

THE EFFECT OF CHILD ALLOWANCES ON FERTILITY

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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 and therefore we measured only the short term effect. Furthermore, the cuts took place near turning points in the business cycle and in parallel to reductions in other social benefits, which may not be fully reflected in the estimations.

1. 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

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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 2002–03 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 Arabs – who 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

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.

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 research was carried out shortly after the sharp cut in child allowances (in 2003) and therefore it is still unclear to what extent the subsequent drop in fertility (during the period 2004–07) reflects the long-term effects of the cut, even if other factors are held constant. This is due to the fact that if individuals decided to reduce their completed fertility, they would have been likely to increase their birth spacing immediately following the reduction in child allowances and this would have been reflected in a particularly large decline in number of births in the short run. However, it is possible that the process of adjustment to lower completed fertility is a slow one and has yet to be completed due to the need to modify lifestyle behavior (such as entry into the labor market, obtaining additional education, etc.).

In addition, it is difficult to determine whether short-run estimates fully reflect the reaction to the reduction in child allowances since during the relevant period it was unclear to what extent the reduction was permanent, particularly against the background of the frequent changes made in the level of child allowances during the sample period.

In retrospect, the trends in fertility have continued during the years following the sample period. Thus, Hleihel (2011) found that the downward trend in fertility among ultra-Orthodox Jewish women, other Jewish women and Moslem women continued during the period 2007–09.

The rest of the study is organized as follows: Chapter 2 reviews the literature. Chapter 3 surveys the changes in the size of child allowances over the years. Chapter 4 describes the database and Chapter 5 presents descriptive statistics. Chapter 7 is devoted to the results derived from estimation of birth probability during the period 1994–2007. This is followed by the conclusion.

2. SURVEY OF THE LITERATURE²

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").

² A general description of the econometric methods can be found in Hotz et al. (1997).

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 following the expansion of child allowances system in the 1970s and that there had been a moderate increase in the fertility of Bedouin³ 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 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 1994–2007. No increase in fertility was found among the Bedouin while among the Druze⁴ 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 6).

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\$1,000 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

³ Traditional Moslem Arabs, some of whom are fully or partly nomadic and organized by tribe.

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.

(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.

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. Chen (2011) found that an increase of one percent in family income in France, as a result of changes in deductions/credits for children, led to an increase of 0.09 in the number of dependents (children).

Fertility patterns among the ultra-Orthodox Jews and Bedouins

The study focuses on two population subgroups with particularly high rates of fertility, i.e. the ultra-Orthodox and Bedouins, since the changes in the child allowance in Israel have mainly affected high birth-order children.

From a historical perspective, (Mayshar and Manski, 2000),⁷ the completed fertility of Sephardic **ultra-Orthodox** women who married prior to the establishment of the State stood at about 7 children and fell to less than 6 children among those who married in the

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 The authors define ultra-Orthodox according to whether the last school attended by the husband was an advanced yeshiva.

1970s and 1980s. In contrast, the completed fertility of Ashkenazi ultra-Orthodox women rose sharply from about 3 children in the earlier period, which is similar to that of Sephardic non-ultra-Orthodox women, and caught up to and even surpassed that of Sephardic ultra-Orthodox women during the later period (see also Berman, 1999).

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.).

There are a number of processes that over the years have led to a drop in the value of children. These include urbanization, which led to modernization and the reduced dependence on grazing as a source of income, in parallel to the increase in the rates of school attendance among children, which have reduced the necessity and possibility of using children as manpower; the weakening of the extended family; less of a need to support one’s parents (partly due to the eligibility for old age pensions beginning in the 1970s); and the increase in the cost of childrearing, particularly in the city. The urbanization process had less of an effect on the value of children from a socio-political perspective since local government leaders encourage growth in the number of eligible voters. As a result of these developments, fertility should have declined, particularly among urban residents. However, two factors worked in the opposite direction: the increase in the child allowance for children of third birth order or higher since 1994, with the cancellation of the status of “military veteran” (see Chapter 1)⁸ and the strengthening of Islamic

⁸ Frish (2006) found, as mentioned, that as a result of the increase in child allowances fertility did not increase among Bedouin women who were now eligible for a larger child allowance relative to that of women with “military veteran” status, who were already receiving a larger child allowance.

fundamentalism, which is also reflected in the increased rate of polygamous marriages during the last two decades (Abu-Rabia et al., 2008). In actuality, there was a significant decline in fertility during the 1980s and 1990s (Meir and Ben-David, 1989; Frish, 2008).⁹

3. 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.¹⁰

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 (see Figure A1 in the Appendix).¹¹

An amendment to the National Insurance Law in November 2000 (which was called the "Halpert Law" after its initiator), whose goal was to assist large families and which went into effect on January 2001, significantly increased the child allowance for the fifth child (by 47 percent), the sixth child (by 33 percent) and the seventh and higher birth-order children (by 43 percent).

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 1). 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 2).

During the years 2002–03, a reform of welfare policy was carried out which resulted in child allowances being cut drastically. Initially, the updating of child allowances was frozen and later they were reduced by 15 percent.¹² The most dramatic change in the structure of the child allowance took place in June 2003, whereby the allowance for a child born up

⁹ The total fertility of Bedouin women aged 25–44 (who did not have the "military veteran" status) fell from an average of 8.1 children during the period 1981–8 to an average of 6.7 children during the period 1994–96 (Frish, 2008).

¹⁰ For a comprehensive survey of the history of the child allowance and changes in the law, see Mayshar and Manski (2000), Ofir and Eliyav (2005), Mi-Ami (2008) and the National Insurance Institute (various years).

¹¹ 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.

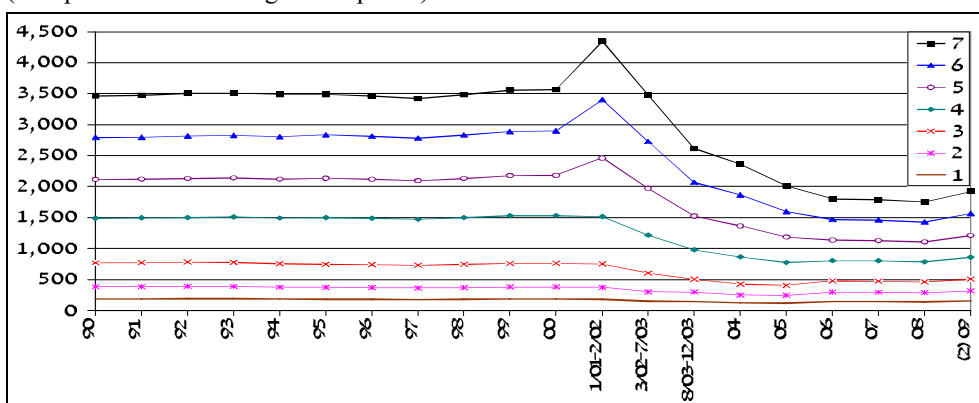
¹² In the Arrangements Law for 2002, the updating of child allowances according to the CPI was cancelled starting from March and in addition child allowances were reduced by 12 percent. According to the Emergency Economic Plan of that same year, the reduction was increased to 15 percent starting in July and child allowances were not updated in January 2003 according to the rise in the CPI for the previous year (which was 6.5 percent).

until June 2003 ("old" child) was gradually reduced starting from August 2003, such that by the end of 2009 it would equal the child allowance for the first child.¹³

Allowance for a child born after June 2003 was immediately reduced to that for a first child, regardless of his birth order.¹⁴

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 allowances¹ 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.

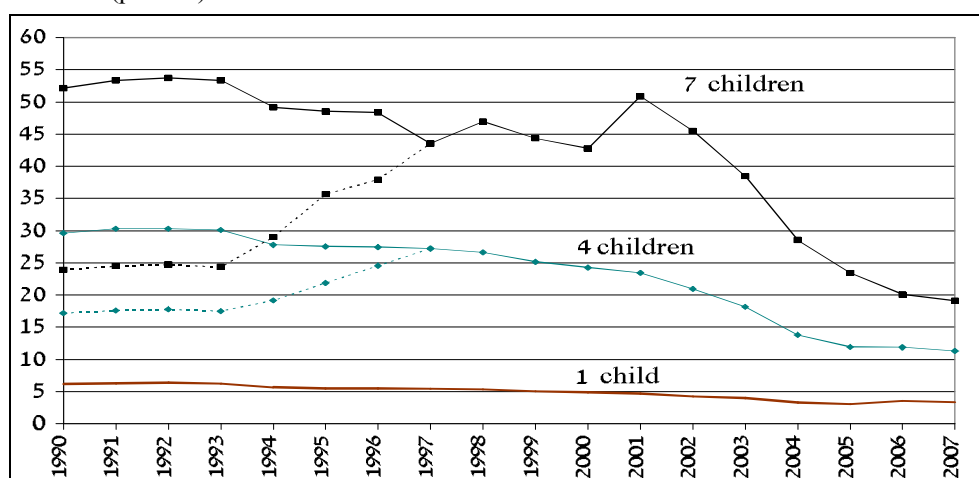
² Does not include an addition to child allowances for birth order 2–4 as part of the Economic Efficiency Law for 2009-10 (Arrangements Law).

¹³ According to the calculations of the National Insurance Institute, almost no high birth-order "new" children remained at the end of 2009 since a child that reaches 18 stops receiving a child allowance and every additional "new" child pushes an "old" child one place down in the birth order.

