

Parametric Social Security Reforms and Saving: Evidence from Turkey

Yigit Aydede

Department of Economics, Saint Mary's University, Halifax, NS B3H 3C3, Canada.
Email: yigit.aydede@smu.ca.

Abstract: This paper argues the distributional effects of parametric pension reforms on saving and provides some evidence from Turkey. First, I develop a two-period overlapping generations model in which wealth distributions are initiated by an adverse demographic shock to the PAYG system. Unlike other empirical studies testing age-consumption profiles, I argue that, when transfers are used to balance the system, the significant difference between workers and retirees in terms of the marginal propensity to consume (MPC) can substantiate the negative effects of wealth redistribution on national saving. In the second part, I apply panel estimations by using microdata from the Household Budget Surveys conducted in 2003, 2004, 2005, and 2006 for more than 50,000 households. I show that, although the MPC is not higher for older generations, it is significantly higher for retirees than for workers. Even though confirming this fact alone does not promise a reduction in national saving, the results imply that, given the unparalleled generosity of the Turkish PAYG system and its significance in households' budgets and as long as reforms redistribute wealth from workers to retirees, the recent parametric reforms should contribute to the current negative trend in national saving.

Keywords: Intergenerational Transfers, Life-Cycle Saving, Social Security

JEL classification: J1, H31, E21

Coupled with other structural problems in the economy, the severe financial crisis early in 1999 forced the Turkish government, led by the World Bank, to reform its impaired social security system in August 1999. This parametric reform, which was followed by several others, set a required minimum retirement age (absent before) and aimed to achieve an actuarial balance of the pay-as-you-go (PAYG) system as well as to reduce pressure on the borrowing needs of the government in the medium term. The distinction of the Turkish case comes from the fact that the Turkish retirement system is still one of the most generous social security systems in the Organisation for Economic Co-operation and Development (OECD) region, although it is insolvent. In 2004, a new member of the system had \$74,000 average gross pension wealth with \$2,510 per capita gross national income (GNP) where the same numbers were \$183,000 and \$35,430, respectively, for the U.S. (OECD, 2004). The cost of this generosity is being shifted onto

new generations by a mounting legacy debt. That is, the total deficit of the system accounted for 4.5 percent of the GNP in 2004, and the present value of the total resources used to finance the system's deficit between 1990 and 2003 is almost equal to the GNP created in 2003 (Ministry of Labor and Social Security, 2004).

Since 1999, there have been three major parametric reforms that fully affected only new entrants to the labor force. The reforms were phased in gradually so that the old members and retirees of the system were able to keep their previous pension entitlements unchanged. In June 2006, a third reform on Social Security and Health Care was legislated by the Turkish Parliament, which is expected to reduce the cumulative deficit to zero in 48 years.¹ Despite the fact that the minimum age was increased to 65, many people will still be qualifying for retirement in their late 40s and early 50s until 2040. As documented by Brook and Whitehouse (2006), even after three major reforms, the generosity of the pre-1999 system will continue to have a major impact on pension benefits for many decades to come. In other words, policy makers designed these reforms to keep the generous payments for current members intact so that the system's long-term balance must be achieved by redistributing wealth from workers to retirees.

Many studies exist on how these reforms might provide a sustainable financial recovery; however, studies that investigate the direct effects of these parametric reforms on wealth distribution and aggregate saving are absent. This lack of interest might be due to the fact that the private saving rate in Turkey has been higher than the OECD average for the last 30 years. However, there has been a significant fall (20 percentage points of GDP) and a steady decline in the aggregate private saving rate since 2001, which is a particular concern for officials now (IMF, 2007).² There is broad agreement that this trend stems from boosting confidence, relaxed liquidity constraints, increased political stabilization, and "Ricardian" effects from increasing public saving after the post-2001 recovery of the economy.

A large number of studies relate the intergenerational redistribution of wealth to national saving. In brief, unlike the infinite-horizon model, the life-cycle model implies that the time path of taxes has real impacts on the economy by changing the severity of tax distortion on different generations. It breaks the link between the horizon of private individuals and that of the government. If generational differences in the marginal propensity to consume (MPC) are significant, any public policy that redistributes wealth from younger generations to older generations causes national consumption to increase and saving to fall (Auerbach and Kotlikoff, 1983; Kotlikoff, 2003).

However, except for the windfall that the early generations receive at the introduction, if the implicit rate of return for the PAYG system is not different from what a private investment can earn, transfers by the system do not alter lifetime wealth for generations. Therefore, analyzing the distributional effects of existing PAYG systems on consumption requires an explicit model in which the system faces unexpected adverse shocks and the planner uses transfers to balance the system. In this paper, I argue that there are distributional effects of these parametric reforms on saving

¹ Since the Supreme Court has rejected the law, the reform did not take effect in January 2007. The court indicated that the rejected reform attempted to revoke the previous rights given to current members and retirees. Therefore, it is expected that the revised version of the reform that the government has been working on will be phased in over an extended period of time.

² Even though it is not as sharp as in private saving, Turkey's national saving has also been falling.

and provide some evidence from Turkey.

More specifically, in the first part of this paper, to show how parametric reforms may impact consumption (saving), I develop a two-period overlapping generations model in which wealth distributions are initiated by an adverse demographic shock to the PAYG system. Unlike other empirical studies testing age-consumption profiles, I argue that, when transfers are used to balance the system, the significant difference between workers and retirees in terms of the MPC can substantiate the negative effects of wealth redistribution on national saving. In the second part, I apply panel estimations by using microdata from the Household Budget Surveys conducted in 2003, 2004, 2005, and 2006 for more than 50,000 households. I show that while the MPC is not higher for older generations, it is significantly higher for retirees than for workers.

Confirming this fact alone does not promise a reduction in national saving, particularly under developing country conditions. However, the results imply that, contrary to what many expect from these reforms and given the unparalleled generosity of the Turkish PAYG system and its significance in households' budgets,³ as long as they redistribute the wealth from workers to retirees, the recent parametric reforms will contribute the current negative trend in national saving.

This paper relates to an extensive literature. Aydede (2008) analyzes the relationship between saving and social security in a time-series setting for Turkey by using the social security wealth (SSW) series calculated between 1970 and 2003. The results show that SSW, which is the biggest part of household wealth in Turkey, has robust and positive effects on aggregate consumption; therefore, it suppresses aggregate saving.⁴ Aggregate time-series studies (Feldstein, 1974; Barro, 1978; Engen and Gale, 1997; Blake, 2004) have well-known shortcomings (Kotlikoff, 2003; Seidman, 1985) and therefore have been outnumbered by cross-section/panel studies testing the significance of the displacement between pension and non-pension wealth at the individual level.⁵ The major problem with these studies, however, is that they use information about households not about families, which does not distinguish transfers across generations from transfers across households.⁶ Therefore, a significant negative coefficient of SSW cannot answer whether pension wealth displaces non-pension wealth.

