10-2020

Does early access to pension wealth improve health?

Seonghoon KIM
Singapore Management University, SEONGHOONKIM@smu.edu.sg

Kanghyock KOH
Korea University - Korea

APRIL 2020

Does Early Access to Pension Wealth Improve Health?*

We examine the health impacts of early access to public pension wealth by exploiting a unique policy in Singapore allowing individuals to withdraw a proportion of their pension savings after their 55th birthday. For the identification, we employ a regression discontinuity design by comparing individuals before and after their 55th birthday. To address anticipated and lagged health impacts, we adopt the donut regression discontinuity approach. Using nationally representative monthly panel data, we find that early access to pension wealth improves self-reported overall health.

JEL Classification: I10, H55, D15

Keywords: health, early access to pension wealth, regression discontinuity design

Corresponding author:
Kanghyock Koh
Department of Economics
Korea University
145 Anam-ro, Anam-dong
Seongbuk-gu
Seoul
South Korea
E-mail:kkoh@korea.ac.k

Published in Economic Inquiry, 2020, 58 (4), 1783-1794. https://doi.org/10.1111/ecin.12903

* We are grateful to Junxing Chay for his excellent research assistance. We thank the seminar participants at Fudan University and Peking University for their valuable comments. We also thank the editor, Jason Lindo, and two anonymous reviewers. The SLP data collection was financially supported by Singapore Ministry of Education Academic Research Fund Tier 3 grant (MOE2013-T3-1-009). Koh gratefully acknowledges financial support by Korea University grant (K2009571). All errors are our own.

1. Introduction

Much research has been conducted to understand how and why economic resources affect welfare. The majority of the empirical studies in the literature have focused on changes in the *levels* of economic resources (e.g., cash transfers, inheritances, lottery wins, layoffs) and their welfare implications. However, can changes in the *allocations* of economic resources within the life-cycle of an individual also affect welfare? In the absence of complete capital markets, individuals are constrained from optimally responding to income shocks (e.g., borrowing money in a state with a higher marginal utility of consumption) because of liquidity constraints, leading to lower welfare.

An important policy application of this question is whether individuals should be allowed early access to pension wealth before retirement. To ensure adequate retirement preparedness, many governments mandate their citizens to save a significant proportion of labor income and make pension savings inaccessible before reaching an official claiming age. Under the standard life-cycle model of a rational agent, such a policy is inefficient because it creates additional liquidity constraints. Therefore, some countries such as the United States, the United Kingdom, South Korea, and Singapore have recently implemented policies that relax the withdrawal restrictions of pension balances before the official claiming age (Beshears et al. 2015).

Despite growing policy debate, credible empirical evidence about the effects of early access to pension wealth is rare. Previous studies focus on the effects of flexible access to defined contribution retirement savings accounts (Amromin and Smith 2003; Argento et al. 2015; Armour et al. 2015). These studies have two empirical issues. First, those who enroll in employer-based defined contribution retirement savings plans are self-selected. Second, these studies cannot use an exogenous variation in the eligibility of early access to pension wealth. As a result, they only provide descriptive evidence. To overcome these limitations, Agarwal et al. (2018) studied an age-based pension policy rule in Singapore that runs a defined contribution-style public pension savings system called the Central Provident Fund (CPF). The CPF is a comprehensive social security savings system under which local residents are required to contribute a certain proportion of their earnings. Singaporeans are allowed to withdraw a proportion of their CPF balances once reaching their 55th birthday. Agarwal et al. (2018) showed that this early withdrawal policy modestly increases consumption spending and reduces credit card debt.

In this study, we examine the health impacts of early access to pension wealth. A direct mechanism through which such early access can improve health is the increase in healthcare utilization (Grossman 1972). In principle, individuals can receive more medical treatment when they are allowed to withdraw pension wealth. However, this is not likely to be the case in our setting because Singaporeans can withdraw balances in the medical savings account in the CPF system when they or their immediate family members incur medical expenditure regardless of age. Therefore, flexible access to pension wealth might have little impact on health via the healthcare spending channel.