¹⁴ Apart from this, all child allowances were reduced by another approximately 8 percent during the period from February 2004 until December 2005 and there was no update according to the CPI. The Economic Policy Law for the 2004 fiscal year lowered child allowances again, by NIS 24 per month for the first to third children from February 2004 until December 2005, by NIS 24 per month for the fourth child and higher during the period February-June 2004 and by NIS 5 per month during the period July 2004 until December 2005.

Starting from July 2004, a "family supplement" was paid for third and fourth children in families that receive a guaranteed income supplement or alimony from the National Insurance Institute. In 2004, the child allowance stood at NIS 101 per child.

Figure 2
Child allowances¹ per family relative to the poverty line,² according to number of children (percent)



Source: National Insurance Institute and calculations by the authors.

¹ For children born up until June 2003.

Continuous line - including "military veterans" allowance; Broken line - excluding "military veterans" allowance.

² 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.

4. 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 (for the distribution of women according to population subgroup, see Table 2 below).

In the first stage, the women were identified in the Residents Registry¹⁵ and data on the women, their spouses and their children since 1950 were then extracted from it. This included the following demographic characteristics for the women: date of birth, country of birth, date of immigration, family status, population subgroup, city of residence and postal code¹⁶ and date of death. Information was not available on religion and therefore it was not possible to distinguish Moslem Arabs from Christian ones,¹⁷ even though the fertility of the latter is much lower than that of the former. The file of their spouses (husband/divorced/deceased husband) contained date of birth, date of last marriage and date

¹⁵ For purposes of the study, periods prior to emigration, following the cancellation of residency (i.e. leaving the country), and of course after death were excluded.

¹⁶ The city of residence and postal code are correct as of January 2008 (there is no information on periods prior to that).

¹⁷ In 2007, about 9.6 percent of all Arab women aged 15-44 were Christians (CBS, various years).

of death. The file of their children included all live births, date of birth and gender. The file did not include stillbirths, which only appear in the records of the Ministry of Health.¹⁸

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.

A woman was defined as ultra-Orthodox in a number of ways, as is explained in detail in Toledano et al. (2009).¹⁹ An ultra-Orthodox woman according to the **narrow definition** is a woman who studied/is studying in an ultra-Orthodox seminary and/or a woman who married a man who studied/is studying in a yeshiva and did not serve in the army or served less than a year. An ultra-Orthodox woman according to the **wide definition** is one who is ultra-Orthodox according to the narrow definition or one for whom the following relatives were defined as ultra-Orthodox according to the narrow definition: at least two siblings, father and/or mother, at least two children and a woman whose husband has two such relatives. In this study, we will focus on the wide definition.

5. DESCRIPTIVE STATISTICS

a. General

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,²⁰ differentiation was made between the ultra-Orthodox and others; among non-Jews,

¹⁸ In 2007, the proportion of stillbirths (with a weight of 500 grams or more) was about 0.6 percent of total births, which is similar to the proportion in previous years (Central Bureau of Statistics, various years). The proportion of legal pregnancy terminations out of total known pregnancies (births and legal pregnancy terminations) fell continuously, from 12.5 percent during the period 1995-99 to 11.4 percent in 2007 and did not show any deviation during the period following the cut in child allowances as part of the Economic Recovery Program (June 2003).

¹⁹ The Appendix there contains a comparison to other methods of identifying the ultra-Orthodox in surveys and in administrative data.

²⁰ Included among Jews were also non-Jewish immigrants (apart from Lebanese who arrived in Israel as a result of the evacuation of Israel from South Lebanon in 2000).

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.

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

Population subgroup	1996-	2001-	2006-	First difference	Second difference	Number of women ¹		
	1997	2002	2007			Thousands	Percent	
	(1)	(2)	(3)	(3)-(2)	[(3)-(2)] less [(2)-(1)]			
Jews	Ultra-Orthodox ²	7.50	7.24	6.74	-0.51	-0.25	117.0	7.3
	Others	2.22	2.13	2.20	0.07	0.02	1266.2	72.1
Arabs	Bedouins – South ³	7.08	6.76	5.62	-1.14	-0.82	35.0	2.2
	Bedouins – North ⁴	4.06	4.04	3.25	-0.79	-0.77	11.4	0.7
	Jerusalem	4.05	3.97	3.56	-0.41	-0.34	54.9	3.4
	Other	3.71	3.70	3.08	-0.62	-0.61	197.9	12.4
Druze ⁵	3.30	2.85	2.52	-0.34	0.11	29.9	1.8	
Total	2.81	2.78	2.77	-0.03	0.03	1595.3	100.0	

Source: National Insurance Institute and calculations by the authors.

¹ Women aged 15–44 in 2007.

² Wide definition.

³ Arab women living in the south district.

⁴ 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.

⁵ Including Circassians.

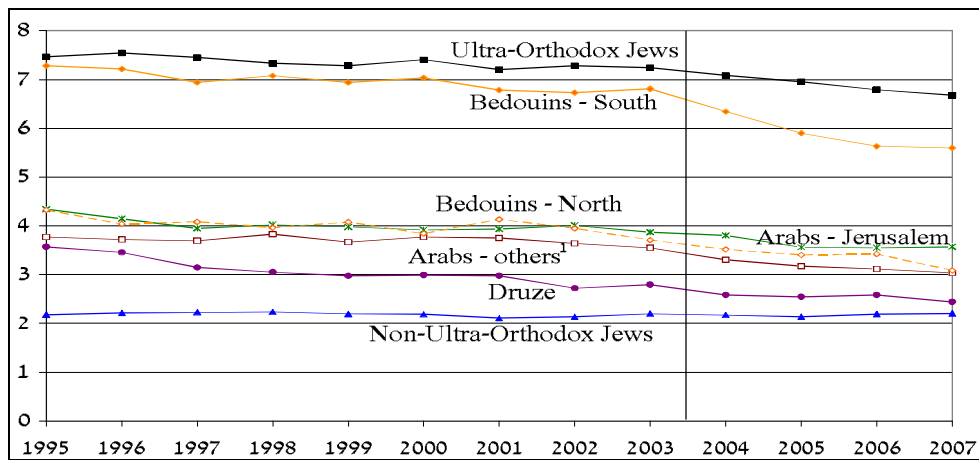
Table 1 and Figure 3 show that TFR among the ultra-Orthodox Jews declined up until the early 2000s (to 7.2 children), just prior to the sharp cut in the child allowance. Subsequently, there was a clear drop in TFR (first difference in Table 1) to 6.7 children in 2006–07,²¹ which was below the rate predicted 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 2006–07 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

²¹ It is interesting that a national representative survey carried out in late 2004 and early 2005 showed that married ultra-Orthodox men and women are interested in having 8.8 children (DellaPergola, 2007).

that had already appeared in 2002–03. The lion's share of Arabs in Jerusalem are Moslem Palestinian residents 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 2006–07) during the subsequent period.²² 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.

Figure 3
Total fertility rate according to subgroup, 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).

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

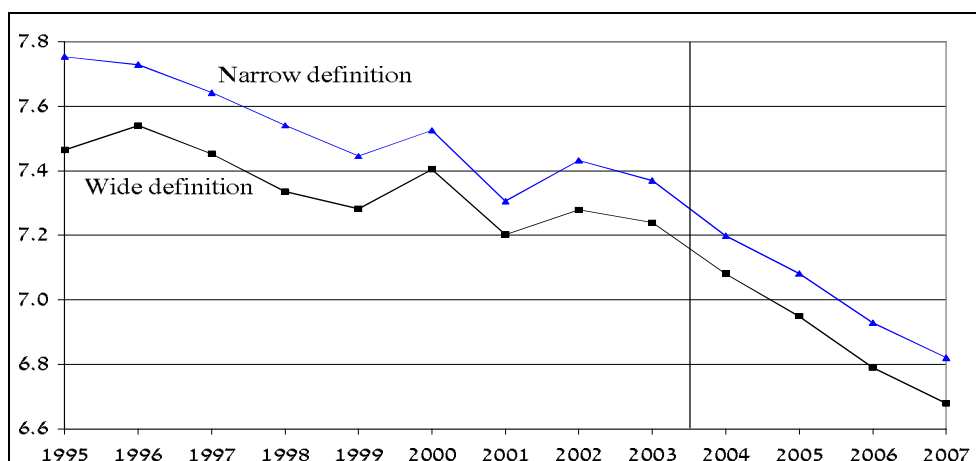
²² The drop in fertility among Jerusalem Arabs may also be related to the building of the Security Fence, which reduced the freedom of movement of Palestinians holding Israeli identity cards. Therefore, it can be expected that some of them will have preferred to immigrate to the municipal area of Jerusalem. Since the supply of housing in the city is limited, housing density will have increased (Kimhi, 2006) and therefore fertility is likely to have declined.

