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Distributive Effects of Israel's Pension System

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Abstract

This paper examines several aspects of Israel's restructured retirement benefits system, focusing on distributive effects. We characterize 10 stylized representative prototypes of Israeli households, reflecting common demographic, wage and employment profiles. These prototypes are used to examine the joint effects of tax benefits for pensions and the public Old Age Allowances program's contributions and disbursements on the lifetime income distribution, net replacement rates at retirement and lifetime consumption smoothing. We find that the system is neutral in terms of its effect on lifetime income distribution, except for the top income decile which gains somewhat less than the others. We also find that pension savings result in a net loss for many low-income households, unsmooth their consumption and lead to "too high" post-retirement net replacement rates. Furthermore, evidence from a unique dataset point to rational and active behavior of most households with respect to these incentives. These findings suggest that the parameters of the retirement-age benefits system should be adjusted following the introduction of mandatory pensions.

השפעת ההסדרים הפנסיוניים בישראל על התחלקות ההכנסות

עדי ברנדר

תקציר

מאמר זה בוחן את מערכת ההטבות לחיסכון לגיל פרישה בישראל, תוך התמקדות בהשפעתה על חלוקת ההכנסות. בעזרת נתונים על השכר, התעסוקה ותכונות דמוגרפיות אנו מאפיינים 10 טיפוסים של משקי בית המייצגים את האוכלוסיה בישראל. על בסיס תוואי התעסוקה והשכר של טיפוסים אלה נבחנת ההשפעה המשותפת של הטבות המס לחיסכון פנסיוני ושל מערכת הקצבאות לגיל פרישה של הביטוח הלאומי על התחלקות ההכנסות לאורך חיי הפרט, על רמת ההכנסה בגיל פרישה ביחס לזו שבסוף תקופת העבודה (יחס התחלופה) ועל החלקת התצרוכת במשך החיים. נמצא כי מערכת החיסכון לגיל פרישה היא ניטראלית מבחינת השפעתה על התחלקות ההכנסות בין משקי בית לאורך חייהם, פרט לעשירון העליון (וחלק מהעשירון השני) שזוכים להטבות נטו נמוכות במקצת מהאחרים. עוד נמצא כי בעלי הכנסות נמוכות מפסידים פיננסית (נטו) מחיסכון פנסיוני, הפוגע בנוסף גם בהחלקת התצרוכת על פני חייהם ומייצר עבורם יחס תחלופה "גבוה מדי" בגיל הפרישה. ניתוח בעזרת בסיס נתונים ייחודי מלמד כי קבלת ההחלטות של מרבית משקי הבית בתחום הפנסיוני היא במידה רבה רציונלית ואקטיבית, ותואמת את מבנה התמריצים. ממצאים אלה מצביעים על הצורך להתאים את הפרמטרים של מערכת ההטבות לגיל פרישה בישראל בעקבות הפעלת פנסיית החובה.

1. Introduction

Israel's pension and social-security Old-Age-Allowance (OAA) systems have undergone substantial reforms since 1995 dealing predominantly with their solvency. The reforms, resembling those in many OECD countries (Salomaki, 2006; Dang et al., 2001), included a rapid increase of the legal retirement age, substantial cuts in the terms offered by the defined-benefits occupational pension-funds for their existing members and closing these funds for new members. Additionally, newly hired public-sector employees were moved from employer-fully-funded arrangements to defined contribution – unsubsidized – private pension funds.

After the solvency risks were alleviated, policy-makers' focus shifted to poverty among the elderly. The high and rising overall poverty rates in Israel drew attention to the large proportion (about 22 percent) of old people living below the poverty line - in contrast to most OECD countries.[1] Additionally, the government was concerned about the fiscal costs of Social Security's means-tested Income-Supplement program and wanted to ensure that retirees will be able to provide for themselves instead of relying on public funds; there also was a concern that retirees take advantage of the means-tested support.[2] The main factor pointed-out as responsible for the limited availability of retirees' own-resources was too-little pension savings among those in the lower part of the income distribution (Table 1). Consequently, the structure of tax incentives for long-term savings was altered to support almost exclusively pension savings (defined as savings towards the payment of a retirement-age annuity). Furthermore, in light of pending legislative intervention, employers and the trade-unions agreed to adopt a national pension accord from 2008, which was extended by government decree to cover all the employees.

Pensions offer two key advantages for individuals: 1) consumption smoothing over a life-time-span, including insurance for longevity[3]; 2) potential financial gains due to direct government subsidies and tax breaks (financed by general taxation). With respect to the first advantage, it was argued that people may not save enough for retirement

[1] Forster and Mira D'ercole (2005) find that only in 7 OECD countries poverty rates among the elderly are higher than for the whole population.

[2] Part of this concern is that non-pension savings are not effectively accounted for in the calculation of the means-tested support, due to misreporting by applicants.

[3] Insurance for longevity and its pricing is a major determinant of pension-benefits' value and a source for potential failures in the annuities market (Finkelstein and Poterba, 2002, 2004).

Table 1: Pension and Employment when Reaching the Retirement Age

Income Quintile in 2000 [1]	Work and pension status in 2005			Status in 2007
	Does not work and has no pension	Works and does not collect a pension	Collects a pension[2]	Does not work and has no pension[3]
	(Percent of the employees in each quintile)			
Working Men aged 60-65 in 2000				**Working Men aged 64-66 in 2005**
1	44.8	29.8	25.5	37.0
2	31.3	38.0	30.7	24.9
3	24.1	39.3	36.6	18.3
4	19.9	30.3	49.9	14.4
5	15.5	26.5	58.0	15.8
Total	**25.8**	**31.2**	**43.0**	**22.1**
Working Women aged 55-65 in 2000[4]				**Working Women aged 59-65 in 2005[5]**
1	48.0	42.0	10.0	36.9
2	27.5	48.0	24.4	21.7
3	16.2	38.6	45.2	12.1
4	14.1	35.7	50.2	9.4
5	14.1	37.0	48.9	9.8
Total	**27.3**	**40.3**	**32.4**	**19.0**

Source: calculations based on the tax records panel dataset for 2000, 2005 and 2007.

[1] The income quintiles are calculated for the entire population and not for each group separately.

[2] Either work or not.

[3] Based on the income quintiles in 2005.

[4] Excluding those over 60 who already received a pension in 2000.

[5] Excluding those over 60 who already received a pension in 2005.

due to myopia about their needs at that age (Kotlikoff, 1987). This myopia can reflect either "wrong" discount rates or ignorance/passiveness regarding future needs.[4] On the other hand, mandatory savings can result in "too much" savings for various types of workers and in sub-optimal distribution of disposable income through life (e.g, as related to balancing pension savings and the costs of raising children and paying mortgages), especially if individuals are rational and informed (Martin and Whitehouse, 2008). Rational individuals are also expected to respond to the net financial benefits from pension savings reflecting the various tax and subsidy incentives. These incentives, however, may also generate "too much" savings. Furthermore, savings incentives might significantly affect the cross-section life-time income distribution.[5] While the desired level of income redistribution is primarily a matter of social and political preferences it is important that decision-makers be aware of the consequences of various decisions, because in the case of pensions the results may not be fully visible.

[4] Beschears et al. (2006) and Choi et al. (2004) discuss the inertia and passiveness of individuals with respect to their pension savings.

[5] Diamond (2009) points-out the need to account for the interactions between tax and pension systems.

This paper examines the distributive effects of Israel's pension system from several angles associated with the individual's point-of-view, as related to the potential effects of "Mandatory Pensions". First, we estimate the distributive effect of the pre-legislation pension system by calculating the net lifetime financial gains from participating in the compulsory social-security OAA system and from choosing to join a pension-fund (accounting for the interactions between them). To make the analysis as realistic as possible we focus on typical life-time employment and income profiles depicted for prototypes derived from labor market and demographic data. This approach differs from various previous studies.[6] Then we point-out the potential effects of pension-savings on these net gains. Consumption smoothing is examined by analyzing pension replacement rates for various types of workers and the ratio of disposable income per "standardized' person in the household during the families' life. A unique dataset – containing a panel of randomly selected 300,000 Israeli tax-payers (10 percent of the population) in 2000, 2005 and 2007 – is used to examine the individual and household characteristics associated with the decision to save for retirement and the degree to which individuals and households responded to the changes in pension regulations in recent years. Specifically, one of the implications of moving to a fully-funded defined contribution system is that low-income individuals (those below the income-tax threshold) no longer have direct financial gain from participating in the system.[7] Their response to this change can provide some insights as to whether individuals are indeed passive with respect to their pension savings.