This paper builds on the argument conceptualized by Auerbach and Kotlikoff (1983) and Kotlikoff (2003) that, if generational differences in the MPC are significant, any public policy that redistributes wealth from younger generations to older generations causes national consumption to increase and saving to fall. The plan for the paper is as follows. Section 1 explains the model. The data and its sources are presented in Section 2. Empirical results are provided in Section 3. I discuss the findings in Section 4.

³ It is expected that as SSW declines for younger generations they are more likely to increase their savings for retirement, which in turn may have a positive impact on national saving (IMF, 2007).

⁴ The estimated magnitude of this dissaving is around 24 percent for 2003.

⁵ The most recent study is Hurd, Michaud, and Rohwedder (2009). An extensive list of cross-section studies can be found in the CBO Memorandum (1998) and Engen and Gale (1997).

⁶ For example, households with higher SSW could accumulate less non-pension wealth if they expect to have a bequest from their parents in the future. Cross-household transfers within an expanded family could make households with greater than average SSW accumulate less private wealth than otherwise would be the case. Likewise, a household with higher SSW could have higher non-pension wealth if its non-pension wealth includes inheritances.

1 The Model

When a planner faces an adverse shock and decides on a parametric reform to secure the system, expectations about the future can deviate from what the planner promises—depending on the sustainability of the actual policy in people’s eyes. To show formally how expectations on the pension system affect total consumption, I use a simple two-period overlapping-generations model where there is no productive capital and identical individuals are endowed by w . They save (s) in the first period, then retire and spend their saving in the second period. There is no uncertainty in their lifetime, liquidity constraints, bequests, or growth in endowments. To avoid defining the utility function explicitly, I assume that the real interest rate (r) is equal to the personal discount rate (ρ). The planner runs a balanced PAYG system where the young, y , pay taxes, τ , and the seniors, o , receive benefits, b . In all periods $\dots, t-2, t-1$, there exists a steady state with

$$Rb = L\tau \Rightarrow b = (1+n)\tau, \quad (1)$$

R and L stand for the numbers of retirees (the old) and the workers (the young), respectively, and the population grows by n , which is the implicit rate of return (IRR) of the system. In period t there is an adverse demographic shock (θ), so that $n_t = n - \theta_t$. Consequently, the budget of the pension system changes to

$$b_t = (1+n-\theta_t)(\tau + \tau_t^s). \quad (2)$$

The government uses tax surcharges (τ^s) and splits the fiscal burden $\theta_t\tau$ between existing generations at time t so that elderly and young cohorts have to bear a share $1-\delta_t$ and δ_t , respectively. Consequently, we have

$$b_t = b - (1-\delta_t)\theta_t\tau. \quad (3)$$

Substituting (3) into (2) and using the definition for b (1), we can derive

$$\tau_t^s = \frac{\delta_t\theta_t\tau}{1+n-\theta_t}. \quad (4)$$

Note that if $\delta_t = 1$ we have $b_t = b$ so that the old in t bear no burden from the shock. In this sense, when an adverse shock hits, the planner’s decision on δ becomes a parametric reform for the existing PAYG system and constitutes unexpected wealth transfers among generations similar to those at the system’s introduction point, where the initial seniors receive a windfall.

From the individual’s perspective, shocks are recognized when the young are required to pay tax surcharges (τ^s), and they form their expectations on δ in the first period determined by the planner in the second period. Formally, every young person who is required to pay taxes and tax surcharges maximizes

$$U_j(c_{yj}, c_{oj+1}) = u(c_{yj}) + (1 + \rho)^{-1} u(c_{oj+1}),$$

subject to

$$c_{yj} = w - \tau - \tau_j^s - s \quad \text{and} \quad s_j = \left(\frac{c_{oj+1} - E_j b_{j+1}}{1 + r} \right)_j$$

If the utility function satisfies the conventional conditions and $\rho = r$, the young at time t solves this problem with the following values:

$$c_{yt} = \frac{1+r}{2+r} (w - \tau - \tau_t^s + E_t b_{t+1} (1+r)^{-1}), \quad (5)$$

$$s_t = 1/(2+r)(w - \tau - \tau_t^s - E_t b_{t+1}). \quad (6)$$

Given that all individuals recognize that the planner commits to a balanced budget (2), the young's expectation about benefits at t becomes:

$$E_t b_{t+1} = (1 + n_{t+1} - E_t \theta_{t+1})(\tau + E_t \tau_{t+1}^s). \quad (7)$$

Assuming that $E_t \theta_{t+1} = 0$ and using (4), we obtain

$$(1 + n_{t+1}) E_t \tau_{t+1}^s = \theta_t \tau E_t \delta_{t+1}. \quad (8)$$

Using (8) and the fact that $(1 + n_{t+1}) = (1 + n - \theta_t)$, (7) becomes

$$E_t b_{t+1} = \tau(1 + n) - \theta_t \tau (1 - E_t \delta_{t+1}). \quad (9)$$

Substituting (9) and (4) into (5), we obtain

$$c_{yt} = \frac{1}{2+r} \left[(1+r)w + (n - \theta_t - r)\tau - \frac{(1+r)\theta_t \tau \delta_t}{1+n-\theta_t} + \theta_t \tau E_t \delta_{t+1} \right]. \quad (10)$$

Likewise, the old also face the following consumption function at time t :

$$c_{ot} = (1+r)s_{t-1} + b_t = \frac{1+r}{2+r} (w - \tau - E_{t-1} b_t) + b_t. \quad (11)$$

Because $E_{t-1} \theta_t = 0$ and $E_{t-1} b_t = (1+n)\tau$, when we substitute (2) for b_t , (11) becomes:

$$c_{ot} = \frac{1+r}{2+r}w + \frac{n-r}{2+r}\tau - \theta_t\tau(1-\delta_t). \quad (12)$$

