

The Impact of Retirement on Household Consumption in Japan*

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Abstract

Using monthly data from the Japanese Family Income and Expenditure Survey, we examine the impact of retirement on household consumption. We find little evidence of an immediate change in consumption at retirement, on average, in Japan. However, we find a decrease in consumption at retirement for low income households that is concentrated in food and work-related consumption. The availability of substantial retirement bonuses to a large share of Japanese retirees can help smooth consumption at retirement. We find that those households that are more likely to receive such bonuses experience a short-run consumption *increase* at retirement. However, among households that are less likely receive a retirement bonus, we find that consumption decreases at retirement.

Keywords Retirement; Household Consumption; Life Cycle Permanent Income Hypothesis; Retirement bonus;

JEL Classifications D12; E21

1 Introduction

Driven in part by the aging of populations across the globe, there is widespread concern regarding the ability of households to adequately plan and save for retirement. A lack of planning for retirement as well as a lack of knowledge regarding one's private pension benefits has been found in studies of households in the U.S. (Gustman and Steinmeier 1999; Lusardi 2003; Chan and Stevens 2008). The empirical evidence as to whether households are adequately saving for retirement yields conflicting findings. Studies that use simulation methods to compare optimal savings levels to those found in the actual U.S. population indicate that savings are indeed adequate (Engen, Gale, and Uccello 1999; Scholz, Seshadri, and Khitatrakun 2006). Studies that examine consumption changes at retirement find evidence that consumption systematically falls at retirement which, based on the Life-Cycle/Permanent Income Hypothesis (LCPIH), may indicate that households do not adequately save in advance of an expected reduction in income at retirement. This result has been found in the UK (Banks, Blundell, and Tanner 1998; Smith 2006), the U.S. (Bernheim, Skinner, and Weinberg 2001; Fisher et al. 2005; Haider and Stephens 2007), Italy (Miniaci, Monfardini, and Weber 2003; Battistin et al. 2007), and Germany (Schwerdt 2005).

More recently, however, there is evidence of heterogeneity in the consumption response at retirement. For example, Smith (2006) only finds a response for those individuals who involuntarily retired while Battistin et al. (2007) find no effect once they control for changes in household composition at retirement. In addition, Aguiar and Hurst (2005) and Hurd and Rohwedder (2003; 2008) provide evidence which suggests modifying the LCPIH to incorporate household production may help explain the drop in consumption at retirement. In a thorough review of this literature, Hurst (2008) notes that there is substantial heterogeneity in spending changes at retirement across consumption categories and across households. In this sense, more evidence is needed.

In this paper we investigate whether consumption falls at retirement in Japan. Specific features of the Japanese retirement system provide an interesting setting for examining retirement consumption changes. Many private employers in Japan institute a feature known as "Teinen" retirement, now typically at age 60, when employees must either leave their firm or are transferred to significantly lower paying jobs elsewhere within the company. However, many workers receive rather

sizable bonuses upon reaching their Teinen retirement age which, depending upon the worker's sector of employment, can average more than four times their annual income. In addition, retiring private sector workers were eligible to receive unemployment benefits, in addition to their public pension benefits, for up to one year following retirement prior to 1998. These additional sources of income can help households offset the large drop in monthly income at retirement and may lead to dramatically different retirement consumption changes in Japan relative to other developed countries.

We use data from the Japanese Family Income and Expenditure Survey (JFIES), which is a large monthly household panel survey that collects information on consumption and income for six consecutive months and thereby enables us to analyze within-household consumption changes at the exact month of retirement. As Blau (2008) and Hurd and Rohwedder (2008) emphasize, using a true panel dataset is much more advantageous when identifying the impact of retirement on consumption, whereas prior studies typically use synthetic cohorts or cross-sectional surveys (e.g. Banks, Blundell, and Tanner 1998; Hurd and Rohwedder 2003; Fisher et al. 2005; Wakabayashi 2008).

We find little evidence that consumption immediately decreases at retirement, on average, in Japan although monthly income decreases sharply when households exit the labor force. We also find that consumption falls when workers exit the labor force due to unemployment which suggests that data quality issues do not preclude us from finding a response at retirement. Our finding that consumption does not fall at retirement in Japan is consistent with the results of Wakabayashi (2008) who finds, using data from a cross-sectional survey, that *expected* consumption changes at retirement can be explained by life-cycle factors including expected changes in household composition at retirement. Since Japan has a relatively high personal savings rate, we address the possibility that these results are driven primarily by asset accumulation by separately estimating the model for above and below median income households. We find that consumption decreases at retirement for the below median income households although this reduction is limited to food and work-related consumption. This finding is consistent with results in the prior literature surveyed in Hurst (2008).

An important institutional difference between Japan and most other countries is the generous

bonuses distributed by firms at Teinen retirement. Battistin et al. (2007) note that Italian households also receive large retirement bonuses and, similar to our full sample results for Japan, find that the consumption of these households does not fall at retirement (after controlling for contemporaneous family size changes). We present evidence that the receipt and magnitude of bonuses in Japan depends upon one's sector of employment. Public sector and large private firm employees are more likely to receive these bonuses and, conditional upon receipt, collect larger bonuses. We find that workers in these sectors experience a short-run *increase* in consumption at retirement which is surprising given that the amount and receipt of these bonuses are known in advance to retirees. We also find that small private firm employees, who are less likely to receive bonuses and also earn smaller bonuses, reduce their consumption at retirement as has been found in other countries. Thus, while Japanese households do not, on average, exhibit significant consumption decreases at retirement, the estimated responses differ substantially across employment sectors.

One caveat for our estimates is that retirement is treated as exogenous in our analysis. Since the JFIES is a monthly panel dataset, we cannot use age as an instrument for retirement as has been done in prior papers (e.g., Aguiar and Hurst 2005) unless we were to ignore the panel aspect of the JFIES. While Haider and Stephens (2007) have demonstrated potential concerns with using age as an instrument, they also find similar results in the U.S. for both OLS and 2SLS estimates which use retirement expectations as an instrument. The widespread use of Teinen retirement by Japanese employers, however, means that most employee retirements in Japan are very predictable. However, since we cannot clearly define which employees are retiring at a time that they had previously anticipated, our findings must be interpreted with this endogeneity concern in mind.

It is also important to note that the JFIES covers a six-month sample period for each household which is a much shorter time interval in comparison to other panel datasets used in this literature such as the Panel Study of Income Dynamics, Health and Retirement Study, and the British Household Panel Survey (e.g., see Bernheim, Skinner, and Weinberg 2001; Smith 2006; Haider and Stephens 2007; Blau 2008; and Hurd and Rohwedder 2008). An advantage of the JFIES relative to these other panel datasets is that the monthly data allow us to observe the immediate consumption response to retirement rather than examining the response over a one or two year window between survey waves. To the extent that other events which occur between survey waves also influence

consumption decisions, the immediate consumption response we estimate can be directly tied to the household's transition into retirement.

A limitation of following households for only six months, however, is that the impact of poor planning on consumption may not become evident for many months or even years after retirement. For example, Bernheim, Skinner, and Weinberg (2001) find that in addition to a consumption decline one to two years after retirement, U.S. households experience an additional drop in consumption three to four years after retiring. Since we are using a six month sample period, we cannot rule out that consumption subsequently declines across all employment sectors after our sample period ends. We view our approach as testing a weak form of the LCPIH which is that the retirement consumption response occurs immediately upon leaving the labor force. Thus, it is difficult to directly compare our short-run estimates to the prior literature which examines longer periods following retirement. If consumption continues to fall during the years following retirement as it does in the United States (Hamermesh 1984; Bernheim, Skinner, and Weinberg 2001), our findings for the short-run consumption response can be considered as a lower bound for the long-run impact of retirement on consumption in Japan.

The remainder of the paper is set out as follows. The next section discusses a number of aspects of the Japanese retirement benefit system including Teinen retirement. The following section discusses the data used in this paper, the Japanese Family Income and Expenditure Survey. Section four presents the results of our analysis and the final section concludes.

2 Retirement in Japan

2.1 The Japanese Retirement Benefit System

The Japanese retirement benefit system involves a variety of pension plans that are both publicly and privately managed.¹ The public pension system in Japan is comprised of two tiers: the national pension and the employee pension. Whether or not an individual receives both of these public pensions depends upon their sector of employment. The private pension system consists of both firm specific pensions and, in more recent years, personal pension plans.

¹The discussion in this section is based on Casey (2004).

All Japanese citizens participate in the national pension (sometimes referred to as the basic pension) and make monthly contributions into the program.² The benefit amount received by each participant in the national pension depends only on the number of years the participant made contributions. Earnings levels are not factored into national pension benefit payments.

The employee pension is actually a system of multiple pension plans that separately cover private sector, central government, and local government employees. Dependent spouses are also covered by employee pensions. Self-employed workers, certain agricultural workers, and employees in small businesses are not eligible for the employee pension.³ Benefit levels in the employee pension depend upon the individual's earnings while they were working. Recipients who reach retirement age can draw benefits while they are still working although the amount they receive is subjected to an earnings test and is reduced as their earnings increase.

