# Examining the Changes in Health Investment Behavior After Retirement

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**Abstract**

This study examines the effects of retirement on health investment behaviors. We conduct a large-scale international comparison of the change in health investment behaviors after retirement among 13 developed countries, using harmonized datasets. We find that the changes in most of health investment behaviors are heterogenous across countries.

JEL Classification Numbers: I00, I100, I120
Keywords: retirement, health investment behaviors, global aging data

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# 1 Introduction

Retirement-related policies, such as a reform of the pension system, have become important in developed countries to sustain the social security system. When policymakers evaluate the effect of these reforms, health is a key factor. Since an active work life is beneficial for the health of the elderly, it would lead to reduction of medical expenses, and to medical expense increases otherwise. Health status may change unintentionally owing to the introduction of these policies, which should take account of the changes in medical cost required.

Along with the growing interest in examining the effect of the policies that delay the retirement of the elderly, a number of studies have investigated the relationship between retirement and health over the last two decades, since Kerkhofs and Lindeboom (1997). [1] There are, however, no unified views on the impact of retirement on various health indexes. In the light of this statement, we need to discuss why these studies report different estimated results and understand the relationship between retirement and health.

Attempts to analyze the mechanism behind the effect of retirement on health have begun recently. Eibich (2015) is the first study to clearly point out and investigate the mechanism by using Germany data. Eibich (2015) considered the heterogeneity of the effect of retirement on health investment behaviors with respect to the age, education, gender, and so on. However, Eibich (2015) solely focused on the case of Germany, and thus, the findings cannot be generalized. This study extends Eibich (2015) and attempts to explain the heterogeneity in the results of retirement effect on health in the related literatures. We analyze and compare the mechanism behind the effect of retirement on health by examining the change in health investment behaviors after retirement in 13 developed countries, including Germany. Analyzing external validity is a key to discuss why the effects of retirement on health differ across countries. This is because the heterogeneity of health investment behaviors behind the relationship between retirement and health may explain the difference of the effect of retirement on health in the related literature.

We analyze and compare the latest longitudinal data set from the United States, England, other European countries, Japan, and Korea. Our results suggest that the changes in health investment behaviors after retirement are heterogeneous across countries.

# 2 Data

This study uses the Health and Retirement Study (HRS) and other sister datasets, [2] which constitute panel surveys of elderly people in developed countries. We consider three definitions of retirement: "not working for pay," "self-reported retired," and "completely retired." "Not working for pay" implies that a respondent is not working for pay in the survey year. "Self-reported retired" implies that a respondent reports his employment status as not employed/active in the labor market, for example, "retired, disabled, or homemaker." We define a respondent who is "not working for pay" and reports his employment status "self-reported retired" as "completely retired." This definition enables us to exclude a job seeker from the retired population. This definition is close to that of Eibich (2015).

In this study, we analyze some health investment behaviors such as alcohol consumption, smoking, physical activities, food habits, social participation, and doctor visit. The scales of each measure

[1] Johnston and Lee (2009) and Rohwedder and Willis (2010) are representative papers.

[2] We explain this point in detail in the supplementary material.

for health investment behaviors are adjusted for international comparison because each dataset applies different measures. The measures used for each behavior are represented in Table 1.

We include all the observations in the age group 50-85 for the main analysis and exclude those who have not worked in survey period. It is true that Eibich (2015) restricted the sample to those aged 55-70. However, the age range considered in our study is more suitable for international comparison. Eibich (2015) showed that the probability of retirement increases sharply at 60 and 65 years in Germany. Other countries, however, do not exhibit the same phenomenon depending on the pensionable ages. In the supplementary material, we explain the details of the dataset, the definition of retirement, the scales of health investment behavior, and the sample restriction method.

# 3 Estimation Method

We follow the same estimation procedures by Motegi et al. (2016). We estimate the equation as follows: [3] [4]:

$$y_{it} = \beta_0 + \beta_1 NW_{it} + X'_{1it}\delta_1 + \theta_i + \eta_t + \epsilon_{1it} \tag{1}$$

$$NW_{it} = \alpha_0 + \alpha_1 NP_{it} + \alpha_2 NP_{it} \cdot age_{it} + \alpha_3 EP_{it} + X'_{1it}\delta_2 + \xi_i + p_t + \epsilon_{2it} \tag{2}$$

where $i$ represents an index of an individual and $t$ denotes an index of time. $X_{1it}$ represents a set of exogenous control variables that include age, age squared, marital status, the number of children, income, wealth, house ownership, job stress, physical stress, residence variables and wave variables. Controlling job stress is important and Eibich (2015) does not include any controls. The dependent variable $y_{it}$ represents health investment behaviors. The binary variable $NW_{it}$ equals one if the elderly is retired, according to the detailed definitions provided in Section 6.2. $\epsilon_{1it}$ in equation (1) is an unobserved error term. $\theta_i$, $\xi_i$ represent unobserved individual fixed effects, and $\eta_t$, $p_t$ denote unobserved time effects. The coefficients that we are interested in is $\beta_1$. Standard OLS estimates cannot generate consistent results due to the endogeneity problem about $NW_{it}$.

$NP_{it}$ and $EP_{it}$ are two types of instrumental variables: normal pension eligibility age and early pension eligibility age. $NP_{it}$ ($EP_{it}$) is a dummy variable that equals one when individual $i$ has already attained his or her normal (early) pension eligibility age at period $t$. [2] Since, there is no early pension eligibility age in some countries, we use $NP_{it}$ and $NP_{it} \cdot age_{it}$ as IVs. Both of the pension eligibility ages are determined by individual characteristics such as birth year and not by individual decisions. In addition, the pension eligibility age has recently changed due to the reform of the pension system in many countries. We implement Durbin-Wu-Hausman (DWH) test after IV estimation and check the endogeneity of $NW_{it}$ excluding $\theta_i$ and $\eta_t$. Either fixed effects with time effects instrumental variable or fixed effects with time effects is applied depending on the results of the DWH test.

[3] Motegi et al. (2016) explain why this equation is estimated.

[4] For Korea and Japan, we use $EP_{it} \cdot age_{it}$ instead of $NP_{it} \cdot age_{it}$ in the equation (2).

Table 1: Variable definition of each health investment behavior

| | | |
|---|---|---|
| Drinking | Y/N | whether drinking |
| | Freq. | frequency of drinking in a week |
| | Amount | the number of drinking per day |
| Smoking | Smoking | whether smoking |
| Physical activity | Vigorous | frequency of vigorous activities |
| | Moderate | frequency of moderate activities |
| Social participation | Social | whether participating social events |
| Doctor visit | Doctor | frequency of doctor visit |
| Diets | Food | logged expenditure of food consumption |
| | Eat out | logged expenditure of eating out consumption |

# 4 Results

We focus only on the coefficients of retirement variable for each country.[5] In addition, we cannot discuss it when the coefficients of pensionable age dummy variables for the first stage are not significant. The results are demonstrated in Table 2. [2] We show the results that are not discussed in the paper (e.g., the amount of smoking, sleep, and frequency of contact with children) in the supplementary material.

- Alcohol Consumption and Smoking: In the U.S., Germany, and Czech, the amount of alcohol consumption per day decreases after retirement (Amount). In the U.S., Czech and Japan, the frequency of alcohol consumption decreases after retirement (Freq.). In Germany, Czech, Estonia, South Korea and Japan, the probability of alcohol consumption decreases after retirement (Y/N). With respect to smoking, the probability of smoking decreases after retirement in the U.S., France, South Korea, and Spain.

- Physical Activity, Social Participation, and Doctor Visit: There is a heterogeneity in the change in the frequency of physical activity (Vigorous, Moderate) after retirement among the 13 countries. With respect to Vigorous activity, only in England, South Korea, Spain and Japan, people increase the frequency after retirement. Furthermore, only in England and Germany, people increase social participation after retirement. With respect to doctor visit, in the U.S. and Spain, people sharply decrease the number of doctor visits after retirement.

- Food Habits: In some countries (France, Switzerland), the expenditure on eating out decreases after retirement. However, in many countries, the expenditure on eating out does not decrease. Furthermore, the food expenditure does not decreases after retirement in many countries.

According to our results, the changes in most of health investment behaviors after retirement are heterogeneous across countries. It is difficult to explain the results in all countries by using the same settings of the model by Grossman (1972). It is possible that there are some differences among different countries in preference to health stock or the production function of health stock.

# 5 Conclusion

This study examined the effects of retirement on health investment behaviors and compared the result across countries. Analyzing the change in health investment behaviors after retirement in 13 developed countries, including Germany, the goal of this study was to extend Eibich (2015). We find that the changes in most of health investment behaviors are heterogenous among the 13

[5]The full results, including control variables, are available on request.

Table 2: Main results

| | Drinking | | | | Physical activity | | | | Diets | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Y/N | Freq. | Amount | Smoking | Vigorous | Moderate | Social | Doctor | Food | Eat out |
| U.S. | 0.485*** | 0.293** | -0.050*** | 0.170 | 0.558* | 0.698** | 0.395* | -4.822* | -0.002** | -0.001 |
| England | -0.010 | 0.011 | -0.060 | -0.048 | 0.069* | 0.878*** | 0.013 | | -0.000 | -0.000 |
| Germany | -0.025 | 0.130* | -4.540** | 0.169** | -0.119 | 0.022 | 0.030 | 0.903 | 0.000 | 0.002 |
| France | 0.031 | 0.126* | 0.138 | -0.001 | -0.110 | 0.087 | 0.016 | -0.158 | 0.002 | -0.002* |
| Denmark | 0.029** | 0.088 | -0.101 | 0.072 | 0.181* | 0.447** | -0.017 | -0.267 | 0.003 | -0.002** |
| Switzerland | 0.037 | -0.002 | -0.447 | -0.010 | 0.909 | -0.021 | 0.004 | 0.393 | 0.027 | -0.001 |
| Czech Republic | -0.057* | -0.225** | -1.171** | -0.010 | -0.010 | -0.047 | -0.041 | 0.017 | 0.001 | -0.001* |
| Estonia | 0.002 | 0.011 | -0.028 | 0.000 | -0.263** | -0.085 | 0.004 | 0.433 | | 0.000 |
| Japan | -0.101*** | -0.359*** | -0.225** | | | | 1.084* | | | 0.001 |
| SouthKorea | 1.248** | 3.773** | -0.126 | -0.046 | 6.811* | | -0.001 | 74.981* | | |
| China | -0.051 | -0.211** | 0.076 | | | | | | | |
| Sweden | 0.014 | 0.357** | -1.184 | 0.045 | 1.337*** | 0.017 | -0.002 | 1.113*** | 0.001 | -0.000 |
| Spain | -0.044 | -0.273*** | -0.359 | -0.180*** | -0.040 | 1.568*** | 0.010 | 1.691** | 0.001 | -0.001 |
| Poland | 0.097* | -0.008 | 0.892 | | -0.264 | -0.250** | 0.007 | -0.115 | | -0.001 |
| Slovenia | 0.016 | -0.178 | 0.270 | 0.223** | 1.406 | -0.209 | 0.581 | 8.167 | 0.000 | 0.004 |

* $p < .1$, ** $p < .05$, *** $p < .01$

The red (blue) character indicates the positive (negative) impact.

countries. For example, changes in social participation and physical activity are heterogenous, although retired people have sufficient time to participate in these activities. Thus, the results of Eibich (2015) cannot be generalized to other countries.