By using (10) and (12), the marginal effect of the transfer policy on the total consumption, $C_t = R_t c_{ot} + L_t c_{yt}$, can be observed as follows:

$$\frac{dC_t}{d\delta_t} = R_t\theta_t\tau(MPC_{ot}) - L_t\theta_t\tau\left[(MPC_{yt}) - \frac{1}{2+r}\frac{dE_t\delta_{t+1}}{d\delta_t}\right], \quad (13)$$

where, as shown in (10) and (12), MPCs out of transfers ($\delta\theta\tau$) for the old and the young are one and $(1+r)/\{(2+r)(1+n-\theta_t)\}$, respectively. When we use $L_t = (1+n-\theta_t)L_{t-1}$ with L_{t-1} (i.e., R_t) normalized to one, (13) becomes

$$\frac{dC_t}{d\delta_t} = \theta_t\tau\left[(MPC_{ot} - MPC_{yt}(1+n-\theta_t)) + \frac{dE_t\delta_{t+1}}{d\delta_t}\frac{(1+n-\theta_t)}{2+r}\right]. \quad (14)$$

Note that the first term in the brackets, the difference between MPCs, is always positive, and the sign of (14) depends on the sign of the second expression in the brackets. There are three possible cases. First, if the transfer is born by the current young generation, ($E_t\delta_{t+1} = 0$), a wealth redistribution will increase consumption by $\theta\tau/(2+r)$. Second, if the transfer is shifted onto unborn generations and the policy is binding, that is, $E_t\delta_{t+1} = \delta_t$, consumption will rise by $\{(2+n-\theta_t)(\theta\tau)\}/(2+r)$. Third, if the system promises generous but unsustainable SSW by setting δ close to one with an unbinding transfer policy, consumption may even decline. The diversion between expectations and the actual policy becomes more likely as each generation faces increasing tax surcharges (or rising public debt) in the face of cumulating shocks. Consequently, a binding policy (a constant δ) grows to be unsustainable, as implied by (14) below.

$$\tau_s^s = \frac{\delta_s\tau\sum_{i=t}^s\theta_i}{1+n-\sum_{i=t}^s\theta_i}, \quad (14)$$

which has to be less than or equal to $(w-\tau)$. This brings up a possibility that the planner may decide to end the program (gradually or all at once) so that the expectation about the policy variable (δ) can realistically be lower than zero. This brings up a theoretical ambiguity on how a Ponzi-scheme like PAYG affects consumption.

It is obvious from (10) and (12) that when $n-\theta > r$ SSW becomes positive, and, using (14), aggregate consumption, $C_t = R_t c_{ot} + L_t c_{yt}$, can be expressed by

$$C_t = f(w_t, SSW_t, \Delta E_t\delta_{t+1}, dMPC_t, X_t), \quad (15)$$

where $dMPC$ is the difference between MPCs of the old and the young and X is the vector of other factors, such as housing wealth, financial wealth, liquidity constraints, and so on, that may affect consumption. This representation is also consistent with traditional life-cycle models investigating the same subject (Ando and Modigliani, 1963; Barro, 1974; Feldstein, 1974).

In short, as summarized by (15), the short-run effect of any generational transfer on total consumption depends on two things. One, the difference between marginal propensities to consume (out of transfers) for retirees and workers. Two, the aggregated effect of the generational policy on the expectations of workers at t . Therefore, the key to understanding if a public policy that redistributes resources between generations affects national saving requires answers to the following three empirical questions. First, does the system redistribute wealth through parametric reforms? Second, is there a significant difference between workers and retirees in terms of MPC? Third, what are the expectations of the new members in the system?

The first and the third questions have been discussed by many researchers (The World Bank, 2000; IMF, 2000; Brook and Whitehouse, 2006; Aydede, 2008; TUSIAD, 2004). The consensus being that the Turkish PAYG system is one of the worst social security systems in the world in terms of generational fairness, which results in a declining trend in expected SSW for new members of the system between 1970 and 2003. The next section answers the second question.

2 Data

In the absence of rich panel data, studies on consumption and saving usually build a “pseudo-panel” to disentangle age effects from cohorts and time effects to observe life-cycle profiles of consumption.⁷ In contrast, we specifically seek to uncover differences in consumption profiles at any given time distinguished by age and work status. Therefore, we want to preserve cohort/time effects in our study. The variation in the MPC that we want to observe comes from work status that may coincide with a declining lifespan as one gets older so that younger generations can be workers and the older generations retirees. This provides us with a convenient opportunity to use pooled cross-section data.

⁷ Most recent studies are Borsch-Supan (2003), Deaton and Paxson (2000), and Demery and Duck (2004).

Table 1: Summary Statistics

| | 2003 | | 2004 | | 2005 | | 2006 | |
|--|---------|---------|---------|---------|---------|---------|---------|---------|
| | R | W | R | W | R | W | R | W |
| Number of Households | 4,496 | 9,835 | 1,487 | 3,367 | 1,446 | 3,231 | 1,459 | 3,456 |
| Includes Workers/Retirees | 20% | 3% | 17% | 3% | 18% | 4% | 18% | 3% |
| Average Age | 60.58 | 39.39 | 60.32 | 39.88 | 61.03 | 39.56 | 61.09 | 39.98 |
| Male | 96% | 98% | 94% | 98% | 94% | 98% | 95% | 98% |
| Married | 93% | 97% | 90% | 97% | 90% | 97% | 91% | 96% |
| Urban | 82% | 80% | 82% | 78% | 82% | 78% | 83% | 76% |
| Education | 33% | 59% | 37% | 59% | 34% | 56% | 34% | 57% |
| Average Values of HH (000.000 TL) | | | | | | | | |
| Disposable Income | 826 | 1,040 | 1,030 | 1,320 | 1,188 | 1,493 | 1,309 | 1,703 |
| Total Consumption | 729 | 830 | 923 | 1,040 | 1,132 | 1,267 | 1,262 | 1,597 |
| Nondurables | 648 | 720 | 795 | 875 | 950 | 1,024 | 1,099 | 1,372 |
| Durables | 81 | 110 | 128 | 165 | 182 | 243 | 163 | 225 |
| Transfers (% of Dis. Inc.) | 66.20% | 4.11% | 65.04% | 5.15% | 66.01% | 5.52% | 66.97% | 5.46% |
| Real Estate | 154,000 | 135,000 | 171,000 | 154,000 | 207,198 | 187,823 | 238,448 | 211,073 |

Note: R and W stand for Retirees and Workers, respectively.