There are three types of private pensions. Employers at large firms (over 500 employees) are able to offer firm-specific pension benefits. This benefit can replace part of the payments from the employee pension. Any amount of the firm-specific pension that exceeds the employee pension either can be paid out as annuity or can be taken as a lump sum. There are also personal pension plans that are specifically available for self-employed workers who choose to make voluntary contributions to such a pension. Finally, there are personal savings plans that are available to the entire population.

The age of eligibility currently differs for the national pension and the employee pension. Before a pension reform in 1994, male public pension recipients were eligible to receive the national pension at age 65 while they could receive the employee pension at age 60.⁴ In addition, men who were eligible to receive the employee pension could also receive a "bridge" pension benefit between ages 60 and 64 which equalled the full national pension amount that they would receive beginning at age 65. However, the bridge pension is only available to those who have completely left the labor force.

The reform in 1994 implemented a gradual increase in the eligibility age for the employee

²Low income families are exempt from contributions. Prior to 1985, non-employed spouses of workers could voluntarily contribute but have been required to do so since then. Students were able to voluntarily contribute beginning in 1985 and their contributions became mandatory in 1994.

³Also, part-time employees as well as workers on temporary contracts are ineligible for the employee pension.

⁴The age of eligibility currently differs for men and women in Japan. Since our analysis focuses on male-headed households, the discussion of benefit ages is limited to male benefit eligibility.

pension. Beginning in 2001, this eligibility age increased by one year at three year intervals so that by 2013 men will have to be age 65 to receive their full employee pension. However, this reform also introduced a form of early retirement whereby men can begin receiving their employee pension as early as age 60 although benefits will be reduced by 6 percent for each year they begin taking their benefits prior to their employee pension eligibility age. The bridge pension, however, still cannot be received prior to the employee pension eligibility age.

Retiring private sector workers are allowed to receive unemployment benefits for up to one year after leaving the labor force.⁵ Assuming that they were eligible, retirees were allowed to concurrently draw public pension benefits and unemployment benefits prior to 1998. A reform imposed in 1998 only allows individuals to receive benefits from one of these two programs at any point in time. Thus, depending upon the relative magnitude of the two sources of benefits, some workers now elect to receive unemployment benefits upon retirement until such payments are exhausted and then switch to receive their public pension benefits.

2.2 Teinen Retirement

Teinen retirement is a feature of the Japanese retirement system by which the workers “complete their job” at an age which is pre-specified by the firm.⁶ The phrase “complete their job” typically has one of two meanings. Employees stop working in their current position either in the month in which they reach the Teinen retirement age or at the end of the fiscal year (end of the month of March) during which they reach their Teinen retirement age. At this point, workers do not necessarily stop working for their employer. Instead, there are a number of possibilities depending upon the employer and employee. Workers may leave the labor force, they may begin working for a new employer, or they may remain with their present employer in a significantly lower paying job.⁷

Many firms pay workers a bonus when they reach their Teinen retirement age. These bonuses typically range from 20 to 30 million yen (which is roughly equivalent to \$200,000 to \$300,000). Although monthly income dramatically declines at retirement (as we show below), the availability

⁵Public sector workers are not eligible to receive unemployment benefits as legislated in Article 6 of the Employment Insurance Law.

⁶The word Teinen means “predetermined age” in Japanese.

⁷At larger firms, remaining with the same employer may entail working at a different establishment site.

of the lump sum retirement bonus may allow Japanese households to better smooth consumption at retirement.

The practice of Teinen retirement is widespread among Japanese firms. Figure 1 presents tabulations on the adoption of Teinen by firms using data that is gathered as part of the Employment Management Survey (EMS) conducted annually by the Ministry of Health, Labor, and Welfare.⁸ The solid line at the top of the Figure shows the share of the Japanese firms that offer Teinen retirement. This share increased rapidly in the 1980s and has hovered around 96 percent since 1991. It is important to note that the EMS only surveys firms with at least 30 employees, so this Figure likely overstates the share of firms with a Teinen retirement age.

The remaining lines in Figure 1 show, among the firms that offer Teinen retirement, the share of firms with a given Teinen age. Over this period, due in part to a June 1994 law change that mandated all Teinen retirement ages to equal or exceed age 60 by April 1998, the Teinen age shifted from ranging between ages 55 and 60 to becoming concentrated at age 60. By 2002, over 90 percent of firms set the Teinen retirement age exactly at 60 while nearly seven percent set the retirement age at exactly at 65. Since these distributions are calculated at the firm-level and are not weighted by employees, the spike at age 60 *among workers* is likely underestimated because larger firms are more likely to have Teinen retirement at age 60 (Sato 1999).

Additional evidence on the importance of Teinen retirement is provided by the quinquennial Japanese Employment Status Survey (ESS). Unlike the monthly Japanese Labour Force Survey, the ESS elicits information on the reason for leaving the previous job for all individuals who left or changed jobs during the previous year. Results from the 2002 ESS indicate that among men ages 60-64 who left or changed jobs, over 63 percent did so because of Teinen retirement. The comparable figures among men ages 55-59 and men ages 65 and above are 9 percent and 35 percent, respectively.⁹ Consistent with the practice of Teinen retirement occurring at the end of

⁸The Employment Management Survey elicits information from roughly 4,500 each year. Limited results from the EMS are available in English from the Cabinet Office at <http://www8.cao.go.jp/kourei/english/annualreport/index-wh.html>.

⁹See Tables 7 and 8 of ESS survey results posted on-line at <http://www.stat.go.jp/English/data/shugyou/2.htm>. The data are only available in five year age ranges and thus are unable to replicate the single age spikes found in the Employment Management Survey. As a point of comparison, in the 1997 ESS the share of men leaving or changing their jobs due to Teinen is 31 percent between ages 55-59, 75 percent between ages 60-64, and 37 percent at ages 65 and above

the fiscal year, the modal month reported for leaving jobs among men ages 55 and over in the ESS is March. One-third of those who changed jobs and over 20 percent of those who leave the labor force reported doing so in March.

The distribution of Teinen bonuses differs systematically across employment sectors. The General Survey on Wages and Working Hours System (GSWWHS) gathers data regarding the magnitude of Teinen bonuses from private sector firms with at least 30 employees.¹⁰ The bonuses reported in the GSWWHS are for workers with at least 20 years with the firm. The magnitude of these bonuses relative to annual income is shown by firm size in Figure 2. While employees at the smaller firms receive retirement bonuses that are twice their annual income, firms with 100 to 999 workers give bonuses that are nearly three times their annual income. Firms with at least 1,000 workers are the most generous as they provide bonuses that average four times the worker's annual income.

Public sector workers also receive large Teinen bonuses. The National Civil Service Law and the Local Civil Service Law both provide that public servants who worked for more than one year receive a retirement bonus. The magnitude of the public sector bonuses are fairly large. A survey conducted by the National Personnel Authority notes that the average lump-sum retirement bonus for retirees in 2005 was over 27,000,000 yen which corresponds to a bonus to annual income ratio between four and five.¹¹ Thus, public sector employees receive retirement bonuses that are comparable to workers in large private firms.

3 Data

The data we use are drawn from the Japanese Family Income and Expenditure Survey (JFIES) which is a household panel survey that excludes agricultural workers and households of single individuals. Households in the JFIES are interviewed for six consecutive months. The panel is rotating meaning that in any given month approximately one-sixth of households are being interviewed for the first time, one-sixth for the second time, etc. In each month roughly 8,000

¹⁰The General Survey on Wages and Working Hours System is conducted every four or five years by the Ministry of Health, Labor and Welfare.

¹¹Details of this survey can be found, in Japanese, at <http://www.jinji.go.jp/nenkin/nenkintop.htm>.

households record daily expenditures and income receipt in a diary which is collected twice a month. However, the available micro data only identify the month in which each expenditure and income item is recorded in the diary. In addition, retrospective income is collected for the year preceding the first interview. Household demographic and labor force information are also collected in the JFIES.

We use the panel data feature of the JFIES to examine within household changes in monthly consumption and income at retirement. The advantage of this approach is that we can examine consumption changes immediately following retirement. A potential drawback is that we only have five monthly changes per household so the probability of observing a given household head retiring while in the sample is relatively small. Even though the share of household heads without a job increases by roughly 70 percent between ages 50 and 70 in the JFIES, the chances that the six-month window during which a household is sampled overlaps with the head leaving the labor force is less than two percent (assuming households are uniformly sampled between ages 50 and 70). The large sample sizes of the JFIES allow us to proceed with the household-level analysis.

We use JFIES data from the 1986-2005 surveys. We begin our sample period in 1986 since the JFIES did not collect monthly income data from non-working households prior to October 1985. We restrict the sample to male-headed households that remain in the survey for all six months. While sample attrition in panel data yields important concerns about sample selection in some contexts, over 92 percent of households remain in the sample for all six months. In addition, we only use households in which the household head does not change during the six-month survey period (e.g., from the husband to the wife). This restriction has no effect on our results since such changes occur for less than one-third of one percent of all households and nearly one-half of the head changes occur when the head leaves the household while the other family members remain in the survey.