# 6 Appendix

## 6.1 Pension Eligibility Age

In this section, we will explain how to calculate the pensionable age. We use the information from the Bureau of Labor Statistics in each country. However, information about the pension eligibility age for some countries are unavailable. In such cases, we contact with the Bureau of Labor Statistics or Bureau of Statistics directly, and attempt to retrieve the information if possible. If we cannot find any information in the previous step, we use the OECD pension at a glance, social security programs throughout the world (Europe, Asia and the Pacific, and The Americas), and The EUs Mutual Information System in Social Protection (MISSOC) as data sources. We cannot get the detailed pension eligibility age for many countries. Finally, we get the details of the correct pension eligibility ages for the following countries: the U.S., England, Germany, France, Denmark, Switzerland, Czech, Estonia, Japan, China [6] , and Korea. With respect to these countries, we can directly obtain the correspondence table between birth cohort and pensionable age. With respect to the information about Sweden, Spain, Poland, and Slovenia, we construct the correspondence table between birth cohort and pensionable age based on the OECD pension at a glance, social security programs throughout the world (Europe, Asia and the Pacific, and The Americas), The EUs Mutual Information System in Social Protection (MISSOC), and information from governmental institutions. [7] We do not analyze the countries where the detail information about the pension

[6] Pension eligibility age depends on hukou status and the type of employer according to the China Labour Bulletin. When generating IVs for China, we use the hukou status variable "r@hukou" in the harmonized CHARLS, and the type of employer (current job:"fd002", last job: "fl014") and civil servant status (current job:"fd006", last job: "fl015") in the original CHARLS.

[7] We are unable to get the direct information about the correspondence between pensionable age and birth cohort for these countries. Thus we construct the correspondence from the OECD pension at a glance, social security programs throughout the world (Europe, Asia and the Pacific, and The Americas), and The EUs Mutual Information System in Social Protection (MISSOC).

eligibility age cannot be available. We show all pensionable ages in all countries which we analyze in the following tables.

Table 3: Pension eligibility age (the U.S., the U.K., Germany, France)

Table 4: PEA: US

| Birth cohort | PEA |
|---|---|
| **Early PEA** | |
| | 62y0m |
| **Normal PEA** | |
| ~ 1937.12 | 65y0m |
| 1938.1 ~ 1938.12 | 65y2m |
| 1939.1 ~ 1939.12 | 65y4m |
| 1940.1 ~ 1940.12 | 65y6m |
| 1941.1 ~ 1941.12 | 65y8m |
| 1942.1 ~ 1942.12 | 65y10m |
| 1943.1 ~ 1943.12 | 66y0m |
| 1944.1 ~ 1944.12 | 66y0m |
| 1945.1 ~ 1945.12 | 66y0m |
| 1946.1 ~ 1946.12 | 66y0m |
| 1947.1 ~ 1947.12 | 66y0m |
| 1948.1 ~ 1948.12 | 66y0m |
| 1949.1 ~ 1949.12 | 66y0m |
| 1950.1 ~ 1950.12 | 66y0m |
| 1951.1 ~ 1951.12 | 66y0m |
| 1952.1 ~ 1952.12 | 66y0m |
| 1953.1 ~ 1953.12 | 66y0m |
| 1954.1 ~ 1954.12 | 66y0m |
| 1955.1 ~ 1955.12 | 66y2m |
| 1956.1 ~ 1956.12 | 66y4m |
| 1957.1 ~ 1957.12 | 66y6m |
| 1958.1 ~ 1958.12 | 66y8m |
| 1959.1 ~ 1959.12 | 66y10m |
| 1960.1 ~ 1960.12 | 67y0m |

Table 5: PEA: UK

| Birth cohort | PEA |
|---|---|
| **Normal PEA: Male** | |
| ~ 1953.12 | 65y0m |
| 1954.1 ~ 1954.12 | 66y0m |
| 1955.1 ~ 1959.12 | 66y0m |
| 1960.1 ~ 1960.12 | 67y0m |
| 1961.1 ~ | 67y0m |
| **Normal PEA: Female** | |
| ~ 1949.12 | 60y0m |
| 1950.1 ~ 1950.12 | 61y0m |
| 1951.1 ~ 1951.12 | 62y0m |
| 1952.1 ~ 1952.12 | 63y0m |
| 1953.1 ~ | 65y0m |

Table 6: PEA: Germany

| Birth cohort | PEA |
|---|---|
| **Early PEA: Male** | |
| ~ 1952.12 | 63y0m |
| 1953.1 ~ 1953.12 | 63y2m |
| 1954.1 ~ 1954.12 | 63y4m |
| 1955.1 ~ 1955.12 | 63y6m |
| 1956.1 ~ 1956.12 | 63y8m |
| 1957.1 ~ 1957.12 | 63y10m |
| 1958.1 ~ 1958.12 | 64y0m |
| 1959.1 ~ 1959.12 | 64y2m |
| 1960.1 ~ 1960.12 | 64y4m |
| 1961.1 ~ 1961.12 | 64y6m |
| 1962.1 ~ 1962.12 | 64y8m |
| 1963.1 ~ 1963.12 | 64y10m |
| 1964.1 ~ 1964.12 | 65y0m |
| **Early PEA: Female** | |
| ~ 1951.12 | 60y0m |
| **Normal PEA** | |
| ~ 1946.12 | 65y0m |
| 1947.1 ~ 1947.12 | 65y1m |
| 1948.1 ~ 1948.12 | 65y2m |
| 1949.1 ~ 1949.12 | 65y3m |
| 1950.1 ~ 1950.12 | 65y4m |
| 1951.1 ~ 1951.12 | 65y5m |
| 1952.1 ~ 1952.12 | 65y6m |
| 1953.1 ~ 1953.12 | 65y7m |
| 1954.1 ~ 1954.12 | 65y8m |
| 1955.1 ~ 1955.12 | 65y9m |
| 1956.1 ~ 1956.12 | 65y10m |
| 1957.1 ~ 1957.12 | 65y11m |
| 1958.1 ~ 1958.12 | 66y0m |
| 1959.1 ~ 1959.12 | 66y2m |
| 1960.1 ~ 1960.12 | 66y4m |
| 1961.1 ~ 1961.12 | 66y6m |
| 1962.1 ~ 1962.12 | 66y8m |
| 1963.1 ~ 1963.12 | 66y10m |
| 1964.1 ~ 1964.12 | 67y0m |

Table 7: PEA: France

| Birth cohort | PEA |
|---|---|
| **Early PEA** | |
| ~ 1951.6 | 60y0m |
| 1951.7 ~ 1951.12 | 60y4m |
| 1952.1 ~ 1952.12 | 60y9m |
| 1953.1 ~ 1953.12 | 61y2m |
| 1954.1 ~ 1954.12 | 61y7m |
| 1955.1 ~ 1955.12 | 62y0m |
| 1956.1 ~ . | 62y0m |
| **Normal PEA** | |
| ~ 1951.6 | 65y0m |
| 1951.7 ~ 1951.12 | 65y4m |
| 1952.1 ~ 1952.12 | 65y9m |
| 1953.1 ~ 1953.12 | 66y2m |
| 1954.1 ~ 1954.12 | 66y7m |
| 1955.1 ~ 1955.12 | 67y0m |
| 1956.1 ~ . | 67y0m |

## Table 8: Pension eligibility age (Denmark, Switzerland, Estonia, Japan)

Table 9: PEA: Denmark

| Birth cohort | PEA |
|---|---|
| **Early PEA** | |
| ~ 1953.12 | 60y0m |
| 1954.1 ~ 1954.6 | 60y6m |
| 1954.7 ~ 1954.12 | 61y0m |
| 1955.1 ~ 1955.6 | 61y6m |
| 1955.7 ~ 1955.12 | 62y0m |
| 1956.1 ~ 1956.6 | 62y6m |
| 1956.7 ~ 1958.12 | 63y0m |
| 1959.1 ~ 1959.6 | 63y6m |
| 1959.7 ~ 1964.6 | 64y0m |
| 1964.7 ~ | 64y0m |
| **Normal PEA** | |
| ~ 1953.12 | 65y0m |
| 1954.1 ~ 1954.6 | 65y6m |
| 1954.7 ~ 1954.12 | 66y0m |
| 1955.1 ~ 1955.6 | 66y6m |
| 1955.7 ~ 1955.12 | 67y0m |
| 1956.1 ~ 1956.6 | 67y0m |
| 1956.7 ~ 1958.12 | 67y0m |
| 1959.1 ~ 1959.6 | 67y0m |
| 1959.7 ~ 1964.6 | 67y0m |
| 1964.7 ~ | 67y0m |

Table 10: PEA: Switzerland

| Birth cohort | PEA |
|---|---|
| **Early PEA: Male** | |
| ~ 1924.12 | 63y0m |
| 1925.1 ~ 1950.12 | 63y0m |
| **Early PEA: Female** | |
| ~ 1937.12 | 60y0m |
| 1938.1 ~ 1940.12 | 61y0m |
| 1941.1 ~ | 62y0m |
| **Normal PEA: Male** | |
| ~ 1924.12 | 65y0m |
| 1925.1 ~ 1950.12 | 65y0m |
| **Normal PEA: Female** | |
| ~ 1937.12 | 62y0m |
| 1938.1 ~ 1940.12 | 63y0m |
| 1941.1 ~ | 64y0m |

