.072***	0.002	0.072**	0.041	-0.025	0.003
2006		-0.027	0.004	0.006	0.001	0.054	-0.032	0.028
		Effect of years 2004–7 on birth probability[3]						
Dummy for 2004–7		0.0082	-0.0397**	-0.113***	-0.141***	-0.112***	-0.075***	0.013

Source: National Insurance Institute and calculations by the authors.
* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.
1) All the control variables in Table 3, except for the child allowance and trend, appear in all the estimations.
2) Not including Bedouins, Jerusalem Arabs and Druze.
3) Estimations in which the dummy variables for each of the years were replaced by the trend and a dummy variable for the years 2004–7.

Table 3. The effect of child allowances and control variables on the birth probability of married women according to population subgroup, 1994–2007[1]

	Ultra-Orthodox	Arabs[1]	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
Child allowance for child 4^		1.6 E-5***		1.3 E-5***	1.4 E-5***	-3.7 E-6
Child allowance child 7^	6.2 E-6***		1.7 E-5***			
Trend	-0.0187***	-0.0051***	-0.0197***	-0.0204***	-0.0102***	-0.0396***
Marriage^	0.3648***	0.1944***	0.5860***	0.3347***	0.0436*	0.2917***
Birth in the previous year	-1.6508***	-0.9259***	-1.2122***	-1.0239***	-1.3461***	-1.2855***
Daughters only[3]	-0.0018	0.4385***	0.3217***	0.4813***	0.3837***	0.5224***
Woman is employed^	0.0136	-0.1254***	-0.1004***	-0.0843***	-0.1098***	-0.0871***
Woman's salary^	6.2 E-7***	-2.0 E-7***	-2.1 E-7	-2.9 E-6***	1.6 E-7	-3.9 E-8
Country of origin (as opposed to Israel)						
Europe	0.0744**					
America	0.0907***					
Asia	0.0942					
Africa	0.1288**					
Immigrant[4]	0.0386					
Size of income supplement^	2.1 E-6	8.8 E-6***	5.2 E-6***	7.6 E-6***	4.5 E-7**	6.2 E-6***
Receives alimony^	-0.5953***	-0.6953***	-1.1701***	-1.5422***	-1.2521***	-1.4066***
Receives disability pension^	-0.6956***	-0.2411***	-0.1877***	-0.1208*	-0.2292***	-0.1394***
Characteristics of the husband						
Age	-0.0002	0.1285***	-0.0011	0.1298***	0.0262***	0.1961***
Age squared	-0.0006***	-0.0024***	-0.0006***	-0.0023***	-0.0008***	-0.0030***
Salary^	-7.3 E-7***	-5.0 E-8***	-4.2 E-8	1.6 E-8	-5.2 E-8	1.8 E-7*
Self-employed^	-0.2752***	0.0220**	0.0291	0.0156	0.0764***	0.0447***
Number of mother's siblings	0.0147***	0.0419***	0.0108***	0.0127***	0.0383***	0.0245***
Proportion of ultra-Orthodox in the zip code area[5]	-0.1533***					
Total fertility rate in the zip code area[6]	0.0588***					
Ultra-Orthodox according to the narrow definition	0.0736***					
Unemployment rate[7]^	0.0017	-0.0028	0.0126	0.0010	0.0036	-0.0114*
District of residence		V	V	V		V
Residence in Jewish-Arab city		V				
Residence in a recognized settlement[8]			-0.0366***			
Age of the woman	V	V	V	V	V	V
Number of previous children	V	V	V	V	V	V
Number of observations	220,055	1,000,785	108,418	54,780	207,730	154,173
Adjusted R-squared[9]	0.140	0.136	0.092	0.116	0.138	0.123
Effect of child allowances At the average point	**2.6%**	**7.4%**	**5.8%**	**5.8%**	**6.1%**	**Not significant**

Source: National Insurance Institute and calculations by the authors.

* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level. ^ Lagged by one year.

1) A discussion of non-ultra-Orthodox Jewish women can be found in the body of the paper.

2) Not including Bedouins, Jerusalem Arabs and Druze.

3) Dummy variable that receives a value of one for women with two or more daughters and no sons at the beginning of the year.

4) Immigrated in 1989 or later.

5) Proportion of ultra-Orthodox Jewish women aged 25–39 within total Jewish women aged 25–39 in the zip code area (as of January 2008; calculated only when at least 30 Jewish women live in the area). The proportion is a number between 0 and 1.

6) Number of children per ultra-Orthodox Jewish woman aged 35 and over in the zip code area (as of January 2008; calculated only when at least 30 Jewish women live in the area).

7) National unemployment rate.

8) Residence in one of the following towns: Ara'ra-Banegev, Hura, Kuseifa, Laqye, Segev-Shalom and Tel Sheva.

9) McFadden's (adjusted) R^2.

Table 4. Effect of various child allowances on the birth probability of married women according to population group, 1994–2007[1]

	Ultra-Orthodox	Arabs[2]	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
	Marginal effect of child allowance[3]					
Child allowance for child 4	6.4 E-6**	1.6 E-5***	2.4 E-5***	1.3 E-5***	1.4 E-5***	-3.7 E-6
Child allowance for child 7	6.2 E-6***	1.1 E-5***	1.7 E-5***	1.1 E-5**	1.3 E-5***	2.7 E-6
Marginal child allowance	5.2 E-6**	3.0 E-5***	2.7 E-5***	2.2 E-5***	2.3 E-5***	6.8 E-6
	Effect of child allowances at the average point for the period 1994–2007					
Child allowance for child 4	2.8%	7.4%	8.8%	5.8%	6.1%	Not significant
Child allowance for child 7	2.6%	4.7%	5.8%	4.6%	5.3%	Not significant
Marginal child allowance	1.6%	9.8%	7.2%	7.1%	7.2%	Not significant
	Effect of the reduction in child allowances during the period 2004–7					
Child allowance for child 4	2.7%	6.6%	7.8%	5.2%	5.5%	Not significant
Child allowance for child 7	2.4%	3.8%	4.7%	3.7%	4.3%	Not significant
Marginal child allowance	1.4%	7.8%	5.7%	5.6%	5.6%	Not significant
	Dummy variables for the period 2004–7[4]					
Estimated coefficient	**-0.0397	***-0.113	***-0.141	***-0.112	***-0.075	0.013
Decrease in birth probability	3.9%	10.7%	13.2%	10.6%	7.2%	Not significant

Source: National Insurance Institute and calculations by the authors.

* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.