3.1 Labor Force Status and Retirement in the JFIES

The JFIES obtains information on the job status of all household members. Jobs are coded as falling into twelve categories (roughly speaking, occupations) including blue collar, white collar, self-employed, and not working. We aggregate these jobs classifications into three categories: employees,

the self-employed, and those not working. Unfortunately, the JFIES does not contain the reason for not working. As such, we cannot distinguish between the unemployed and the retired. However, in the 1997 Employment Status Survey where individuals report their reasons for leaving their previous employment, nearly 85 percent of men ages 60 and over who had exited the labor force in the previous year reporting doing so either because of Teinen retirement or because of old age/illness.¹² Moreover, the unemployment rate has typically been very low in Japan ranging around 2 or 3 percent until the late 1990s.¹³ Therefore, in our analysis, we regard older heads without jobs as being retired.

Figure 3 shows the distribution of employment status over the life cycle for our JFIES sample of male households heads based on their first monthly interview. As the Figure indicates, prior to age 55 virtually all male heads are either working for someone else or are self-employed. The rate of self-employment gradually rises from under 20 percent at age 40 to roughly 30 percent by age 55. The share of employees declines slowly prior to age 60 at which point it begins to decrease rapidly. Since the share of self-employment declines slowly for older household heads, the share without a job increases dramatically beginning at age 60. However, as noted earlier, only 65 percent of Japanese men are out of the labor force by age 70 which is substantially lower than the comparable rates for men in other developed countries.

We limit our sample to households where the head's age ranges from 40 to 65. Since we cannot distinguish between the unemployed and the retired, our primary sample consists of households ages 55 to 65 which contain nearly all of the Teinen retirement ages (see Figure 1), are comprised of labor force exits which, given the findings from the ESS noted above, are primarily due to retirement, and contain a dramatic increase in retirements (see Figure 3). We limit the sample at age 65 since many retirements at subsequent ages likely are due to individuals that previously underwent a Teinen retirement and moved to a lower paying job at that time as opposed to having left the labor force. We also present some results for labor force exits at ages 40 to 54 as a point of comparison since labor force exits among these workers are likely comprised of unemployment spells.

¹²The comparable number for the 2002 ESS is 71 percent.

¹³The unemployment rate increased after 1997 to roughly 5%.

We focus on the retirements of employees and we exclude the transitions out of the labor force for self-employed workers. Since we estimate panel data models below that have individual fixed effects, the effect of retirement on consumption will be identified by those workers who transition into retirement during their sample period. Whereas, as we demonstrated above, many of the employees are induced to retire by their firm's Teinen rules, the retirement decisions of the self-employed are far more likely to be endogenously determined. While we do not contend that the retirements of employees are entirely exogenous, focusing on the group of workers who have far less control over the timing of their retirement provides a stronger test of the ability of households to smooth consumption at retirement. Furthermore, 3.6 percent of sample employees ages 40 to 65 leave the labor force during their six-month sample period while only 0.6 percent of the self-employed do so. Given that a far greater number of individuals in this age range are employees, the self-employed only represent a small fraction of the workers who transition out of the labor force. Both due to concerns about the endogeneity of their retirement decision and their relatively small share of retirement transitions, we exclude individuals who are self-employed at any point during their sample period from the remainder of our analysis.¹⁴ Summary statistics for our sample are presented in Table 1.

3.2 Consumption Measures in the JFIES

As discussed above, the JFIES collects information on consumption and income using daily diaries which is aggregated to create total consumption and income measures for each month. We face the standard problem in this literature which is to determine which expenditure items should be used in the consumption measures. Ideally, we would have information on both non-durable consumption as well as the consumption of services from durable goods. As with prior studies, we assume that non-durable and durable consumption are separable and focus on non-durable consumption. Our primary consumption measure of interest is non-durable goods and services consumption. This consumption category closely reflects the non-durable consumption measure found in studies using

¹⁴In addition, the JFIES does not collect monthly income data for the self-employed so we could not use these workers in any income-related analysis.

the U.S. Consumer Expenditure Survey (Parker 1999; Hsieh 2003; Stephens 2008).¹⁵

One concern with using consumption measured in monthly intervals is that some of the items that are classified as non-durable may in fact, have a durable component. For example, while footwear is classified as a non-durable good, consumers may enjoy the benefits for such items for multiple years. As such, we follow Lusardi (1996) by examining a category of strictly non-durable consumption which restricts items that can be consumed within a quarter.¹⁶

We examine three additional consumption categories. We examine food consumption since a number of studies in the consumption literature, including those that examine the retirement consumption puzzle (e.g., Bernheim, Skinner, and Weinberg 2001; Haider and Stephens 2007), use datasets in which food consumption is the only available consumption measure. Hurst (2008) notes that the retirement consumption declines observed in most studies occur within food consumption and work-related consumption. Thus, we create a category of work-related consumption, based loosely on the category used in Banks, Blundell, and Tanner (1998). We define work-related consumption as food away from home (excluding school lunches), non-durable transportation (only the subcategory of commuter monthly pass for train and bus), and adult clothing. To determine the extent to which work-related consumption plays an important role in retirement consumption changes in Japan, we also examine non-work-related consumption which is the difference between non-durable consumption and work-related consumption.

The income and consumption measures used in our analysis are deflated by the CPI using the year 2000 as the base year. In addition, the consumption measures are adjusted using the same equivalence scale as Banks, Blundell, and Tanner (1998).¹⁷

¹⁵Non-durable consumption includes food at home and away from home, nutritional supplements, utilities (electricity, gas, water, and other fuel), domestic non-durables (e.g., kitchen items such as plastic wrap and dishwashing detergent), automotive maintenance, communication (e.g., phone bills and postage stamps), toiletries, tobacco, clothing services, medical goods and services, public transportation, recreational goods and services, personal care services, domestic utensils, clothing, footwear, readings, and personal effects.

¹⁶We define strictly non-durables as food at home and away from home, utilities, domestic non-durables, nutritional supplements, automotive maintenance, communication, toiletries, tobacco, clothing services, medical services, public transportation, recreational services, and personal care services.

¹⁷For this scale, each adult beyond the first adult is counted as 0.6 adult equivalents while each child under age 18 is counted as 0.43 adult equivalents.

4 The Impact of Retirement on Household Consumption

4.1 Income Changes at Retirement

Figures 4 and 5 present monthly household income, head's labor income, and government transfer income in the months before and after retirement for households where the head is ages 55 to 65 in the first interview.¹⁸ These Figures are constructed using sample households where the head is an employee during their first monthly interview but exits from the labor force by the sixth monthly interview.¹⁹ The Figures show income up to five months prior to retirement and up to four months after retirement where the first month without a job labeled as month zero.

In order to clearly understand the patterns of monthly income receipt, we have divided the Figures based on whether the head retires in an even month such as February, April, June, etc. (Figure 4) or an odd month such as January, March, May, etc. (Figure 5). The reason is that since 1990, public pension benefits are only paid in even months which leads to a fluctuating pattern of monthly income receipt and obfuscates the income patterns when pooling retirements across all months.

These Figures indicate that there is a large decrease in monthly income following retirement. Panel A of Figures 4 and 5 show the share of households reporting income from each of the three sources. Over 90 percent of households report income in each of the months prior to retirement. Following retirement, this share ranges between 60 and 80 percent, depending upon whether the month is one in which public pension benefits are received. Over 80 percent of these households report that the head receives labor income in the months prior to retirement. Not surprisingly, none of these households report labor income from the head after he retires.²⁰

Panel A of Figures 4 and 5 also indicate that government transfer receipt increases sharply following retirement. As we noted earlier, households are eligible to receive unemployment benefits

¹⁸We exclude income due to annual bonuses from the calculations presented in these Figures.

¹⁹The Figures are limited to households that have exactly one change in employment status. Only four percent of all employment status changers (between employee, self-employed, and no job) are observed making multiple employment status changes during their six month panel period.

²⁰As shown in Panel A of Figures 4 and 5, there are many months in which less than two-thirds of households report the receipt of any income. Therefore, we present graphical results for retirement income changes rather than regression estimates since the use of log income as a dependent variable would result in the sizable share of zero income monthly observations being excluded from a regression analysis of log income changes.

for up to one year after retirement although since 1998 they cannot simultaneously receive public pension income and unemployment benefits. Thus, some of the increase in government transfer income not only may be due to public pension income but also may be due to unemployment benefits. Although not shown here, when we examine data from 1995 to 2005 during which public pension income can be separated from other government transfers in the JFIES, we find that each month roughly 30 percent of households report some form of other government transfers after retirement while only five percent do so prior to retirement. Thus, not only does public pension income receipt increase after retirement but so does other transfer income which is likely driven by unemployment insurance receipt.

The average level of income receipt is shown in Panel B of Figures 4 and 5. Averaging over the months leading up to retirement, total household income averages roughly over 450,000 yen. However, the average of the monthly income spikes in the period following retirement is closer to 250,000 yen. Thus, Japanese households experience a sizeable decrease in average income in the month of retirement.