Table 11: PEA: Estonia

| Birth cohort | PEA |
|---|---|
| **Early PEA: Male** | |
| | 60y0m |
| **Early PEA: Female** | |
| ~ 1943.12 | 57y0m |
| 1944.1 ~ 1944.12 | 57y6m |
| 1945.1 ~ 1945.12 | 57y6m |
| 1946.1 ~ 1946.12 | 57y6m |
| 1947.1 ~ 1947.12 | 57y6m |
| 1948.1 ~ 1948.12 | 57y6m |
| 1949.1 ~ 1949.12 | 58y0m |
| 1950.1 ~ 1950.12 | 58y6m |
| 1951.1 ~ 1951.12 | 59y0m |
| 1952.1 ~ 1952.12 | 59y6m |
| 1953.1 ~ 1953.12 | 60y0m |
| **Normal PEA: Male** | |
| ~ 1953.12 | 63y0m |
| 1954.1 ~ 1954.12 | 63y3m |
| 1955.1 ~ 1955.12 | 63y6m |
| 1956.1 ~ 1956.12 | 63y9m |
| 1957.1 ~ 1957.12 | 64y0m |
| 1958.1 ~ 1958.12 | 64y3m |
| 1959.1 ~ 1959.12 | 64y6m |
| 1960.1 ~ 1960.12 | 64y9m |
| 1961.1 ~ 1961.12 | 65y0m |
| **Normal PEA: Female** | |
| ~ 1947.12 | 60y0m |
| 1948.1 ~ 1948.12 | 60y6m |
| 1949.1 ~ 1949.12 | 61y0m |
| 1950.1 ~ 1950.12 | 61y6m |
| 1951.1 ~ 1951.12 | 62y0m |
| 1952.1 ~ 1952.12 | 62y6m |
| 1953.1 ~ 1953.12 | 63y0m |
| 1954.1 ~ 1954.12 | 63y3m |
| 1955.1 ~ 1955.12 | 63y6m |
| 1956.1 ~ 1956.12 | 63y9m |
| 1957.1 ~ 1957.12 | 64y0m |
| 1958.1 ~ 1958.12 | 64y3m |
| 1959.1 ~ 1959.12 | 64y6m |
| 1960.1 ~ 1960.12 | 64y9m |
| 1961.1 ~ 1961.12 | 65y0m |

Table 12: PEA: Japan

| Birth cohort | PEA |
|---|---|
| **Normal PEA: Male** | |
| ~1941.4.1 | 60y0m |
| 1941.4.2~1943.4.1 | 61y0m |
| 1943.4.2~1945.4.1 | 62y0m |
| 1945.4.2~1947.4.1 | 63y0m |
| 1947.4.2~1949.4.1 | 64y0m |
| 1949.4.2~1953.4.1 | 65y0m |
| 1953.4.2~1955.4.1 | 65y0m |
| 1955.4.2~1957.4.1 | 65y0m |
| 1957.4.2~1959.4.1 | 65y0m |
| 1959.4.2~1961.4.1 | 65y0m |
| 1961.4.2~ | 65y0m |
| **Normal PEA: Female** | |
| ~1932.4.1 | 55y0m |
| 1932.4.2~1934.4.1 | 56y0m |
| 1934.4.2~1936.4.1 | 57y0m |
| 1936.4.2~1937.4.1 | 58y0m |
| 1937.4.2~1938.4.1 | 58y0m |
| 1938.4.2~1940.4.1 | 59y0m |
| 1940.4.2~1946.4.1 | 60y0m |
| 1946.4.2~1948.4.1 | 61y0m |
| 1948.4.2~1950.4.1 | 62y0m |
| 1950.4.2~1952.4.1 | 63y0m |
| 1952.4.2~1954.4.1 | 64y0m |
| 1954.4.2~1958.4.1 | 65y0m |
| 1958.4.2~1960.4.1 | 65y0m |
| 1960.4.2~1962.4.1 | 65y0m |
| 1962.4.2~1964.4.1 | 65y0m |
| 1964.4.2~1965.4.1 | 65y0m |
| 1965.4.2~ | 65y0m |

## Table 13: Pension eligibility age (South Korea)

Table 14: PEA: Korea

| Birth cohort | PEA |
|---|---|
| **Early PEA** | |
| ~ 1952.12 | 55y0m |
| 1953.1 ~ 1956.12 | 56y0m |
| 1957.1 ~ 1960.12 | 57y0m |
| 1961.1 ~ 1964.12 | 58y0m |
| 1965.1 ~ 1968.12 | 59y0m |
| 1969.1 ~ . | 60y0m |
| **Normal PEA** | |
| ~ 1952.12 | 60y0m |
| 1953.1 ~ 1956.12 | 61y0m |
| 1957.1 ~ 1960.12 | 62y0m |
| 1961.1 ~ 1964.12 | 63y0m |
| 1965.1 ~ 1968.12 | 64y0m |
| 1969.1 ~ . | 65y0m |

Table 15: Pension eligibility age (Czech)

| | | Female[*1] | | | | |
|---|---|---|---|---|---|---|
| **Birth cohort** | **Male** | **0** | **1** | **2** | **3-4** | **5-** |
| 1936.1~1936.12 | 60y2m | 57y0m | 56y0m | 55y0m | 54y0m | 53y0m |
| 1937.1~1937.12 | 60y4m | 57y0m | 56y0m | 55y0m | 54y0m | 53y0m |
| 1938.1~1938.12 | 60y6m | 57y0m | 56y0m | 55y0m | 54y0m | 53y0m |
| 1939.1~1939.12 | 60y8m | 57y4m | 56y0m | 55y0m | 54y0m | 53y0m |
| 1940.1~1940.12 | 60y10m | 57y8m | 56y4m | 55y0m | 54y0m | 53y0m |
| 1941.1~1941.12 | 61y0m | 58y0m | 56y8m | 55y4m | 54y0m | 53y0m |
| 1942.1~1942.12 | 61y2m | 58y4m | 57y0m | 55y8m | 54y4m | 53y0m |
| 1943.1~1943.12 | 61y4m | 58y8m | 57y4m | 56y0m | 54y8m | 53y4m |
| 1944.1~1944.12 | 61y6m | 59y0m | 57y8m | 56y4m | 55y0m | 53y8m |
| 1945.1~1945.12 | 61y8m | 59y4m | 58y0m | 56y8m | 55y4m | 54y0m |
| 1946.1~1946.12 | 61y10m | 59y8m | 58y4m | 57y0m | 55y8m | 54y4m |
| 1947.1~1947.12 | 62y0m | 60y0m | 58y8m | 57y4m | 56y0m | 54y8m |
| 1948.1~1948.12 | 62y2m | 60y4m | 59y0m | 57y8m | 56y4m | 55y0m |
| 1949.1~1949.12 | 62y4m | 60y8m | 59y4m | 58y0m | 56y8m | 55y4m |
| 1950.1~1950.12 | 62y6m | 61y0m | 59y8m | 58y4m | 57y0m | 55y8m |
| 1951.1~1951.12 | 62y8m | 61y4m | 60y0m | 58y8m | 57y4m | 56y0m |
| 1952.1~1952.12 | 62y10m | 61y8m | 60y4m | 59y0m | 57y8m | 56y4m |
| 1953.1~1953.12 | 63y0m | 62y0m | 60y8m | 59y4m | 58y0m | 56y8m |
| 1954.1~1954.12 | 63y2m | 62y4m | 61y0m | 59y8m | 58y4m | 57y0m |
| 1955.1~1955.12 | 63y4m | 62y8m | 61y4m | 60y0m | 58y8m | 57y4m |
| 1956.1~1956.12 | 63y6m | 63y0m | 61y8m | 60y4m | 59y0m | 57y8m |
| 1957.1~1957.12 | 63y8m | 63y4m | 62y2m | 60y8m | 59y4m | 58y0m |
| 1958.1~1958.12 | 63y10m | 63y8m | 62y8m | 61y2m | 59y8m | 58y4m |
| 1959.1~1959.12 | 64y0m | 64y0m | 63y2m | 61y8m | 60y2m | 58y8m |
| 1960.1~1960.12 | 64y2m | 64y2m | 63y8m | 62y2m | 60y8m | 59y2m |
| 1961.1~1961.12 | 64y4m | 64y4m | 64y2m | 62y8m | 61y2m | 59y8m |
| 1962.1~1962.12 | 64y6m | 64y6m | 64y6m | 63y2m | 61y8m | 60y2m |
| 1963.1~1963.12 | 64y8m | 64y8m | 64y8m | 63y8m | 62y2m | 60y8m |
| 1964.1~1964.12 | 64y10m | 64y10m | 64y10m | 64y2m | 62y8m | 61y2m |
| 1965.1~1965.12 | 65y0m | 65y0m | 65y0m | 64y8m | 63y2m | 61y8m |
| 1966.1~1966.12 | 65y2m | 65y2m | 65y2m | 65y2m | 63y8m | 62y2m |
| 1967.1~1967.12 | 65y4m | 65y4m | 65y4m | 65y4m | 64y2m | 62y8m |
| 1968.1~1968.12 | 65y6m | 65y6m | 65y6m | 65y6m | 64y8m | 63y2m |
| 1969.1~1969.12 | 65y8m | 65y8m | 65y8m | 65y8m | 65y2m | 63y8m |
| 1970.1~1970.12 | 65y10m | 65y10m | 65y10m | 65y10m | 65y8m | 64y2m |
| 1971.1~1971.12 | 66y0m | 66y0m | 66y0m | 66y0m | 66y0m | 64y8m |
| 1972.1~1972.12 | 66y2m | 66y2m | 66y2m | 66y2m | 66y2m | 65y2m |
| 1973.1~1973.12 | 66y4m | 66y4m | 66y4m | 66y4m | 66y4m | 65y8m |
| 1974.1~1974.12 | 66y6m | 66y6m | 66y6m | 66y6m | 66y6m | 66y2m |
| 1975.1~1975.12 | 66y8m | 66y8m | 66y8m | 66y8m | 66y8m | 66y8m |
| 1976.1~1976.12 | 66y10m | 66y10m | 66y10m | 66y10m | 66y10m | 66y10m |
| 1977.1~1977.12 | 67y0m | 67y0m | 67y0m | 67y0m | 67y0m | 67y0m |
| 1978.1~1978.12 | 67y2m | 67y2m | 67y2m | 67y2m | 67y2m | 67y2m |
| 1979.1~1979.12 | 67y4m | 67y4m | 67y4m | 67y4m | 67y4m | 67y4m |
| 1980.1~1980.12 | 67y6m | 67y6m | 67y6m | 67y6m | 67y6m | 67y6m |
| 1981.1~1981.12 | 67y8m | 67y8m | 67y8m | 67y8m | 67y8m | 67y8m |
| 1982.1~1982.12 | 67y10m | 67y10m | 67y10m | 67y10m | 67y10m | 67y10m |
| 1983.1~1983.12 | 68y0m | 68y0m | 68y0m | 68y0m | 68y0m | 68y0m |

[*1]: Pensionable ages for female are different by the number of children.