The paper is organized in the following way. Section 2 provides a short description of Israel's pension system and of the changes implemented since 1996. Section 3 provides information on characteristics of the Israeli labor force that were used to generate wage profiles and behavior patterns for the different household types used in the analysis. In Section 4 we calculate the net financial benefits from participating in Social-Security's OAA and saving for pension. We then calculate the programs' joint impact on the size and spread of life-time income of various household types. Section 5 evaluates the arguments in favor of mandating pension savings and Section 6

[6] See e.g., Martin and Whitehouse (2008), OECD (2005, 2007) and Bank of Israel (2008).
[7] The pension funds are still eligible to receive preferred government bonds paying 4.8 percent real annual return to cover 30 percent of their assets, but – accounting for management costs – this yield is not higher than long-term yields in the financial markets.

concludes by discussing the potential impact of the "Mandatory Pension" decree and highlighting issues and options for policy adjustment.

2. Characteristics of the Israeli pension system

Israel's retirement income system is based on a universal social-security pillar, augmented by a means-tested income-supplement program, and on individual savings in pension funds. Until 2008 pension-fund savings were optional, but a government decree has now made such savings mandatory for incomes up to the average wage (an income level exceeded by roughly one third of all employees). This legislation complements an overhaul of Israel's pension system that began in 1995. To set the ground for the analysis this section briefly describes these changes and the current characteristics of the system.[8]

Until 1995 Israelis' retirement savings were concentrated in occupational pension-funds which offered generous defined-benefit schemes. Public-sector employees, as well as those in large organizations such as the banks and the utility companies, were offered similar benefits in employer-funded programs with no direct employee contribution. Individuals could also enjoy tax benefits for depositing a portion of their uncovered salaries into private savings accounts – provided that the amounts were not withdrawn for at least 15 years from the date the account was opened.

Government support for pension-saving took two forms: tax allowances at the times of deposit and withdrawal and preferential yields for the deposited amounts. The pension funds received special non-tradable government bonds at above market yields (5.57 percent plus indexation to the CPI) to cover 93 percent of their deposits. Still, by the early 1990s it became clear that the benefits' generosity made the funds operations unsustainable – in line with developments in other developed countries (World Bank, 1994; Martin and Whitehouse, 2008). Therefore, in March 1995 the funds were closed to new members and the rights of their existing members were somewhat reduced. New pension funds were launched which were required to be actuarially balanced. These funds still received preferential government bonds to cover 70 percent of their deposits, although the yield was reduced to 5.05 percent. The government also

[8] This section relies to a large extent on Achdut and Spivak (2009).

guaranteed a real return of 3.5 percent for the remaining 30 percent of their assets and assumed the risk of changes in longevity.

The 1995 reform was only a first step in the pension system's restructuring. Between 1995 and 2002 the government stepped away from the guarantee to the new pension funds' yields and for the risks associated with changes in life-expectancy.[9] After 2001 new public-sector employees were no long eligible to participate in the employer-funded pension scheme and were placed in the new pension funds. These modifications were, however, only a prelude for the 2003 reform.

In 2003, as part of the fiscal consolidation program, the government significantly reduced the benefits for pension savings at all levels. First, the retirement age was raised from 65 to 67 for men (phased-in until 2009) and from 60 to 64 for women (to be completed in 2017). At the same time tax benefits for early retirement were reduced and the preconditions for receiving early pensions toughened. The "old" pension funds were nationalized, the benefits for their existing members were substantially reduced and their contributions increased. The share of special government bonds issued for these funds was lowered to 30 percent of their assets, and instead the government offered a substantial one-off subsidy to cover the existing estimated actuarial deficits of the funds.[10] The government also removed its guarantee for the rights of the existing members.

The terms of pension savers in the "new" pension funds were also downgraded. The coverage of special government bonds was reduced to 30 percent of the funds' assets and the yield was lowered. Combined with raising the management fees the preferential return in the funds was essentially eliminated. The funds were also transformed to a pure defined-contribution setting which implied that the only financial benefit for investing in the funds is due to tax incentives.

Another policy change implemented gradually since 2003 was the removal of tax benefits for long-term savings not directly designed towards retirement-age annuities. Since 2008 individuals are required to save in an annuity-oriented account a sufficient

[9] The costs associated with this move for savers are discussed in Yosef and Spivak (2008).
[10] The actual payment will be phased-in over 35 years.

amount to ensure a pension equal at least to the minimum wage in order to qualify for tax benefits for additional savings towards a lump-sum payment upon retirement.

Finally (so far) in 2008 the trade-unions and the employers' organizations agreed on "mandatory pensions". This agreement was extended by government decree to all the employees. It mandates that each employee working for at least 6 months with the same employer will be insured in a pension-fund. Employees that already have an account with a pension-fund will be insured after the 3rd month. Coverage under this decree applies to amounts up to the average national wage, and the legislation does not pertain to employees that were in a better scheme before the decree was issued. The contributions are set to rise gradually and reach 15 percent (10 percent by the employer and 5 by the employee) by 2013.

Following the various reforms the current benefits for pension savings by the young cohorts in Israel are composed of four tax incentives:

1. Employer deposits into a pension fund or an employer-funded program up to 7.5 percent of the insured salary are non-taxable for the employee and exempt from social-security contributions. This provision covers salaries up to 4 times the average wage.

2. Employee contributions on the portion of their salary for which the employer also deposited are eligible for a 35 percent tax credit. This credit is provided for deposits of up to 7 percent of the insured income, for incomes up to the average wage. A credit of 5 percent is granted for the portion of income between the average wage and twice the average wage. Similar provisions exist for employees whose employers do not contribute to their pension savings.

3. The return on amounts deposited in pension funds is exempt from taxation.[11]

4. The annuity payments are taxed as regular income at the time they are disbursed with an additional exemption of 35 percent of the annuity, up to a level of about 30

[11] The general tax rate on interest and capital gains for individuals is 15 percent on indexed assets (on the real yield) and 20 percent on non-indexed assets (on the nominal yield).

percent of the average wage. Additionally, pensioners are eligible for a supplementary credit point (197 NIS monthly) if their spouse does not work and has no pension.

In addition to pension savings individuals are eligible for OAA from Social-Security. The monthly contribution for these benefits is 0.22 percent of incomes below 60 percent of the average wage and 3.85 percent for the portion of income above this threshold (capped at 5 times the average wage). Employers also contribute 1.45 percent on wages up to 60 percent of the average wage and 2.04 percent on higher incomes. The benefits offered by the system include three components:

1. A monthly lump-sum amount of about 16 percent of the average national wage for a single person and 24 percent for a couple. The amounts are indexed to the CPI.

2. An addition of 2 percent for each year of contribution – beyond the first 10. This addition is limited to 50 percent of the basic amount. Couples of two workers are eligible for the benefit based on the sum of their individual rights.

3. A means-tested income-guarantee scheme providing a minimum income of 30 percent of the average wage for individuals and 45 percent for couples. The eligibility is not affected by pensions of up to 13 percent of the average wage for individuals and 20 percent for couples.[12]

3. Typical income and employment profiles

An analysis of the life-time effects of retirement savings and benefits on income distribution requires information on the income and employment patterns of individuals, on the persistence of their rank in the income distribution, on the typical household characteristics and on the incomes of other members of the household – particularly the spouse. To identify the most common prototypes we combine three datasets, each with a unique contribution:

1) The annual national Incomes Surveys which allow tracing changes in the wages of various *types* of individuals over time. Although the surveys do not follow a fixed

[12] The latest increase in the means-tested benefits for people over the age of 80, implemented since late 2008, is not accounted for in the calculations.

panel they do facilitate a comparison of the wages of individuals with similar characteristics over long periods. The surveys also contain data on education, and additional household and demographic characteristics.

2) The Social Survey of 2002, which focused on pensions and life-time employment, provides information about the number of years worked by individuals with various characteristics during their adulthood.

3) A dataset including a random sample of 10 percent of all the tax-payers in Israel in 2000, 2005 and 2007. This unique dataset was constructed to include the tax records of the same individuals in these years (provided that they worked or received a pension in at least one of them), as well as the tax records of their spouses. The data are augmented by additional variables from the official state registry such as the locality of residence, date of immigration, and the number and dates-of-birth of the families' children, including those who passed the age of 18. This facilitates tracing the pattern of births over the individual's life - particularly important data for identifying potential breaking points in female careers as well as per-capita income of the household.