Another possible explanation for the fall in fertility among Jerusalem Arabs is the amendment to the Citizenship and Entry into Israel Law (Temporary Measure) – 2003, which prohibits Israelis who have married residents of the territories from living with them within the boundaries of the State (B'Tselem, 2004). As a result, the proportion of Jerusalem Arabs marrying residents of the territories, whose fertility is higher, probably declined. Apparently, some of these couples immigrated to the territories, such that the proportion of single women within the population of Jerusalem Arab women rose and this also had a negative effect on fertility.

b. The ultra-Orthodox Jews

Figure 4 presents total fertility for ultra-Orthodox women, according to both the narrow and wide definitions. It can be seen that total fertility according to the narrow definition is somewhat higher than according to the wide definition, although according to both definitions fertility dropped significantly starting in 2004. Thus, during the years 2002–03, it stood at 7.3–7.4 children and in 2007 at 6.7–6.8.

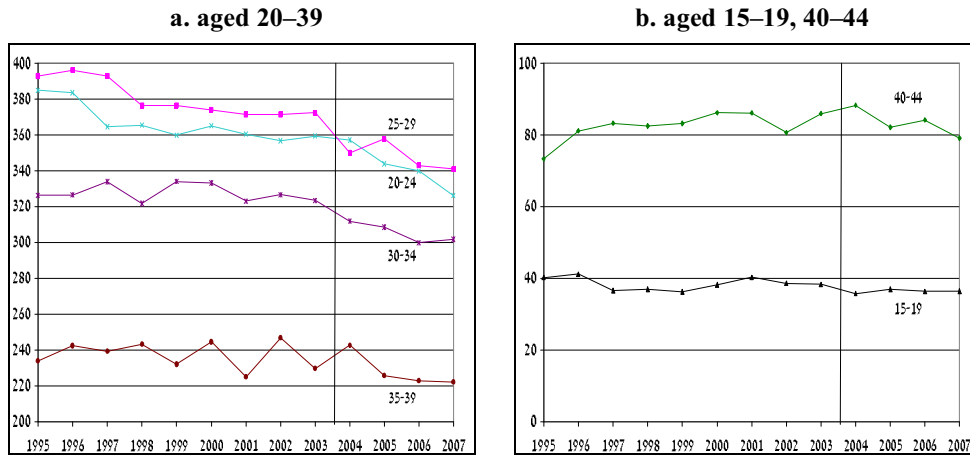
Figure 4
Total fertility of ultra-Orthodox Jewish women according to the various definitions, 1995 to 2007



Source: National Insurance Institute and calculations by the authors.

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 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 than for younger families with fewer children. Figure 5 indicates that the age-specific fertility rates for the ultra-Orthodox (wide definition) 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.

Figure 5
Age-specific fertility rates among ultra-Orthodox Jews,¹ 1995–2007
 (births per thousand women)

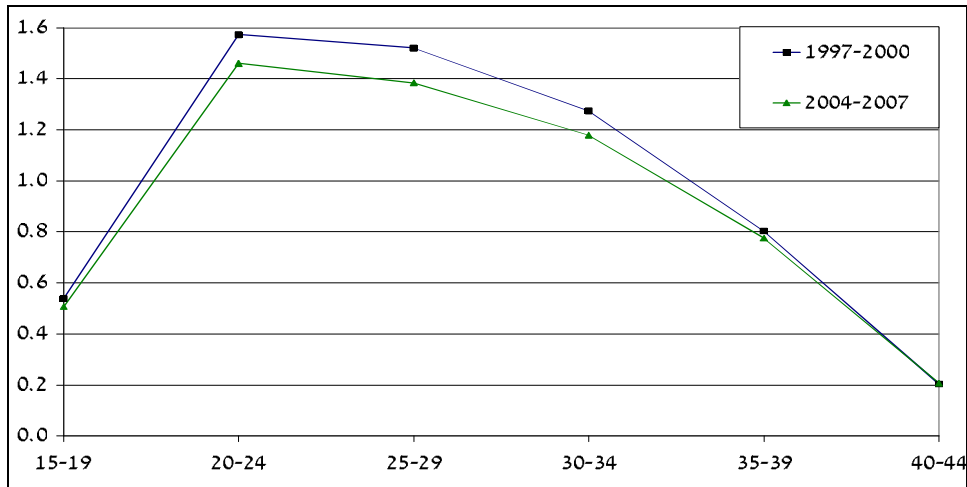


Source: National Insurance Institute and calculations by the authors.

¹ Wide definition.

A similar picture is obtained from an analysis of the number of children born to ultra-Orthodox women (according to the wide definition) during two periods: 1997–2000 which was prior to the Halpert Law and 2004–07 which was subsequent to the cut in child allowances. The number of children born to ultra-Orthodox women aged 15–44 stood at 0.98 during the first period and fell to 0.92 during the second period (over the course of the women's entire fertile period this translated into a decline of about 0.5 children per woman). Figure 6 shows that this phenomenon encompassed all age groups, apart from the very youngest and very oldest women. Figure 7 presents the number of children born to an ultra-Orthodox woman during the two periods according to the number of her children at the beginning of each period. It appears that the number of children born fell after the cut in child allowances for women that already had 1–3 children, and particularly for women taking care of 8 or more children, for whom the cut in child allowances was most significant, both with respect to the marginal child allowance for their next child and the total child allowances for all their children.

Figure 6
Number of children born to an ultra-Orthodox Jewish woman,¹ according to age:² 2004–2007 compared to 1997–2000

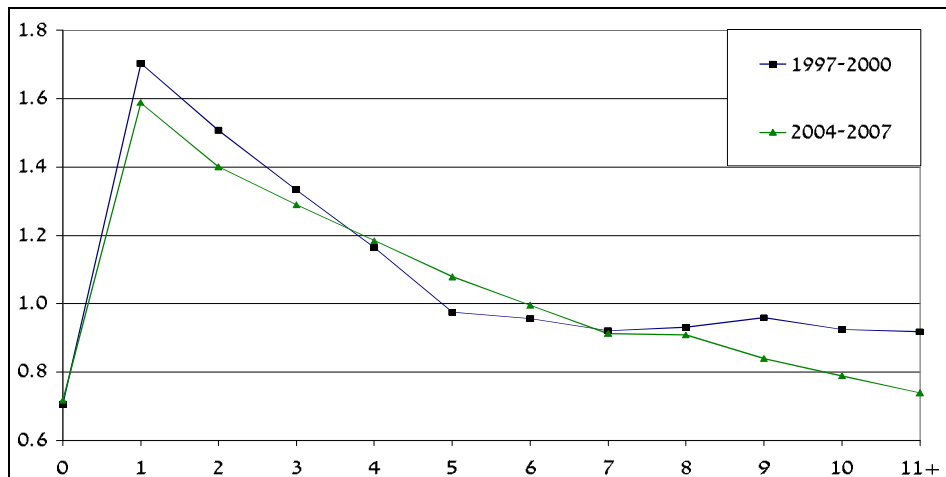


Source: National Insurance Institute and calculations by the authors.

¹ Ultra-Orthodox Jews according to the wide definition.

² Age at the beginning of each period.

Figure 7
Number of children born to an ultra-Orthodox Jewish woman,¹ according to initial number of children:² 2004–2007 compared to 1997–2000



Source: National Insurance Institute and calculations by the authors

¹ Ultra-Orthodox Jews by the wide definition.

² Number of children at the beginning of each period.

Table A1 in the Appendix presents the change in the number of children born to a married woman during the period following the cut in child allowances in comparison to the period prior to it, according to population subgroup, age group and number of children just prior to each of the periods. The table indicates that among married ultra-Orthodox women fertility declined in most age groups and regardless of the initial number children, apart from the case of women with no children, most of whom were newly married and who generally give birth within a short time after getting married. The drop in fertility was more significant among the youngest women and among those taking care of between one and four children.

c. Bedouins

The analysis differentiates between Bedouins in northern Israel – living in what are known to be Bedouin settlements in the Northern District²³ (it was not possible to identify the others) – and in southern Israel (Southern District) since Bedouin society in southern Israel is much more traditional and fertility rates are much higher there (see below). For 2007, the analysis identified 11.4 thousand Bedouin women aged 15–44 in northern Israel and 35.0 thousand in southern Israel. In southern Israel, there are three types of Bedouin settlements (appearing in parentheses is the distribution in percent of women aged 15–44 in 2007 between the types of settlement): recognized settlements, including Hura, Kuseife, Laqye, Ar'ara-Banegev, Segev-Shalom and Tel Sheva (61); unrecognized settlements (34); and Jewish settlements (5). The Bedouins in the recognized settlements enjoy a higher socioeconomic status than those in unrecognized settlements, who have the lowest socioeconomic status among the various population subgroups in Israel (see also the Statistical Abstract for Bedouins in the Negev 2004, 2005; Abu-Bader and Gottlieb, 2008).