Table 16: Pension eligibility age (Sweden, Spain, Poland, Slovenia)

| | **Early** | | **Normal** | |
|---|---|---|---|---|
| | **Male** | **Female** | **Male** | **Female** |
| Sweden | 61y0m | 61y0m | 65y0m | 65y0m |
| Spain | 61y0m | 61y0m | 65y0m | 65y0m |
| Poland | 60y0m | 55y0m | 65y0m | 60y0m |
| Slovenia | 58y0m | 58y0m | 63y0m | 61y0m |

Table 17: Pension eligibility age (China)

| **Gender** | **Hukou type** | **Occupation** | **Normal PEA** |
|---|---|---|---|
| Male | | | 60y0m |
| Female | Agricultural Hukou | | 60y0m |
| | Non-agricultural Hukou | Civil servants | 55y0m |
| | | Enterprises | 50y0m |

## 6.2 Data and Institutional Setting

### 6.2.1 Global Aging Data

This study uses the Health and Retirement Study (HRS) [8] and other sister datasets such as the China Health and Retirement Longitudinal Study (CHARLS), the English Longitudinal Study on Aging (ELSA), the Korean Longitudinal Study of Ageing (KLoSA), the Survey on Health, Aging, and Retirement in Europe (SHARE), and the Japanese Study of Aging and Retirement (JSTAR). These datasets constitute panel surveys of elderly people. Furthermore, these family datasets are constructed so that the questions of the HRS are reproduced in those of other studies as much as possible. They include a rich variety of variables to capture living aspects in terms of economic status, health status, family background, as well as social and work status. We primarily use the harmonized datasets. [9] However, when variables are not available in the harmonized datasets, we use the variables of the original datasets.

### 6.2.2 Definition of Retirement

In this study, we use three retirement definitions: "not working for pay," "self-reported retired," and "completely retired." "Not working for pay" implies that a respondent is not working for wages or other type of payment. "Self-reported retired" implies that a respondent self-reports his employment status as retired: for this definition, we use the "r@lbrf" variable in each harmonized data (e.g., Harmonized SHARE, Harmonized ELSA), which are constructed based on the RAND HRS data. In the HRS, "r@lbrf" takes seven values, and we define a respondent as "self-reported retired" if "r@lbrf" indicates "partly retired," "retired," "disabled," or "not in labor force." In other words, the difference between "not working for pay" and "self-reported retired" is whether unemployed respondents are included or excluded. [10] Numerous related studies (e.g. **?**, **?**) use the two similar definitions of retirement.

We also define "completely retired" when a respondent is both "not working for pay" and "self-reported retired." This definition enable us to exclude a job seeker from the retired population and is close to that of Eibich (2015). In this study, we mainly use the "completely retired" definition and the results with other retirement definitions are discussed in Section 6.3 of this material.

### 6.2.3 The Variables of Health Investment Behaviors

In this study, we analyze health investment behaviors such as alcohol consumption, smoking, physical activities, sleeping time, eating habits, social participation, contact with children, and doctor visit. In this subsection, we explain the variables of the behaviors and show the summary

[8] See the website (http://hrsonline.isr.umich.edu) for detailed information of the HRS.

[9] The Gateway to Global Aging Data (http://gateway.usc.edu) provides harmonized versions of data from the international ageing and retirement studies (e.g. HRS, ELSA, SHARE, KLoSA, CHARLS). All variables of each dataset aimed to have the same items and follow the same naming conventions. The harmonized datasets enable researchers to conduct cross-national comparative studies. The program code to generate the harmonized datasets from the original datasets is provided by the Center for Global Ageing Research, USC Davis School of Gerontology, and the Center for Economic and Social Research (CESR). Some variables, such as measures of assets and income, are imputed by this code.

[10] See the codebook of the Rand HRS data fore details about the variable "r@lbrf" which we use. http://hrsonline.isr.umich.edu/modules/meta/rand/randhrsm/randhrsM.pdf. They explain how they construct the variable "r@lbrf" in p.1033. We use the variable "r@lbrf" in all harmonized data sets.

statistics. [11]

- Alcohol consumption: Table 18 shows the summary statistics of alcohol consumption measures around 2010. "Alcohol consumption: yes/no" indicates whether respondents consume alcohol or not in the survey year, and takes 1 if respondents drink. "Alcohol consumption: Freq." is a categorical variable and measures the alcohol consumption frequency in a week. The value ranges from zero to four. [12] "Alcohol consumption: Amount" measures the number of drinks per day in HRS, SHARE, JSTAR, KLoSA, and CHARLS [13] and per week in ELSA. Table 18 shows that the ratio of Western people who drink alcohol is larger than tat of Asian people.

- Smoking: Table 19 shows the summary of smoking measures. "Smoking: yes/no" takes one if a respondent smokes at the interview. "Smoking: Amount" measures the number of cigarettes consumed per day in HRS, JSTAR, KLoSA, and CHARLS, and those of grams of cigarettes on a weekday and holiday in ELSA. In SHARE wave 1 and wave 2, we can use three types of smoking amount variables, number of cigarettes, number of pipe, and number of cigars or cigarillos, and define the smoking amount variable as the number of cigarettes.

- Physical activities: Table 20 shows the summary of physical activities measures. "Vigorous Physical Activity: Freq.," "Moderate Physical Activity: Freq.," and "Light Physical Activity: Freq." measure the frequency of physical activities. These measures are the categorical variables in HRS, ELSA, SHARE, and JSTAR. The scales of the measures are different among datasets. [14] In KLoSA and CHARLS, these indicate the frequency per week. We construct the dummy variable which takes one when doing activities at least once in a week. We can also use the measure of walking in HRS, JSTAR, and CHARLS and the that of exercising time in the JSTAR. [15]

- Sleeping: "Sleeping: Hours" in Table 21 measures the sleeping duration. The JSTAR database contains the information about the sleeping duration for weekdays and holidays separately. The SHARE and The KLoSA datasets do not contain the information about sleeping time. There is little difference in sleeping duration between each country.

- Food habits: Table 22 shows the summary of eating habit measures. "Food Expenditure" measure the monthly expenditure on food in HRS, ELSA, SHARE, JSTAR, and KLoSA and weekly expenditure in CHARLS. Similarly, "Eat out Expenditure" is the measure of eat out expenditure. These variables are adjusted in ten 10,000 nominal US dollar.

[11] We calculate the results using 2010 data for HRS, ELSA, SHARE and KLoSA, 2009 data for JSTAR, and 2011 data for CHARLS.

[12] It takes "0" if not drinking in a week; "1" if drinking once or twice a week; "2" if three or four times; "3" if five or six times; and "4" if every day.

[13] We can use three types of drinking amount variables such as beer, wine, and liquor. In CHARLS, we define the number of drinks as the sum of these three variables.

[14] In HRS and JSTAR, the variables are in a range from one to five: "1": hardly ever or never; "2": from once to three times a month; "3": once a week;"4": more than once a week; and "5": every day. In ELSA and SHARE, the variables are in a range from one to four: "1": hardly ever or never; "2": from once to three times a month; "3": once a week; and "4": more than once a week.

[15] In JSTAR, the measure is a categorical variable in a range from one to five: "1": hardly ever or never; "2":less than 30 minutes; "3": 30 to 60 minutes; "4": 60 to 90 minutes; and "5": more than 90 minutes. In CHARLS, the measure is a categorical variable in a range from one to five: "1": less than 10 minutes;"2": from 10 to 30 minutes; "3": from 30 to 120 minutes; "4": from 120 to 240 minutes; and "5": more than 240 minutes.

- Other behaviors: Finally, Table 23 shows the summary statistics of other behaviors. "Social Participation: yes/no" indicates whether a respondent attends the social activities or not. "Contact with Children: Freq." is a categorical variables and measures the frequency of contact with children living apart from respondents. The scales of the measure are different among datasets. [16] "Doctor Visit: Freq." measures the frequency of doctor visit per two years in HRS and KLoSA, per twelve months in SHARE, and per month in the JSTAR and the CHARLS. The number of visiting doctors is used as a health investment behavior variable in our study; however, is used for measuring the health status in some studies, such as Eibich (2015).

### 6.2.4 Sample Restrictions

We use waves from 3 to 11 for the HRS. This is because the waves 1 and 2 of the HRS are the same as the Study of Assets and Health Dynamics (AHEAD). We cannot connect these datasets due to a difference in the content of the questions. The ELSA does not contain information about job stress and physical stress in waves 1 and 3, and thus, we use waves 2, 4, 5, and 6 for the ELSA.

We include all observations for the age group 50-85 for the main analysis. We omit the samples who have not worked. Restricting this range is desirable for analyzing the retirement effects. While Eibich (2015) restricted the sample to the age group 55-70, the age range used in our study is ideal for international comparison. Eibich (2015) showed that retirement increases sharply between 60 and 65 years in Germany. However, we observe that the retirement age varies across countries. The analyzed samples include individuals with disability, civil servants, and self-employed individuals. The pension system for them is slightly different, but we set an equal pensionable age for simplicity. The sample also includes individuals who were not employed prior to retirement. We include "age variables" and "squared age/100" to control age effects.

[16] In HRS and ELSA, the measure ranges from one to six: "1": once a year; "2": once or twice a year; "3": Every few month; "4": once or twice a month; "5": once or twice a week; and "6": more than twice a week.
In SHARE, the measure ranges from one to seven: "1": Never; "2": less than once a month; "3": about once a month; "4": about every two weeks; "5": about once a week; "6": several times a week; and "7": daily.
In KLoSA, the measure ranges from one to ten: "1": never; "2": almost never a year; "3": once or twice a year; "4": three or four times a year; "5": five or six times a year; "6": once a month; "7": twice a month; "8": once a week; "9": twice or three times a week; and "10": almost every day.
In CHARLS, the measure ranges from one to nine: "1": almost never; "2": once a year; "3": once every 6 months; "4": once every 3 months; "5": once a month; "6": every 2 weeks; "7": once a week; "8": 2-3 times a week; and "9": almost every day.