The key characteristics identified with the various datasets are the following:

1. Working people are typically married. More than three quarters of all the working individuals in the tax dataset were married; this share is quite stable across age groups (Table A-1). Therefore, meaningful analysis of pre-retirement income patterns and post-retirement standard of living has to center on couples.

2. More than 90 percent of working adults between the ages of 40 and 65 have children (including those over the age of 18). More than 50 percent have at least three offsprings (Table A-1). The larger number of parents compared to married individuals is mostly accounted for by divorced parents (Table A-2).

3. More than three quarters of the working men and almost nine out of ten working women have a working spouse. There is a positive correlation between own-income and the probability that the wife is working (Table A-3).

4. The average age difference between male workers and their wives is about three years among couples in which both spouses work. Given the existing and planned official retirement ages this implies that married couples typically reach the retirement age at about the same time (Table A-4).

5. From the Social Survey we find that men typically worked with few interruptions throughout their adulthood. However, those with low incomes experience somewhat longer breaks (Table A-5-I). A specific and quantitatively important sub-group is Arab (mostly manual) workers that tend to retire relatively early; this tendency is reflected to some extent in the persistently low share of work-years among Arabs over the age of 40 (Table A-5-II). However, on average Arab men are likely to meet the 35-years minimum requirement for full-tenure at social-security because they can start working at age 18.

6. Working women tend to have much longer interruptions of their working life. This is correlated with having a large number of children (Table A-5-III) and with their income: those who reach monthly salaries of over 5,000 NIS work a proportion of their adult life that is only moderately lower than that of parallel men[13] – but they are less than a half of the working women (Table A-5-I). We also find the reverse phenomenon – the more experience women accumulated during their working lives – the higher their average income (Table A-5-IV). Additionally a positive correlation exists between working years and education, but quite a few women with high education work part-time or quit the labor force for significant periods. Only a small fraction of Arab women works.

7. Using the Incomes Survey we simulate the life-time wage patterns of various individuals. We do that by examining the change in the prototypes' wages between 1988 and 2007 (looking at a 20 years older age group in 2007) as well as by looking at a cross-section of individuals in 2007. We find clear and consistent patterns for men, which differ between education levels. Those with high education move up the wage-ladder early in their careers and enjoy large wage increases for about 30 years before their wages stabilize. The pattern is similar, although more moderate, for those

[13] Since the purpose of this examination is to identify common patterns the question of causality is not discussed here.

with post-secondary education up to – and including - a bachelor's degree. In contrast, those with lower education have an initial low wage which is rising by less than the national average wage over the course of their employment (that is, they have no premium for tenure).

8. Women's wages rise more moderately than men's, especially at the ages 30-45. This reflects the interruptions in their career and shorter working hours, especially in the periods of raising children (Brender and Gallo, 2008). Even at the high-education level a significant share of women work part-time (Table A-6). The wages of women with low-education tend to rise at a similar, or even higher, rate than men in these ages – but this may be due to a statistical artifact, since a large share of the women in this group does not work.

9. Consistent with the wage profiles identified above, the tax dataset shows significant persistence of individuals' rank in the income distribution within the main working age (30-55). While these data only cover a 5 years period they have the advantage of being based on a panel (Table A-7-I). We also find that the dropout rate among those at the bottom deciles is double that of those at the top. The same type of persistence is observed between 2005 and 2007 (Table A-7-II).

10. There is a strong correlation between workers' incomes and those of their spouses. It is also much more common to find non-working wives of men with low incomes (Table A-8).

Based on these observations we set up several prototypes of individuals which share the most common characteristics of the Israeli population in order to analyze the pension system. These are described in Table 2 and their detailed characteristics appear in Table A-9 in the appendix. Rough estimates suggest that the characteristics of some 15-20 percent of the working households are similar to those of Type 1, another 15 percent match Type 2 and about 25 percent are reasonably represented by Types 9 and 10.

Table 2: Description of the Household Types Used in the Pension Analysis

Type		Net Lifetime Income[1]
1	Manual worker, married to a non-working wife, 4 kids, retires at age 60.	1.3
2	Secondary education, married to a non-working wife, 3 kids.	1.6
3	Secondary education, wife working part-time when the children are in pre-school age: 0.7 of full-time when the first child is born and 0.5 when the second is born. Three kids.	2.4
4	Bachelor, post-secondary education.	2.1
5	Post secondary education for both husband and wife, 2 kids.	3.7
6	Single (divorced mother) with post-secondary education, two kids. Working part-time until the kids reach age 18. Housing costs are covered by alimony until the children reach age 18.	1.2
7	Academic degree for both husband and wife, 3 kids. Wife works 50 percent of a full-time job all her adult life.	3.9
8	Post secondary education, wife has secondary education and works 20 years. Three Kids.	2.7
9	Academic degree for both husband and wife, 3 kids.	4.8
10	"Fast-track" successful couple, both with tertiary education and working full-time. Two kids.	6.9

[1] Millions of NIS (constant 2008 prices) capitalized to age 25. Including child allowances.

4. Loss/Benefit from Social Security and Pension Savings

The analysis of the net gains or losses from participating in the social-security OAA program and from contributing to a pension plan was based on the simulated wage profiles of the various types described in Table 2. We first calculated the contributions and potential benefits in the – compulsory – OAA program and then the marginal benefit from choosing to save in a pension fund, accounting for potential offsets with the OAA. We focus on three parameters: 1) net life-time financial gain or loss from participating in a program, 2) the net replacement rate offered by the program relative to the last income earned by the employee, 3) the path of the ratio of disposable income to the "poverty-line" over the course of the individual's life.

4.1 Old-Age Allowances

The OAA program's three main components are the universal basic amount, the tenure-based supplement and the means-tested income-supplement. For two-worker couples with tenure of at least 35 years for each spouse (regardless of the hours worked or income during these years) the means-tested program is irrelevant because the sum of their regular benefits slightly exceeds those of the means-tested income-

supplement. This latter program has disregard boundaries for labor income and pensions that differ between individuals and couples. Once the disregard level is exceeded the phase-out rate of the allowance is 60 percent, until it reaches the basic – universal – amount (which includes the tenure supplement). Contributions to the OAA are based on a two-level schedule with a cap at 5 times the average wage. Direct contributions are not expected to cover the full-cost of the program for most individuals and the balance is covered by pre-specified government contributions.

To calculate the net benefits from the program each "type's" OAA annual contributions were simulated and accumulated using a real interest rate of 3.5 percent.[14] The accumulated contributions were compared to the value of the benefits the individual (or couple) are eligible for if they do not have a pension. For two-worker couples this typically means that they would receive the sum of their individual benefits (except if one of them did not work at least 35 years). For other couples and for singles the potential benefits include the means-tested supplement. The calculated potential benefit is then capitalized by using pension-fund conversion coefficients for the equivalent amount and conditions.[15]

Columns 1 and 2 of Table 3 report the life-time contributions and potential benefits of the OAA. It is evident that the program is very progressive and provides a large subsidy for low-income households. For higher-income households it offers a much smaller subsidy, but they still enjoy a net-benefit from participating. Only at the very top of the income distribution – about 15 percent of all households which are represented by "type 10" (and those on the range between types 9 and 10) – do the program contributions exceed the benefits.[16]

[14] This is an assumed long-term net return accounting for management fees of pension funds. As discussed in Whitehouse (2000, 2001) differences in administrative fees may have significant impact on the real return. Such differences seem to have emerged between funds in Israel but we abstract from this issue here.

[15] Specifically, we use the coefficients applied to individuals who are currently 25 years old. Notwithstanding the uncertainty of these numbers, as discussed by Whitehouse (2007), the current coefficients do not vary significantly between cohorts and the results are not qualitatively sensitive to changes in the magnitudes of those prevailing between cohorts.

[16] The comparison between income groups abstracts from the possibility, discussed in Cutler et al. (2006) and Breyer and Hupfeld (2007) that life-expectancy is positively correlated with income.

Table 3: Life-Time Benefits from Social Security's Old-Age Allowance Program and from Pension Savings

	Social-Security OAA Program		Net gains from pension savings[2]			
	Life-time contribution	Value of potential benefits[1]	Life-time tax benefits for pension savings	Only husband	Household	Total net benefit from OAA + pension[3]
	(1)	(2)	(3)	(4)	(5)	(6)
	(NIS 1,000s, at 2009 prices)					
Type						
1	94	1,148	29	-143	…	1,054
2	138	1,148	190	-82	…	1,010
3	187	1,161	198	190	198	1,172
4	336	643	463	308	…	615
5	447	1,161	500	463	500	1,214
6	95	685	32	…	-165	591
7	703	1,161	729	719	729	1,187
8	371	1,161	468	463	468	1,258
9	845	1,161	850	719	850	1,166
10	1,711	1,161	1,443	1,196	1,443	893

[1] The capitalized benefit using pension fund conversion coefficients. Including the means-tested program's benefits if the individual's/household's post-retirement income is below the relevant threshold.