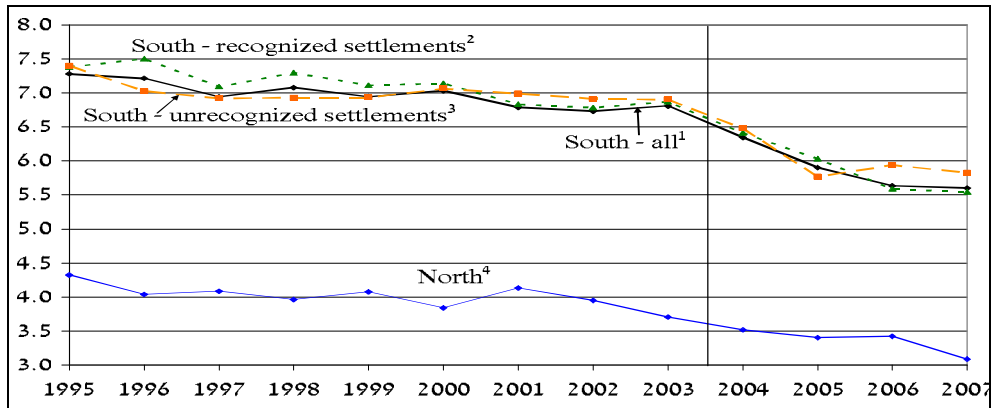
The total fertility of Bedouin women living in recognized settlements in southern Israel was stable during the period 2001–03 (6.7 children) and somewhat lower than that of Bedouin women in the unrecognized settlements (6.9 children) as can be seen from Figure 8. Following the cut in child allowances, the total fertility rate of the both groups fell significantly: among the former it stabilized at 5.6 children during the years 2006–07 while among the latter the decline was more moderate, with total fertility falling to 5.9 children. The decline in fertility among Bedouin women in the South encompassed all age groups (Figure 9).

The comparison of number of children born to Bedouin women before and after the cut in child allowances indicates that fertility declined following the cut for all age groups (Figure 10) and number of children just prior to each period (Figure 11). Table A1 in the Appendix shows that fertility among married Bedouin women in southern Israel during the period following the cut was lower than during the period prior to the cut for all age groups and initial number of children (apart from women without children) and the difference is statistically significant.

²³ See Footnote 4 to Figure 8.

Total fertility of Bedouin women is much lower in northern Israel than in southern Israel and since 2002 it was characterized by a downtrend. Table A1 in the Appendix indicates that the decline in fertility was statistically significant and that it encompassed most age groups and initial number of children.

Figure 8
Total fertility of Bedouin women, 1995–2007



Source: National Insurance Institute and calculations by the authors.

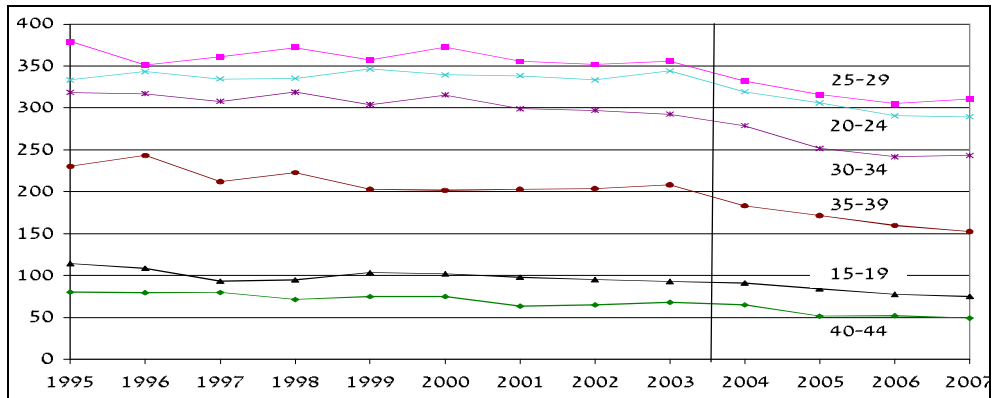
¹ Arab women in the Southern District (including Jewish settlements).

² Arab women in the following settlements: Hora, Kasifa, Lakiya, Arara-Banegev, Segev-Shalom and Tel Sheva.

³ Arab women in the Southern District who do not live in recognized or Jewish settlements.

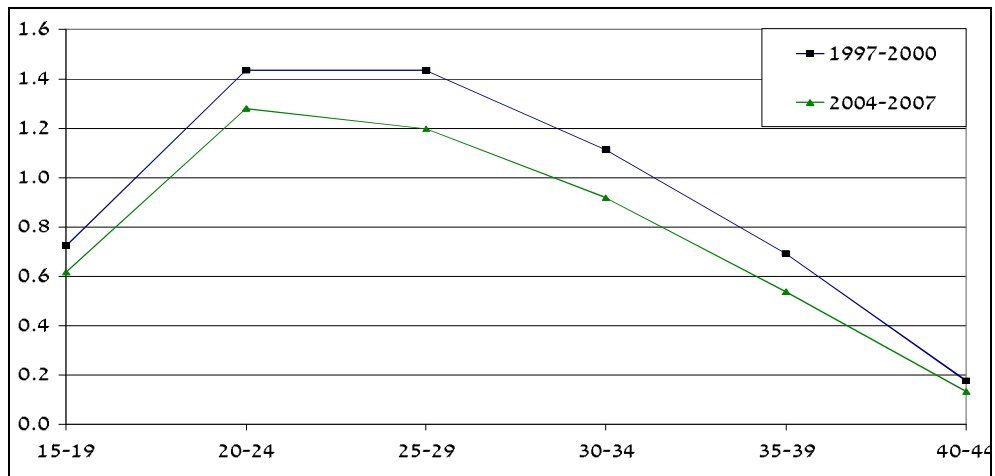
⁴ Arab women in northern Israel who live in the following settlements: Aramsha, Basmat Tab'un, Bir El-Maksur, Bu'eine-Nuyeidat, Demeide, Hamam, Hussniyya, Ibtin, Ka'abiyye-Tabbash-Hajajare, Kamane, Khawaled, Mansiyet Zabda, Rumat Heib, Sallama, Sawa'id (Hamriyye), Shibli-Humm Al-Ghanam, Tuba-Zangariyye and Zarzir.

Figure 9
Age-specific fertility rates among Bedouins in the South, 1995–2007
 (births per thousand women)



Source: National Insurance Institute and calculations by the authors.

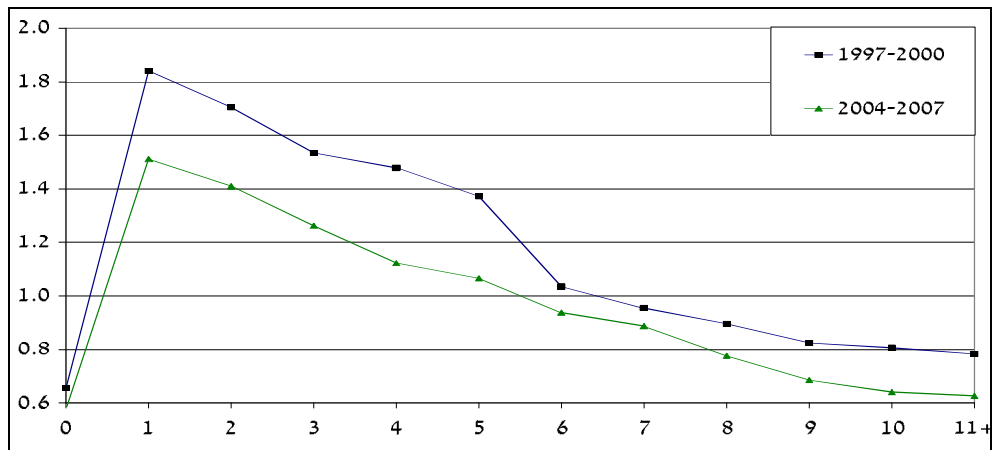
Figure 10
Number of children born to Bedouin women in the South according to age:¹
2004–2007 compared to 1997–2000



Source: National Insurance Institute and calculations by the authors.

¹ Age at the beginning of each period.

Figure 11
Number of children born to Bedouin women in southern Israel according to initial
number of children:¹ 2004–2007 compared to 1997–2000



Source: National Insurance Institute and calculations by the authors.

¹ Number of children at the beginning of each period.

d. Household income and changes in fertility

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 12 presents TFR for women aged 25–44²⁴ according to the husband's income for three sufficiently large subgroups with high fertility rates: the ultra-Orthodox Jews, Bedouins in the South and other Arabs (who are not Bedouins, Jerusalem Arabs or Druze). The figure shows 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). Figure A2 in the Appendix shows that following the reduction in child allowances, total fertility declined to a greater extent among Arab women whose income in 2000 was relatively low and to the same extent among other population subgroups.

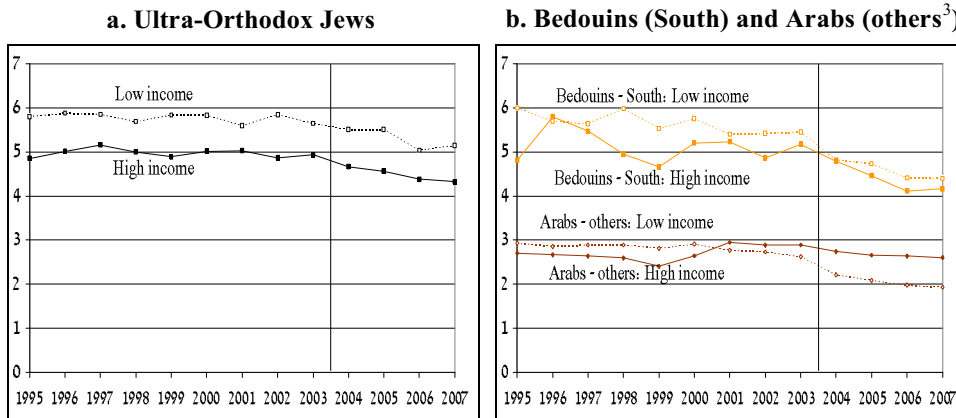
The above results should not in fact be attributed to the income effect since the husband's income may be evidence of his level of religious observance. Thus, for example, one can surmise that ultra-Orthodox men with relatively high incomes are less religious than low-income earners, who tend to remain in yeshiva for extended periods. Evidence of this can be found in Figure 13, which presents the changes in TFR for women aged 25–44 according to number of siblings,²⁵ 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.²⁶

²⁴ 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.