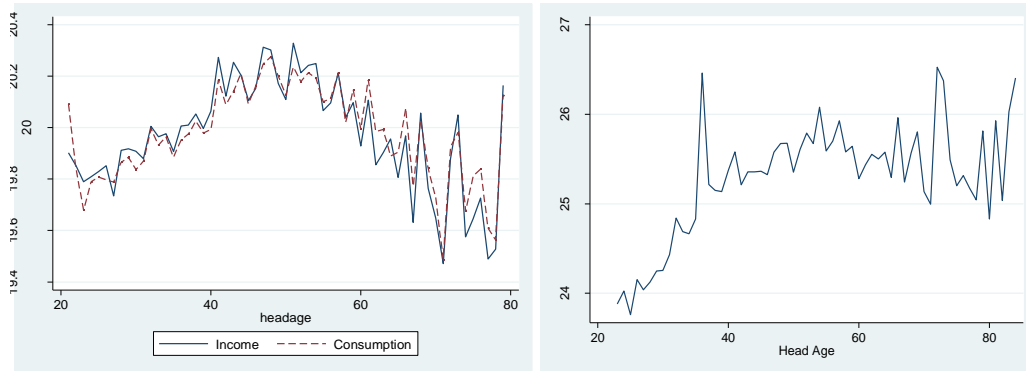
We use the raw data from the Household Budget Survey conducted each year from 2003 to 2006 by the Turkish Statistical Institute (TUIK) in Turkey.⁸ Each survey has three parts: information on each household's general characteristics, information on each household's consumption, and information on income, demographics, and employment status of each individual in each household.⁹ They are the most recent and nationally representative household surveys, covering a sample of 25,920 households for 2003, 8,600 for 2004, 8,640 for 2005 and 2006. They were randomly chosen from all parts of Turkey by the stratified multi-stage systematic cluster sampling method satisfying the OECD's standards.¹⁰ We define two groups, workers and retirees, and 10 age cohorts in each survey. The summary of surveys for each categorization is given in Table 1 above and Table 2 below.

⁸ Technical details of the surveys can be found at the TUIK's web page: www.tuik.gov.tr.

⁹ Very detailed information on consumption and income is the unique characteristic of the surveys. For example, the surveys provide data on more than 200 different types of consumption expenditures.

¹⁰ This is not applicable to earlier surveys conducted in 2002, 1994, and 1987.

Figure 1: Age Profiles of Income, Consumption, and Illiquid Wealth¹¹



The group of retirees includes households whose heads are retired, not working, and are receiving public annuity payments from one of the three public social security institutions.¹² If the head of the household is currently employed and covered by one of the public schemes, the household is classified in the group of workers. We define regions whose population is more than 20,000 as urban. Lastly, the threshold for education is elementary or higher school degree. A quick visual inspection shows the importance of public social security in the retirees' lives: almost two-thirds of their disposable income comes from transfer payments. Another interesting point is the fact that retirees seem to have more wealth in real estate than workers.¹³

As seen in Figure 1 above, which uses the pooled data,¹⁴ disposable income, and consumption increase in early ages and fall as the head of the household gets older, while wealth in real estate (mostly housing) does not show the same trend. This can be explained by capital market imperfections and prevailing bequest motives in extended families. These factors may also amplify the difference between workers and older individuals in terms of the MPC. Uncertainty in the absence of private annuity markets breaks the link between today and the future and leads to high personal discounts for future earnings in younger ages. Therefore, as they get older (or approach retirement), individuals consider taxes paid in the past as “sunk” and annuity payments as “unexpected,” which may not be bequeathed but consumed by older individuals. As a result, it would be likely to observe an increasing trend in the MPC out of income (out of liquid wealth), while individuals may not be able to dissave as they get older.

¹¹The graphs use average values in logs.

¹²A retired household head who keeps working is not included in this group.

¹³Real estate wealth represents a perceived value.

¹⁴We deflated the values to 2003 by using the consumer price index.

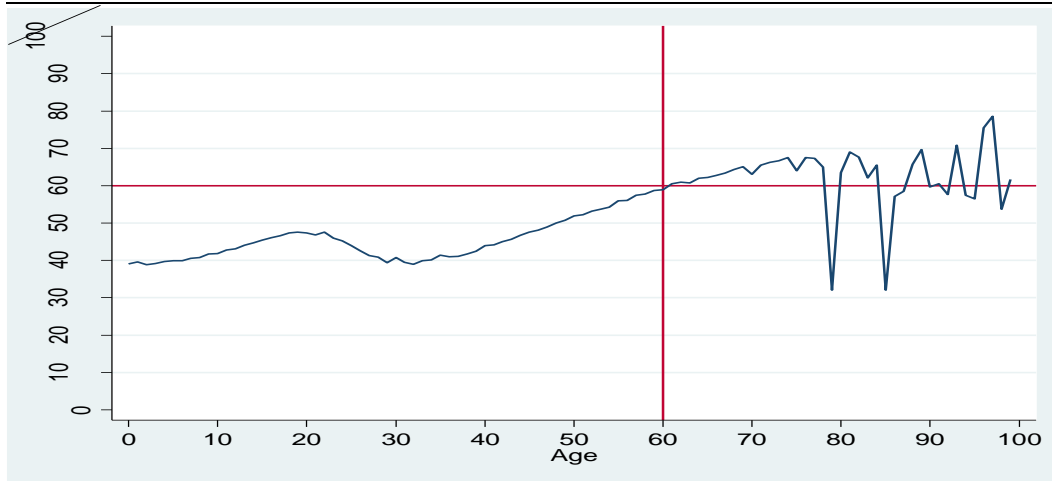
Table 2: Summary Statistics by Age Cohorts

| | 0-25 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65+ |
|--|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|
| Number of Households | 690 | 3,477 | 5,986 | 7,043 | 7,502 | 6,393 | 6,393 | 4,419 | 3,304 | 6,753 |
| <u>Demographics of HHH</u> | | | | | | | | | | |
| Average Age | 22.37 | 27.33 | 31.99 | 37.01 | 41.81 | 46.88 | 51.87 | 56.65 | 61.7 | 71.03 |
| Male | 84% | 94% | 95% | 94% | 94% | 92% | 91% | 88% | 86% | 81% |
| Married | 38% | 92% | 96% | 95% | 94% | 92% | 90% | 87% | 83% | 74% |
| Urban | 78% | 81% | 77% | 73% | 73% | 71% | 70% | 66% | 63% | 62% |
| Employed | 75% | 92% | 93% | 92% | 88% | 75% | 60% | 48% | 39% | 26% |
| LFPR | 79% | 95% | 96% | 95% | 92% | 78% | 62% | 50% | 40% | 26% |
| Education | 56% | 56% | 51% | 44% | 43% | 39% | 34% | 28% | 18% | 13% |
| Covered Worker | 37% | 61% | 59% | 60% | 58% | 42% | 25% | 12% | 7% | 3% |
| Uncovered Worker | 51% | 33% | 36% | 35% | 34% | 44% | 59% | 76% | 83% | 87% |
| Retired | 2% | 2% | 4% | 5% | 11% | 34% | 55% | 70% | 74% | 80% |
| <u>HH has</u> | | | | | | | | | | |
| Private Pension/Health Ins. | 1% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% |
| Car | 8% | 17% | 24% | 28% | 32% | 32% | 33% | 28% | 19% | 13% |
| Sick Member | 13% | 12% | 16% | 19% | 25% | 29% | 38% | 43% | 51% | 57% |
| Housing Debt | 49% | 56% | 59% | 57% | 56% | 56% | 54% | 49% | 40% | 31% |
| Access to Financial Markets | 17% | 25% | 31% | 29% | 31% | 31% | 29% | 23% | 16% | 10% |
| <u>Average Values of HH</u> (000.000 TL.) | | | | | | | | | | |
| Disposable Income | 545 | 691 | 759 | 811 | 908 | 975 | 1,000 | 908 | 822 | 730 |
| Total Consumption | 510 | 582 | 645 | 681 | 764 | 809 | 821 | 731 | 646 | 574 |
| Transfers (% of Dis. Inc.) | 25% | 6% | 5% | 5% | 7% | 16% | 24% | 33% | 34% | 39% |
| Wealth in Real Estate | 52,200 | 51,400 | 73,100 | 117,000 | 151,000 | 153,000 | 193,000 | 170,000 | 183,000 | 161,000 |