[2] Accounting for offsets with means-tested old-age allowances.

[3] Assuming that households losing from pension savings do not contribute to a pension fund.

Table 4 shows that the OAA provides quite an adequate replacement rate for low-income households: the replacement rate is close to 100 percent for "type 1" which represents about one fifth of the working population. "Type 2" also enjoys quite adequate replacement when accounting for job-related costs during their employment years. In contrast, the replacement rates appear to be insufficient for higher-income households. This is hardly surprising as the program's purpose is to protect the elderly from poverty, rather than provide a standard of living consistent with their employment income – especially when compared to the top of their earnings which is typically reached prior to retirement.

Table 4: Net Replacement Rate at Retirement[1]

	No Pension	With Pension
	(1)	(2)
Type	(Percent of pre-retirement income)	
1	94.2	171.1
2	74.8	141.4
3	54.4	145.1
4	33.8	116.5
5	31.1	113.2
6	49.8	112.9
7	29.4	112.1
8	35.7	100.6
9	24.4	108.7
10	15.5	87.9

[1] The ratio of post-retirement income to the last net income before retirement (calculated net of pension contributions).

4.2 Pensions

The placement of all new pension savers in Israel in pure defined contribution programs implies that the only net financial benefits from such savings are due to tax incentives. These benefits are granted in Israel mostly at the contribution stage but also at the time the annuities are disbursed. However, to enjoy these tax-benefits one has to reach the income-tax threshold – an income level which 45 percent of all employees (30 percent of working men) fall below.[17] Upon retirement, the annuity payments are taxed at the regular brackets with an additional discount on pensions up to about a third of the average wage. An additional tax benefit is granted to pensioners whose spouses have no pension, and Social security's OAA are tax-exempt. This implies that many of those who enjoyed tax advantages at the contribution stage enjoy a substantial – or full – exemption at the withdrawal stage as well.

To calculate the net benefits from pension savings we simulated the contributions of the employees (or households) through their (assumed) entire working life.[18] The hypothesized contribution rate for those who contribute was the maximum allowed by the tax-authorities, regardless of whether the individual's income is above the threshold for affecting tax benefits. This assumption is in the spirit of the "mandatory pension" decree and consistent with the current practice; it will be revisited below.

[17] Only 3 percent of all employees reach the income level at which the cap on tax-exemptions for employer contributions - 4 times the average wage – is effective.

[18] The hypothesized alternative to pension savings is not saving at all. In this way we abstract from the tax exemption on the pension accumulation return.

Column 3 of Table 3 shows the capitalized value of the lifetime pension tax benefits granted to the household. These amounts include the capitalized sum of the tax benefits during the contribution period reduced by the taxes paid on the annuity – in line with the tax benefits at that stage. The benefits are quite small for the low-income types, reflecting their low income-tax rates – if they pay at all – throughout their working lives.[19] This is particularly true with respect to women who enjoy extra tax credits for their children.[20] In contrast, the tax benefits for high-income households are large and may even exceed the value of the OAA.

While all households may gain from the pension tax benefits, these gains can be offset, or even reversed, by a phase-out of the means-tested component of the OAA. As discussed above this offset is relevant only for couples in which at least one spouse did not work 35 years and for singles. In such cases the magnitude of the offset depends on the joint annuities amount. Columns 4 and 5 show that this offset can be quite substantial. Household types 1, 2 and 6 – in which there is only a single worker with low income – actually lose from saving for a pension. These types represent a substantial share of households in Israel, especially in the populations targeted by the "mandatory pension" decree.[21] The mid-high income bachelor (type 4) loses about a third of the pension tax benefits but retains a positive incentive for savings. All the household types that represent two fully working spouses are not affected by the offset and retain their tax benefits (although in the case of the relatively low-income type 3 these are quite small).

Column 6 reports the net combined benefits from the OAA program and joining a pension fund (if yielding a net-gain). We find that there are only small differences between the various household types: low income ones enjoy a large net surplus in the OAA while the others replace these benefits with tax incentives.[22] The only, somewhat different household type is 10, which enjoys a smaller benefit due to high

[19] The benefit is always positive due to the exemption of employer contributions from social-security.
[20] The Israeli tax unit is the individual. Women receive an additional 0.5 tax credit (2.75 compared to 2.25 for men) and one more for each child. As a result only a relatively small fraction of working women – especially of working mothers – actually reaches the tax threshold (Brender, 2005, 2009).
[21] Individuals with higher income at relatively old ages who lack the 35 years tenure and did not save for a pension may also lose from the legislation, but such individuals are quite rare.
[22] The benefits for non-working individuals and households are of the same magnitude as those for working ones.

taxes on the annuities. Household types 4 and 6, which include singles, have similar benefits to the others - proportionally reduced to their size. Therefore it appears that, in their pre-mandatory-pension design, Israel's joint OAA and pension systems are neutral in terms of life-time income distribution.[23]

Column 2 of Table 4 shows the net replacement rates for the various types of households if they contribute to a pension fund through their entire working life. These rates are calculated relative to the pre-retirement income, net of taxes, social-security charges and pension contributions. It is evident that for low-income households full pension savings create too-high replacement rates, especially given that they also lose-out on a net basis from pension savings. For higher-income households the life-time savings produce a more moderate replacement rate, although still substantially higher than 100 percent. This may suggest that lifetime savings at the maximum permitted rates are too high, at least at the assumed real net return of 3.5 percent. It should be noted that the mandatory contribution rate from 2013 will be slightly higher than those assumed here. Furthermore, the tax-records data indicate that in practice the pensions of the current retirees that do collect a pension typically provide a replacement rate of about 40 percent (for the top 4 quintiles, excluding OAA). These rates are much lower than those mandated by the current law and similar to the prevailing rates in most OECD countries.

4.3 Pension contributions and income allocation through life

While the discussion of pensions is often focused on the need to secure an adequate standard of living for the elderly there is also the opposite concern: does the pension system produce "too much" savings? When decisions take place freely between market-priced pension-alternatives such a result is unlikely. However, the presence of tax-subsidy incentives and mandatory savings may lead to different outcomes.

The main reason why pensions can actually "unsmooth" consumption is that tax benefits are typically granted with an annual cap based on gross income, attempting to smooth contributions. This approach ignores the distribution of other expenses during

[23] Although the taxes used to cover the residual cost of the OAA program are paid disproportionately by those at the top life-time income levels. Also, high-income households have to actually save for pension in order to enjoy the same benefits provided to low-income ones by the OAA.

a families' life – most notably on raising children and mortgages. Although a family could ideally spread mortgage payments over its entire life, typically they are paid during a limited period – while the "residence" consumption continues deep into retirement. The costs of child-raising are particularly relevant in Israel where families typically have 2 or 3 – and in many cases more – kids, child allowances are significantly lower than in most developed countries, and tax benefits for parents are small and limited to women.

To estimate the household's "appropriate" consumption level its simulated income (including child allowances) was divided by the number of "standard" persons, using the scale employed in the calculation of the "poverty line". We also deducted the simulated mortgage payments for those household types that are expected to have one – based on the national Expenditures Survey conducted by the Bureau of Statistics (Table 5).

Table 5: Mortgage Payments by Age Group

Age of head of household	Has mortgage[1]	Monthly mortgage payments[2]
25-29	24.8	30.7
30-34	34.0	23.4
35-44	48.5	18.7
45-54	43.4	20.1
55-64	28.5	36.7

Source: Calculations based on the 2007 "Household Expenditure Survey".

[1] Percent of all households in the age-group.

[2] Among those paying a mortgage; In percent of gross labor income.