²⁵ 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.

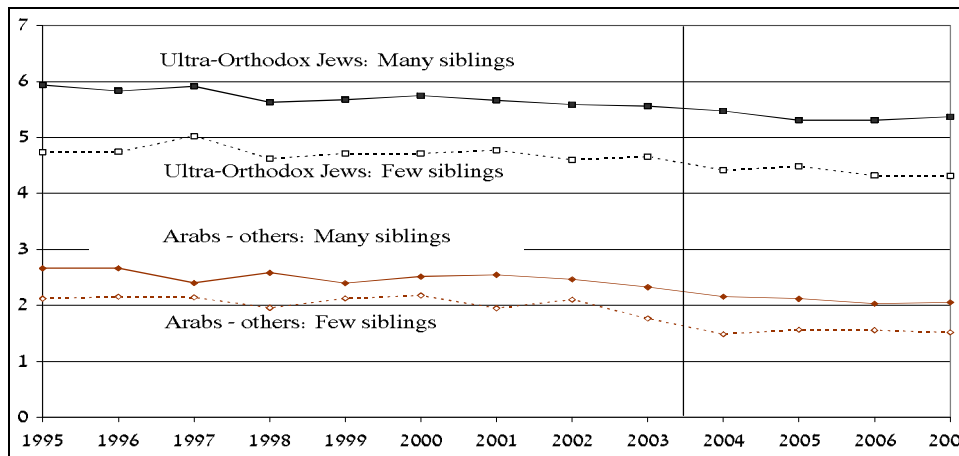
²⁶ Beenstock's (2007) estimation indicated that the number of siblings has a strong positive influence on fertility rates in Israel, as do the results of the present research presented below.

Figure 12
Total fertility rates for women aged 25–44¹ according to husband's income,²
1995–2007



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 13
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).

6. ESTIMATION RESULTS

a. Naïve estimations – fertility before and after the reduction in child allowances

The first section of this chapter is devoted to estimations based on the comparison of number of births during two periods (each three and a half years long): the “earlier period” of July 1997 to the end of 2000, which preceded the changes in legislation (the “Halpert Law”), and the “later period” from July 2004 to the end of 2007, during which all the pregnancies took place after the reduction in child allowances.

The estimations assume that the past fertility patterns of women can be used to predict fertility patterns in the future. Therefore, the control group for women who experienced the reduction in child allowances is the group of women with similar fertility patterns during the earlier period. For example, the expected number of births during the later period for ultra-Orthodox women who were aged 30 with 3 children in July 2004 is the number of actual births during the earlier period for ultra-Orthodox women who were the same age and had the same number of children in 1997, on the assumption that circumstances did not change between the two periods. An estimate of the impact of the child allowance reduction can be derived from the difference in number of births for similar women between the two periods.

Since the estimations in this section do not take long-term fertility trends into account, they were restricted to two population subgroups, which until the cut in child allowances had relatively stable levels of fertility, i.e. the ultra-Orthodox and Bedouins in the South. The estimation also do not take into account possible effects of the business cycle on fertility patterns. These two factors are taken into account in the second part of the chapter in which long-term estimations are presented for the period 1994–2007.

The dependent variable is the number of births per woman during the earlier and/or later period while the explanatory variables include a dummy for the later period and demographic-socioeconomic characteristics: age of the woman at the beginning of the period, number of children at the beginning of the period and age of the husband at the beginning of the period; a dummy for whether the woman and her husband were employed²⁷ and the salaries of the woman and her husband; number of siblings of the mother and proportion of ultra-Orthodox women in the postal code area (which is likely to be an indicator of her degree of religious observance).²⁸

The naïve estimations were carried out using ordinary least squares (OLS). Similar estimations, in which the dependent variable was defined as an count data (in Poisson or Negative Binomial types of models), produced similar results.²⁹

²⁷ In the case of the ultra-Orthodox, the fact that the husband is not working is likely to be an indicator that he is studying in a yeshiva and therefore is also an indicator of his level of religious observance and of belonging to the Lithuanian stream.

²⁸ The proportion of ultra-Orthodox women aged 25-39 according to the wide definition out of total Jewish women aged 25-39 in a postal code area (as of January 2008).

²⁹ For technical reasons, it was not possible to test zero-inflated Poisson and Negative Binomial models, which deal with the situation in which zeros are common in the dependent variable.

The estimation results for married ultra-Orthodox women (according to the wide definition) indicate that the number of children born during the later period declined by about 0.08, a decrease of about 6 percent, relative to the number of children born during the earlier period (1.32 children) and the difference is statistically significant. A rough calculation shows that total fertility fell by about 0.7 children at most.³⁰

Fertility among married Bedouin women in the South fell by about 0.2 children in the later period relative to the earlier one (1.06 children) and according to a rough calculation this translates into a reduction of at most 1.5 children over the whole fertility period.

b. Long-term estimations

The binary logit method was used to estimate the birth probability for each of the years during the period 1994–2007. The dependent variable is birth/no birth for a particular woman in each year, which is estimated using the demographic-socioeconomic characteristics of the woman and the size of the child allowance lagged by one year.³¹ The long-term estimations include the following characteristics as explanatory variables: the trend; age of the woman, number of previous children, a dummy for getting married in the previous year, a dummy for a birth in the previous year, a dummy for women who only have daughters; a dummy for continent of origin, a dummy for immigrants (for Jews only); age of the husband, a dummy for whether the woman and her husband are employed and the salaries of the woman and her husband, social benefits from the National Insurance Institute in the previous year (guaranteed income supplement, a dummy for alimony and a dummy for disability insurance); general unemployment rate in the previous year; number of the mother's siblings; area of residence and dummy for residence in a mixed city (for Arabs only) and a dummy for residence in a recognized settlement (for Bedouins only). In the case of ultra-Orthodox women, the following variables were also used in the estimation: the proportion of ultra-Orthodox women in the postal code area, a dummy for the narrow definition of ultra-Orthodox and total fertility in the postal code area, which is also meant to be an indicator of level of religious observance and the extent to which the commandment to “be fruitful and multiply” is fulfilled.³²

Long-term estimation has a number of advantages over naïve estimation for the two periods (i.e. before the reduction in child allowances in 2003 and subsequent to that). First, it becomes possible to directly test the effect of the size of child allowances on fertility;

³⁰ This is an upper bound for the drop in fertility since a relatively high proportion of ultra-Orthodox women belong to a young age group, in which fertility is relatively high, and therefore it also fell by a large amount during the later period.

³¹ An average pregnancy lasts 39 weeks and about three quarters of fertile women become pregnant within three months of the decision to do so (Gnoth et al., 2003). Therefore, the period of time from the moment of the decision to become pregnant until a child is born is around one year. Therefore, the explanatory variables in the estimation are in general lagged by one year.

³² Total fertility in the postal code area is defined as the number of children per ultra-Orthodox woman (according to the wide definition) aged 35 and over in the postal code area (as of January 2008). The area of residence is to a large extent a choice variable of the family and therefore total fertility in the area may reflect the family's desired number of children.

second, long-term trends in fertility can be taken into account; and finally, the connection between macroeconomic variables and fertility can be analyzed.

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 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.

The trend in the birthrate over time is examined in Table 2 at the end of the chapter. It presents the estimated coefficients of the 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 (2004–07).

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.

Additional estimations that included dummy variables for the years 2004–07 indicate a sharp drop in the birthrate during that period: about 14 percent for Bedouins in the South; about 11 percent for Arabs and Bedouins in the North; about 8 percent for Jerusalem Arabs; a much lower drop of about 4 percent among the ultra-Orthodox; and among non-ultra-Orthodox Jewish women and Druze women there was no statistically significant change in fertility beyond that of the trend. Other estimations (not shown) also included a variable for the size of the child allowance and as a result of its inclusion the trend variable for the years 2004–07 was no longer significant while the size of the child allowance coefficient remained significant. This is evidence of the contribution of the cut in child allowances to the drop in fertility during the period 2004–07, except in the case of the ultra-Orthodox, for whom the size of the child allowance was not significant (perhaps due to the gradual decline in the birthrate).³³

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. The estimates point to a positive and significant effect of child allowances on the fertility of the ultra-Orthodox and non-Jews (apart from Druze). The magnitude of the estimates is not easy to interpret and therefore the last line of Table 3 presents the change in birth

³³ Note also the significance of the estimates for the years 2004 and 2005 in Table 2, which also indicates that fertility among the ultra-Orthodox declined gradually during the period following the cut in child allowances.

probability for a woman who receives the average child allowance in comparison to one who does not receive any child allowance.³⁴

Following is the effect of child allowances at the average points 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 (narrow and wide definition) – about 3 percent.

The changes in the size of the child allowance (which primarily affected children of high birth order) did not have a statistically significant effect on Druze women, who on average have less than three children.³⁵

The estimated coefficients of child allowances for *all* women are similar to those of married women (Table A2 in the Appendix), except for non-ultra-Orthodox Jewish women. Therefore, the discussion of the effect of child allowances on the fertility of non-ultra-Orthodox Jewish women was deferred until the end of the chapter.