The summary of the four surveys by age cohorts is given in Table 2 above, where several important points are worth mentioning. Due to the lack of a required minimum retirement age and easy early retirement opportunities through disability,¹⁵ all age groups include retired households, and their share reaches 11 percent at age 40–44 and 34 percent at age 45–50. Moreover, the proportion of households who work without social security coverage is higher than 33 percent for all age groups and increases for older cohorts because of the existence of an implicit tax penalty for retirees who keep working in formal sectors. Interestingly, labor-force participation rates for household heads are much higher than the national average, which is around 55 percent.

¹⁵ The minimum retirement age is set at 58 by the reform in 1999.

Figure 2: Average Age of Household Head by Age of Individual for 2003



The surveys in our study collect information on consumption for households not for individuals.¹⁶ This represents a particular problem in developing countries where the oldest members in extended families are usually referred to as household heads, even if they are not the primary income earners. For example, a single 70-year-old father who receives only a retirement income can be shown as the head of a multigenerational household in surveys while actually other members at different lifecycle stages make consumption and income decision for the family. To understand the bias that this problem might introduce to age-consumption profiles, we plot the average age of each individual's household head against the individual's age in Figure 2 above.

If everyone were a household head, the graph would plot a 45-degree line. In general, the plot that lies above the 45-degree line indicates that young adults live with their parents. While the disconnection between the household head's and the individual's age gets worse at ages before 30 and after 70, it is not so dramatic between these ages. As argued by Deaton and Paxson (2000), this evident bias affects the estimation by smoothing differences in the MPC particularly for ages below 30 and above 70.

3 Differences in MPC

Even though the specification of conventional consumption functions has become increasingly more sophisticated over the years, a typical study investigating age-consumption profiles tests changes in consumption due to changes in income, wealth, expectations, and other control variables. As stated before, our empirical objective is to test whether there is a significant difference in MPCs of retirees and workers that substantiates the negative impact of redistribution through parametric reforms as shown by (15) above. Consequently, our estimating framework takes the following form:

¹⁶ Even though there are ways to estimate consumption at the individual level from household information, the estimations usually use household consumption by the age of household heads rather than by the age of individuals.

$$c_i = \beta_0 + \beta_1 RE_i + \beta_2 PDI_i + \beta' Z_i + u_i, \quad (16)$$

where *RE* and *PDI* represent the total assets in real estate and personal disposable income (including all forms of net government transfers), respectively. *Z* is a set of dummy variables, which we will define later in the regression analysis. The subscript *i* stands for each household and *u* is for the factors that may have effects on consumption but not defined in the function.

In estimating β_2 in Equation (16), we control the size of households by finding values for per-adult equivalent persons adjusted by the OECD's equivalent scale.¹⁷ To see the sensitivity of this selection, we also estimate the same regressions by (1) including the number of persons living in the same household as a separate variable, and (2) calculating per-person values by dividing household values by the number of people living in the household for each year. In addition, because the selection of household heads is left to family members during the surveys, we reassign the position of head of the household to the primary income earners in each household and reestimate the regressions. To control for the other factors that might influence the households' consumption behavior, we use the following dummy variables:

| | | |
|------------------|---|---|
| <i>Education</i> | = | 1, if HHH's education is higher than elementary school |
| <i>Indebt</i> | = | 1, if HH has a financial debt in housing |
| <i>AFM</i> | = | 1, if anybody in the HH has a credit card and/or financial assets |
| <i>Sex</i> | = | 1, if HHH is male |
| <i>Car</i> | = | 1, if HH has a car |
| <i>Married</i> | = | 1, if HHH is married |
| <i>Sick</i> | = | 1, if anybody in HH is sick and under continuous treatment |
| <i>Life</i> | = | 1, if HH has private life and/or health insurance |
| <i>Urban</i> | = | 1, if HH lives in a region that has a population of more than 20,000 people |
| <i>Employed</i> | = | 1, if HHH has a paying job |
| <i>Retired</i> | = | 1, if HHH receives retirement benefits from a public social security scheme |
| <i>Informal</i> | = | 1, if HHH has a paying job without public social security coverage |

where HH and HHH represent household and household head, respectively. Specifically, we define a dummy variable, *Car*, because we expect transportation costs with very high gas prices to affect the households' consumption decisions. In addition, we control the households' ability to access financial markets and their willingness to reduce risk exposure by two separate variables: *AFM* and *Life*.

The main explanatory, disposable household income, covers the last 12 months and includes all cash and in-kind earnings, unearned income from financial investments, all

¹⁷ The OECD scale assumes that the first adult's weight is 1, other adults have weight of 0.7, and the children have a weight of 0.5.