Table 6 provides some evidence on the level of net income per "standard person" relative to the poverty line (27 percent of the average wage per "standard person"). For each household type this ratio is calculated under the alternative assumptions of saving for pension and not saving. The results show that for all family types full pension savings tend to exacerbate the phenomenon of relatively low disposable income at the early stages of a family's life. This phenomenon is most notable in the low-income types where the already low disposable income in younger ages is further reduced in order to generate high post-retirement income. It therefore seems quite

rational for low and median-income families to postpone pension savings, especially if their salaries trend towards higher tax-brackets.[24]

5. Myopia, Passivity and Irrationality of Savers

Some of the arguments for government intervention in the pension market relate to households' myopia with respect to post-retirement savings. It is argued that young persons underestimate their pension needs and are consequently "stuck" with too little resources when they retire. An observationally similar argument is that even if individuals are aware of these needs they tend to postpone action with respect to their pensions, so by the time they start saving it may be too late to accumulate sufficient funds to pay for a decent annuity.

Table 6:
Disposable Income Per "Standard Person" Relative to the Poverty Line

		Age				
Type		**30**	**40**	**50**	**60**	**Retirement**
		(Percent of the "poverty line" at that year)				
1	With pension	71	65	84	101	152
	No pension	81	74	97	118	98
2	With pension	82	71	92	115	160
	No pension	92	80	105	133	98
3	With pension	103	79	126	161	207
	No pension	121	92	145	185	99
4	With pension	241	261	280	288	295
	No pension	271	294	315	325	104
5	With pension	171	147	292	294	294
	No pension	199	172	333	335	99
6	With pension	126	71	84	186	203
	No pension	145	82	97	216	104
7	With pension	169	135	208	317	316
	No pension	196	157	235	359	99
8	With pension	142	72	162	258	235
	No pension	167	83	184	293	99
9	With pension	196	154	254	384	373
	No pension	231	182	288	433	99
10	With pension	268	290	400	616	490
	No pension	310	336	447	683	99

[24] The tax incentives in Israel are granted in the form of non-refundable tax credits; many employees spend a significant share of their working lives under the tax threshold and cannot use these credits. Moreover, the value of the exemption for the employer contributions directly depends on the tax bracket.

While distinguishing between optimization based on individual discount rates and myopia is not a trivial analytical issue, this section tries to examine the saving behavior of Israeli workers in this light. The analysis above suggests that saving for pension is a poor financial move for low-income individuals and for families with one earner – both in the present and during the course of adulthood. We also find that consumption smoothing would suggest that younger families that pay mortgages (which include a savings component) and those with children are likely to be less inclined to save at that stage of their life.

Chart 1 shows that pension contributions are indeed positively correlated with income.[25] In the bottom deciles of the employment-income distribution less than one fifth of working men and less than a third of working women save for pension while at the top deciles pension contributions are almost universal. In the lower deciles the larger share of women saving for pension compared to men is consistent with the fact that nearly 90 percent of working women have a working spouse (Table A-3) – so they are less likely to fall into the position of net losers from savings due to an offset of the means-tested component of the OAA. Women are also more commonly employed in the public sector, banks and large corporations where pensions are almost universal.

[25] The chart is based on the 2007 tax-records dataset. The charts for earlier years are similar.

Chart 1: Pension Contribution by Income Deciles (2007)

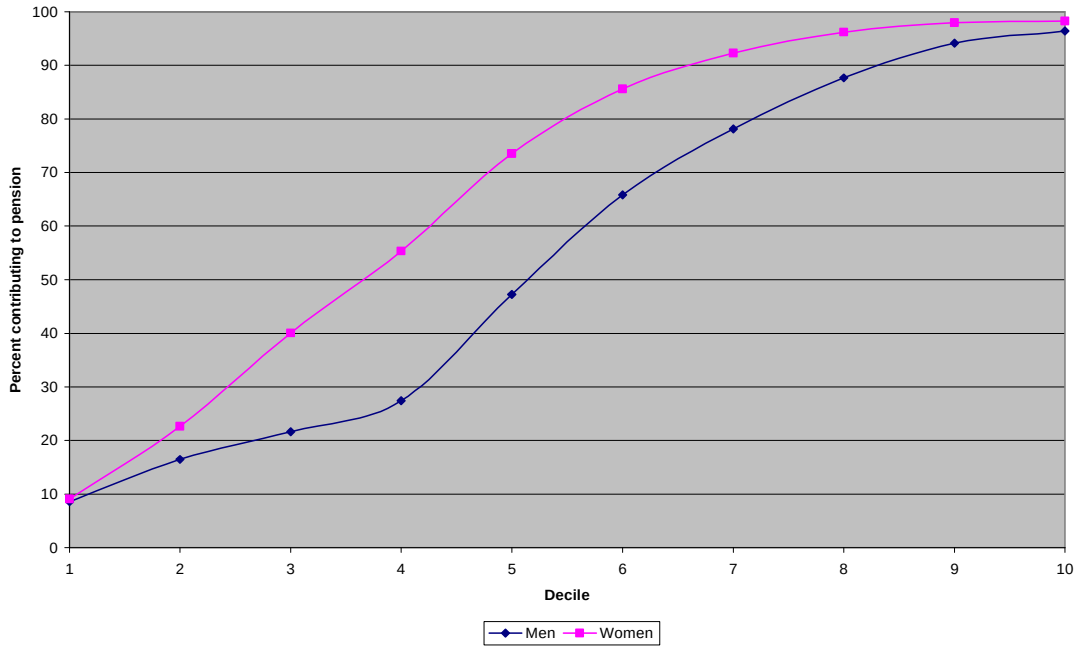

Table 7 examines the savings decisions of households in a more detailed and formal way. Equation 1 reports the results of a Probit equation where the dependent variable was whether the individual contributed to a pension fund or not. This analysis is based on more the 125,000 tax files of males in 2007 (the coefficients are similar for the 2005 data) and the results are quite consistent with the expectations discussed above.[26]

[26] Equations estimated for women showed similar results. The noticeable difference was that the coefficient for young children was positive. This non-intuitive result is likely to reflect a selection bias: mothers for young children are more likely to quit work if their employers do not accommodate their special needs. The employers that would typically do that are large and established organizations (e.g., the public sector and the banks) where pensions are universal.

Table 7: Probit Equations for Working Men's Probability to Contribute to a Pension-Plan in 2007

	Equation 1			Equation 2		
	Marginal effect	Z		Marginal effect	Z	
Age	0.00883	6.4	*	-0.00398	-2.3	**
Age squared	-0.00006	-3.6	*	0.00005	2.5	**
Married (binary var.)	0.01766	3.2	*	0.03157	5.8	*
Divorced/Widowed (binary var.)	-0.01676	-2.1	**			
Annual income (NIS thous.)	0.00250	88.6	*	0.00205	76.8	*
Squared annual income	0.00000	-62.8	*	0.00000	-55.5	*
Annual income <48,000 (binary var.)	-0.32594	-67.9	*	-0.32470	-60.2	*
Number of jobs during the year	-0.01882	-10.3	*	-0.02713	-13.4	*
Months worked (up to 12)	0.00848	12.3	*	0.00552	7.6	*
Does the spouse work (binary var.)	0.18451	31.4	*	0.14576	21.4	*
Spouse contributing to pension (binary var.)	0.12102	23.9	*	0.09849	20.4	*
Annual income of Spouse (thous.)	-0.00034	-8.6	*	-0.00022	-5.3	*
Number of children	-0.00501	-2.3	**	-0.00672	-4.4	*
Number of Children at ages 0-3	-0.01299	-3.4	*	-0.00753	-2.3	**
Number of Children at ages 4-8	-0.01263	-3.6	*	-0.01531	-5.5	*
number of Children at ages 9-18	-0.00880	-3.1	*	-0.00462	-1.9	***
Age of spouse	-0.00340	-19.9	*	-0.00271	-15.4	*
Resides in Arab locality	-0.08559	-16.9	*	-0.08701	-16.1	*
Immigrated since 1989	-0.06394	-3.8	*			
Immigrated since 1989 * potential work years[1]	0.00237	5.6	*			
Contributed to pension in 2000 (binary var.)				0.25352	60.7	*
Worked during 2000 (binary var.)				-0.04357	-10.0	*
Annual income in 2000 (thous.)				-0.00012	-11.2	*
Change in spouse's annual income (thous.)				-0.00019	-3.6	*
Got married after 2000 (binary var.)				-0.05226	-6.2	*
Constant (coefficient)	-1.05042	-13.8	*	-0.14340	-1.3	
Number of observations	126,321			104,599		
Pseudo R sq.	0.3555			0.3865		

Source: calculations based on the 2000 and 2007 tax records datasets.
Equation 1, for working men aged 23-65; Equation 2, working men aged 28-65.
[1] For immigrants, the difference between 67 and their immigration age with a maximum of 46.
(*) significant at the 1 percent level; (**) significant at the 5 percent level; (***) significant at the 10 percent level

- Income has a strong and positive effect that rises throughout the relevant incomes range[27]. Consistent with expectations there is a strong and distinct negative effect for individuals with salaries below the income-tax threshold. Having a working wife also has a strong positive effect – as it reduces the potential loss from the phase-out of the income supplement.
- Having a wife that contributes to a pension-fund has an additional strong effect on the choice to save. Given the other variables in the equation this quantitatively important variable (0.12) is likely to reflect two factors: 1) the lower probability to be at the phase-out level of the OAA income supplement which is based on the joint

[27] The joint **effect** of the coefficients of income and squared income begins to decrease at extremely high (hypothetical) incomes of more than 60 times the average wage.

pension income, 2) the wife's work experience: it is required to reach 35 working years to receive the full tenure supplement in the OAA, and women who contribute to pension have, on average, longer working spells than those who do not.