Another mechanism, which has not received much attention in the literature, is "peace of mind." Early access to pension wealth allows individuals to reallocate wealth over time, but they do not experience an increase in wealth or income over the remaining life-cycle. In this institutional setting, individuals might experience less stress (Di Tella and MacCulloch 2006) even without changing consumption spending or labor supply.[1] Since improvements in

[1] Agarwal et al. (2018) found that only a small proportion of withdrawn money is spent—even among those who have withdrawn. A growing literature investigates peace of mind as a possible channel through which health insurance improves individuals' subjective well-being. Haushofer et al. (2018) recently showed that access to health insurance significantly improves quality of life measured by cortisol level (known as a stress hormone)—even among those who

psychological well-being or happiness could improve health (Graham 2008; Steptoe et al. 2015), we argue that psychological well-being could be a mechanism through which the early pension withdrawal policy could affect health.

To identify the causal effects of early access to pension wealth on health, we exploit the same policy rule that Agarwal et al. (2018) used. We adopt an age-based regression discontinuity design (RDD) by comparing individuals around the age cutoff of withdrawal eligibility. To address the presence of anticipation and lagged health impacts, we also employ the donut RD approach following Barreca et al. (2011, 2016). Using data from the Singapore Life Panel (SLP), a nationally representative monthly longitudinal survey of Singaporeans aged 50–70 years, we find evidence that early access to pension wealth discontinuously improves self-reported health status. However, we do not find discontinuous changes in individuals' medical spending at the same cutoff age. Instead, we find discontinuous improvements in individuals' psychological well-being measured by life satisfaction in economic situations. Further, we find no discontinuous changes in labor supply and consumption spending related to health at the cutoff age. Given this evidence, we argue that early access to pension wealth might have improved health via the improvement in psychological well-being.

We contribute to the literature by providing novel evidence on how early access to pension wealth affects an individual's health. Numerous studies have examined the health impacts of economic resources by exploiting an exogenous change in income or wealth through lottery winning (Lindahl 2005; Apouey and Clark 2015; Cesarini et al. 2016), inheritance (Van Kippersluis and Galama 2014), and public cash transfer (Gross and Tobacman 2014). By

---

do not use healthcare. Kim and Koh (2018) also showed that expanded healthcare insurance coverage improves overall life satisfaction via the peace-of-mind channel.

contrast, our study exploits an exogenous change in the intertemporal allocations of economic resources via the early pension balance withdrawal policy.

This study is also related to the literature on the effects of pension rules in the United States and Europe on health (Snyder and Evans 2006; Behncke 2012; Hallberg et al. 2015; Bloemaen et al. 2017; Fitzpatrick and Moore 2018; Gelber et al. 2018; Gorry et al. 2018; Kuhn et al. 2018; Picchio and Van Ours 2018). This literature has mainly examined the effects of pension rules at later ages close to retirement, such as changes in the benefit amounts and the official pension claiming age. We complement this literature by investigating the health impacts of an individual's ability to withdraw some of his or her pension balances at a younger age, long before the retirement age or pension claiming age. Additionally, unlike public pension policies in other countries, early access to pension wealth in Singapore is related to neither change in health insurance coverage nor other work incentives.

The remainder of the paper is structured as follows. We describe the institutional background of the CPF in the next section. We present the data, empirical strategy, and findings in Sections 3, 4, and 5, respectively. We conclude in Section 6.

2. Institutional Background

The Central Provident Fund

The CPF is a mandatory, comprehensive social security savings system for citizens and permanent residents in Singapore. Conventional pay-as-you-go public pension systems such as the U.S. Social Security program pay out defined monthly benefits according to predetermined rules. However, the CPF is a set of tax-exempted individual savings accounts to which individuals are required to contribute a significant proportion of their earnings.[2] Individuals can withdraw from its balances only after the official claiming age (called the payout eligibility age or drawdown age in the CPF system), 65 years. Hence, the major feature of the CPF is similar to that of the 401(k) plan, a defined contribution pension account in the United States. The core function of CPF savings is to cover spending needs for retirement, healthcare, and housing. However, CPF savings can also be used to pay education expenses or buy approved insurance plans and financial products.