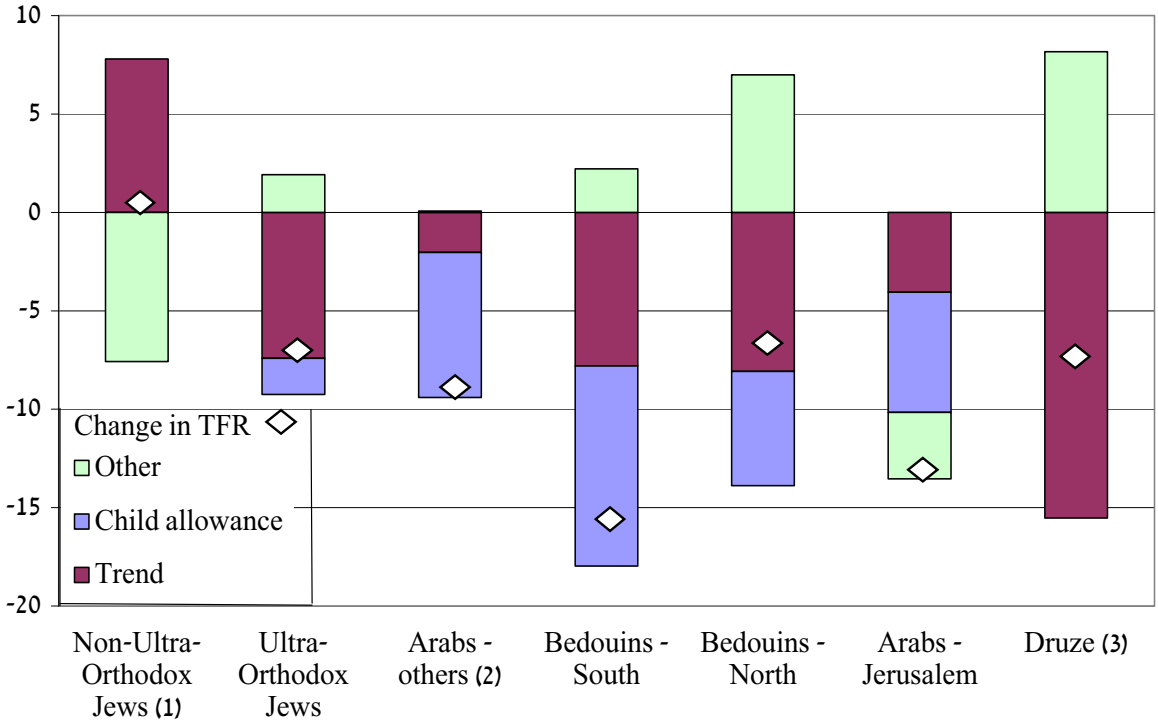
1) A discussion of non-ultra-Orthodox Jewish women can be found in the body of the paper.

2) Not including Bedouins, Jerusalem Arabs and Druze.

3) Estimation as in Table 3.

4) Estimation as in Table 3, in which the child allowance variables were replaced by dummy variables for the years 2004–7.

Figure 10. Effect of child allowances and the trend in fertility on the birth probability of married women: 2007 relative to 2003 (percent)



Source: National Insurance Institute and calculations by the authors.
1) Married and unmarried women. The effect of child allowance on fertility is not significant.
2) Arab women who are not Bedouins or Jerusalem residents (Druze women are also not included).
3) The effect of child allowances on fertility is not significant.

Table 5. The effect of the *2004–7 period* on the birth probability of married women according to socioeconomic characteristics and population subgroup, 1994-2007[1] (interaction between the period and socioeconomic characteristics)

	Ultra-Orthodox	**Arabs[2]**	**Bedouins South**	**Jerusalem Arabs**
Women aged 34 or over	No difference	-0.1594***	-0.0795*	-0.0890**
Large number of children[3]	No difference	-0.4620**	-0.3140***	0.3502*
Husband worked during the previous three years[4]	-0.0543***	No difference	No difference	No difference
Total family income below the median[5]	-0.0570***	-0.0683***	-0.0470**	-0.0658***
Total *per capita* family income below the median[5]	-0.0534***	-0.0729***	-0.0486**	-0.0614***
Number of the mother's siblings:[6] Intermediate	-0.0365*	0.0309***	No difference	-0.0426*
High	No difference	No difference	-0.0683*	-0.0893***
Proportion of ultra-Orthodox in zip code area:[7]				
Intermediate	-0.0658***			
High	-0.1155***			
Estimated coefficient for 2004–7 period (from Table 4)	-0.0397***	-0.113***	-0.141***	-0.075***

Source: National Insurance Institute and calculations by the authors.
* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.