The following demographic factors increased the fertility rates of married women (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.³⁶ 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)³⁷ 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 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 (except for non-Jews; results not shown) since it is an indirect indicator of level of education/modern lifestyle and apparently a lower level of religious observance as well.

³⁴ In the logit estimation, the marginal effect of child allowances on birth probability, in percentage points, is calculated as follows: $\frac{\partial E(\text{birth})}{\partial CA} = P(1-P)\beta \overline{CA}$ 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.

³⁵ Tests carried out on specific groups of Druze according to region (the Carmel, the Galilee and the Golan) and for all Druze women, including unmarried ones, also show that the change in child allowances did not have any statistically significant effect.

³⁶ 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.

³⁷ 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.

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 (according to the narrow definition) so is the TFR in the postal code area³⁸ since these are indicators of the level of religious observance.

The unemployment rate had no significant effect on fertility (except for the Druze). This result was obtained both in estimations that included the national rate of unemployment (Table 1) and those that controlled for the regional rate of unemployment among women aged 20–44, with differentiation between Jews and others (in estimations not shown that relate to the ultra-Orthodox, other Arabs and Bedouins in the South). It should be emphasized that the estimated coefficients for the child allowance were similar in both cases. They also remained unchanged when controlling for the real rate of change in GDP, whose effect on fertility was not found to be statistically significant (not shown).³⁹

Sensitivity tests were carried out for the inclusion of explanatory variables in the estimations since some of them may be “endogenous”, i.e., correlated with a third factor that also affects the probability of giving birth. Thus, for example, the correlation between employment of ultra-Orthodox men and fertility may be a result of the degree of religious observance. An additional problem involves attributing the effect of the reduction in child allowances on fertility to intermediate variables, which will downwardly bias the estimated coefficient of the child allowance. For example, a reduction in child allowances will increase employment, which will in turn reduce fertility (see below for an elaboration of this point). Therefore, employment, the salaries of the woman and her husband, the receipt of social benefits, etc. were omitted from the estimations. Also omitted were a birth in the previous year and the number of previous children since they were influenced by the size of the child allowance in the past which is correlated with its size in the present. Table A3 in the Appendix indicates that the estimated effect of the child allowance on fertility changed very little when the “endogenous” variables were omitted (compare to Table 3).

In order to deal with the possible existence of serial correlation between observations (birth/no birth) for the same woman over time, use was made of clustering.⁴⁰ The results in Table A3 in the Appendix indicate that the magnitude of the estimated coefficients is preserved and so is their statistical significance. We would mention that serial correlation reduces the efficiency of the estimation but does not lead to bias. In the same context, a model was also estimated with fixed effects, which essentially embody all the unobservable fixed characteristics of the women, including their level of education, and according to the results the estimated coefficients of the child allowance (not shown) remained basically unchanged. Sensitivity tests were also carried out for the trend in fertility and the hypothesis of a non-linear trend (squared and cubed) was rejected.

³⁸ Fertility in the postal code area is likely to be influenced by the size of the child allowance. However, its omission from the estimation did not change the estimated coefficient of child allowances.

³⁹ The security situation is also likely to have an effect on fertility, both direct and indirect by way of the economic situation. This effect is very difficult to identify, particularly according to population subgroup, and is deserving of a separate research.

⁴⁰ In a GEE estimation with the GEMMOD procedure in SAS.

Two variables that may contribute to the explanation of fertility were not included in the estimations: woman's education (due to the lack of data) and age at marriage (due to possible endogeneity).⁴¹ 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).⁴²

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.⁴³ In any case, the data in Table A4 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.

Sensitivity analysis of the effect on fertility for various child allowances, i.e. the fourth child, the seventh child and the marginal child is shown in Table 4 (upper section). 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 subgroups 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 2004–07 to that of the dummy variables for that period⁴⁴ (Table 4, lower section) indicates that the reduction explains a major portion of the decline in fertility. This conclusion is reinforced by Figure 14 which shows that most of the decline in the fertility of non-Jews (apart from the Druze) during the period 2004–07 occurred as a result of the reduction in child allowances.

⁴¹ It is possible that age at marriage itself is dependent on the child allowance, particularly in traditional societies, where deferring marriage is a method of birth control. The age at marriage can have opposing effects on fertility. Thus, on the one hand, marriage at an early age is likely to indicate a traditional society and the desire to have a large family. On the other hand, as the age at marriage rises, the probability of birth for married women increases, given a fixed desired number of children.

⁴² This was done using the Central Bureau of Statistics Labor Force Survey for the years 2003–07 among women aged 18 and over in each of the following population subgroups: Arabs (not including Bedouins in the South and Arabs in Jerusalem), Bedouins in the South, Arabs in Jerusalem and Druze. It was not done for Bedouin women in the North since they could not be identified in the Survey. Among the ultra-Orthodox, the level of education does not successfully predict various behavior patterns (such as the supply of labor) and therefore the average level of education was not attributed to them.

⁴³ Among Bedouin women in the South, the increase in the average level of education over the years was well above the trend (as compared to a stable rate of increase among other Arab women and among Druze women). Thus, in the case of Bedouin women the use of average education was not successful and it would have been worthwhile using individual data, if it had been available.

⁴⁴ For the estimation equations in which the child allowance was replaced by dummy variables for the years 2004–07 as explanatory variables.

1. The differential effect of changes in the size of the child allowance

The estimations were also used to determine the extent to which the decline in fertility during the period following the reduction in child allowances was differential according to the socioeconomic characteristics of the married women.

The effect is expected to be stronger among low income earners (reflecting, for example, non-employment of the husband and the receipt of a guaranteed income supplement), in groups whose upbringing and ideology encourage large families (as can be seen in the large number of siblings and religiosity of ultra-Orthodox Jewish women) and among those whose income from the child allowance is expected to decline significantly (those with relatively young children since the loss from the cut in child allowances will continue over a longer period, i.e. until the children reach 18).

The testing of the differential effect of the changes in the child allowance on fertility, according to socioeconomic characteristics, was carried out by adding a variable for interaction between the period 2004–07 (following the reduction in child allowances) and those socioeconomic characteristics (Table 5). The estimations show that the cut led to a sharper decline in fertility among low income earners, as expected. However, the decline in fertility was in fact larger among those whose upbringing and ideology encourage large families. With respect to the differential effect of the cut in child allowances according to the long-term loss in income, the results were ambiguous and in any case the effect was small in magnitude.

The fact that the decline in fertility among women near the end of their childbearing period (older women or women with a large number of children) was larger than that of younger women indicates that this is not just a case of spacing but rather a decline in completed fertility, since to the extent that these women were still interested in the same number of children they had planned before the cut they would not have delayed births.

A similar test for the differential effect of the change in the child allowance on fertility according to socioeconomic characteristics was carried out by replacing the period 2004–07 variable with the size of the child allowance (including in the interaction variable). The results were similar to those described above, apart from the case of the ultra-Orthodox for whom no differential effect was found (see Toledano et al., 2009).

2. Non-ultra-Orthodox Jewish women

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 A2) although no effect was found for all women (married and unmarried).

The positive effect of the child allowance on the fertility of the married women is not consistent with the fact that these women have an average of slightly more than two children in their lifetime and only about 14 percent of them had four or more children.

Therefore, the changes in child allowance over the years were relevant for only a minority of non-ultra-Orthodox Jewish women (Figure 1).⁴⁵

One possible explanation for the statistically significant effect of the child allowance on the fertility of non-ultra-Orthodox Jewish women 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 in Toledano et al., 2009). 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).

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 (not presented).

When the interaction between the child allowance for the fourth child and the various socioeconomic characteristics were included in the estimations in order to test the differential effect of child allowances on fertility according to socioeconomic characteristics, the following results were obtained (not shown): child allowances had a greater effect on young women, on women in families with low per capital income, on women who were not working, on immigrant women and on women living in the periphery (northern and southern regions) or in Judea, Samaria and Gaza Strip relative to the rest of the country (regional differences may reflect socioeconomic-cultural differences and degree of religious observance). To the same extent, there was a relative decline in fertility among women in these groups during the years 2004–07 relative to other women. Child allowances were not found to have any differential effect according to previous number of children.

Separate estimations were carried out for the effect of the child allowance for the fourth child on the fertility of non-ultra-Orthodox Jewish women (married and unmarried) in each of the same differentiated groups according to socioeconomic background, in which differences in the effect of the child allowance were identified previously. The size of the child allowance did not have any effect on fertility in any of the groups, apart from a small though statistically significant effect on women whose mothers had four or more children and on women who had not worked during the previous three years.

Finally, separate equations were estimated for non-ultra-Orthodox Jewish women who did National Service, the vast majority of whom are religious or traditional⁴⁶ and have much higher fertility than other non-ultra-Orthodox Jewish women. It was found that the size of the child allowance for the fourth child did not have any effect on the fertility of those women, as in the case of other non-ultra-Orthodox Jewish women.

⁴⁵ This is an underestimate of completed fertility since the figure was calculated for married women aged 15–44 (in 2002), whose fertile period had not yet ended.