The monthly contributions from labor earnings go to the following three CPF accounts before age 55: Medisave account, Ordinary Account (OA), and Special Account (SA). The Medisave account is a medical savings account from which an individual can withdraw balances for outpatient care, screenings, hospitalization, and long-term care and approved health insurance plans. The OA is a savings account from which people can withdraw some balances only when they buy a residential property or a health insurance policy, invest in financial markets, or pay for education expenses, regardless of age. The SA balance can be used to invest in government-approved financial products. The allocation of CPF contributions varies by age and account type and follows a schedule predetermined by the government. For example, for those aged 35 and below, 62% of CPF contributions go to the OA, while only 21.6% goes to the Medisave account. However, for those aged between 60 and 65, 63.6% goes to Medisave, while 21.2% goes to the OA. Table A1 shows the allocation schedule. The Singapore CPF Board guarantees an interest rate of 2.5% per annum for the OA and 4% per annum for the SA and Medisave account.[3] For

[2] The contribution rate is 37% of monthly wages (20% by the employee and 17% by the employer) up to age 55. Then, it starts to gradually decrease, reaching 12.5% (5% by the employee and 7.5% by the employer) by the 65th birthday.
[3] CPF members can earn an extra 1% interest on the first S$60,000 of combined CPF account balances.

further details of the CPF system, see Agarwal et al. (2018) and the official website (www.cpf.gov.sg).

CPF Withdrawal Policy upon Reaching Age 55

Unless CPF account holders disenroll from the CPF system (e.g., immigration or death), it is impossible to withdraw CPF balances before one's 55th birthday except for certain government-approved purposes such as paying healthcare utilization for family members, purchasing a residential property, and paying for children's education bills. However, upon reaching the 55th birthday, CPF account holders can withdraw at least S$5,000 or the remaining CPF balance after setting aside the minimum sum set by the government, called the Full Retirement Sum.[4] This sum is automatically deducted to purchase a life annuity plan called CPF LIFE, and individuals can start receiving payouts from age 65. The Full Retirement Sum is S$176,000 for those who reach their 55th birthday in 2019.[5] If an individual owns a property, he or she can set aside a lower amount, called the Basic Retirement Sum, to buy a less generous version (a lower monthly payout amount) of CPF LIFE. Those who have insufficient balances to pay for the Basic Retirement Sum are ineligible for CPF LIFE or receive prorated payouts depending on available balances when reaching 65. The requested withdrawal amount is not subject to income tax. However, withdrawal of eligible CPF balances can be made only once a year excluding government-approved circumstances. In October 2016, the SLP asked 55–65-year-old respondents about their CPF withdrawals at age 55.[6] To those between 50 and 54 years, it asked

[4] As of April 19, 2019, 1 SGD was equivalent to 0.74 USD or 0.65 EUR.

[5] The Full Retirement Sum has increased each year. For example, it was S$161,000 in 2015 and S$166,000 in 2016. The amount will increase by S$5,000 each year for the next two years, too. See Table A2 for the details.

[6] The SLP asked about CPF withdrawals during the year in which respondents turned 55 to two groups separately (i.e., 55-year-olds and 56–65-year-olds) to address the potential recall error by older respondents. To those aged

their plan to withdraw CPF balances at age 55. Column (1) of Table 1 shows that 41% of those aged between 50 and 54 were planning to withdraw CPF balances when they become eligible. This expectation is highly consistent with the actual withdrawal behavior of those aged 55 and above. Columns (2) and (3) of Table 1 show that approximately 45% of those aged 55 years and 40% of those aged between 56 and 65 withdrew some CPF balance when they reached 55, respectively. The 50–54-year-old respondents who reported a positive probability of CPF withdrawal said they expect to withdraw S$23,743 on average. Of respondents who withdrew CPF balances, 55-year-old respondents withdrew S$32,852 on average, while 56–65-year-olds withdrew S$42,686. The older group withdrew more because the authorized withdrawal amounts were higher. For example, those born before 1954 could have withdrawn up to 50% of their CPF balance upon reaching 55.