4.2 Consumption Changes at Retirement

We examine the impact of retirement on consumption by exploiting the panel feature of the data. Rather than estimating a first-difference specification as is done in many papers in this literature, we instead estimate a fixed effects specification.²¹ By using this approach, the estimated impact is the cumulative impact of retirement on consumption rather than the contemporaneous change in consumption between adjacent survey waves. Thus, we estimate

$$C_{i,t} = \alpha_i + X_{i,t}\beta + M_t\gamma + \sum_{\tau=2}^4 \gamma_{\tau}Retire_{i,\tau} + \epsilon_{i,t} \quad (1)$$

where $C_{i,t}$ is equivalence scale-adjusted consumption in month t for household i , α_i is a household fixed effect, $X_{i,t}$ is a set of household-specific regressors in month t , M_t is a set of month-specific characteristics, $Retire_{i,\tau}$ is a set of month relative to retirement indicators, and $\epsilon_{i,t}$ is a household-month specific error term. The set of household-specific regressors, $X_{i,t}$, include the head's age and

²¹Bernheim, Skinner, and Weinberg (2001) use both a first-difference and fixed effects specification.

age squared, the number of adults, the number of children, and the number of non-head workers.

We control for a number of month-specific characteristics, M_t . We include calendar month indicators to control for seasonality in consumption.²² We also include a set of month in the sample indicators to control for “survey fatigue” since we find that the longer a household is in the survey, the less consumption that they generally report regardless of whether or not they retire. Failing to control for survey fatigue would falsely attribute this survey-reporting phenomenon to retirement consumption changes since both the likelihood of being retired and survey fatigue are increasing as a household’s time in the sample increases. In addition, we include indicators for whether or not the month in question is one in which public pension benefits are disbursed since Stephens and Unayama (Forthcoming) find that consumption significantly responds to public pension payment receipt before 1990.²³ Finally, we include indicators for the month before and the month of each increase in the consumption tax.²⁴

The main regressors of interest are the set of indicators, $Retire_{i,\tau}$, for the months before or since the month of retirement, t^* . Since all of the households in our sample are employees as of the first survey wave, we can observe households up to five months prior to retirement (if they retire between their fifth and sixth months in the panel) and up to four months after retirement (if they retire between their first and second months in the panel). Due to our limited sample sizes of retiring households, we cannot precisely estimate each of the nine possible month indicators capturing the time before and after retirement. As such, equation (1) includes three retirement indicators in $Retire_{i,\tau}$: an indicator for one or two months before retirement (months $t^* - 2$ and $t^* - 1$), an indicator for the month of retirement and the month immediately after retirement (months t^* and $t^* + 1$), and an indicator for two to four months after retirement (months $t^* + 2$ through $t^* + 4$). Thus, the omitted category is three to five months before retirement.

Our sample contains all households where the head is an employee in their first interview regardless if the head retires during their sample period. While we could estimate the impact of

²²Since we include a household fixed effect and households are only in the panel for six months, we do not include a set of year indicators.

²³Although these benefits are disbursed on the same fixed calendar month schedule for all households, the distribution pattern changed from quarterly to bi-monthly beginning in 1990. As such, calendar month indicators alone cannot capture the disbursement of these benefits for the entire 1986-2005 sample period. See Stephens and Unayama (Forthcoming) for more details.

²⁴The consumption tax was introduced in April 1989 and then increased from 3% to 5% in April 1997.

retirement on consumption only using households that are observed retiring during their six-month panel period, we would have difficulty separately identifying the impact of retirement from that of survey fatigue with the retiring household sample only. The inclusion of non-retiring households helps identify the survey fatigue effects so we are able to differentiate between these effects and the impact of retirement in our estimates.

Table 2 presents the results from estimating equation (1) using our JFIES sample.²⁵ Panel A of the Table presents results using the primary sample of households ages 55 to 65. For these households, we do not find a significant drop in non-durable or strictly non-durable consumption at retirement. For food and work-related consumption, the estimates are consistent with a pattern of falling consumption after retirement. In particular, the work-related consumption exhibit significant drop, as found in prior studies (Hurst 2008). Interestingly, we find that non-work-related consumption significantly *increases* at the time of retirement. We will investigate closely this last result below in Section 4.3.

One possible explanation for our main finding that non-durable consumption does not fall at retirement is that data quality issues, such as a lack of reporting by respondents, may preclude us from finding an immediate response when using monthly consumption data. We are not concerned about this issue since the results in Figures 4 and 5 suggest that the self-reported income measures exhibit large changes at retirement. We further investigate this possibility by examining a younger set of households ages 40 to 54 in Panel B of Table 2. Since the evidence from the Employment Status Survey that we discussed above suggests that most retirements occur after age 55, we interpret the results of estimating equation (1) using 40 to 54 year-olds as measuring the consumption response to unemployment. For these households, we find that strictly non-durable and work-related consumption significantly decrease after the household head becomes unemployed while the decrease in food consumption is marginally significant. Overall, the contrasting results between the two Panels of Table 2 suggest that, on average, consumption does not fall at retirement in Japan while it does when households become unemployed.

Prior work finds that the consumption response to retirement varies by income and wealth.

²⁵The standard errors reported here are adjusted to allow for arbitrary forms of serial correlation among the error terms within a household.

Bernheim, Skinner, and Weinberg (2001) find that consumption changes at retirement are larger for households that are lower in either the income distribution or the wealth distribution. Aguiar and Hurst (2005) note that they find decreases in caloric intake for low wealth households at retirement. While we can link the JFIES to the Family Savings Survey (FSS) which contains information on household wealth (see below), the matched sample is too small to precisely estimate consumption changes at retirement by wealth. We can, however, examine consumption changes by pre-retirement income levels. The first JFIES interview asks households to report their total income for the twelve months prior to the initial interview. As a proxy for differential consumption responses by wealth, we examine whether the consumption response at retirement differs for households above and below the median income level in their survey year.

Table 3 presents the results split by the median income level where we use our primary sample of households ages 55 to 65.²⁶ For households below the median income level (Panel A), we find a significant decline in both food and work-related consumption following retirement. Panel B shows little evidence of a response for households above the median income level, although we find a marginally significant *increase* in non-durable consumption in the month of and month immediately following retirement for these households. We investigate this last result in the following subsection.

4.3 The Impact of the Teinen Retirement Bonus

Our estimates presented thus far suggest that Japanese household consumption falls at retirement for only for low income households and then just within the categories of food and work-related consumption. In this regard, our results are consistent with the summary of the literature in Hurst (2008). However, one reason that households in Japan may not reduce their consumption at retirement is the Teinen bonus system. As we discussed earlier, these bonuses are rather substantial which may help households to smooth consumption at retirement. In addition, employees in the public sector and at large private firms are more likely to receive these bonuses than workers at smaller private firms. Thus, we can gauge the importance of these bonuses by examining the differences in the retirement consumption changes across these three groups.

²⁶In results not shown here, we also split the sample into income quartiles but continue to find patterns similar to those shown in Table 3.

Figure 6 presents the timing of retirements for the three employee groups. The Figure shows that employment in the government sector (public servants) and in large private firms (firms with at least 100 employees) decreases sharply at age sixty and continues to decrease rapidly at ensuing ages. Employees in small private firms also show a more rapid rate of labor force exit after age 60 as well, but do not exhibit a sharp exit rate at any particular age.

Although we would prefer to directly link Teinen bonuses with consumption changes at retirement, the JFIES does not record the receipt of these payments. However, we are able to examine wealth data that is collected in conjunction with the JFIES. Households that have their first JFIES interview in August, September, or October are asked to participate in the Family Saving Survey (FSS) which is fielded in the January in which the household participates in the JFIES. These households are then asked questions about the amount of savings, investments, and liabilities as of December 31. Moreover, until 1999, these households were also surveyed in the FSS the following January so that we have information on the household's stock of wealth at the same point in the year for two consecutive years.²⁷ Thus, for these households that participate in the FSS, we can examine changes in their wealth between consecutive years. From our sample of JFIES households, we use data from roughly 24,000 households that participated in consecutive FSS surveys from 1986-1999 where the male head is age 40-65.²⁸

We present evidence of Teinen bonus receipt by examining the *change* in the asset-to-income ratio between consecutive waves of the FSS. We focus on the change in this ratio rather than the level of assets since smoothing consumption at retirement depends upon a household's relative level of assets (i.e, the asset to income ratio) as opposed to just their level of assets. Assets are defined as financial assets minus financial debt.²⁹ In order to avoid the ratio being affected by changes in the household's income between years (especially in the case of retirement), the ratio in both years

²⁷When a household is surveyed for the second time as part of the FSS, they do *not* participate the JFIES. Beginning in 2000, the FSS was abolished and replaced with the collection of assets and debts in the JFIES. However, the JFIES does not collect a second observation on wealth for households as was done in the FSS.

²⁸From an initial sample of almost 42,000 households, the vast majority of dropped households are a result of the age restrictions. Roughly 2.5 percent of households are dropped since we restrict the sample to households that participate in both of their potential FSS surveys. Over twelve percent are dropped due to a change in the household head.

²⁹The FSS does not contain information on housing wealth. However, since household mobility upon retirement is rare in Japan, the relative movements in the ratio by age should not be affected by the exclusion of housing wealth. The FSS also does not contain the value of other real assets such as vehicles.

is constructed using the annual income measure reported by the household at the first FSS survey.