⁴⁶ 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 2005–07, is as follows: religious – 52 percent; traditional-religious – 22 percent; traditional but not so religious – 17 percent; and not religious/secular – 9 percent.

3. Comparison to Cohen et al. (2007)

Our research is 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 conceiving⁴⁷ during the period 1999–2005 (more or less equivalent to the period 2000–06 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).⁴⁸

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

⁴⁷ The date of conception was calculated as the date of birth less 39 weeks.

⁴⁸ The updated version did not include Arab Christians in the research population.

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:⁴⁹ 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 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.

4. The size of the child allowance and the probability of working

The effect of the cut in child allowances on reducing fertility can either be a direct result of the increased cost of childrearing or an indirect result of the increased labor supply of mothers. The indirect effect is due to the reduction in family income which leads to the increased labor supply of women. This in itself is likely to lead to a drop in fertility as a result of the reduction in time available for childrearing.

The probability of women working during each of the years 1994–2007 was estimated as a function of the size of the child allowance and additional control variables (including the rate of unemployment) for population subgroups whose labor supply is likely to be more affected than others by changes in the size of the child allowance (Table A5 in the Appendix).⁵⁰ It appears that the average child allowance during that period (as opposed to not receiving any child allowance at all) reduced the probability of working among non-Jewish women, whose participation rates were relatively low, by a magnitude of between 4 and 7 percent.⁵¹ Among ultra-Orthodox women, who are characterized by relatively high

⁴⁹ The analysis in the updated version of Cohen et al. (2007) relates only to the present value of the marginal child allowance.

⁵⁰ Arab women in Jerusalem were not included since their condition in the labor market deteriorated markedly as a result of the second Intifada and the construction of the Security Fence.

⁵¹ Also estimated was the probability of working during the period 2000–07 for women aged 22 or older, where a dummy for the number of children in 1999 above the medium number of children for women in the same population subgroup and of the same age in that year was added. The dummy variable is meant to represent the spacing of births, which reflects the desired number of children. The estimated coefficients of the child allowance remained basically unchanged except for Bedouin women in the South, for whom the coefficient became insignificant.

rates of participation, the average child allowance in fact raised the probability of working by about 3 percent.⁵² This period was characterized by an upward trend in the rate of employment among women in all the population subgroups and the rate of unemployment was negatively correlated with the rate of employment. It is worth mentioning that the sensitivity tests described above showed that the estimated effect of changes in the size of the child allowance on fertility in the various population subgroups remained unchanged even when the explanatory variables for employment of the woman and her salary in the previous year were omitted.

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 Jews	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	2001 – Increase in child allowances ("Halpert Law")	-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	2002	-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		-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	2006	-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 2004–2007 on birth probability ³								
Dummy for 2004–07		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. Number of observations as in Table 3.

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 2004–07.

⁵² It might have been assumed that the positive correlation between the size of the child allowance and the participation rate of ultra-Orthodox women is a result of the increased participation rate among ultra-Orthodox men during the period following the cut in child allowances, in contrast to its stability at a lower rate during the period preceding the cut, which may have led to ultra-Orthodox women leaving the workforce. However, the estimation of the employment rate for ultra-Orthodox men as a function of the size of the child allowance and additional explanatory variables indicates that in fact the child allowance had a positive effect on the rate of employment.

Table 3
The effect of child allowances and control variables on the birth probability of married women according to population subgroup, 1994–2007¹

	Ultra-Orthodox Jews	Arabs ²	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 [^]	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 (wide definition) 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 (wide definition) 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) R².

Table 4
Effect of various child allowances on the birth probability of married women
according to populations group, 1994–2007¹

	Ultra-Orthodox Jews	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 2004–2007					
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 2004–2007 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.

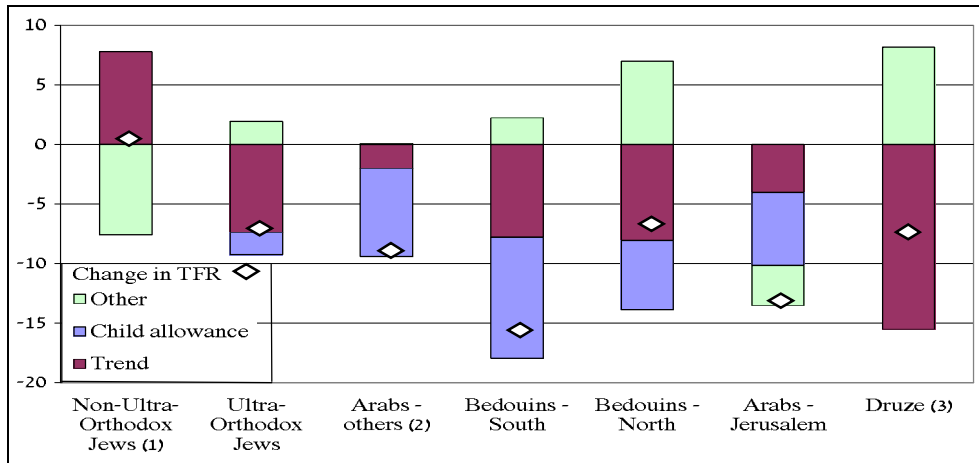
¹ A discussion of non-ultra-Orthodox Jewish women can be found in the body of the paper.

² Not including Bedouins, Jerusalem Arabs and Druze.

³ Estimation as in Table 3. Number of observations as in Table 3.

⁴ Estimation as in Table 3, in which the child allowance variables were replaced by dummy variables for the years 2004–07. Number of observations as in Table 3. .

Figure 14
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 2004–2007 period on the birth probability of married women according to socioeconomic characteristics and population subgroup, 1994–2007¹ – relative to the socioeconomic characteristics of the remaining group
 (interaction between the period and socioeconomic characteristics)

	Ultra-Orthodox Jews	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 <i>per capita</i> 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***			
Average age of children (up to 18) exceeds 6 ⁸	0.1382***	-0.0601***	-0.0420	-0.0358
Estimated coefficient for 2004–07 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 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 2004–07 but do not include the size of the child allowance variable. No significant differences were found in the effect of the period 2004–07 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).

⁸ The estimations were carried out only for women who had children and a dummy variable for the average age of children (up to 18) exceeding 6 was added to the explanatory variables.

7. 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.

The child allowance increases family income and can have an impact on a variety of life outcomes and behavior patterns, such the welfare of the household, the labor supply of mothers, fertility patterns, etc. Fertility patterns in turn affect important macroeconomic variables, such as income inequality, economic growth and fiscal policy, and they are also related to the sensitive question of demographic balance between majority and minority groups and related issues.

During the past two decades, there have been significant changes in the size of the child allowance in Israel. Thus, in the mid-1990s, child allowances were increased significantly for most non-Jewish high birth-order children; in the 2000s they were increased significantly for all high birth-order children (the “Halpert Law”); in 2003, they were drastically reduced; and recently, in 2009, there was an additional upward revision. This study has attempted to analyze the effect of these changes on fertility during the period 1994–2007.

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, *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.

A preliminary test found that an increase in the size of the child allowance has a negative effect on the labor supply of non-Jewish women. Therefore, the overall effect of child allowances on fertility, which is also the result of their effect on the labor supply of women and in turn on fertility, was also tested and the results remained basically unchanged.

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, which made it difficult for low-income families to finance childrearing expenses, and whose effect on households is only partly reflected in the control variables used in the estimation. In addition, it may be that other processes –

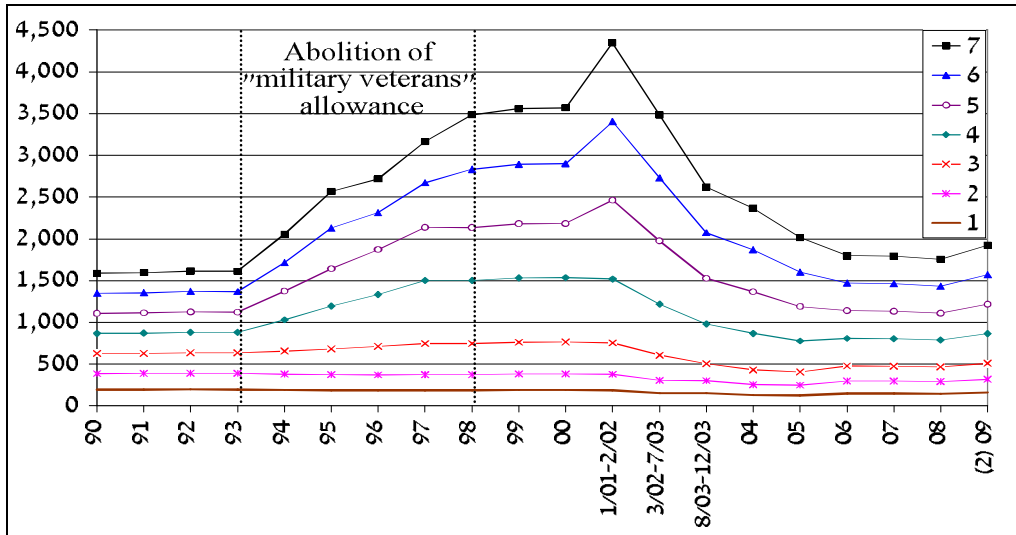
whether social, cultural or religious – matured during this period and thus led to the decline in fertility.