3. Data

Since the introduction of the SLP in July 2015, 7,000–8,000 respondents have participated in the survey on a monthly basis, collecting a variety of information on demographics, household spending, health, healthcare utilization, subjective well-being, labor market participation, and family structure. We use 44 monthly periods of SLP data from July 2015 to March 2019. Our key dependent variable is overall health status measured by a self-reported response to the following question: "Would you say your health is excellent, very good, good, fair, or poor?" We assign 1 to "poor," 2 to "fair," 3 to "good," 4 to "very good," and 5 to "excellent." We also construct a binary indicator of whether a person's health status is poor or fair.

above 65 as of October 2016, the SLP did not ask CPF withdrawal-related questions because of recall bias, as the event took place more than 10 years ago. CPF withdrawal information was collected in October 2016.

To study possible mechanisms, we use healthcare expenditure, domain-specific life satisfaction regarding one's economic situation, the probability of employment and full-time status, and spending amounts for selected consumption items as additional dependent variables. The SLP collects monthly spending data on medical care such as inpatient and outpatient services, prescription drugs, nursing home, and private health insurance. We use total medical spending by summing this medical care expenditure. Life satisfaction regarding one's economic situation is measured by the self-reported response to the following question: "How satisfied are you with your overall economic situation?" Respondents can choose one of five options, from "very dissatisfied" (=1) to "very satisfied" (=5).[7] We use binary indicators of employment status and full-time work status as measures for labor supply. The consumption spending amounts we use are leisure-related activities (e.g., sports, hobbies, vacations); food and beverages; and tobacco, which are closely related to health.

4. Empirical Strategy

To identify the causal effects of early access to pension wealth on health, we exploit the fact that individuals are allowed access to pension wealth upon reaching their 55th birthday. Thus, we compare the health status of sample respondents below and above the cutoff age using an RDD. For the estimation, we consider the following regression model:

$$y_i = \beta_0 + \beta_1 1[age_i > c] + f(age_i - c) + \gamma X_i + \varepsilon_i \qquad (1)$$

[7] Overall life satisfaction is measured on the same five-item Likert scale using the self-reported response to the following question: "Taking all things together, how satisfied are you with your life as a whole these days?"

where y_i is the self-reported overall health status of individual i and age_i is his or her age in months. The cutoff age, c, is equal to the month of the 55th birthday, determined by the early pension withdrawal policy rule.[8]

To identify the effects of early access to pension wealth, we estimate a discontinuity in health status at the cutoff age, which is the month of the 55th birthday. $f(age_i - c)$ is a smooth function between the outcome and age in months. To flexibly control for the age profile of health status, we use the second-order polynomials of age in months, fully interacted with $1[age_i > c]$, based on the age profile of health status from the data. X_i includes individual characteristics such as dummy variables of education attainment, gender, Chinese ethnicity, number of children, household net worth, and year fixed effects.

The parameter of interest is β_1, which represents a discontinuous change in health status at the cutoff age. We interpret β_1 as the causal effects of being eligible for early access to pension wealth on health. For the statistical inference, we calculate standard errors clustered at the age-in-month level and corrected for heteroskedasticity.

Our key identification assumption is that an individual's observable and unobservable characteristics change smoothly at c except for the withdrawal eligibility of public pension savings.[9] We indirectly test the validity of this assumption. Figure A1 shows the smooth pattern of the observable characteristics at the age cutoff but few discontinuities in the individual characteristics. The estimated discontinuities of those characteristics are generally small in magnitude and statistically insignificant. In addition, if our estimate of the discontinuity at the

---

[8] We do not include observations in the month of the 55th birthday, because some respondents surveyed in the month of their 55th birthday could be ineligible for the pension balance withdrawal.