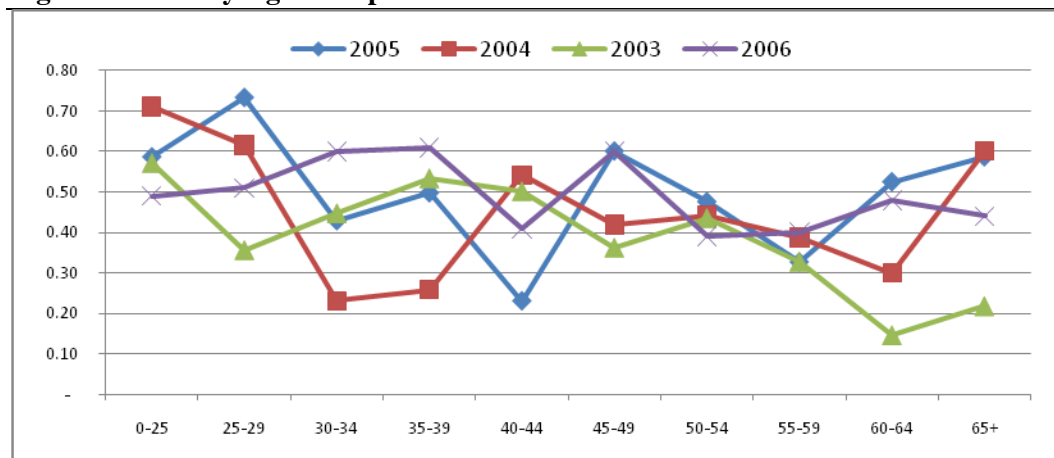
transfers from private and public resources, and imputed rent for owner-occupied dwellings, net of taxes and adjusted by the consumer price index. Consumption, on the other hand, covers the last month's expenditures on nondurable goods and services and includes the value of one-twelfth of the durable goods. In addition to purchased items, it also includes gifts, donations, fringe benefits from employers, and consumption from the household's own productions. We take the monthly average of annual disposable household income in all regressions. Table 3 below summarizes the regression results for all years using per-adult values adjusted by the OECD equivalent scales.

Table 3: Regression Results for MPC

| Cohorts | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | C1 | C2 | C3 | HHH | C1 | C2 | C3 | HHH | C1 | C2 | C3 | HHH | C1 | C2 | C3 | HHH |
| 0-25 | 0.57 | 0.68 | 0.51 | 0.51 | 0.71 | 0.79 | 0.39 | 0.65 | 0.59 | 0.69 | 0.56 | 0.55 | 0.49 | 0.47 | 0.55 | 0.55 |
| 25-29 | 0.36 | 0.45 | 0.24 | 0.33 | 0.62 | 0.73 | 0.46 | 0.62 | 0.73 | 0.82 | 0.63 | 0.69 | 0.51 | 0.49 | 0.55 | 0.35 |
| 30-34 | 0.45 | 0.53 | 0.39 | 0.41 | 0.23 | 0.26 | 0.23 | 0.26 | 0.43 | 0.48 | 0.38 | 0.41 | 0.60 | 0.55 | 0.31 | 0.31 |
| 35-39 | 0.53 | 0.57 | 0.47 | 0.54 | 0.26 | 0.31 | 0.23 | 0.26 | 0.50 | 0.70 | 0.35 | 0.69 | 0.61 | 0.62 | 0.61 | 0.57 |
| 40-44 | 0.50 | 0.54 | 0.45 | 0.52 | 0.54 | 0.56 | 0.52 | 0.53 | 0.23 | 0.26 | 0.22 | 0.30 | 0.41 | 0.41 | 0.32 | 0.39 |
| 45-49 | 0.36 | 0.49 | 0.34 | 0.41 | 0.42 | 0.45 | 0.38 | 0.40 | 0.60 | 0.64 | 0.54 | 0.53 | 0.60 | 0.52 | 0.51 | 0.54 |
| 50-54 | 0.44 | 0.47 | 0.38 | 0.42 | 0.44 | 0.45 | 0.48 | 0.41 | 0.48 | 0.54 | 0.40 | 0.42 | 0.39 | 0.54 | 0.40 | 0.54 |
| 55-59 | 0.33 | 0.41 | 0.23 | 0.30 | 0.39 | 0.44 | 0.44 | 0.39 | 0.33 | 0.32 | 0.35 | 0.39 | 0.40 | 0.39 | 0.45 | 0.40 |
| 60-64 | 0.15 | 0.14 | 0.22 | 0.22 | 0.30 | 0.39 | 0.12 | 0.19 | 0.52 | 0.60 | 0.48 | 0.40 | 0.48 | 0.61 | 0.49 | 0.41 |
| 65+ | 0.22 | 0.30 | 0.16 | 0.23 | 0.60 | 0.65 | 0.51 | 0.42 | 0.59 | 0.66 | 0.56 | 0.45 | 0.44 | 0.46 | 0.36 | 0.35 |

Notes: C1, C2, and C3 represent three different methods of controlling household size: per adult equivalent values by OECD scales (C1), per person values (C2), and unadjusted values with household size as a separate variable (C3). We also reestimated the regressions by giving headship to the member whose income was the highest. The results are given under HHH. All coefficients are significant at 1 percent confidence level with robust standard errors.

Figure 3: MPC by Age Groups



The first thing to observe is that older age cohorts do not have consistently higher MPCs than younger cohorts. In fact, as shown in Figure 3 above, there is a reverse trend in 2003. However, this result should be taken cautiously. First of all, the expected u-shaped

MPC pattern covers an individual's lifespan, which, unlike ours, needs a cohort analyses rather than a single-year test. Second, as explained before, because we use information on households, the coefficients underestimate the true MPC for older age cohorts. Finally, Turkey has very young retirement ages due to the lack of minimum retirement age and easy early retirement options through the disability coverage.¹⁸ There are a significant number of retirees in every age group who mostly work in widespread informal sectors because of tax penalties for retirees who keep working. Even though we control for these factors in the regression, they still impact age-consumption profiles.

Except for the first age group, having a car, access to financial markets, and living in urban areas have significant and positive effects on consumption (results are not shown). Consistent with the effect of real estate wealth on consumption, financial debt in housing does not have a significant impact on consumption for most age groups, and it becomes negative for older age groups. The insignificant effect of marriage and sex on consumption may come from the negligible share of female and/or single household heads similar to households with private life/health insurance. As expected, retirement affects consumption positively at older ages. Interestingly, employment status has no consistent signs for all age groups and no significant effect on consumption. This can be explained by the widespread existence of extended families where the household head's income is only a small fraction of the total household income. Although it is not significant, having to work in an informal sector in later ages has negative effects on consumption. Finally, as our results imply, having an elementary or higher school degree always pays back.

If the social security system has well-defined age requirements and rules for retirement eligibility, as in most developed countries, age-consumption profiles may coincide with work status profiles. However, when there is no minimum retirement age and more than half of the adult population is out of a labor force whose large portion works in informal sectors, a distributive aspect of a PAYG system should be analyzed between workers and retirees of the system. Table 5 shows the test results of consumption profiles for workers and retirees.