The research was carried out a relatively short time after the reduction in child allowances and individuals probably found it difficult to decide whether or not this was a permanent change, particularly against the background of frequent changes in child allowances. In addition, it is unclear whether the decline in fertility due to the cut in child allowances will at the end of the day be reflected in a decline in completed fertility or only in the deferral of births until a more opportune period.

It is important to emphasize that the study has focused on the effect of the cut in child allowances on fertility; however, this policy measure may also have implications in other areas, such as the welfare of the family, the labor supply of mothers, the health situation of newborns and therefore life outcomes, income inequality, etc. These issues deserve their own research.

APPENDIX

Figure A1
Child allowance¹ per family, according to number of children: non-“military veterans”, 1990–2009
 (NIS per month, in average 2007 prices)



Source: National Insurance Institute and calculations by the authors.

¹ For children born up until June 2003.

² Not including the addition to the child allowance for children of birth order 2–4 as part of the Economic Efficiency Law for 2009–10 (Arrangements Law).

Table A1

The change in average number of children born to a married women during the period following the reduction in child allowances in comparison to the period preceding it,¹ according to ethnic group, age and number of children at the beginning of each period²

Age group	Non-ultra-Orthodox Jews								Ultra-Orthodox Jews (wide definition)							
	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
15-19	0.332	0.174	0.274						0.131	-0.179						
20-24	0.091	0.119	0.073	0.003	-0.091				-0.092	-0.141	-0.138	-0.192	-0.227			
25-29	0.049	0.050	0.025	0.038	-0.018	-0.059	0.157		-0.060	-0.052	-0.128	-0.102	-0.077	-0.053	-0.039	-0.047
30-34	0.184	0.111	0.030	0.000	0.051	0.014	-0.018	-0.086	0.195	-0.010	-0.028	-0.062	-0.067	-0.013	-0.085	-0.046
35-39	0.133	0.095	0.053	0.007	0.015	0.032	0.018	-0.014			-0.080	-0.013	0.068	0.008	-0.049	-0.034
40-44	0.036	0.011	0.005	0.003	0.002	0.001	0.004	-0.010			-0.024	-0.023	0.016	-0.012	-0.017	-0.058
	Bedouins in the South								Bedouins in the North							
15-19	0.023	-0.189	-0.257						-0.081							
20-24	-0.034	-0.156	-0.286	-0.275	-0.342	-0.200			-0.254	-0.245	-0.274	-0.257				
25-29	-0.061	-0.380	-0.200	-0.251	-0.416	-0.303	-0.287	-0.312	-0.400	-0.090	-0.210	-0.250	-0.244			
30-34				-0.006	-0.147	-0.260	-0.305	-0.353				-0.161	-0.217	-0.291		
35-39								-0.085					-0.088	-0.048	-0.048	
40-44									-0.081							
	Jerusalem Arabs								Druze							
15-19	0.185	-0.173	-0.118						-0.092	-0.058						
20-24	0.230	-0.104	-0.168	-0.171	-0.108				-0.036	-0.126	-0.195	-0.361				
25-29	0.083	-0.032	-0.113	-0.170	-0.137	-0.212	-0.301		0.002	-0.083	-0.171	-0.174	-0.172			
30-34	0.019	0.004	-0.164	-0.118	-0.077	-0.121	-0.077	-0.154	0.013	-0.047	-0.131	-0.124	-0.197	-0.099	-0.169	
35-39	-0.014	0.126	0.055	-0.033	-0.042	-0.059	-0.069	-0.011				-0.066	-0.056	-0.074	-0.077	
40-44	-0.016		0.005	-0.010	0.005	0.001	-0.004	0.034				-0.021	-0.031	-0.018	0.001	-0.038
	Other Arabs															
15-19	-0.055	-0.159	-0.304													
20-24	-0.178	-0.162	-0.173	-0.169	-0.284											
25-29	-0.185	-0.166	-0.201	-0.181	-0.153	0.128	-0.256									
30-34	-0.087	-0.152	-0.171	-0.121	-0.126	-0.115	-0.167	-0.124								
35-39	0.023	-0.127	-0.016	-0.028	-0.045	-0.030	-0.053	-0.061								
40-44	0.007	0.021	-0.009	0.001	-0.000	-0.013	-0.008	-0.002								

Source: National Insurance Institute and calculations by the authors.

¹ The period following the reduction in child allowances: July 1, 2004–December 31, 2007. The period preceding the reduction in child allowances: July 1, 1997– December 31, 2000.

² Bold numbers indicate a 5% level of significance. Empty cells indicate less than 100 observations in each of the periods.

Figure A2
Total fertility of married women aged 25–44 according to the woman’s income,¹
2000 to 2007



Source: National Insurance Institute and calculations by the authors.

¹ Gross annual income of the woman in 2000 from salary and self-employed income. Low income: in the lower tercile of the distribution of income for women born in the same year and in the same population subgroup. High income: Upper tercile of the distribution of income for women born in the same year and in same population subgroup.

² Arab women who are not Bedouins or residents of Jerusalem (also does not include Druze).

Table A2
The effect of the size of child allowances¹ on birth probability according to population subgroup, 1994–2007

	Non-ultra-Orthodox Jews	Ultra-Orthodox Jews	Arabs ²	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
	Marginal effect of child allowance ³						
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. Number of observations for married women 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 A3
Sensitivity tests for the inclusion of control variables in the estimation of the effect of child allowances¹ on the probability of married women giving birth, according to population group, 1994 to 2007^{2,3}

	Ultra-Orthodox Jews	4Arabs	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
All variables (Table 3)	6.2 E-6***	1.6 E-5***	1.7 E-5***	1.3 E-5***	1.4 E-5***	-3.7 E-6
Without "endogenous" variables	5.8 E-6***	1.7 E-5***	1.6 E-5***	1.3 E-5***	1.5 E-5***	-2.2 E-6
Trend + age of women only	4.6 E-6***	1.7 E-5***	1.5 E-5***	1.4 E-5***	1.5 E-5***	-1.7 E-6
Trend + age of woman only (cluster for the woman)	5.3 E-6***	1.8 E-5***	1.6 E-5***	1.4 E-5#	1.4 E-5***	-1.9 E-6#
Number of observations	220,055	1,000,785	108,418	54,780	207,730	154,173

Source: National Insurance Institute and calculations by the authors.

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

#Standard deviations were not obtained for technical reasons.

¹ Child allowance for child 4: Arabs, Bedouins in the North, Jerusalem Arabs and Druze. Child allowance for child 7: ultra-Orthodox Jews and Bedouins in the South.

² A discussion of non-ultra-Orthodox Jewish women can be found in the body of the text.

³ The results of the estimation, which include the explanatory variables that are liable to be endogenous, were taken from Table 3.

In estimations that do not include the "endogenous" variables, the following variables were omitted: birth in the previous year, employment of the woman, the salary of the woman, the size of the guaranteed income supplement, receipt of alimony payments, receipt of disability insurance, salary of husband, self-employed husband, proportion of population in postal code area that is ultra-Orthodox (for ultra-Orthodox only), total fertility in the postal code area (for ultra-Orthodox only) and number of previous children.

The following variables remained in the estimations: size of the child allowance, the trend, marriage in previous year, daughters only, group of origin (for ultra-Orthodox only), immigrant (for ultra-Orthodox only), age of husband, age of husband squared, number of mother's siblings, ultra-Orthodox by the narrow definition (for ultra-Orthodox only), rate of unemployment, region/district of residence (non-Jews only), residence in a mixed city (for Arabs only), residence in an unrecognized settlement (for Bedouins only) and age of the woman.

⁴ Does not include Bedouins, Jerusalem Arabs and Druze.

Table A4

The effect of the size of child allowances¹ 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 Jews	Arabs ²	Bedouins South	Bedouins North	Jerusalem Arabs	Druze
	Marginal effect of child allowance ³						
With control ⁴	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 ⁴	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 and number of observations as in Table 3.

⁴ 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).

Table A5
Effect of the child allowance on the probability of women working according to population subgroup, 1995 to 2007

	Ultra-Orthodox Jews	Arabs ¹	Bedouins in the South	Druze
Child allowance – child 4		-1.0 E-5***		-2.0 E-5***
Child allowance – child 7	8.1 E-6***		-1.0 E-5***	
Trend	0.0424***	0.0466***	0.0840***	0.0512***
Rate of unemployment ²	-0.0299***	-0.0373***	-0.0061	-0.0449***
Additional control variables ³	V	V	V	V
Number of observations	435,141	2,345,925	350,358	336,955
Adjusted R ² ⁴	0.126	0.074	0.090	0.095
Effect of child allowance at the average point	2.6%	-3.5%	-4.6%	-7.3%

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 Not including Bedouins, Jerusalem Arabs and Druze.

² National rate of unemployment.

³ Constant, age of woman (discreet), birth in the previous year, family status, marriage in previous year, divorce in the previous year and daughters only. For ultra-Orthodox Jews, the following explanatory variables were also included: proportion of ultra-Orthodox Jewish women in the postal code area, total fertility in the postal code area and ultra-Orthodox Jews according to the narrow definition. For Arabs: region of residence and residence in a mixed city. For Bedouins in the South: area of residence and residence in an unrecognized settlement. For Druze, area of residence was added.

⁴ McFadden's (adjusted) R². Number of observations as in Table 3.

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