[9] Another identification assumption is that individuals cannot manipulate the running variable, that is their age, at around the age-55 cutoff. This is a relatively minor requirement in our context because biological age is impossible to change by nature.

age cutoff is causal, the magnitude of the estimate would be similar regardless of the inclusion of the individual characteristics as control variables. Hence, we compare the regression results with and without controlling for the individual characteristics as a robustness check.[10]

5. Empirical Results

5.1. Main Results

Panels A and B in Figure 1 show the age profiles of health, measured by self-reported general health status, and the probability that self-reported general health status is fair or poor, respectively. Each dot represents the average health status conditional on age in months. The dashed line represents a second-order polynomial fit and the solid line represents the local linear regression fit using the Epanechnikov kernel with a bandwidth of three months. The shaded area represents the 95% confidence intervals of the local linear regression. In both panels, no health improvements are observed at the cutoff age. Instead, we observe that self-reported health begins to improve immediately before the cutoff age and then continues to improve until it starts to re-deteriorate after about 12 months. This evidence suggests the presence of anticipated and lagged health impacts of early access to pension wealth. Since the early pension withdrawal policy after the 55th birthday is publicly known information in advance, there could be an anticipation effect on health. On the contrary, since it might take time to accumulate health capital, the health impacts of early access to pension wealth could be lagged.

Table 2 reports the estimated discontinuities in health in the month of the 55th birthday using regression specification (1). Column (1) reports that the estimated discontinuities are -0.006 points for self-reported health status and 0.0001 for the probability that self-reported health

[10] The estimates could be statistically more precise when including control variables because the variances of the residuals would become smaller.

status is fair or poor. These estimates are small in magnitude and statistically insignificant. As we saw from Figure 1, there could be anticipated and lagged health impacts, which might mask the true impacts of early access to pension wealth. To the best of our knowledge, no standard approach is available in the RD literature to estimate the potential policy impacts in the presence of anticipation and lagged effects. Hence, to account for such anticipation and lagged effects, we adopt the donut RD approach that estimates the program effect after dropping observations immediately near the cutoff age following Barreca et al. (2011, 2016). We presume that the magnitude of the estimates would be greater using larger donut holes if anticipation and lagged health impacts exist. Consistent with this conjecture, columns (2) to (7) show that the RD estimates become monotonically larger as the size of donut holes increases from one to six months. The estimates also become statistically significant when using larger donut holes.[11] Table A3 shows that the magnitudes of the coefficient estimates remain similar, although they become statistically less significant when excluding the control variables.

Then, we report the RD estimates with their 95% confidence intervals by varying the length of the bandwidths (see Figure A2). Panels A and B present the donut RD estimates using donut hole sizes of zero months and six months, respectively.[12] We set the minimum length of the bandwidth (h_{min}) as a function of donut hole size (d), h_{min}=d+7, to avoid the case in which bandwidth length is too short given the donut hole size. Panel A shows that the estimates are

[11] Barreca et al. (2016) and Kolesár and Rothe (2018) argue that clustered standard errors could be undesirable due to the underlying assumption of employing it for statistical inference. As an alternative approach for the inference, the authors suggested to use Eicker-Huber-White heteroskedasticity-robust standard errors if the bandwidth size can be sufficiently reduced or two recently proposed confidence intervals (bounding the second derivative and bounded misspecification error). When we apply the alternative methods for statistical inference, the estimated discontinuities become statistically insignificant. Hence, we are cautious about the statistical significance of our main results. The results using the alternative methods are available upon request.

[12] We do not report the regression results using other donut hole sizes to save space. The results are available upon request.

sensitive to the choice of bandwidth when using no donut holes. However, panel B shows that the estimates are robust to the choice of bandwidth when using a donut hole of six months. These results might suggest that the RD estimates are robust once anticipation and lagged health impacts are controlled for.

To strengthen the causal interpretation of our findings, we conduct two falsification checks. First, we consider 52, 53, 54, 56, 57, and 58 years as pseudo-cutoff ages. If the baseline estimates reported in Table 2 are driven by the early pension withdrawal policy, we would not be able to find similar impacts on health. Table A4 indeed shows little evidence that the RD estimates for self-reported health status and the probability that self-reported general health status is fair or poor at the cutoff are statistically insignificant and do not monotonically increase when using larger donut holes.[13] Second, we investigate whether there are health improvements among foreigners. Only citizens and permanent residents are eligible for early access to public pension wealth. If the baseline estimates are causal, we would not be able to find similar health impacts among foreigners. Table A5 indicates that the estimated discontinuities at the cutoff are statistically insignificant and that the estimates do not monotonically increase as the donut hole size increases. However, the results should be cautiously interpreted because the sample size of these foreigners is only 249.[14]

As stated in Section 2, the CPF contribution rate decreases from 37% to 26% upon turning 55. Since this reduction might increase labor income, it could improve individuals' health. Although Agarwal et al. (2018) found a limited role of the contribution rate change in estimating the effects of CPF withdrawal at age 55 on consumption spending, we conduct

[13] The corresponding age profiles are available upon request.