- The equation also points to the liquidity effect: the presence of children, especially young ones, in the household reduces the tendency to save for retirement.

- Single individuals (including divorced) tend to contribute less. This may reflect their larger probability to be eligible to the means-tested part of the OAA compared to married working couples.

- Arabs (identified as residents of Arab localities) are substantially less likely to contribute to a pension fund. This is consistent with the characterization of "Type 1" as representing predominantly the Arab population. Notwithstanding the potential role of cultural influences, this result is also reflective of the unstable lifetime employment patterns of the Arab population and the very low probability that the wife will have any meaningful work history.

- The likelihood of savings for pension among immigrants that arrive in Israel since 1989 is strongly related to the age at which they arrive in Israel: the younger they were the more likely they are to save for pension. The age at which their probability to save becomes similar to that of the native population is 40.[28] This cut-off is broadly consistent with their need to accumulate both sufficient benefits in the pension arrangement and a large enough tenure supplement at the OAA to avoid a substantial loss due to the phase-out of the means-tested component.

- Age has a positive effect until retirement. This effect may be due to the phase-out of mortgage payments (Table 5). It may also be associated with the reduction of pension benefits for those who started to work after 1995, but the continuing increase of the probability to save at the near-retirement cohorts is more consistent with the former explanation. This question is revisited below.

[28] A 40 years old immigrant has 27 potential working years before retirement. The sum of the coefficient of "immigrated since 1989" and the coefficient of its interaction with "potential work years" multiplied by 27 is about zero; it becomes positive as the number of "potential work years" rises.

The analysis so far has focused on the snapshot of individuals' behavior in 2007. Equation 2 adds to it a dynamic dimension by examining the effect of the same individuals' characteristics and behavior in the year 2000. To do that the sample is restricted to working men at ages 28-65 in 2008 (who were at least 21 years old in 2000). We find that those who saved for pension in 2000 are 25 percent more likely to save in 2007 than those who did not work and 30 percent more than those who worked and did not contribute to a pension account.[29] The coefficients of the main variables that appeared in Equation 1 are qualitatively similar. Nevertheless, controlling for contributions in 2000 does allow to account better for individuals who have "old' pension arrangements. With this control we find that the age effect becomes negative until the mid-40s and is quantitatively significant and positive only after the age of 50, in line with the declining profile of mortgage payments depicted in Table 5.

Table 8 demonstrates the correlation between the savings decisions over time, showing that those who already contributed in 2000 continued to do so in 2005 while those who did not have not started. Nevertheless, about half of the males and a third of females in the lowest income quintile stopped contributing (the comparison relates only to individuals who continued working).

[29] This is the difference between the coefficients of "worked in 2000" and "contributed to pension in 2000".

Table 8: Percent of Workers Contributing to Pension Savings in 2005, by Gender, Age, Income and Whether they Contributed in 2000

	Men	Women	Men	Women
Age	Contributed in 2000		Did not contribute in 2000	
25-29	76.5	80.3	42.0	47.0
30-44	82.3	85.7	31.2	37.8
45-54	84.1	84.1	26.9	27.4
55-64	75.2	66.1	17.8	10.8
Total	80.7	81.7	29.3	29.5
Income Quintile[1]				
1	51.5	64.5	30.8	34.9
2	60.9	79.0	31.0	41.9
3	76.1	87.9	39.7	48.5
4	86.2	91.7	40.6	51.2
5	91.7	92.7	38.9	48.8
Total	81.7	84.1	33.6	38.7

Source: calculations based on the tax records panel dataset for 2000 and 2005.
[1] For men aged 25-60 and women aged 25-55 in 2000.

Table 9 adds to Equation 2 information about employer size and employment history with the employer. These data are based on employer tax-file numbers and are subject to several caveats: 1) some employers may use different tax-file numbers in different locations; 2) in some cases tax-file changes between 2000 and 2007 reflect only administrative adjustments by the employer rather than genuine business changes; 3) since our data are based on a sample of 10 percent of the population the estimated employer size, which is calculated by counting the number of employees reported under each tax-file number, is inaccurate, especially with respect to small employers. Moreover, it is difficult to infer causality from these data because it may be that either, 1) employees seeking pension arrangements would prefer – ceteris paribus – large employers that may find it easier to offer such coverage; or 2) that pension coverage decisions of large employers are exogenous to individual employees as part of a "package deal" of employment conditions. Nevertheless, although not precise, these data are indicative for the correlation between employer characteristics and pension coverage.

Table 9: Employer Effects on Working Men's Probability to Contribute to a Pension-Plan[1]

	Marginal effect	Z	
Employee contributed to a pension in 2000 (binary var.)	0.42906	51.6	*
Number of employees of the same employer	0.00037	40.4	*
Squared number of employees of the same employer	0.00000	-20.8	*
Employer has one employee in the sample (binary var.)	-0.26889	-49.5	*
Employer has 2 employees in the sample (binary var.)	-0.02120	-2.4	**
Employer has 3-5 employees in the sample (binary var.)	-0.11565	-15.2	*
Largest employer in the sample (binary var.)	0.30448	14.7	*
Change of employer between 2000 and 2007	-0.03517	-2.3	**
Change of employer * age	0.00080	2.6	*
Employer change * Contributed in 2000 (binary)	-0.37611	-33.6	*
Change of employer * Annual income (thous.)	0.00097	21.8	*
Constant (coefficient)	-0.49383	-3.9	*
Number of observations	104,599		
Pseudo R sq.	0.4712		

Source: calculations based on the 2007 tax records dataset, for working men aged 28-65

[1] The equation also included all the variables that appear in Equation 2 of Table 7.

(*) significant at the 1 percent level; (**) significant at the 5 percent level; (***) significant at the 10 percent level

Table 9 shows a strong correlation between employer size and pension coverage. On average the probability that an employee in an enterprise with 50 employees will be covered is 40 percentage points lower than that for one in a 1,000 employee firm. We also find that the probability that employees who contributed to pension in 2000 and changed employer will contribute in 2007 is 9 percentage points higher than for employees who changed employer and did not have such coverage. Finally we find that workers who changed employers between 2000 and 2007 are more likely to save for pension the older they are and the higher their income is. Overall, the addition of the employer related variables adds 9 percentage points to the explained variance of pension coverage.

One of the proposed justifications for government intervention in the pension market is that individuals may be passive with respect to their retirement. As discussed above, the pension reforms between 2000 and 2005 eliminated the financial benefits from pension savings for workers at the bottom 5 deciles of the income distribution (since they do not reach the tax threshold and because the funds were converted to pure DC schemes – with no subsidy). Table 10 examines the response of workers to the changes that took place in the tax system between 2000 and 2005. It shows a marked decrease in the share of contributing individuals at the bottom 5 deciles and a much

milder decrease at the higher ones.[30] There was also quite a noticeable decrease in employer contributions, suggesting that this component of savings also responded rapidly to the changes. Finally, the drop in contributions was much larger among the young cohorts, while among the older ones – in which many still belong to the pre-1995 schemes or to employer-funded programs – the decrease was milder[31].