Figure 7 presents multiple points in the distribution of the change in the asset-to-income ratio by age. Panel A presents the results for employees at small private firms (less than 100 employees). The median and the 75th percentiles of the asset-to-income ratio changes are fairly constant across all age groups.³⁰ The 90th percentile of changes does increase slightly as workers move past age 55 and somewhat more so for workers over age 60. For employees in large firms (Panel B), there are much larger spikes after age 55 for the 90th percentile of changes. There is also a rather large spike at this point in the distribution around age 60. In addition, increases occur at the 75th percentile around and over age 60 as well. The most dramatic changes in the asset-to-income ratios appear for public servants. The 90th percentile of changes is over 1.5 times of annual income at many ages beginning at age 59. In addition, the 75th percentile of the change also increases dramatically at ages 60 and 61.

Separately examining the asset-to-income changes for retiring and non-retiring workers further illuminates the differences in Teinen bonuses across employment sectors. Table 4 presents these results for employees ages 55 to 65 in the first FSS wave. The distribution of the changes in these ratios are shown in Panel A for workers who remain in the labor force between the two waves of the FSS and in Panel B for those who exit the labor force. For employees in small private firms shown in the first row of the Table, the distribution of asset-to-income changes for non-retiring and retiring workers are very similar. However, among large private firm workers, the magnitude of the changes throughout the distribution are nearly twice as large for retiring workers as for non-retiring workers. The relative differences for public sector workers are even starker.³¹ Overall, the household asset-to-income results shown in Figure 7 and Table 4 along with the administrative survey findings presented earlier in Figure 2 are consistent with both the more likely receipt and larger amount of Teinen retirement bonuses for public servants and large private firm employees than for small private firm workers.

³⁰Age along the x-axis in Figure 7 is based on the head's age at the first of the two FSS surveys.

³¹In results not shown here, we examine the relative contribution of each of the sub-components of assets to the overall increase in the asset-to-income ratios among the retiring households shown in Panel B of Table 4. Consistent with the receipt of large Teinen bonuses for large private firm and public sector employees, we find that the vast majority of the average increase for these households is due to changes in deposits (bank accounts, accounts at the post office, etc.) whereas we find very small changes for other assets such as bonds and equities.

Table 5 presents the results of estimating equation (1) separately for workers from each of these three sectors. Panel A of the Table finds a significant consumption decrease following retirement for workers retiring from small private firms. The response in the month of and the month immediately after retirement is negative but insignificant except for food consumption. The response two to four months following retirement is significant across all of the consumption measures shown in Panel A of the Table 5 except for non-work-related consumption. Thus, consumption is significantly reduced following retirement for small firm workers who are less likely to receive and earn smaller Teinen retirement bonuses.

Panels B and C of Table 5 present the results for large private firm workers and public servants, respectively. As the results in Figure 7 indicate, these workers tend to receive large Teinen bonuses at retirement. In fact, we find that consumption *increases* at retirement for these households with the non-durable consumption response being significant in the month of and the month immediately following retirement for workers from both of these sectors. In addition, the non-durable consumption response is positive two to four months following retirement and is significant for large private firm workers. Strictly non-durable consumption yields similar results except that the response is only significant for large firm employees.

An alternative possibility is that other differences between workers across the different sectors, such as income and wealth, could yield the differences in the retirement consumption changes shown in Table 5. Small private firm workers comprise roughly 60 percent of the below median households but only slightly over one-third of above median income households in Table 3. However, the differences in consumption responses at retirement by income are not nearly as distinct as they are by employment sector. Thus, the differential consumption responses by income seem to be masking the differences across employment sectors rather than vice versa.

In addition, wealth differences do not offer a plausible explanation for the differences in retirement consumption responses across sectors. Using the same data from the FSS that is used to create Figure 7, we can calculate asset-to-annual income ratios across sectors in the year prior to retirement for households ages 55 to 65. We find that these ratios are 1.38, 1.64, and 1.24 for workers in small private firms, large private firms, and the public sector, respectively. Thus, the average ratio of assets-to-annual income for small private workers exceeds that of public sector

employees which suggests that wealth differences cannot explain the differences in the retirement consumption response across these two sectors.

A third alternative possibility is that uncertainty surrounding the date of retirement may explain the observed retirement consumption changes. As we have discussed, pre-determined (Teinen) retirement dates are far more prevalent among public servants and employees at large firms than among employees at small firms. Therefore, the retirement consumption decreases for small firm employees may indicate that they are more likely to be subjected to unexpected retirements. Thus, lacking the availability of instruments for expected retirements among small firm workers, we cannot conclude the the negative retirement consumption changes for this set of employees violates the LCPIH. However, the increase in consumption at retirement for the likely recipients of large Teinen bonuses (i.e., public servants and large firm employees) is inconsistent with the LCPIH since the receipt of large anticipated payments, such as the Teinen retirement bonuses, should not be correlated with consumption changes.

There is an interesting comparison between our finding of an immediate increase in consumption at retirement for employees at large private firms and in the public sector and the results found by Bernheim, Skinner, and Weinberg (2001) for high wealth households in the United States. Bernheim, Skinner, and Weinberg estimate that consumption increases at retirement for households in the highest wealth quartile and remains relatively higher in the years following retirement. However, most U.S. employees are not receiving large lump sums at retirement, especially during the period which they examine (the 1970s and 1980s) when most U.S. workers had defined benefit pensions that paid a fixed monthly benefit after the worker retires. Perhaps these higher rates of consumption are maintained in future years for these Japanese households as well although we cannot examine their behavior given our limited panel duration.

5 Conclusion

Using data from the Japanese Family Income and Expenditure Survey, we analyze the impact of retirement on household consumption. The six-month panel feature of the JFIES allow us to examine the consumption response in the month of retirement in Japan. We find that household

income falls dramatically at retirement in Japan as it does in other countries. However, we find that, on average, there is no significant consumption response for retiring households ages 55 to 65. Since we find evidence that consumption significantly falls upon becoming unemployed for workers ages 40 to 54, we do not believe that data quality can explain the lack of an estimated retirement response.

Why do we not observe a consumption decrease at retirement, on average, in Japan as has been observed in other countries? The high savings rate in Japan might be one obvious candidate explanation although we do not find much evidence of differential effects when we split the sample between above and below median income households. As we discussed above, one very plausible reason is the sizeable Teinen bonuses that retiring households receive. These bonuses are very large, relative to annual income, which can provide households with the ability to smooth over the large income changes at retirement. We present results from surveys of employers which indicate that employees at large private firms are, relative to small private firm workers, more likely to receive Teinen bonuses and that they receive larger bonuses. In addition, public servants receive large bonuses at retirement. We also present evidence from the Family Saving Survey which is consistent with these differences in bonus income payments at retirement between employment sectors.

We find that consumption increases at retirement for workers that likely receive a retirement bonus. This result is surprising since the LCPIH predicts that an anticipated transitory income shock such as the Teinen bonus should not affect consumption. Moreover, we find that workers at smaller firms, who are both less likely to receive and earn smaller bonuses, experience consumption decreases at retirement. These findings provide suggestive evidence that retirement bonuses prevent household consumption from falling at retirement in Japan.

On the other hand, we find a retirement consumption decrease in food and work related consumption, although the decline in food consumption is not statistically significant. Hurst (2008) emphasizes that there is substantial heterogeneity in spending changes at retirement across consumption categories and across households. Specifically, the declines in spending at retirement are concentrated among food and work related expenses. Thus, the results we find for Japan are broadly consistent with the findings in previous literature.

We have also discussed two important caveats for our findings. First, our analysis treats re-

tirement as exogenous. The widespread use of Teinen retirement suggests that most retirements in Japan are, in fact, pre-determined. Since there are no viable instruments available for retirement when using the monthly JFIES panel data, our findings must be interpreted in light of these potential endogeneity concerns. To the extent that unexpected retirements are driven by job loss and disability, our estimates would be negatively biased although we find, on average, no significant decrease in consumption at retirement. Second, due to the relatively short length of our panel, we are only able to follow households for five months after retirement. Based on results from the United States where consumption continues to fall during the years following retirement (Hamermesh 1984; Bernheim, Skinner, and Weinberg 2001), our findings for the short-run consumption response can be considered as a lower bound for the long-run impact of retirement on consumption in Japan.