Table 18: Summary Statistics of Alcohol Consumption Habits (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS** | | | | | |
| Alcohol consumption: yes/no | 21037 | 0.55 | 0.50 | 0 | 1 |
| Alcohol consumption: Freq. | 20994 | 0.69 | 1.14 | 0 | 4 |
| Alcohol consumption Amount | 20991 | 0.82 | 1.59 | 0 | 40 |
| **ELSA** | | | | | |
| Alcohol consumption: yes/no | 8724 | 0.88 | 0.33 | 0 | 1 |
| Alcohol consumption: Freq. | 8627 | 1.39 | 1.37 | 0 | 4 |
| Alcohol consumption Amount | 8670 | 5.62 | 8.90 | 0 | 294 |
| **SHARE**[*1*2] | | | | | |
| Alcohol consumption: yes/no | 34968 | 0.75 | 0.43 | 0 | 1 |
| Alcohol consumption: Freq. | 34955 | 1.44 | 1.50 | 0 | 4 |
| Alcohol consumption Amount | 30860 | 1.94 | 4.70 | 0 | 70 |
| **JSTAR** | | | | | |
| Alcohol consumption: yes/no | 1296 | 0.38 | 0.49 | 0 | 1 |
| Alcohol consumption: Freq. | 1296 | 1.06 | 1.53 | 0 | 4 |
| Alcohol consumption Amount | 1249 | 0.76 | 1.36 | 0 | 15 |
| **KLoSA** | | | | | |
| Alcohol consumption: yes/no | 7649 | 0.35 | 0.48 | 0 | 1 |
| Alcohol consumption: Freq. | 7649 | 0.56 | 0.96 | 0 | 4 |
| Alcohol consumption Amount | 7382 | 1.75 | 3.17 | 0 | 50 |
| **CHARLS** | | | | | |
| Alcohol consumption: yes/no | 13537 | 0.40 | 0.49 | 0 | 1 |
| Alcohol consumption: Freq. | 12615 | 0.59 | 1.32 | 0 | 4 |
| Alcohol consumption Amount | 17105 | 0.55 | 6.29 | 0 | 602 |

[*1]: We calculate results using person-level analysis weight.

[*2]: We calculate results with SHARE countries used in this paper.

Table 19: Summary Statistics of Smoking Habits (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS** | | | | | |
| Smoking: yes/no | 20949 | 0.15 | 0.36 | 0 | 1 |
| Smoking: Amount | 20941 | 1.95 | 6.06 | 0 | 140 |
| **ELSA** | | | | | |
| Smoking: yes/no | 9808 | 0.13 | 0.34 | 0 | 1 |
| Smoking(WD): Amount | 8880 | 0.63 | 8.83 | 0 | 709 |
| Smoking(HD): Amount | 8877 | 0.42 | 3.25 | 0 | 150 |
| **SHARE**[*1*2] | | | | | |
| Smoking: yes/no | 34973 | 0.20 | 0.40 | 0 | 1 |
| Smoking; Amount(N of cigarettes)[*3] | 11477 | 2.92 | 7.34 | 0 | 80 |
| **JSTAR** | | | | | |
| Smoking: yes/no | 4096 | 0.20 | 0.40 | 0 | 1 |
| Smoking: Amount | 4069 | 3.77 | 8.74 | 0 | 100 |
| **KLoSA** | | | | | |
| Smoking: yes/no | 7649 | 0.17 | 0.38 | 0 | 1 |
| Smoking: Amount | 7649 | 2.60 | 6.33 | 0 | 50 |
| **CHARLS** | | | | | |
| Smoking: yes/no | 13068 | 0.30 | 0.46 | 0 | 1 |
| Smoking: Amount | 11944 | 4.15 | 9.24 | 0 | 80 |

[*1]: We calculate results using person-level analysis weight.

[*2]: We calculate results with SHARE countries used in this paper.

[*3]: Using 2006 data.

Table 20: Summary Statistics of Physical Activities (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS** | | | | | |
| Vigorous Physical Activity: Freq. | 20991 | 2.03 | 1.32 | 1 | 5 |
| Moderate Physical Activity: Freq. | 21007 | 2.93 | 1.33 | 1 | 5 |
| Light Physical Activity: Freq. | 21015 | 3.25 | 1.16 | 1 | 5 |
| Walking: Hours | 6113 | 0.95 | 1.64 | 0 | 24 |
| **ELSA** | | | | | |
| Vigorous Physical Activity: Freq. | 10085 | 1.86 | 1.20 | 1 | 4 |
| Moderate Physical Activity: Freq. | 10087 | 3.12 | 1.19 | 1 | 4 |
| Light Physical Activity: Freq. | 10087 | 3.52 | 0.98 | 1 | 4 |
| **SHARE**[*1*2] | | | | | |
| Vigorous Physical Activity: Freq. | 34955 | 2.32 | 1.34 | 1 | 4 |
| Moderate Physical Activity: Freq. | 34964 | 3.35 | 1.07 | 1 | 4 |
| **JSTAR** | | | | | |
| Vigorous Physical Activity: Freq. | 2796 | 1.29 | 0.83 | 1 | 5 |
| Light Physical Activity: Freq. | 2805 | 2.46 | 1.61 | 1 | 5 |
| Exercise(WD): Hours. | 1605 | 0.81 | 0.76 | 0 | 3 |
| Exercise(HD): Hours. | 2347 | 1.24 | 1.04 | 0 | 4 |
| Walking: Freq. | 4133 | 3.33 | 1.21 | 1 | 5 |
| **KLoSA** | | | | | |
| Vigorous Physical Activity: Freq. | 7649 | 1.53 | 2.46 | 0 | 25 |
| **CHARLS** | | | | | |
| Vigorous Physical Activity: Freq. | 5344 | 1.85 | 2.90 | 0 | 7 |
| Moderate Physical Activity: Freq. | 5336 | 3.34 | 3.30 | 0 | 7 |
| Light Physical Activity: Freq. | 5313 | 5.24 | 2.88 | 0 | 7 |
| Walking: Freq. | 5318 | 2.87 | 1.27 | 1 | 5 |

[*1]: We calculate results using person-level analysis weight.

[*2]: We calculate results with SHARE countries used in this paper.

Table 21: Summary Statistics of Sleeping Habits (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS** | | | | | |
| Sleeping: Hours | 6139 | 6.64 | 2.75 | 0 | 24 |
| **JSTAR** | | | | | |
| Sleeping(WD): Hours | 2705 | 6.92 | 1.28 | 0 | 15 |
| Sleeping(HD): Hours | 3326 | 7.36 | 1.42 | 0 | 18 |
| **CHARLS** | | | | | |
| Sleeping: Hours | 12467 | 6.28 | 1.94 | 0 | 15 |

Table 22: Summary Statistics of Food Habits (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS**[*3] | | | | | |
| Food Expenditure | 4034 | 330.58 | 400.25 | 0 | 16500 |
| Eat out Expenditure | 4056 | 121.45 | 200.43 | 0 | 4800 |
| **ELSA**[*3] | | | | | |
| Food Expenditure | 9952 | 117.96 | 84.07 | 0 | 1314 |
| Eat out Expenditure | 10026 | 18.85 | 26.04 | 0 | 357 |
| **SHARE**[*1*2*3] | | | | | |
| Food Expenditure | 20923 | 517.70 | 336.14 | 0 | 3179 |
| Eat out Expenditure | 22853 | 72.65 | 126.45 | 0 | 1073 |
| **JSTAR**[*3] | | | | | |
| Food Expenditure | 3100 | 443.80 | 430.90 | 0 | 2672 |
| Eat out Expenditure | 2067 | 117.44 | 178.25 | 0 | 1710 |
| **KLoSA**[*3] | | | | | |
| Food Expenditure | 4523 | 318.62 | 206.78 | 9 | 1731 |
| Eat out Expenditure | 4543 | 62.92 | 75.73 | 0 | 865 |
| **CHARLS**[*3] | | | | | |
| Food Expenditure | 12847 | 101.98 | 119.78 | 0 | 3095 |
| Eat out Expenditure | 13397 | 5.73 | 63.88 | 0 | 4334 |

[*1]: We calculate results using person-level analysis weight.

[*2]: We calculate results with SHARE countries used in this paper.

[*3]: Nominal 10000 US $

Table 23: Summary Statistics of Other Habits (Around 2010)

| | Obs. | Mean | S.D. | Min | Max |
|---|---|---|---|---|---|
| **HRS** | | | | | |
| Social Participation: yes/no | 7953 | 0.75 | 0.43 | 0 | 1 |
| Contact with Children: Freq. | 6969 | 5.19 | 1.09 | 1 | 6 |
| Doctor Visit: Freq. | 19867 | 11.15 | 24.93 | 0 | 900 |
| **ELSA** | | | | | |
| Social Participation: yes/no | 7946 | 0.33 | 0.47 | 0 | 1 |
| Contact with Children: Freq. | 7303 | 5.29 | 0.90 | 1 | 6 |
| **SHARE**[*1*2] | | | | | |
| Social Participation: yes/no | 34940 | 0.84 | 0.36 | 0 | 1 |
| Contact with Children: Freq. | 21240 | 6.12 | 1.25 | 1 | 7 |
| Doctor Visit: Freq. | 34865 | 7.30 | 9.46 | 0 | 98 |
| **JSTAR** | | | | | |
| Social Participation: yes/no | 3977 | 0.41 | 0.49 | 0 | 1 |
| Doctor Visit: Freq. | 4147 | 1.03 | 2.34 | 0 | 30 |
| **KLoSA** | | | | | |
| Social Participation: yes/no | 7649 | 0.73 | 0.45 | 0 | 1 |
| Contact with Children: Freq. | 6494 | 6.64 | 1.97 | 1 | 10 |
| Doctor Visit: Freq. | 7631 | 13.38 | 28.69 | 0 | 700 |
| **CHARLS** | | | | | |
| Social Participation: yes/no | 12575 | 0.49 | 0.50 | 0 | 1 |
| Contact with Children: Freq. | 11285 | 7.59 | 1.66 | 1 | 9 |
| Doctor Visit: Freq. | 13382 | 0.45 | 1.47 | 0 | 30 |

[*1]: We calculate results using person-level analysis weight.

[*2]: We calculate results with SHARE countries used in this paper.

### 6.3 Result

Tables 24, 25, 26, 27, and 28 shows the detailed estimated results that we discuss in our paper. [17] We implement the Durbin-Wu-Hausman test after IV estimation, and thereafter, apply either fixed effects with time effects instrumental variable (FE-TE-IV) or fixed effects with time effects (FE-TE) depending on the results of the test. Therefore, the tables show the applied method (FE or FE-IV) in the "Method" column. [18] The results in "completely retired" columns are discussed in the paper and those of other retirement definitions are also shown in the tables. We do not discuss any insignificant first stage results. In addition, the tables show other results (e.g., smoking amount, sleep, and frequency of contact with children) that are not discussed in the paper. Since, in China, we cannot obtain the significant first stage results for all estimations, we do not discuss the results of China in the original paper

[17] All models are estimated via the STATA module xtivreg2 (see **?**)

[18] Full estimation results including the results of control variables are available on request.