¹⁸ As young as 47 for men and 38 for women, the lowest in the world (The World Bank, 2000). The average minimum retirement ages for OECD countries are 64.4 for men and 63.9 for women in 2002 (OECD, 2002).

Table 5: Regression Results with OECD Equivalent Scales

| | 2003 | | | | 2004 | | | |
|--------------------|-----------------|-------|----------------|-------|-----------------|-------|----------------|-------|
| | <i>Retirees</i> | | <i>Workers</i> | | <i>Retirees</i> | | <i>Workers</i> | |
| <i>Income</i> | 0.4743 | 0.000 | 0.32934 | 0.000 | 0.56236 | 0.000 | 0.34653 | 0.000 |
| <i>Real Estate</i> | 1.80E-05 | 0.854 | 8.33E-05 | 0.342 | 2.45E-04 | 0.035 | 2.04E-04 | 0.294 |
| <i>Education</i> | 4.30E+07 | 0.000 | 4.83E+07 | 0.000 | 4.32E+07 | 0.005 | 6.10E+07 | 0.000 |
| <i>Sex</i> | -7.89E+07 | 0.001 | -8.61E+07 | 0.026 | -2.93E+05 | 0.994 | -1.12E+08 | 0.011 |
| <i>Married</i> | 1.28E+06 | 0.924 | 5.38E+07 | 0.011 | 3.71E+07 | 0.223 | 6.25E+07 | 0.172 |
| <i>Urban</i> | 3.95E+07 | 0.000 | 4.08E+07 | 0.000 | -2.13E+07 | 0.176 | -5.59E+07 | 0.000 |
| <i>Car</i> | 8.10E+07 | 0.000 | 8.77E+07 | 0.000 | 6.66E+07 | 0.000 | 8.59E+07 | 0.000 |
| <i>Indebt</i> | -1.59E+05 | 0.981 | 6.68E+06 | 0.285 | -4.61E+07 | 0.022 | -2.02E+07 | 0.168 |
| <i>Sick</i> | 2.04E+07 | 0.002 | 1.85E+06 | 0.783 | 4.95E+07 | 0.122 | 2.44E+07 | 0.233 |
| <i>AFM</i> | 4.20E+07 | 0.001 | 6.10E+07 | 0.000 | 1.38E+08 | 0.012 | 6.12E+07 | 0.000 |
| <i>Life</i> | 2.01E+07 | 0.735 | 1.79E+08 | 0.000 | 7.53E+07 | 0.000 | 5.37E+07 | 0.000 |
| <i>cons</i> | 1.55E+08 | 0.000 | 1.72E+08 | 0.000 | 1.12E+08 | 0.046 | 2.72E+08 | 0.000 |
| <i># of obs.</i> | 4,496 | | 9,835 | | 1487 | | 3367 | |
| F | 101.39 | | 190.81 | | 41.64 | | 73.59 | |
| R-squared | 0.5356 | | 0.4374 | | 0.5189 | | 0.4463 | |
| C2 | 0.51068 | 0.00 | 0.35781 | 0.00 | 0.61032 | 0.00 | 0.36765 | 0.00 |
| C3 | 0.43087 | 0.00 | 0.31001 | 0.00 | 0.5189 | 0.00 | 0.31244 | 0.00 |
| HHH | 0.46251 | 0.00 | 0.30925 | 0.00 | 0.48254 | 0.00 | 0.32001 | 0.00 |
| | 2005 | | | | 2006 | | | |
| <i>Income</i> | 0.554 | 0.000 | 0.361 | 0.000 | 0.525 | 0.000 | 0.432 | 0.000 |
| <i>Real Estate</i> | 0.000 | 0.252 | 0.000 | 0.064 | 0.000 | 0.679 | 0.000 | 0.247 |
| <i>Education</i> | 60.890 | 0.003 | 115.840 | 0.000 | 89.060 | 0.001 | 93.270 | 0.000 |
| <i>Sex</i> | -154.460 | 0.014 | -216.550 | 0.050 | -45.810 | 0.225 | -259.420 | 0.004 |
| <i>Married</i> | -32.050 | 0.374 | 88.350 | 0.153 | -29.800 | 0.232 | 4.470 | 0.936 |
| <i>Urban</i> | -1.320 | 0.955 | 77.070 | 0.000 | 68.510 | 0.000 | 45.320 | 0.007 |
| <i>Car</i> | 129.470 | 0.000 | 143.160 | 0.000 | 142.120 | 0.000 | 155.140 | 0.000 |
| <i>Indebt</i> | 12.570 | 0.588 | -21.430 | 0.190 | 40.320 | 0.067 | 8.170 | 0.580 |
| <i>Sick</i> | 88.290 | 0.015 | 31.560 | 0.484 | 113.590 | 0.033 | 34.850 | 0.165 |
| <i>AFM</i> | 41.510 | 0.431 | -16.200 | 0.282 | 149.030 | 0.019 | 4.160 | 0.792 |
| <i>Life</i> | 41.710 | 0.011 | 79.790 | 0.000 | 69.560 | 0.000 | 61.030 | 0.000 |
| <i>cons</i> | 272.170 | 0.000 | 316.970 | 0.005 | 115.050 | 0.028 | 377.050 | 0.000 |
| <i># of obs.</i> | 1446 | | 3231 | | 1459 | | 3456 | |
| F | 32.46 | | 75.99 | | 36.21 | | 79.09 | |
| R-squared | 0.4942 | | 0.4323 | | 0.4035 | | 0.4703 | |
| C2 | 0.5908 | 0.00 | 0.4377 | 0.00 | 0.6267 | 0.00 | 0.4508 | 0.000 |
| C3 | 0.5183 | 0.00 | 0.3279 | 0.00 | 0.4203 | 0.00 | 0.4267 | 0.000 |
| HHH | 0.5209 | 0.00 | 0.3311 | 0.00 | 0.4922 | 0.00 | 0.4134 | 0.000 |

Notes: I use robust standard errors. The probability that the coefficient is not different from zero is given next to each coefficient. C2, C3, and HHH are defined before. Since the values in 2005 are expressed in YTL (1YTL = 1,000,000 TL), the coefficients are smaller.

Unlike age-consumption profiles, retirees have higher MPCs than workers in all four years, and the cross differences are significant at the 1 percent level. This outcome is not

sensitive to the method of controlling household size and the selection of household heads. Because we classify households according to the head's work status, similar to the bias in age-consumption profiles, we may have households, for example, whose heads are retired but the rest are workers. As the figures in Table 1 show, almost 20 percent of retired households have one or more workers, while it is 4 percent for workers with at least one retiree in the household. In order to see its effect on estimations, we reestimated the regressions by controlling whether a retired (worker) household has a worker (retiree). The results show that controlling it increases the MPC for retirees but does not affect workers.