Table 10: The Change in Contribution Between 2000 and 2005.[1]

Income Quintile in 2005 [2]	Percent Contributing in 2005	Change from 2000	Only employer contributes in 2005	Change from 2000	employee contributes with the employer in 2005	Change from 2000
1	21.0	-14.9	12.5	-5.1	7.2	-8.9
2	40.1	-18.6	15.8	-4.1	23.4	-14.1
3	67.6	-13.5	19.7	-2.1	47.6	-11.1
4	88.1	-4.5	19.5	0.9	68.4	-5.1
5	96.1	-1.1	11.8	-1.6	84.1	0.5
Total	**62.6**	**-10.5**	**15.9**	**-2.4**	**46.2**	**-7.7**
Age						
21-24	16.0	-22.2				
25-29	46.8	-18.0				
30-44	64.5	-9.2				
45-64	68.7	-8.5				
65+	45.5	-15.5				
Total	**51.9**	**-12.5**				

Source: calculations based on the tax records panel dataset for 2000 and 2005.
[1] The change is expressed in percentage points from the 2000 level.
[2] Ages 25+

Table 11 shows that too-little pension savings may not have necessarily been the dominant problem. It reports the share of individuals in post-retirement ages that collected a pension in 2005, had no labor income and continued to contribute to pension-related schemes. We find that more than half of the men and more than a third of the women continued to save after retirement, including individuals at all (post-retirement) income levels. Moreover, these figures reflect only pension-related savings that require reporting to the tax authorities; other savings, such as bank deposits, bonds and stocks, are not recorded in this dataset. Therefore, it appears that many individuals reach their pension age with incomes beyond their immediate consumption needs. While this does not necessarily mean that the pre-retirement level of savings was excessive from the individual point-of-view – as it may reflect precautionary savings for later-care needs and bequest preferences – it does put into

[30] Overall, the percent of contributing employees in Israel – 62 percent – is quite similar to those in Germany, Canada, Ireland the UK and the US (Antolin and Whitehouse, 2008).
[31] While the members of the old funds also suffered a substantial downgrading of their benefits, these funds still offer much better terms than any available alternative.

question the rationale for government intervention. This intervention, in addition for compulsory savings, focused on shifting savings from programs allowing lump-sum withdrawals to annuity-paying ones, evidently targeting consumption-smoothing and not just increasing the overall available post-retirement resources.

Table 11: Post-Retirement[1] Pension Contributions by Type of Income and Income Level

	Men		Women	
	Percent Contributing	percent of the group	Percent Contributing	percent of the group
Source of income				
Receives a pension on account of a late spouse	21.1	1.7	44.2	21.1
Has labor income and no pension	30.6	22.4	47.5	24.2
Has pension and no labor income	56.6	64.7	36.4	47.7
Has both labor income and pension	74.3	11.2	63.5	7.0
Total	52.2	100.0	42.6	100.0
Income quintile in 2005 [2]				
1	63.3	…	44.4	…
2	65.1	…	30.8	…
3	59.4	…	29.1	…
4	53.0	…	35.6	…
5	49.0	…	42.9	…
Total	56.6	…	36.4	…

Source: calculations based on the 2005 tax records dataset.

[1] Men over the age of 65 and women over 60.

[2] Among those that have only income from pension.

It should be noted that the current retirees accumulated their pension benefits in a period where pension savings were optional. Therefore, these – perhaps – excessive savings possibly reflect a response to the high and unsustainable returns offered in the old system. Nevertheless it is indicative that individuals do respond to financial incentives for pension savings. Another indication for this responsiveness is the sharp decline in the share of post-retirement savers in pension programs between 2000 and 2005 (Table 10), as the incentives for such contributions were eroded.[32]

Overall the behavior of workers with respect to their pension contributions seems to be rational and active: employees seem to adjust their saving choices in a way that is consistent with the financial incentives. It appears that the low contribution rates of low-income employees reflect the meager-financial incentives for pension savings, and the undesired consumption path in which such savings result.

[32] Due to legislative changes the data after 2007 do not allow to monitor post-retirement savings.

6. Conclusion

Government intervention in the pension market is often justified by a need to protect the public from miscalculating and underestimating the advantages of saving for retirement. A similar argument is that young cohorts are too passive with respect to their post-retirement needs and may therefore act too late to ensure sufficient resources for that age. Another argument – to some extent an analytical opposite of the previous two – is that individuals optimize their life-time income profiles by taking (unfair) advantage of old-age income-support programs. All these arguments were used in the debate preceding the recent adoption of "mandatory pensions".

The current paper studied the reality of the Israeli pension system in its post-reform pre-mandatory-pension structure. Using stylized representative prototypes of the most common Israeli household compositions and employment profiles it examined the potential benefits of pension savings for each "type". The findings suggest that mandating pension savings imposes a net loss on low-income households that breaks the egalitarian feature of the current system: while at present all family types (except those at the top lifetime income decile) roughly enjoy the same subsidy/tax incentive, compulsory contributions will make the benefits for low-income households smaller than those of the others. This loss results from eroding their entitlement for the means-tested income supplement without offering offsetting effective tax incentives.[33] These calculations make the argument that low-income households take an excessive advantage of the means-tested income support program less convincing.

The disadvantage of mandatory savings for low-income households is also evident in its impact on their life-time income distribution. The post-retirement replacement rates offered by the new system are over 140 percent for quite a significant group. These high incomes come at the expense of low disposable income at younger ages, when households have to care for children and pay mortgages.

The analysis therefore shows that, given the existing level and structure of OAA, saving for retirement is not beneficial for low-income households while it is for

[33] The recently adopted plan to raise the means-tested benefits for retirees at the oldest cohorts increases the loss inflicted on low-income families by mandatory pensions, but its magnitude does not qualitatively change the analysis.

higher-income ones. An examination of the households' behavior suggests that they indeed act in line with these calculations. Moreover, households' response to the restructuring of pension incentives between 2000 and 2005 suggests that they are not indifferent to developments in this area – notwithstanding that the magnitude of change in this period was quite extreme.

The disadvantages of "mandatory pensions" are not limited to lifetime low-income households. Many middle-income households begin their careers at income levels below the tax threshold. For these families it may be preferable to postpone savings until their income grows due to consumption smoothing and to yield considerations (losing the tax credit of 35 percent is equivalent to 9 years of – assumed - net returns in the pension fund). The current decree forces them to contribute in each month regardless of their income. Moreover, there is no provision for partial contributions which would allow couples to optimize their contributions with respect to their eligibility for tax credits – e.g., when women work part-time post-partum. This is a substantial restriction in the decree because half of those who did not contribute to pension before it was affected had a spouse that did. These individuals are also highly unlikely to need assistance from the OAA income supplement.

The initial concerns that led policy-makers to adopt the "mandatory-pension" had to do with the income distribution and the low-standard-of living of the elderly. It seems, however, that the policy-action they adopted, in its current setting, only harms further the weakest segments among the working population. The high income inequality appears to be a reflection of labor market outcomes and not a result of the restructured pre-compulsory pension system. While the pension decree may reduce future fiscal expenses of the OAA's income supplement, it will do so at the cost of increasing life-time inequality and the effective tax-rate on the lifetime poor. A potential positive outcome of that may be raising labor market participation of non-working spouses from low-income households' to avoid the reduction in their allowance. However, this participation can be minimal as there is no floor for the necessary monthly working hours to meet the tenure requirement. Working couples may actually reduce their labor supply, due to the substitution effect; although Brender and Strawczynski (2006) and Brender and Gallo (2009) show that the elasticity of labor supply to wages is quite low in Israel.

Finally, if policy-makers are concerned with reducing the number of income-supplement recipients, this target may be achieved in a way that is more consistent with retaining the lifetime neutrality of the pension system. One way to achieve it is by making the tax credits refundable while financing the additional cost by reducing the size of the credit to about 30 percent. Such a scheme will split the cost of reducing the income-supplement more evenly.

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Appendix A

Table A-1: Family Structure by Age Group and the Lifetime Number of Children - Working Individuals in 2005

Age	Married	With one child	With 2 children	With 3+ children	With children Under 18
	(Percent of all working families)				
25-29	53.7	16.7	10.7	6.2	33.6
30-39	75.6	17.3	27.9	29.6	74.2
40-49	79.9	9.9	23.7	57.7	78.7
50-59	79.5	10.6	22.7	58.1	32.3
60-64	78.7	9.7	19.6	58.9	6.5
65-69	74.2	12.7	14.8	47.7	2.1

Source: calculations based on the tax records dataset for 2005.

Table A-2: Marital Status of Working Single Mothers[1]

Age	Single	Divorced	Widowed
	(Percent of all working mothers)		
25-29	3.5	4.7	0.1
30-34	2.6	7.4	0.3
35-39	3.2	12.2	0.9
40-44	3.2	14.3	1.4
45-49	2.2	16.3	2.6
50-54	2.1	16.4	4.1
55-59	2.1	15.9	6.6
60-64	1.7	15.5	11.7

Source: calculations based on the 2005 tax records dataset.
[1] The term single-mothers refers here to women that had children during the course of their lives and were not married in 2005.