Table 24: Alcohol consumption behaviors

| | Not Working for Pay | | | Self-Reported Retire | | | Completely Retire | | |
|---|---|---|---|---|---|---|---|---|---|
| **Drinking:Y/N** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | 0.356***(0.088) | FE-IV | 65368 | 0.203***(0.042) | FE-IV | 59178 | 0.333***(0.076) | FE-IV | 66665 |
| England | -0.006(0.006) | FE | 13970 | -0.002(0.005) | FE | 13241 | -0.009(0.006) | FE | 14217 |
| Germany | -0.526**(0.217) | FE-IV | 1839 | -0.318***(0.110) | FE-IV | 1687 | -0.304**(0.123) | FE-IV | 1970 |
| France | 0.013(0.020) | FE | 2316 | 0.015(0.023) | FE | 2350 | 0.017(0.020) | FE | 2532 |
| Denmark | 0.021(0.014) | FE | 2407 | -0.010(0.015) | FE | 2191 | 0.006(0.014) | FE | 2433 |
| Switzerland | 0.007(0.027) | FE | 1427 | 0.058**(0.029) | FE | 1126 | 0.015(0.028) | FE | 1423 |
| Czech | -0.125***(0.041) | FE | 1343 | -0.075(0.047) | FE*1 | 1045 | -0.117***(0.038) | FE | 1416 |
| Estonia | -0.085(0.072) | FE*1 | 614 | -0.106**(0.053) | FE | 734 | -0.086*(0.052) | FE | 784 |
| Japan | -0.072*(0.041) | FE*1 | 1545 | -0.089**(0.043) | FE | 1523 | -0.089**(0.043) | FE | 1523 |
| South Korea | -0.032(0.022) | FE*1 | 3983 | -0.038**(0.019) | FE | 4224 | -0.038**(0.019) | FE | 4235 |
| China | -0.049(0.036) | FE*1 | 2990 | -0.048(0.037) | FE*1 | 2996 | -0.048(0.037) | FE*1 | 2996 |
| Sweden | -0.010(0.018) | FE*1 | 2822 | -0.007(0.019) | FE*1 | 2397 | -0.014(0.018) | FE*1 | 2837 |
| Spain | -0.092**(0.046) | FE | 1229 | -0.035(0.042) | FE*1 | 1347 | -0.067(0.042) | FE | 1446 |
| Poland | 0.080(0.066) | FE*1 | 560 | -0.026(0.071) | FE*1 | 514 | 0.036(0.062) | FE*1 | 610 |
| Slovenia | 0.297(0.262) | FE*1 | 82 | -0.084(0.125) | FE*1 | 146 | -0.089(0.119) | FE*1 | 162 |
| **Drinking:Freq.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.033**(0.013) | FE | 65187 | -0.015(0.012) | FE | 59007 | -0.041***(0.013) | FE | 66475 |
| England | 0.029(0.027) | FE | 13826 | 0.025(0.025) | FE | 13108 | 0.036(0.026) | FE | 14070 |
| Germany | 0.107(0.088) | FE | 1839 | 0.025(0.090) | FE | 1687 | 0.126(0.084) | FE | 1970 |
| France | 0.753**(0.292) | FE-IV | 2316 | 0.064(0.090) | FE | 2350 | 0.593**(0.236) | FE-IV | 2532 |
| Denmark | 0.134*(0.074) | FE | 2407 | 0.000(0.082) | FE | 2191 | 0.092(0.077) | FE | 2433 |
| Switzerland | 0.030(0.085) | FE | 1427 | -0.104(0.101) | FE | 1126 | 0.015(0.083) | FE | 1423 |
| Czech | -0.198*(0.114) | FE | 1343 | 0.092(0.129) | FE*1 | 1045 | -0.186*(0.104) | FE | 1416 |
| Estonia | 0.051(0.152) | FE*1 | 614 | -0.056(0.117) | FE | 734 | -0.029(0.112) | FE | 784 |
| Japan | -0.221*(0.115) | FE*1 | 1545 | -0.269**(0.117) | FE | 1523 | -0.269**(0.117) | FE | 1523 |
| South Korea | -0.097*(0.058) | FE*1 | 3983 | 2.426**(1.029) | FE-IV | 4224 | 2.490**(1.024) | FE-IV | 4235 |
| China | -0.214**(0.098) | FE*1 | 2610 | -0.217**(0.098) | FE*1 | 2616 | -0.217**(0.098) | FE*1 | 2616 |
| Sweden | 0.030(0.053) | FE*1 | 2822 | 0.018(0.066) | FE*1 | 2397 | 0.028(0.053) | FE*1 | 2837 |
| Spain | -0.093(0.153) | FE | 1229 | -0.037(0.110) | FE*1 | 1347 | -0.169(0.117) | FE | 1446 |
| Poland | 0.086(0.134) | FE*1 | 560 | -0.071(0.133) | FE*1 | 514 | -0.025(0.118) | FE*1 | 610 |
| Slovenia | 0.100(0.534) | FE*1 | 82 | -0.428(0.301) | FE*1 | 146 | -0.395(0.289) | FE*1 | 162 |
| **Drinking:Amount** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.047***(0.016) | FE | 65147 | -0.005(0.016) | FE | 58961 | -0.055***(0.016) | FE | 66433 |
| England | 3.561**(1.532) | FE-IV | 11221 | 2.298**(1.073) | FE-IV | 10665 | 2.689**(1.275) | FE-IV | 11407 |
| Germany | 0.133(0.559) | FE*1 | 1062 | -2.997*(1.538) | FE-IV | 952 | -3.343**(1.645) | FE-IV | 1122 |
| France | 0.636(0.495) | FE | 1504 | 0.646**(0.310) | FE | 1516 | 0.554(0.392) | FE | 1646 |
| Denmark | -0.066(0.152) | FE | 1747 | 0.024(0.165) | FE | 1581 | -0.046(0.145) | FE | 1755 |
| Switzerland | 0.024(0.526) | FE | 1027 | 1.284*(0.751) | FE*1 | 793 | -0.225(0.551) | FE | 1028 |
| Czech | -1.639**(0.638) | FE | 1185 | 0.490(0.842) | FE*1 | 931 | -2.042***(0.697) | FE | 1247 |
| Estonia | 1.108(0.879) | FE*1 | 500 | -0.094(0.462) | FE | 598 | 0.125(0.506) | FE | 642 |
| Japan | -0.281*(0.144) | FE*1 | 1276 | -0.166(0.141) | FE | 1269 | -0.166(0.141) | FE | 1269 |
| South Korea | -0.255(0.288) | FE*1 | 3630 | -0.151(0.236) | FE | 3853 | -0.157(0.236) | FE | 3863 |
| China | 0.089(0.412) | FE*1 | 2990 | 0.063(0.416) | FE*1 | 2996 | 0.063(0.416) | FE*1 | 2996 |
| Sweden | -1.150(0.895) | FE | 1508 | -0.612(0.863) | FE*1 | 1243 | -1.256(0.932) | FE*1 | 1507 |
| Spain | 1.103(1.619) | FE*1 | 796 | -0.718(0.996) | FE*1 | 886 | 0.391(1.138) | FE*1 | 951 |
| Poland | 0.977(1.049) | FE | 442 | 1.127(0.871) | FE*1 | 394 | -7.963(4.998) | FE-IV | 468 |
| Slovenia | 0.366(0.594) | FE*1 | 68 | 0.512(0.607) | FE*1 | 122 | 0.443(0.572) | FE | 136 |

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

*1: IVs are insignificant in 1st stage estimation.

Table 25: Smoking behaviors

| | Not Working for Pay | | | Self-Reported Retire | | | Completely Retire | | |
|---|---|---|---|---|---|---|---|---|---|
| **Smoking:Y/N** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.031***(0.011) | FE | 19697 | -0.028***(0.010) | FE | 18718 | -0.037***(0.010) | FE | 20339 |
| England | -0.057*(0.031) | FE | 2888 | -0.043(0.027) | FE | 2859 | -0.042(0.028) | FE | 2998 |
| Germany | 0.131(0.083) | FE*1 | 606 | 0.071(0.081) | FE | 597 | 0.138*(0.078) | FE | 671 |
| France | -0.454*(0.237) | FE-IV | 574 | 0.009(0.066) | FE | 611 | -0.399*(0.232) | FE-IV | 658 |
| Denmark | 0.019(0.061) | FE*1 | 744 | 0.048(0.065) | FE | 708 | 0.025(0.066) | FE*1 | 767 |
| Switzerland | -0.026(0.084) | FE*1 | 505 | 0.305(0.197) | FE-IV | 398 | -0.022(0.083) | FE*1 | 514 |
| Czech | 0.008(0.082) | FE*1 | 504 | -0.002(0.087) | FE | 438 | 0.005(0.065) | FE | 554 |
| Estonia | -0.159(0.176) | FE | 186 | -0.046(0.078) | FE | 280 | 0.017(0.075) | FE | 292 |
| Japan | 0.001(0.044) | FE | 1144 | -0.007(0.051) | FE | 1144 | -0.007(0.051) | FE | 1144 |
| South Korea | -0.033(0.034) | FE | 2225 | -0.654**(0.318) | FE-IV | 2350 | -0.643**(0.319) | FE-IV | 2356 |
| China | -0.056(0.047) | FE*1 | 818 | -0.059(0.049) | FE*1 | 818 | -0.059(0.049) | FE*1 | 818 |
| Sweden | 0.049(0.071) | FE*1 | 683 | -0.034(0.086) | FE*1 | 629 | 0.051(0.066) | FE*1 | 693 |
| Spain | -0.087(0.097) | FE | 471 | -0.215***(0.066) | FE | 545 | -0.189***(0.067) | FE | 572 |
| Poland | -0.053(0.098) | FE*1 | 246 | -0.045(0.084) | FE*1 | 242 | -0.143(0.095) | FE*1 | 268 |
| Slovenia | 0.502**(0.179) | FE | 24 | 0.161(0.147) | FE*1 | 64 | 0.230*(0.128) | FE*1 | 68 |
| **Smoking:Amount** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.448*(0.259) | FE | 19585 | -0.261(0.226) | FE | 18619 | -0.643***(0.240) | FE | 20223 |
| England(WD) | 0.364(1.563) | FE | 1307 | -0.577(1.558) | FE | 1288 | -0.435(1.566) | FE | 1353 |
| England(HD) | 0.290(0.967) | FE | 1305 | 0.523(1.260) | FE | 1286 | 0.779(1.235) | FE | 1351 |
| Germany | 4.307**(2.155) | FE*1 | 378 | 0.643(1.390) | FE | 377 | 3.219*(1.850) | FE | 419 |
| France | -0.309(1.469) | FE*1 | 265 | -1.280(1.275) | FE | 272 | -0.419(1.288) | FE*1 | 288 |
| Denmark | 1.508(1.768) | FE | 361 | -0.837(1.782) | FE*1 | 348 | 0.943(2.198) | FE*1 | 371 |
| Switzerland | -0.986(2.221) | FE | 220 | -2.157(1.823) | FE*1 | 175 | -1.308(2.291) | FE | 219 |
| Czech | -1.330(2.329) | FE*1 | 104 | -5.293*(2.698) | FE | 79 | -1.685(2.405) | FE*1 | 104 |
| Japan | -1.990*(1.163) | FE | 1003 | -2.154*(1.188) | FE | 1000 | -2.154*(1.188) | FE | 1000 |
| South Korea | -1.473**(0.688) | FE | 2225 | -11.427*(6.162) | FE-IV | 2350 | -1.119*(0.626) | FE | 2356 |
| China | -1.016(1.199) | FE*1 | 538 | -1.066(1.248) | FE*1 | 538 | -1.066(1.248) | FE*1 | 538 |
| Sweden | 1.155(0.967) | FE*1 | 487 | 0.883(1.122) | FE*1 | 458 | 0.599(0.854) | FE*1 | 497 |
| Spain | -2.844(1.963) | FE*1 | 286 | -3.800**(1.645) | FE*1 | 301 | -3.313*(1.785) | FE*1 | 317 |
| Poland | 9.536***(2.404) | FE*1 | 32 | -8.720**(3.508) | FE | 26 | 6.069**(2.709) | FE*1 | 36 |

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

∗1: IVs are insignificant in 1st stage estimation.