In addition, the regression results reveal important information about the other factors that affect consumption. For example, even though its sign is positive, a perceived value of wealth in real estate does not have significant effects on consumption, perhaps due to imperfect capital markets and the fact that income from dwellings plus imputed rents are in already disposable income. As expected, higher education or having a car is indicative of higher spending. The effect of access to financial markets on consumption has a consistent positive sign for all years but only significant for 2003 and 2004. Interestingly, while location of household has a significant and positive effect on consumption for workers, it has negative but insignificant effects for retirees.

4 Conclusion

Turkey is a unique case in the literature due to its very generous but unsustainable social security system. Since 1999, there have been three major parametric reforms aimed at correcting the system's long-term balance. All of the three reforms used a phased-in approach to sustaining the long-run financial viability of the program. The duration of this recovery, after three major reforms, will be more than 50 years. There is no doubt that the reforms constitute significant wealth distribution from workers to retirees during this period; the magnitude of which has been calculated by Brook and Whitehouse (2006). There have been many studies debating actuarial and financial aspects of these reforms, except for their impacts on economic dynamics.

This paper is the first of its kind that attempts to assess the distributional effects of parametric PAYG reforms on saving in Turkey. I first develop a two-period overlapping generations model where wealth distribution is initiated by an adverse shock to a PAYG system. Unlike other empirical studies looking for differences in age-consumption profiles, we argue that, when transfers are used to balance the system with no required minimum retirement age, an increase in total consumption critically depends on differences in the MPC of workers and retirees rather than those of age cohorts. Using a very large data set including more than 50,000 households collected by the Household Budget Survey over four years from 2003 to 2006, we test the MPC of age-cohorts as well as that of workers and retirees. Our results are robust and indicate that, while the MPC is not higher for older generations, it is significantly higher for retirees than for workers.

Although this fact has been confirmed, it does not promise a reduction in national saving. The results imply that, as long as parametric reforms constitute wealth transfers from workers to retirees, the recent parametric reforms will contribute to the current negative trend in national saving.

References

- Ando, A., & Modigliani, F. (1963). The Life Cycle Hypothesis of Saving: Aggregate Implications and Tests. *The American Economic Review*, Vol. 53, 55–84.
- Auerbach, A., & Kotlikoff, L. (1983). An Examination of Empirical Tests of Social Security and Savings. In E. Helpman, A. Razin, & R. Sadka (Eds.), *Social Policy Evaluation: an economic perspective* (pp. 161–79). New York: Academic Press.
- . (1987). *Dynamic Fiscal Policy*. New York: Cambridge University Press.
- Aydede, Y. (2008). Aggregate Consumption Function and Public Social Security: The First Time-Series Study for a Developing Country, Turkey. *Applied Economics*, 40, 1807–1826.
- Barro, R. (1974). Are Government Bonds Net Wealth? *Journal of Political Economy*, Vol. 82(6), 1095–1117.
- . (1978). *The Impact of Social Security on Private Saving: Evidence from the U.S. Time Series*. Washington, D.C.: American Enterprise Institute.
- Blake, D. (2004) The Impact of Wealth on Consumption and Retirement Behaviour in the UK, *Applied Financial Economics*, 14, 555–576.
- Borsch-Supan, A. (2003). *Life-Cycle Savings and Public Policy: A Cross-National Study of Six Countries*. San Diego, CA: Academic Press.
- Brook, A., & Whitehouse, E. (2006). The Turkish Pension System: Further Reforms to Help Solve the Informality Problem. OECD Social Employment and Migration Working Papers No. 44. Retrieved June 1, 2010, from <http://www.oecd.org/dataoecd/4/37/37818128.pdf>
- CBO Memorandum. (1998). Social Security and Private Saving: A Review of the Empirical Evidence. *Congressional Budget Office*. Retrieved June 1, 2010, from <http://www.cbo.gov/doc.cfm?index=731>
- Deaton, A., & Paxson, C. (2000). Growth and Saving Among Individuals and Households. *Review of Economics and Statistics*, Vol. 82, No. 2, 212–225.
- Demery, D. & Duck, W. (2006). Saving-Age Profiles in the UK. *Journal of Population Economics*, Vol. 19, 521–541.
- Engen, E., & Gale, W. (1997, June). Effects of Social Security Reform on Private and National Saving. In *Social Security Reform: Links to Saving, Investment and Growth: Conference Proceedings*, Federal Reserve Bank of Boston.

- Feldstein, M. (1974). Social Security, Induced Retirement, and Aggregate Capital Accumulation. *Journal of Political Economy*, Vol. 82, No. 5, 905–926.
- Hurd, M., Michaud, P. C., & Rohwedder S. (2009). The Displacement Effects of Public Pensions on the Accumulation of Financial Assets. Michigan Retirement Research Center. Retrieved June 3, 2010, from <http://www.mrrc.isr.umich.edu>
- IMF (International Monetary Fund). (2000, February). Turkey: Selected Issues and Statistical Appendix. IMF Staff Country Report No. 00/14. Retrieved June 5, 2010, from <http://www.imf.org/external/pubs/ft/scr/2000/cr0014.pdf>
- . (2007, November). Turkey: Selected Issues. IMF Country Report No. 07/364. Retrieved June 5, 2010, from <http://www.imf.org/external/pubs/ft/scr/2007/cr07364.pdf>
- Kotlikoff, L. J. (2003). *Generational Policy* (The Cairoli Lectures). Cambridge, MA: MIT Press.
- Ministry of Labor and Social Security. (2004, July 29). Proposal for Reform in the Social Security System (Draft Text).
- OECD (Organisation for Economic Co-operation and Development). (2004). *Pensions at a Glance. Public Policies across OECD Countries*. Paris: OECD.
- Seidman, L. (1985). A General Equilibrium Critique of Feldstein's Social Security Estimate. *Eastern Economic Journal*, Vol. XI, No.2, 101–105.
- The World Bank, (2000). *Turkey: Country Economic Memorandum—Structural Reforms for Sustainable Growth*. Report No. 20657-TU, Washington D.C.
- TUSIAD – Turkish Industrialists' and Businessman Association. (2004). Reform in the Turkish Retirement System. No: TUSIAD-T/2004-11/382. Retrieved June 10, 2010, from http://www.tusiad.org/tusiad_cms.nsf/bd/3C0A6E00F39210AAC225733E0043240A?OpenDocument