Table A-3: Work Status Given the Spouse's Income

	Wife		Husband	
Spouse's Income Quintile	works[1]	doesn't work	works[1]	doesn't work
	(Percent of spouses in the quintile)			
1	68.2	31.8	86.2	13.8
2	67.9	32.1	89.2	10.8
3	73.6	26.4	89.6	10.4
4	80.0	20.0	88.2	11.8
5	84.3	15.7	91.5	8.6
Total	76.9	23.1	88.8	11.2

Source: calculations based on the 2005 tax records dataset.
[1] Either the observed individual reported that the spouse works or the spouse appears in the dataset with positive labor income.

Table A-4: Age Differences Between Spouses[1]

Age	Age difference (years)	
	Men	**Women**
25-29	0.4	-3.3
30-34	1.6	-2.9
35-44	2.5	-3.2
45-54	3.0	-2.7
55-64	3.5	-2.9

Source: calculations based on the 2005 tax records dataset.

[1] Calculated as the individual's age less the spouse's age.

Table A-5: Accumulated Years of Experience[1] Compared to Potential[2]

(Percent of potential working years)

A-5-I: By Income and Gender

Income	Male		Female	
	experience/ potential	percent of the group	experience/ potential	percent of the group
up to 1500	83.8	2.3	63.6	6.1
1501-3000	87.7	6.0	67.6	17.7
3001-5000	88.9	22.4	81.5	32.7
5001-7000	94.0	19.2	89.2	20.3
7001-9000	95.9	12.3	85.0	8.9
9001-12000	94.7	14.0	89.7	7.6
12000+	92.1	23.9	87.4	6.6

A-5-II: By Gender, Religion and Age

Age	Male, Jewish	Male, Arab	Female
30-34	88.8	79.3	70.0
35-39	89.5	84.8	70.8
40-44	91.0	75.9	73.7
45-49	93.7	79.9	72.8
50-54	90.0	75.6	68.4
55-59	93.4	79.1	65.4

A-5-III: Females by Age and Number of Children

Age	No Children	1 Child	2 Children	3+ Children
35-39	75.1	82.2	81.4	66.1
40-44	73.2	88.6	81.1	71.8
45-49	71.8	80.5	84.4	69.4

A-5-IV: Monthly Income by Share of Potential Years Actually Worked and Age

	The Ratio of Actual Years of Experience Accumulated to Potential				
Age	**up to 30%**	**30%-50%**	**50%-70%**	**70%-85%**	**86%+**
35-49	2,245	3,381	4,816	5,208	6,179
50-59	2,427	3,382	4,565	4,931	6,383

Source: calculations based on the 2002 "Social Survey".

[1] Defined as the self-reported number of years worked by the individual. The figures used here are based on averages of the reported categories.

[2] Potential years are age less 21 for Jewish Men, age minus 18 for Arabs and age minus 20 for Jewish women. The tables include individuals over the age of 25.

Table A-6: Employment of Women, by Education

Years of Schooling	Age			
	25-29	30-39	40-49	50-59
	Percent working from all the women in the group			
0-10	21.7	20.6	28.9	27.9
11-12	49.1	58.0	67.3	58.9
13-15	76.3	74.6	80.8	74.2
16+	78.8	86.3	88.6	82.4
	Percent working less than 30 hours per-week[1]			
0-10	35.2	35.2	32.9	32.4
11-12	37.7	36.4	35.9	34.8
13-15	36.3	37.3	37.8	35.9
16+	35.4	37.7	36.8	36.2

Source: Calculations based on the 2007 "Incomes Survey".

[1] Among those working at least 5 hours.

Table A-7: Persistence of Income Distribution

A-7-I: Between 2000 and 2005 [1]

Income quintile in 2000 [3]	Quintile in 2005 [3]					Not working in 2005 [2]
	1	2	3	4	5	
	(Percent of all the workers in the quintile)					
1	**32.2**	21.4	8.4	3.1	0.8	34.1
2	16.0	**36.6**	22.3	5.0	1.1	19.1
3	7.7	12.1	**41.2**	22.5	2.1	14.3
4	4.1	4.6	9.3	**48.5**	17.1	16.4
5	2.9	2.1	2.7	8.0	**66.6**	17.8
Total	**12.4**	**15.3**	**16.8**	**17.5**	**17.7**	**20.3**

A-7-II: Between 2005 and 2007 [4]

Income quintile in 2005 [3]	Quintile in 2007 [3]					Not working in 2007 [2]
	1	2	3	4	5	
	(Percent of all the workers in the quintile)					
1	**37.2**	18.7	7.0	2.2	1.0	34.0
2	15.0	**48.1**	14.9	3.9	1.1	17.1
3	5.1	14.0	**55.2**	12.7	1.4	11.7
4	2.3	3.1	12.6	**62.4**	8.6	11.0
5	0.8	0.8	1.2	9.0	**72.4**	15.7
Total	**12.0**	**16.8**	**18.2**	**18.1**	**17.0**	**17.8**

Source: calculations based on the tax records panel dataset for 2000, 2005 and 2007.

[1] For the age group 35-50 in 2000 and 40-55 in 2005.

[2] "Not working" is defined as not being reported in the dataset for that year.

[3] Quintiles are defined across the relevant group (e.g., individuals aged 35-50 who worked in 2000).

[4] For the age group 35-55 in 2005 and 37-57 in 2007.

Table A-8: Correlation Between Spouses' Income Quintiles in 2007

Husband's Income	Doesn't work[2]	Wife's Income Quintile				
		1	2	3	4	5
1	45.8	17.6	12.9	10.1	7.9	5.7
2	34.0	16.3	16.7	15.4	10.7	6.9
3	25.9	14.7	16.6	17.6	14.8	10.4
4	20.6	11.5	14.0	15.8	18.9	19.3
5	22.1	9.2	10.0	11.9	18.4	28.5
Total	**29.6**	**13.9**	**14.0**	**14.2**	**14.2**	**14.2**

Source: calculations based on the 2007 tax records dataset.

[1] based on data for married men aged 30-55 with minimum annual income of 12,000 NIS and women with a minimum income of 6,000 NIS.

[2] The share of those who do not work includes women whose husband's state that they work but they do not show-up in the tax authorities' records.

Table A-9: Characteristics of the Various Household Types

Male			Female		Children	Mortgage
Type	Initial monthly salary	Wage profile[1]	Employment	Monthly salary		
1	4,400	1% annual rise, quits work at age 60.	No.	…	4, Born at ages 25, 28, 31, 34	No.
2	5,200	0.9% annual rise	No.	…	3, Born at ages 28, 30, 33	No.
3	5,200	0.9% annual rise	Full up to age 30, 70% up to age 33, 50% thereafter	3,850, rising by 2% annually when working FT. rising with the average wage thereafter	3, Born at ages 30, 33, 35	15% in ages 28 to 47
4	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	…	…	…	…
5	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	Full time until retirement	5,250, rising by 0.6% annually up to age 46 and by 1% thereafter	2, Born at ages 28, 32	15% in ages 27 to 46
6	…	…	Full time until the first child is born and after the youngest reaches 18. 75% of FT in between	5,250, rising by 0.6% annually up to age 46, by 1% up to age 52 and like the average wage thereafter	2, Born at ages 30, 33	…
7	8,700	2.6% up to age 46, 2.1% up to age 56, no increase thereafter	50% of a FT job throughout her career	3,000, rising by 1.6% annually up to age 46 and does not change thereafter	3, Born at ages 30, 33, 36	15% in ages 27 to 46
8	6,300	2.1% up to age 46, 1.8% up to age 60, no increase thereafter	Works FT at ages 25-30 and 50-64	3,850, rising by 1.9% annually up to age 30. At 50 starts with the same wage she had at 30, rising like the average wage thereafter	3, Born at ages 30, 33, 36	20% in ages 27 to 46
9	8,700	2.6% up to age 46, 2.1% up to age 56, no increase thereafter	Full time until retirement	6,000, rising by 1.6% annually up to age 46 and does not change thereafter	3, Born at ages 30, 33, 36	20% in ages 27 to 46
10	10,000	2.5% up to age 45, a 35% raise at 30 and another 50% at 35. From 44 to 60 annual wage increase of 2.3% and no increase thereafter	Full time until retirement	7,050, rising by 1.6% annually up to age 46 and does not change thereafter	2, Born at ages 30, 33	15% in ages 27 to 46

[1] The average wage in the economy is assumed to rise by 1.1 percent annually.