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Table 1: Summary Statistics									
	All Households				Households With				
	Age 40 - 54		Age 55 - 65		Labor Force Exiting Heads		Age 55 - 65		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
<i>A. Variables Measured Monthly</i>									
Total Current Income	506	261	486	315	286	243	311	302	
Labor Income of Head	408	182	347	223	151	191	123	194	
Total Consumption	379	270	356	312	327	284	344	337	
Non-durables	210	104	194	114	179	101	190	123	
Strictly Nondurables	172	79	158	84	150	72	157	95	
Food at Home	72	28	66	28	60	24	64	27	
Food away Home	15	24	11	14	12	13	10	12	
Adult Clothing	16	25	15	28	10	19	12	22	
Non-durable Transportation	23	34	21	33	22	33	21	35	
Work-related consumption	32	34	32	39	23	28	27	33	
Non-durable Non-work-related consumption	179	89	162	96	156	86	162	110	
<i>B. Variables Measured at First Interview</i>									
Yearly Income	7,987	3,287	8,117	3,960	6,526	2,802	7,258	3,377	
Household Size	3.93	1.11	2.98	1.07	3.59	1.27	2.76	0.98	
Number of Workers	1.73	0.76	1.87	0.90	1.32	0.94	1.13	0.99	
Age	46.7	4.3	58.9	2.9	48.6	4.3	60.8	2.5	
Monthly Observations	443,934		186,756		1,356		6,762		
Number of Households	73,989		31,126		226		1,127		

Table 2: The Impact of Retirement on Consumption ^a						
	Non-Durable Consumption	Strictly Non-Durable	Food Consumption	Work-Related Consumption	Non-Work-Related Consumption	
A. Households Ages 55 to 65						
$t^* - 2$ to $t^* - 1$ (Working)	0.013 (0.021)	0.012 (0.021)	-0.013 (0.014)	0.056* (0.078)	0.017 (0.023)	
t^* to $t^* + 1$ (Not Working)	0.034 (0.021)	0.023 (0.020)	-0.020 (0.015)	-0.055*** (0.073)	0.060*** (0.023)	
$t^* + 2$ to $t^* + 4$ (Not Working)	0.001 (0.023)	-0.005 (0.022)	-0.018 (0.016)	-0.124*** (0.086)	0.024 (0.025)	
Number of Obs. (Obs. from Retiring Households)	186,756 6,762	186,756 6,762	186,756 6,762	179,860 6,439	186,756 6,762	
B. Households Ages 40 to 54						
$t^* - 2$ to $t^* - 1$ (Working)	0.007 (0.026)	-0.001 (0.028)	0.012 (0.025)	-0.026 (0.103)	-0.000 (0.103)	
t^* to $t^* + 1$ (Not Working)	-0.042 (0.029)	-0.053* (0.029)	-0.047* (0.024)	-0.238* (0.124)	-0.049* (0.030)	
$t^* + 2$ to $t^* + 4$ (Not Working)	-0.059 (0.043)	-0.094** (0.043)	-0.066* (0.036)	-0.322*** (0.150)	-0.071 (0.046)	
Number of Obs. (Obs. from Unemployed Households)	443,934 1,356	443,934 1,356	443,934 1,356	433,099 1,347	443,934 1,356	

^aThis Table presents the results from using fixed effects regressions to estimate equation (1). The standard errors (shown in parentheses) are adjusted to account for arbitrary forms of serial correlation within households. All regressions are separately estimated and include, in addition to the regressors shown in the Table, household fixed effects, calendar month indicators, survey fatigue indicators, separate sets of public pension payment indicators for both before and after the 1990 change in month of payment patterns, indicators for the month before and month of consumption tax rate changes, the number of adults, the number of children, and the number of non-head workers. *, **, and *** represent significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 3: The Impact of Retirement on Consumption Sample Split by Annual Income ^a						
	Non-Durable Consumption	Strictly Non-Durable	Food Consumption	Work-Related Consumption	Non-Work-Related Consumption	
A. Below Median Income						
$t^* - 2$ to $t^* - 1$ (Working)	0.006 (0.024)	0.004 (0.024)	-0.028 (0.017)	-0.034 (0.064)	0.018 (0.026)	
t^* to $t^* + 1$ (Not Working)	0.011 (0.025)	0.010 (0.025)	-0.046** (0.019)	-0.156*** (0.064)	0.045 (0.028)	
$t^* + 2$ to $t^* + 4$ (Not Working)	-0.014 (0.027)	-0.020 (0.026)	-0.052*** (0.020)	-0.181*** (0.083)	0.010 (0.030)	
Number of Obs. (Obs. from Retiring Households)	93,372 4,008	93,372 4,008	93,372 4,008	88,591 3,744	93,372 4,008	
B. Above Median Income						
$t^* - 2$ to $t^* - 1$ (Working)	0.022 (0.037)	0.021 (0.035)	0.003 (0.023)	0.156** (0.077)	0.016 (0.038)	
t^* to $t^* + 1$ (Not Working)	0.061* (0.036)	0.037 (0.032)	0.009 (0.025)	0.055 (0.085)	0.076** (0.037)	
$t^* + 2$ to $t^* + 4$ (Not Working)	0.017 (0.040)	0.011 (0.038)	0.024 (0.026)	-0.067 (0.094)	0.040 (0.042)	
Number of Obs. (Obs. from Retiring Households)	93,384 2,754	93,384 2,754	93,384 2,754	91,269 2,695	93,384 2,754	

^aMedian income is 7,904 thousand yen at 2000 prices. This Table presents results using only the primary sample where the household head is between ages 55 and 65, inclusive. More details on the regression specifications are given in the notes to Table 2.

**Table 4: Changes in Asset-to-Income Ratios
By Employment Status and Sector^a**

	A. Non-Retiring Households					B. Retiring Households				
	Num of Obs.	Mean	Median	75th percentile	90th percentile	Num of Obs.	Mean	Median	75th percentile	90th percentile
Employees at Small Private Firms	1,827	0.074	0.108	0.393	0.894	148	0.139	0.092	0.557	1.073
Employees at Large Private Firms	1,489	0.165	0.145	0.485	1.182	146	0.492	0.371	1.137	1.992
Public Sector Employees	715	0.228	0.135	0.441	1.383	62	1.411	1.375	2.360	3.028
Total	4,031	0.135	0.125	0.437	1.038	356	0.505	0.324	1.090	2.391

^aThis Table presents calculations using the Family Savings Survey (FSS) sample where the household head is between ages 55 and 65, inclusive, and is an employee at the first wave of the FSS. Small private firms have less than 100 employees while large private firms have at least 100 employees. The changes in asset-to-income ratio is changes in Total Financial Asset in the first and second FSS interviews divided by yearly income reported in the first interview.

Table 5: The Impact of Retirement on Consumption Sample Split by Employment Sector ^a						
	Non-Durable Consumption	Strictly Non-Durable	Food Consumption	Work-Related Consumption	Non-Work-Related Consumption	
A. Employees of Private Firm with Employees < 100						
$t^* - 2$ to $t^* - 1$ (Working)	-0.030 (0.043)	-0.029 (0.041)	-0.077*** (0.022)	-0.146 (0.090)	-0.009 (0.043)	
t^* to $t^* + 1$ (Not Working)	-0.049 (0.036)	-0.046 (0.034)	-0.091*** (0.024)	-0.224** (0.090)	-0.014 (0.038)	
$t^* + 2$ to $t^* + 4$ (Not Working)	-0.083** (0.040)	-0.088** (0.038)	-0.094*** (0.026)	-0.234** (0.103)	-0.062 (0.042)	
Number of Obs. (Obs. from Retiring Households)	78,055 3,022	78,055 3,022	78,055 3,022	73,941 2,817	78,055 3,022	
B. Employees of Private Firm with Employees >= 100						
$t^* - 2$ to $t^* - 1$ (Working)	0.046* (0.027)	0.042 (0.026)	-0.006 (0.020)	0.133* (0.072)	0.042 (0.029)	
t^* to $t^* + 1$ (Not Working)	0.087*** (0.031)	0.068** (0.030)	0.018 (0.022)	0.070 (0.078)	0.099*** (0.032)	
$t^* + 2$ to $t^* + 4$ (Not Working)	0.059* (0.033)	0.054 (0.033)	0.011 (0.024)	-0.065 (0.097)	0.076** (0.035)	
Number of Obs. (Obs. from Retiring Households)	63,803 2,406	63,803 2,406	63,803 2,406	62,087 2,332	63,803 2,406	
C. Public Servants						
$t^* - 2$ to $t^* - 1$ (Working)	0.032 (0.040)	0.039 (0.040)	0.034 (0.030)	0.202 (0.127)	0.029 (0.048)	
t^* to $t^* + 1$ (Not Working)	0.111** (0.052)	0.079 (0.054)	-0.023 (0.032)	0.126 (0.131)	0.142** (0.063)	
$t^* + 2$ to $t^* + 4$ (Not Working)	0.084 (0.060)	0.074 (0.060)	0.041 (0.035)	0.048 (0.143)	0.122 (0.074)	
Number of Obs. (Obs. from Retiring Households)	30,372 1,050	30,372 1,050	30,372 1,050	29,830 1,018	30,372 1,050	

^aThis Table presents results using only the primary sample where the household head is between ages 55 and 65, inclusive. More details on the regression specifications are given in the notes to Table 2.