1) Relative to the socioeconomic characteristics of the remaining group. Each cell represents a separate estimation. All of the estimation equations also include the control variables in Table 3 and dummy variables for the period 2004–7 but do not include the size of the child allowance variable. No significant differences were found in the effect of the period 2004–7 on the birth probability of non-ultra-Orthodox Jews and Bedouins in the North according to socioeconomic characteristics.
2) Does not include Bedouins, Jerusalem Arabs and Druze.
3) Nine children or more.
4) Husband worked for at least one month during each of the previous three years.
5) Per capita family income from labor and from income supplements, disability pension and alimony. Does not include child allowances. The median was calculated separately for each population subgroup and age.
6) Low – 0-5; intermediate – 6-8; high – 9 and above.
7) The proportion of ultra-Orthodox Jewish women aged 25–39 in the zip code area (as of January 2008; calculated only when at least 30 Jewish women live in the zip code). The proportion is a number between 0 and 1 and is divided into thirds (low, intermediate and high).

Table 6. The effect of the *size of child allowance* on the birth probability of married women according to socioeconomic characteristics and population subgroup, 1994–2007[1] (interaction between the size of child allowances and socioeconomic characteristics)

	Ultra-Orthodox	**Arabs[2]**	**Bedouins South**	**Jerusalem Arabs**
Women aged 34 and over	No difference	2.5 E-5*	1.1 E-5*	1.0 E-5*
Large number of children[3]	No difference	8.8 E-5**	3.5 E-5**	-6.0 E-5*
Husband worked during the previous three years[4]	No difference	1.8 E-6**	No difference	No difference
Total family income below the median[5]	No difference	4.4 E-6***	-9.5 E-6***	No difference
Total *per capita* family income below the median[5]	No difference	2.7 E-6***	-1.0 E-5***	No difference
Number of the mother's siblings:[6] Intermediate High	No difference No difference	No difference 6.2 E-6***	No difference No difference	7.6 E-6*** 1.2 E-6***
Proportion of ultra-Orthodox in the zip code:[7] Intermediate High	 No difference No difference			

Source: National Insurance Institute and calculations by the authors.

* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.

1) Relative to the socioeconomic characteristics of the remaining group. Each cell represents a separate estimation. All of the estimation equations also include the control variables in Table 3 and dummy variables for the period 2004–7 but do not include the size of the child allowance variable. No significant differences were found in the effect of the period 2004–7 on the birth probability of non-ultra-Orthodox Jews and Bedouins in the North according to socioeconomic characteristics.
2) Does not include Bedouins, Jerusalem Arabs and Druze.
3) Nine children or more.
4) Husband worked for at least one month during each of the previous three years.
5) Per capita family income from labor and from income supplements, disability pension and alimony. Does not include child allowances. The median was calculated separately for each population subgroup and age.
6) Low – 0-5; intermediate – 6-8; high – 9 and above.
7) The proportion of ultra-Orthodox Jewish women aged 25–39 in the zip code area (as of January 2008; calculated only when at least 30 Jewish women live in the zip code). The proportion is a number between 0 and 1 and is divided into thirds (low, intermediate and high).

G. Conclusion

Child allowances are intended to assist families in financing their expenditures on childrearing. Since over the years Israel has adopted a progressive system of payment, i.e. in which the child allowance size increases with the number of children per household, the child allowance has been a mechanism for supporting large families from weak socioeconomic backgrounds.

During the past decade, there has been significant variation in the size of child allowances. Thus, at the beginning of the decade the child allowance was significantly increased for high birth-order children while in 2003 child allowances were cut drastically.

The research has examined the effect of child allowances on fertility in Israel during the period 1994–2007, with emphasis on the period following the cuts in 2003. Identification was facilitated by the significant variation in the structure and size of child allowances. The estimation was based on National Insurance Institute administrative data on fertility and socioeconomic characteristics for women of childbearing age and their families.

According to the main finding of the research, the size of child allowances affected fertility during the period 1994–2007 and that effect varied across population subgroups. The average child allowance for a high birth-order child increased birth probability among married Arab women by about 6–7 percent and that of ultra-Orthodox women by about 3 percent; on the other hand, there was no effect on non-ultra-Orthodox Jewish women or on Druze women and the overall effect on the total population was less than 2 percent. The results for Arab women are consistent with those of Cohen et al. (2007) while we found a significantly smaller effect for ultra-Orthodox women. In contrast to our findings, they found a strong positive effect among non-ultra-Orthodox Jews and Druze.