[14] The SLP is designed to survey only citizens and permanent residents. However, foreigners are also surveyed when they stay with SLP respondents who are citizens or permanent residents (mostly spouses). We do not report the age profiles of foreigners' health status to save space. The figure is available upon request.

another check to rule out its role. We exploit the fact that self-employed and unemployed individuals are not affected by the CPF contribution rate reduction. If the estimated health improvements in the baseline results are due to the CPF contribution rate reduction, we would not observe similar health improvements among the self-employed and unemployed. Table A6 shows that the estimated health impacts at the cutoff are negative or null. Then, they become increasingly positive when using larger donut holes, as in the baseline results. This provides additional evidence that our baseline findings might not be driven by the CPF contribution rate change. However, the estimates are generally statistically insignificant, which could be due to the smaller sample sizes.[15]

We examine whether the effects of early access to pension wealth on health are heterogeneous by household income. We split individuals into two groups based on their average income level over the sample periods. Table A7 shows that the health impacts of individuals whose average income level is below the median have similar patterns to those of the baseline estimates with larger magnitudes. The estimated discontinuities are small in magnitude and statistically insignificant when using no or small-sized donut holes. Then, the estimates become greater in magnitude and statistically significant when using larger donut holes. By contrast, the estimated health impacts among individuals whose average income level is above the median do not show such patterns. These results could imply that the baseline results are driven by low-income individuals.[16]

5.2. Possible Mechanisms

[15] The age profiles of the health status of the unemployed and self-employed are available upon request.

[16] Since we did not find clear evidence of heterogeneous health impacts by household net worth, we argue that the results should be cautiously interpreted.

We examine possible mechanisms through which early access to pension wealth affects health.[17] We first examine the age profiles of medical spending. However, panel A of Figure 2 shows no discontinuity in medical spending at the age cutoff, nor lagged increases in medical spending. As stated in Section 2, this is likely to be because of the mandatory medical savings account (Medisave) in Singapore from which individuals can withdraw their pension wealth for healthcare expenses regardless of age.[18] Next, we investigate the age profiles of psychological well-being as another possible mechanism. Economic uncertainty under liquidity constraints can adversely affect psychological well-being (Di Tella and MacCulloch 2006). Early access to pension wealth can alleviate these negative psychological impacts even without actually withdrawing pension savings and thus may improve health (Graham 2008; Steptoe et al. 2015). Panel B shows gradual improvements in psychological well-being measured by life satisfaction with respect to one's economic situation once individuals have access to pension wealth, although there is little discontinuity at the age cutoff. In Panel A of Table 3, we estimate a discontinuity of medical spending at the age cutoff. Column (1) shows that the estimated discontinuity is -S$16.7, but the estimate is statistically insignificant.[19] The RD estimates do not increase when using larger donut hole sizes. In Panel B, we estimate the discontinuity in life satisfaction with respect to one's economic situation at the age cutoff with and without the donut hole approach. Column (1) shows that the estimated discontinuity is 0.004 points, which is

[17] We acknowledge that we cannot isolate the relative magnitudes of each mechanism. Our goal is to comprehensively investigate the role of possible channels for the positive health impacts of early access to pension wealth.

[18] A withdrawal request is made by authorized medical staff on behalf of patients, and the withdrawn money directly transfers from the CPF to healthcare institutions. For the details of the usage categories and their withdrawal limits, see https://www.moh.gov.sg/cost-financing/healthcare-schemes-subsidies/medisave.