Figure 1: Share of Teinen-Offering Firms and Distribution of Teinen Ages

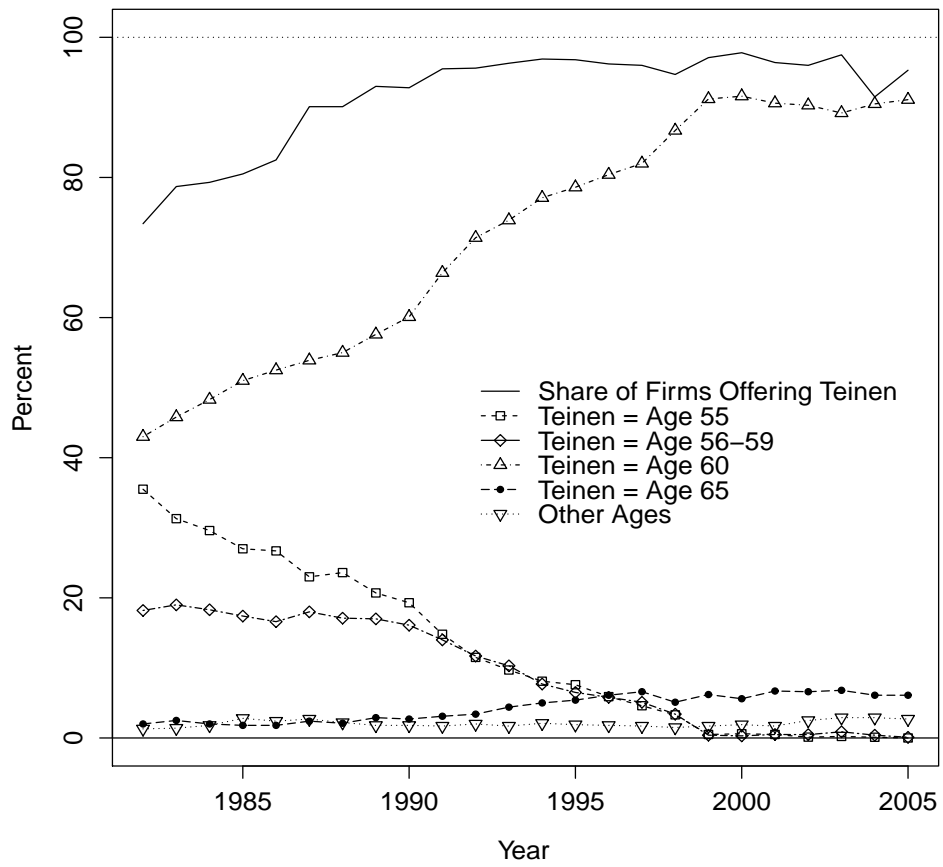


Figure 2: Average Teinen Bonus by Employment Sector

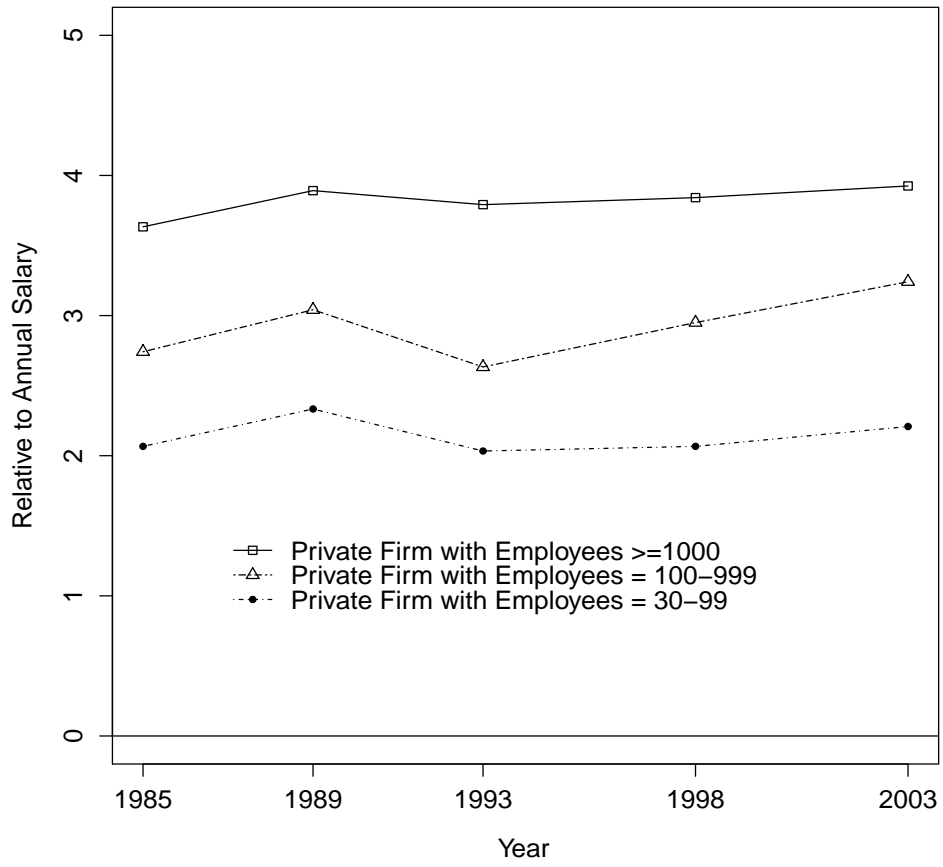


Figure 3: Job Status in First Interview

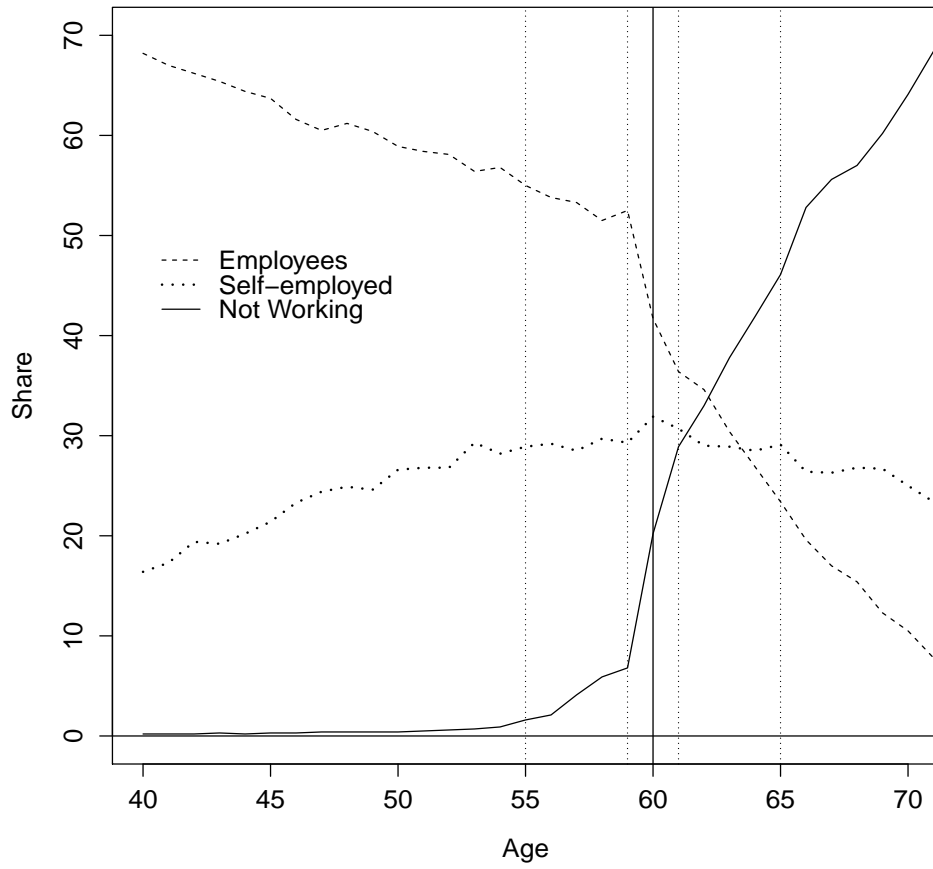


Figure 4: Income at Retirement for Ages 55-65 (Even Month Retirements)