Table 26: Physical activities

| | Not Working for Pay | | | Self-Reported Retire | | | Completely Retire | | |
|---|---|---|---|---|---|---|---|---|---|
| **Vigorous:Freq.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | 0.018**(0.008) | FE | 53849 | 0.029***(0.007) | FE | 49926 | 0.011(0.007) | FE | 55130 |
| England | 0.041***(0.014) | FE | 15124 | 0.038***(0.013) | FE | 14376 | 0.038***(0.013) | FE | 15475 |
| Germany | -0.044(0.039) | FE | 1890 | -0.020(0.039) | FE | 1731 | -0.047(0.036) | FE | 2027 |
| France | -0.056(0.039) | FE | 2408 | -0.064*(0.037) | FE | 2461 | -0.053(0.036) | FE | 2649 |
| Denmark | 0.052(0.043) | FE | 2418 | 0.044(0.044) | FE | 2209 | 0.044(0.042) | FE | 2451 |
| Switzerland | -0.047(0.045) | FE | 1466 | -0.001(0.046) | FE | 1162 | -0.047(0.044) | FE | 1463 |
| Czech | -0.096*(0.050) | FE | 1390 | 0.054(0.051) | FE*1 | 1086 | -0.041(0.047) | FE | 1475 |
| Estonia | -0.175**(0.074) | FE*1 | 646 | -0.080(0.065) | FE | 762 | -0.100(0.066) | FE | 814 |
| Japan | 0.676*(0.353) | FE-IV | 1499 | 0.051**(0.024) | FE | 1489 | 0.051**(0.024) | FE | 1489 |
| South Korea | 0.136***(0.021) | FE*1 | 7157 | 0.082***(0.018) | FE | 7589 | 0.082***(0.018) | FE | 7648 |
| China | -0.169***(0.036) | FE*1 | 1980 | -0.170***(0.035) | FE*1 | 1982 | -0.170***(0.035) | FE*1 | 1982 |
| Sweden | -0.025(0.036) | FE*1 | 2897 | 0.095**(0.041) | FE*1 | 2456 | -0.019(0.036) | FE*1 | 2911 |
| Spain | 0.348(0.252) | FE-IV | 1313 | -0.023(0.047) | FE*1 | 1467 | 0.307*(0.184) | FE-IV | 1575 |
| Poland | 0.013(0.087) | FE*1 | 582 | -0.024(0.084) | FE*1 | 538 | -0.014(0.073) | FE*1 | 638 |
| Slovenia | 0.134(0.170) | FE*1 | 90 | -0.305***(0.092) | FE*1 | 170 | 0.225(0.276) | FE-IV | 186 |
| **Moderate:Freq.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | 0.207*(0.124) | FE-IV | 53882 | 0.133**(0.063) | FE-IV | 49962 | 0.218**(0.109) | FE-IV | 55170 |
| England | 0.246***(0.075) | FE-IV | 15125 | 0.187***(0.057) | FE-IV | 14377 | 0.201***(0.061) | FE-IV | 15476 |
| Germany | -0.008(0.024) | FE | 1890 | 0.006(0.025) | FE | 1731 | -0.012(0.024) | FE | 2027 |
| France | -0.008(0.024) | FE | 2410 | 0.020(0.026) | FE | 2461 | -0.003(0.024) | FE | 2649 |
| Denmark | 0.248**(0.109) | FE-IV | 2417 | 0.004(0.020) | FE | 2208 | 0.203**(0.083) | FE-IV | 2450 |
| Switzerland | -0.009(0.028) | FE | 1466 | -0.035(0.037) | FE | 1162 | -0.012(0.028) | FE | 1463 |
| Czech | -0.056(0.038) | FE | 1390 | 0.048(0.042) | FE*1 | 1086 | -0.039(0.036) | FE | 1475 |
| Estonia | -0.114**(0.050) | FE*1 | 646 | -0.072*(0.040) | FE | 762 | -0.073*(0.041) | FE | 814 |
| China | -0.214***(0.045) | FE*1 | 1972 | -0.229***(0.045) | FE*1 | 1974 | -0.229***(0.045) | FE*1 | 1974 |
| Sweden | -0.009(0.016) | FE*1 | 2898 | -0.000(0.021) | FE*1 | 2457 | -0.011(0.016) | FE*1 | 2912 |
| Spain | 0.534***(0.192) | FE-IV | 1313 | 0.005(0.033) | FE*1 | 1467 | 0.418***(0.135) | FE-IV | 1575 |
| Poland | -0.023(0.062) | FE*1 | 584 | -0.162**(0.065) | FE*1 | 540 | -0.073(0.058) | FE*1 | 640 |
| Slovenia | -0.051(0.063) | FE*1 | 90 | -0.107(0.073) | FE*1 | 170 | -0.522***(0.184) | FE-IV | 186 |
| **Light:Freq.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.004(0.006) | FE | 53889 | 0.093*(0.049) | FE-IV | 49967 | 0.154*(0.084) | FE-IV | 55177 |
| England | 0.125**(0.057) | FE-IV | 15125 | 0.102**(0.043) | FE-IV | 14377 | 0.085*(0.046) | FE-IV | 15476 |
| Japan | -0.011(0.047) | FE*1 | 1504 | -0.006(0.046) | FE | 1492 | -0.006(0.046) | FE | 1492 |
| China | -0.087**(0.037) | FE*1 | 1964 | -0.088**(0.037) | FE*1 | 1966 | -0.088**(0.037) | FE*1 | 1966 |
| **Walking** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.039(0.038) | FE | 19607 | -0.035(0.040) | FE | 17731 | -0.033(0.037) | FE | 20016 |
| Japan | -0.172***(0.065) | FE | 4135 | -0.186***(0.063) | FE | 4162 | -0.186***(0.063) | FE | 4162 |
| China | -0.245**(0.109) | FE*1 | 1962 | -0.252**(0.109) | FE*1 | 1964 | -0.252**(0.109) | FE*1 | 1964 |

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

∗1: IVs are insignificant in 1st stage estimation.

Table 27: Sleeping & Food habits

| | Not Working for Pay | | | Self-Reported Retire | | | Completely Retire | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sleeping** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | 1.874**(0.835) | FE-IV | 19734 | 0.057(0.058) | FE | 17846 | 1.613**(0.770) | FE-IV | 20143 |
| Japan(WD) | 0.133(0.202) | FE*1 | 1648 | 0.062(0.144) | FE*1 | 1641 | 0.062(0.144) | FE*1 | 1641 |
| Japan(HD) | -0.191*(0.113) | FE*1 | 1752 | -0.205*(0.111) | FE*1 | 1767 | -0.205*(0.111) | FE*1 | 1767 |
| China | 0.092(0.097) | FE*1 | 4898 | 0.088(0.097) | FE*1 | 4904 | 0.088(0.097) | FE*1 | 4904 |
| **Logged Food Expenditure** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.002*(0.001) | FE | 13693 | -0.003***(0.001) | FE | 12352 | -0.002**(0.001) | FE | 13989 |
| England | -0.000(0.000) | FE | 15059 | -0.000(0.000) | FE | 14309 | -0.000(0.000) | FE | 15405 |
| Germany | -0.000(0.003) | FE | 935 | 0.006**(0.003) | FE | 871 | 0.001(0.003) | FE | 1007 |
| France | 0.000(0.003) | FE | 1057 | -0.001(0.003) | FE | 1062 | 0.002(0.003) | FE | 1168 |
| Denmark | 0.005**(0.002) | FE*1 | 1234 | 0.003(0.003) | FE | 1128 | 0.004(0.002) | FE | 1256 |
| Switzerland | 0.000(0.004) | FE | 791 | 0.004(0.005) | FE | 620 | -0.002(0.004) | FE | 788 |
| Czech | -0.003(0.006) | FE*1 | 650 | -0.007(0.007) | FE*1 | 486 | -0.002(0.005) | FE*1 | 691 |
| Estonia | -0.008**(0.004) | FE*1 | 276 | 0.011(0.009) | FE*1 | 338 | 0.009(0.008) | FE | 364 |
| Japan | -0.002(0.003) | FE | 2850 | -0.000(0.003) | FE*1 | 2896 | -0.000(0.003) | FE*1 | 2896 |
| South Korea | 0.002**(0.001) | FE | 2672 | 0.001(0.001) | FE*1 | 2880 | 0.001(0.001) | FE*1 | 2900 |
| China | 0.000(0.000) | FE*1 | 4916 | 0.000(0.000) | FE*1 | 4922 | 0.000(0.000) | FE*1 | 4922 |
| Sweden | 0.001(0.002) | FE*1 | 1624 | -0.004(0.003) | FE-IV | 1372 | 0.001(0.002) | FE*1 | 1629 |
| Spain | 0.004(0.004) | FE | 613 | 0.004(0.003) | FE*1 | 685 | 0.001(0.003) | FE | 724 |
| Poland | -0.006*(0.003) | FE*1 | 264 | -0.000(0.003) | FE*1 | 240 | -0.003(0.003) | FE*1 | 288 |
| Slovenia | 0.002(0.007) | FE | 44 | 0.000(0.007) | FE*1 | 78 | -0.001(0.006) | FE | 86 |
| **Logged Eat Out Expenditure** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.001(0.001) | FE | 13747 | 0.000(0.001) | FE | 12388 | -0.001(0.001) | FE | 14046 |
| England | -0.000*(0.000) | FE | 15080 | -0.000(0.000) | FE | 14331 | -0.000(0.000) | FE | 15428 |
| Germany | 0.000(0.001) | FE | 1006 | 0.001(0.001) | FE | 936 | 0.002*(0.001) | FE | 1083 |
| France | -0.004**(0.002) | FE | 1068 | -0.004**(0.002) | FE | 1082 | -0.003*(0.002) | FE | 1188 |
| Denmark | -0.001(0.001) | FE | 1382 | -0.002**(0.001) | FE | 1268 | -0.002(0.001) | FE | 1407 |
| Switzerland | -0.017*(0.009) | FE-IV | 855 | -0.005**(0.002) | FE | 675 | -0.017*(0.009) | FE-IV | 855 |
| Czech | -0.001(0.001) | FE*1 | 712 | -0.002(0.001) | FE*1 | 529 | -0.002(0.001) | FE | 757 |
| Estonia | -0.002(0.001) | FE*1 | 352 | -0.000(0.001) | FE | 434 | -0.000(0.001) | FE | 460 |
| Japan | 0.018(0.019) | FE*1 | 2225 | 0.020(0.021) | FE*1 | 2240 | 0.020(0.021) | FE*1 | 2240 |
| South Korea | -0.000(0.000) | FE | 2675 | -0.000(0.000) | FE*1 | 2883 | -0.000(0.000) | FE*1 | 2903 |
| China | -0.000(0.000) | FE*1 | 5176 | -0.000(0.000) | FE*1 | 5182 | -0.000(0.000) | FE*1 | 5182 |
| Sweden | -0.001(0.001) | FE*1 | 1712 | -0.000(0.001) | FE*1 | 1439 | -0.000(0.001) | FE*1 | 1714 |
| Spain | 0.001(0.002) | FE | 723 | -0.001(0.002) | FE*1 | 787 | -0.001(0.002) | FE | 842 |
| Poland | -0.002*(0.001) | FE*1 | 292 | -0.001(0.001) | FE*1 | 270 | -0.001(0.001) | FE | 322 |
| Slovenia | 0.024**(0.010) | FE-IV | 52 | -0.003(0.005) | FE | 104 | -0.001(0.005) | FE | 112 |