The size of child allowances had a stronger effect, in most cases, on older women who already had a large number of children, women in low-income families and women who had grown up in large families, *ceteris paribus*, and it was these women whose probability of giving birth dropped to a greater extent following the reduction in child allowances in 2003.

The research was carried out a relatively short time after the reduction in child allowances and therefore it is unclear to what extent the sharp decline in fertility during the period 2004–7 will persist in the long run and thus reduce completed fertility. In addition, the reduction in child allowances was universal and therefore no control group exists. Thus, it was not possible to rule out the possibility that part of the decline in fertility was a reaction to the economic slowdown at the beginning of the decade in Israel or the weakening of the social welfare net, whose effect on households is only partly reflected in the control variables used in the

estimation. In addition, it may be that other processes – whether social, cultural or religious – matured during this period and thus led to the decline in fertility.

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APPENDIX

Table A1: The effect of the size of child allowances[1] on birth probability according to population subgroup, 1994–2007

	Non-ultra-Orthodox Jews	Ultra-Orthodox	Arabs[2]	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
	Marginal effect of child allowance						
Total	3.2 E-7	5.4 E-6***	1.7 E-5***	2.0 E-5***	1.4 E-5***	1.2 E-5***	-4.7 E-6
Married women	3.8 E-6***	6.2 E-6***	1.6 E-5***	1.7 E-5***	1.3 E-5***	1.4 E-5***	-3.7 E-6
	Effect of child allowance at the average point for the years 1994–2007						
Total	Not significant	2.4%	8.7%	8.5%	7.1%	5.6%	Not significant
Married women	2.2%	2.6%	7.4%	5.8%	5.8%	6.1%	Not significant

Source: National Insurance Institute and calculations by the authors.
* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.
1) Child allowance for *fourth* child: non-ultra-Orthodox Jews, Bedouins in the North, Jerusalem Arabs, Druze; child allowance for *seventh* child: ultra-Orthodox Jews, Bedouins in the South.
2) Not including Bedouins, Jerusalem Arabs and Druze.
3) Estimations as in Table 3. In the estimations for total women, dummy variables were added for family status and variables related to the husband were omitted.

Table A2: The effect of the size of child allowances[1] on birth probability for married women according to population subgroup, 1994–2007: with and without controlling for age at first marriage

	Non-ultra-Orthodox Jews	Ultra-Orthodox	Arabs[2]	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
	Marginal effect of child allowance						
With control	6.1 E-6***	7.4 E-6***	1.7 E-5***	1.9 E-5***	1.4 E-5***	1.6 E-5***	-3.8 E-6
Without control	3.8 E-6***	6.2 E-6***	1.6 E-5***	1.7 E-5***	1.3 E-5***	1.4 E-5***	-3.7 E-6
	Effect of child allowance at the average point for the years 1994-2007						
With control	3.5%	3.1%	7.9%	6.5%	6.2%	7.0%	Not significant
Without control	2.2%	2.6%	7.4%	5.8%	5.8%	6.1%	Not significant

Source: National Insurance Institute and calculations by the authors.
* Significant at 10 percent level, ** significant at 5 percent level, *** significant at 1 percent level.
1) Child allowance for *fourth* child: non-ultra-Orthodox Jews, Bedouins in the North, Jerusalem Arabs and Druze; child allowance for *seventh* child – ultra-Orthodox Jews and Bedouins in the South.
2) Not including Bedouins, Jerusalem Arabs and Druze.
3) Estimations as in Table 3. In the estimations with control variables, age at marriage was also included (as well as rate of high school matriculation among the women according to population subgroup and birth cohort, whose estimates were not significant).