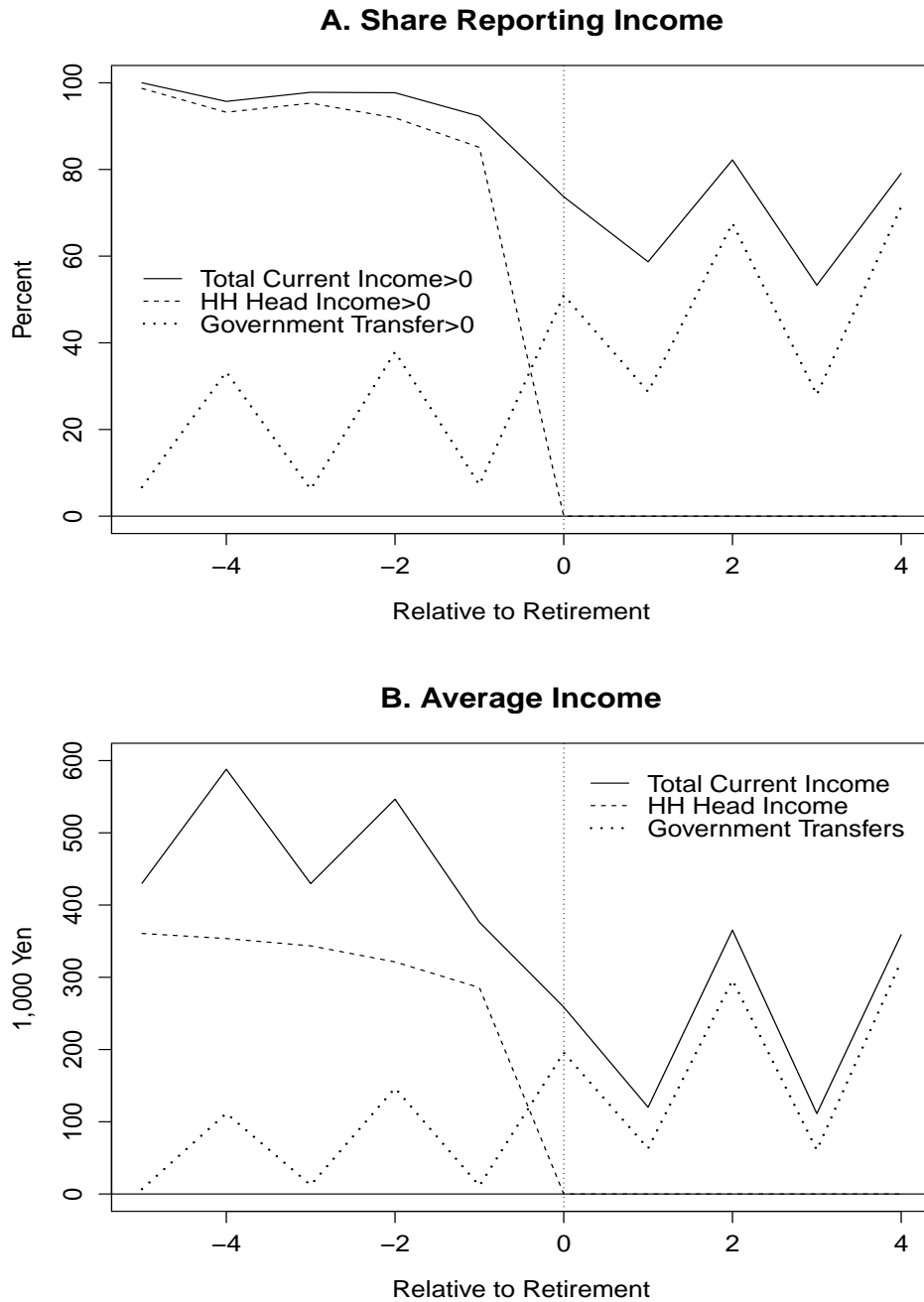


Figure 5: Income at Retirement for Ages 55-65 (Odd Month Retirements)

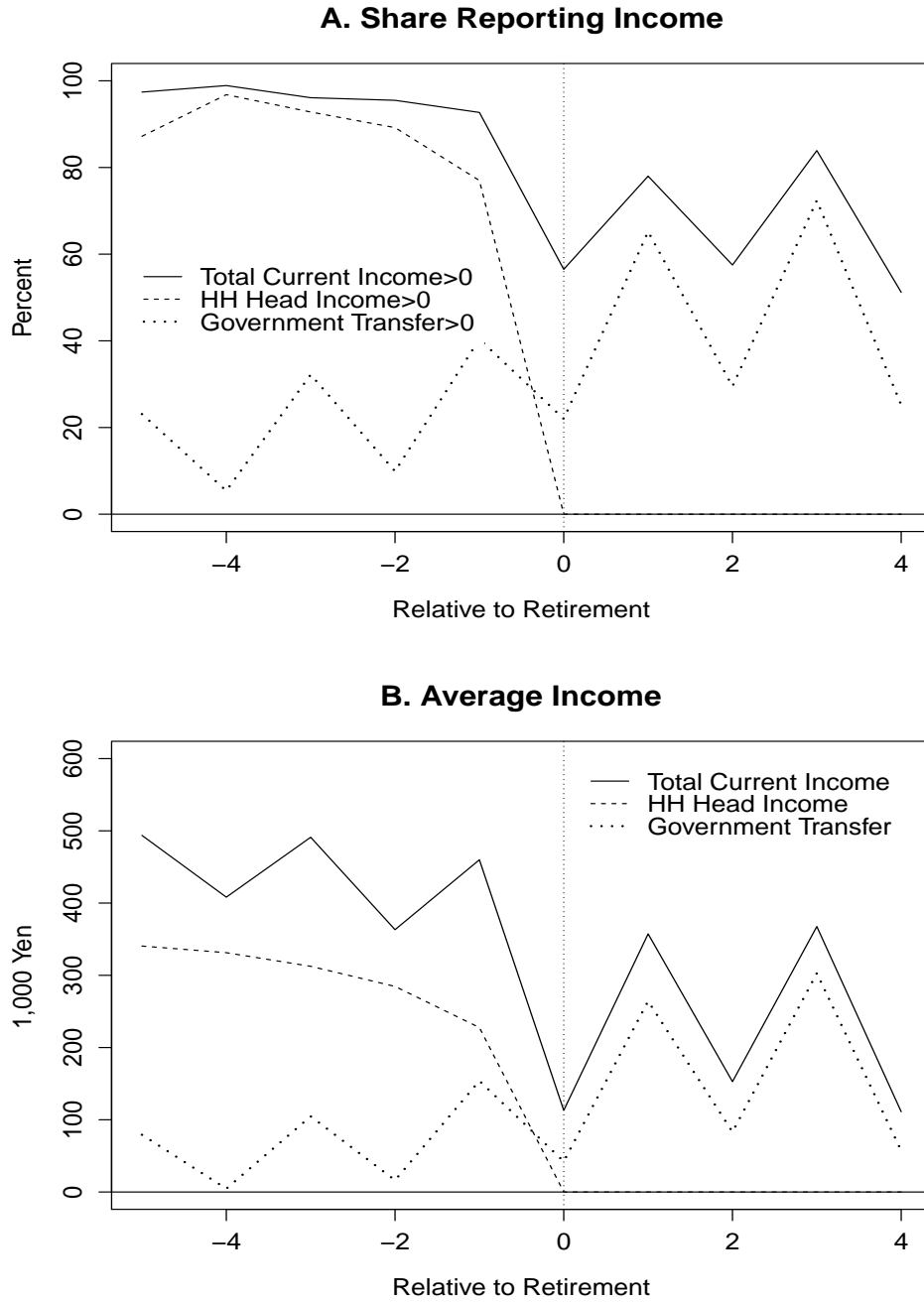


Figure 6: Share of Employees by Employment Sector

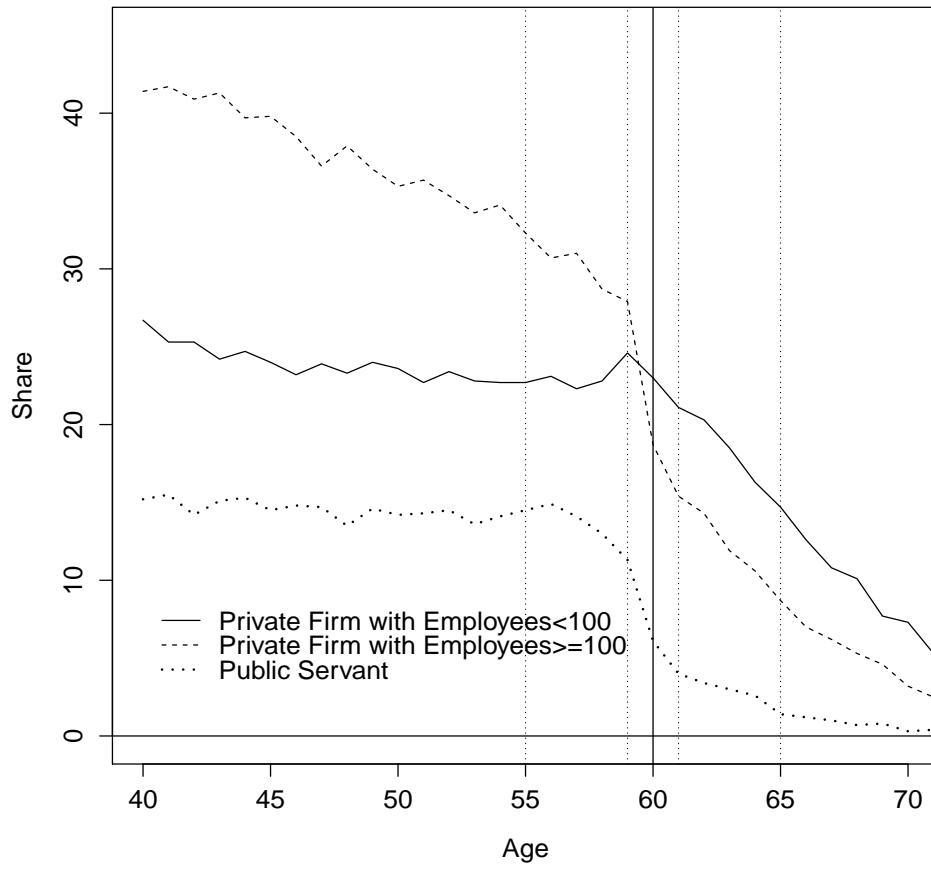


Figure 7: Changes in Asset-to-Income Ratios by Employment Sector