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

∗1: IVs are insignificant in 1st stage estimation.

Table 28: Ohter behaviors

| | Not Working for Pay | | | Self-Reported Retire | | | Completely Retire | | |
|---|---|---|---|---|---|---|---|---|---|
| **Social Participation** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | 0.008(0.016) | FE | 14332 | 0.034**(0.016) | FE | 13015 | -0.002(0.016) | FE | 14533 |
| England | 0.019(0.013) | FE | 13039 | 0.023*(0.013) | FE | 12382 | 0.027**(0.013) | FE | 13276 |
| Germany | 0.063*(0.036) | FE | 1881 | 0.042(0.038) | FE | 1724 | 0.060*(0.034) | FE | 2018 |
| France | 0.033(0.033) | FE | 2378 | 0.018(0.032) | FE | 2426 | 0.019(0.031) | FE | 2612 |
| Denmark | 0.005(0.030) | FE | 2414 | -0.004(0.034) | FE | 2207 | 0.004(0.032) | FE | 2446 |
| Switzerland | -0.003(0.035) | FE | 1466 | 0.029(0.042) | FE | 1162 | 0.009(0.035) | FE | 1463 |
| Czech | -0.021(0.039) | FE | 1387 | 0.015(0.041) | FE*1 | 1084 | -0.019(0.035) | FE | 1472 |
| Estonia | -0.036(0.030) | FE*1 | 640 | -0.035(0.036) | FE | 752 | -0.035(0.035) | FE | 804 |
| Japan | 0.024(0.029) | FE | 4001 | -0.020(0.029) | FE | 4022 | -0.020(0.029) | FE | 4022 |
| South Korea | 0.013(0.017) | FE*1 | 7157 | -0.002(0.015) | FE | 7589 | -0.002(0.015) | FE | 7648 |
| China | -0.020(0.026) | FE*1 | 4970 | -0.022(0.026) | FE*1 | 4976 | -0.022(0.026) | FE*1 | 4976 |
| Sweden | 0.016(0.028) | FE*1 | 2895 | 0.034(0.033) | FE*1 | 2454 | 0.034(0.029) | FE*1 | 2909 |
| Spain | 0.015(0.045) | FE | 1305 | 0.049(0.041) | FE*1 | 1459 | 0.021(0.040) | FE | 1567 |
| Poland | 0.008(0.072) | FE*1 | 584 | -0.018(0.063) | FE*1 | 540 | 0.053(0.062) | FE*1 | 640 |
| Slovenia | 0.068(0.064) | FE*1 | 90 | -0.160(0.113) | FE*1 | 170 | -0.122(0.111) | FE | 186 |
| **Contact with Children** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -0.005(0.029) | FE | 12755 | 0.037(0.031) | FE | 11540 | -0.009(0.030) | FE | 12928 |
| England | 0.038(0.024) | FE | 11665 | 0.047**(0.023) | FE | 10919 | 0.031(0.024) | FE | 11824 |
| Germany | 0.154(0.135) | FE*1 | 732 | -1.671***(0.587) | FE-IV | 659 | -1.413**(0.548) | FE-IV | 789 |
| France | 0.063(0.125) | FE | 1041 | 0.097(0.124) | FE | 1038 | 0.005(0.121) | FE | 1153 |
| Denmark | 0.096(0.100) | FE | 1157 | 0.099(0.105) | FE | 1046 | 0.111(0.099) | FE | 1172 |
| Switzerland | -0.009(0.112) | FE | 697 | -0.091(0.135) | FE | 532 | 0.040(0.111) | FE | 693 |
| Czech | 0.037(0.177) | FE*1 | 635 | -0.002(0.243) | FE*1 | 451 | 0.085(0.178) | FE*1 | 680 |
| Estonia | -0.147(0.149) | FE*1 | 328 | -0.134(0.161) | FE*1 | 384 | 1.764*(0.932) | FE-IV | 408 |
| South Korea | -0.164*(0.092) | FE*1 | 5280 | 0.019(0.084) | FE | 5584 | 0.021(0.084) | FE | 5642 |
| China | 0.007(0.101) | FE | 2498 | 0.013(0.097) | FE | 2500 | 0.013(0.097) | FE | 2500 |
| Sweden | 0.076(0.081) | FE*1 | 1563 | 0.074(0.086) | FE*1 | 1308 | 0.051(0.080) | FE*1 | 1567 |
| Spain | 1.256*(0.650) | FE-IV | 470 | -0.008(0.121) | FE | 517 | 0.739*(0.447) | FE-IV | 567 |
| Poland | 0.303(0.269) | FE*1 | 226 | 0.377(0.264) | FE*1 | 188 | 0.474**(0.232) | FE*1 | 242 |
| Slovenia | 0.283(0.297) | FE | 56 | 1.084**(0.508) | FE-IV | 102 | 0.165(0.152) | FE | 110 |
| **Doctor Visit** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** | **Coeff.(S.E.)** | **Method** | **Obs.** |
| US | -8.016**(3.447) | FE-IV | 85408 | -4.311***(1.512) | FE-IV | 77176 | -7.970***(2.998) | FE-IV | 87245 |
| Germany | 1.236*(0.670) | FE | 1886 | 0.624(0.611) | FE | 1728 | 0.759(0.652) | FE | 2024 |
| France | -0.477(0.448) | FE | 2406 | 1.049*(0.598) | FE | 2457 | 0.113(0.506) | FE | 2645 |
| Denmark | 0.494(0.518) | FE | 2414 | -0.833(0.623) | FE | 2204 | -0.637(0.536) | FE | 2446 |
| Switzerland | 0.467(0.607) | FE | 1465 | -5.180*(2.697) | FE-IV | 1161 | 0.083(0.717) | FE | 1462 |
| Czech | 0.386(0.707) | FE | 1385 | 0.888(0.833) | FE*1 | 1082 | -0.158(0.691) | FE | 1470 |
| Estonia | 1.720(1.560) | FE*1 | 638 | -0.041(0.628) | FE | 754 | 1.270(1.366) | FE | 806 |
| Japan | 0.317(0.277) | FE*1 | 1890 | 0.394(0.328) | FE*1 | 1862 | 0.394(0.328) | FE*1 | 1862 |
| South Korea | 1.016**(0.508) | FE*1 | 5450 | 0.945*(0.508) | FE | 5768 | 0.951*(0.508) | FE | 5812 |
| China | 0.272**(0.110) | FE*1 | 5128 | 0.280**(0.110) | FE*1 | 5134 | 0.280**(0.110) | FE*1 | 5134 |
| Sweden | 1.037***(0.365) | FE*1 | 2892 | 1.479***(0.506) | FE*1 | 2453 | 1.308***(0.408) | FE*1 | 2906 |
| Spain | 0.824(1.003) | FE*1 | 1301 | 1.243(0.927) | FE*1 | 1459 | -7.389**(3.616) | FE-IV | 1565 |
| Poland | 0.620(1.062) | FE*1 | 584 | 1.042(1.046) | FE*1 | 540 | 0.203(0.953) | FE*1 | 640 |
| Slovenia | -4.127*(2.125) | FE*1 | 90 | -1.121(1.847) | FE*1 | 170 | -1.538(1.850) | FE | 186 |

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

∗1: IVs are insignificant in 1st stage estimation.

## Acknowledgement

We would like to thank Peter Eibich, Michael Hurd, Hidehiko Ichimura, Yasushi Iwamoto, Daiji Kawaguchi, Salar Jahedi and participants at the conference on Comparative International Research Based on the HRS Family of Data and Tokyo Labor Economics Conference at Hitotsubashi University for helpful comments. We are responsible for all errors and interpretations. The earlier title is "An International Comparative Study of Health Investment Behaviors After Retirement". We have received a huge amount of support from Kazuyuki Terada. This research is partially supported by the Grants-in-Aid for Scientific Research [Research project number: 13J09809] for the Japan Society for the Promotion of Science (JSPS) Fellows by the Ministry of Education, Science and Culture in Japan.

The HRS (Health and Retirement Study) is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan.

The ELSA (English Longitudinal Study of Ageing) is funded by the US National Institute on Ageing and a consortium of UK government departments coordinated by the Office for National Statistics.

This paper uses data from SHARE Waves 1, 2, 3 (SHARELIFE), 4 and 5 (DOIs: 10.6103 /SHARE.w1.260, 10.6103/SHARE.w2.260, 10.6103/SHARE.w3.100, 10.6103/SHARE.w4.111, 10.6103 /SHARE.w5.100), see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been primarily funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005
-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N211909, SHARE-LEAP: N227822, SHARE M4: N261982). Additional funding from the

German Ministry of Education and Research, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG00
5842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_ 04-064$) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

The Japanese Study of Aging and Retirement (JSTAR) was conducted by the Research Institute of Economy, Trade and Industry (RIETI), Hitotsubashi University, and the University of Tokyo.

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