[19] We also examine sub-categories of aggregate medical expenditure such as inpatient/outpatient care spending, drug spending, and spending on traditional Chinese medicine. However, we find no discontinuities at the cutoff.

statistically insignificant. However, the discontinuities become greater in magnitude and statistically significant when using larger donut holes.[20]

Then, we examine the effects of early access to pension wealth on labor supply and consumption spending. Panel C of Figure 2 shows the age profiles of the employment probability where it appears to discontinuously decrease at the cutoff. Panel D shows that the probability of full-time work does not seem to discontinuously increase at the cutoff.[21] Panel C of Table 3 indicates that the discontinuity is -0.8 percentage points, statistically significant at the 5% level. However, the estimates become statistically insignificant when using the donut RD approach. Panel D shows that the estimated discontinuities are small in magnitude, although they are statistically significant in general. The spontaneous reduction in employment could have lagged health impacts. However, the results are not consistent with those on the probability of full-time work, which deters us from arguing changes in labor supply as a mechanism for the health improvements.

We also present the age profiles of consumption spending related to health.[22] Panels E to G in Figure 2 show little evidence of discontinuous changes in leisure, food and beverages, and tobacco spending at the age cutoff, nor lagged increases in spending. Consistent with the findings, panels E to G of Table 3 show that the estimated discontinuities at the cutoff are small in magnitude and mostly statistically insignificant, and the estimates do not increase when using larger donut holes.

---

[20] Table A8 shows that the estimated discontinuities in overall life satisfaction have similar patterns but are less statistically significant. The corresponding age profiles are available upon request.

[21] The SLP does not provide information on specific working hours.

[22] Agarwal et al. (2018) found an increase in cumulative credit and debit card spending by $650 over the 12-month period after an individual turns 55 (i.e., about $54 per month). Aggregate spending shows a similar pattern, but we do not report it here because it is already documented by Agarwal et al. (2018).

6. Conclusion and Discussion

To prepare for spending needs after retirement, individuals are often mandated by the government to save a large proportion of their labor income in the form of a public pension scheme. Since mandated savings could create liquidity constraints and thereby a welfare loss, it is important to understand whether enabling individuals to access their pension wealth early can actually improve their welfare.

In this study, we focus on the effects of early access to pension wealth on health by exploiting a unique policy rule in Singapore that allows individuals to withdraw a proportion of their pension savings after their 55th birthday. Using the donut RD approach to account for anticipation and lagged effects, we find that early access to pension wealth improves self-reported overall health significantly. Since 41% of the 55-year-olds in our dataset withdraw S$23,743 on average from their pension savings accounts upon turning 55, our back-of-the-envelope calculation indicates that reallocating S$10,000 before retirement can improve self-reported health by about 0.09 points.[23]

Several studies have examined the health impacts of *changes* (mostly increases) in income (Lindahl 2005; Gross and Tobacman 2014; Van Kippersluis and Galama 2014; Apouey and Clark 2015; Cesarini et al. 2016). They tend to find few health impacts of positive income shocks except for Lindahl (2005). As a potential explanation, Van Kippersluis and Galama (2014) and Gross and Tobacman (2014) showed that individuals who experience positive income shocks are more likely to engage in unhealthy behaviors such as alcohol drinking or smoking. By contrast, we find that changing the *allocations* of pension wealth can improve health. One possible explanation for this

[23] We cannot estimate the local average treatment effect of the early pension withdrawal at the cutoff age because of the lack of withdrawal data needed for the first-stage estimation.

difference is that individuals might have weaker incentives to behave unhealthily when they are allowed to reallocate their own wealth. Since allowing the early withdrawal of pension balances does not necessarily increase the fiscal burden of the government, our results imply that flexible access to pension wealth could be a cost-effective policy to improve the health of middle-aged individuals, at least in the short run.

One policy concern about early access to pension wealth is that individuals may squander their savings, leaving insufficient wealth after retirement and thus a worse health status. However, our research design and the available data do not allow us to test this hypothesis.[24] We leave this issue to future research.

---

[24] Although the official CPF LIFE annuity payout eligible age is 65 years old, we find no evidence of a discontinuous change in the employment rate at this age cutoff. Given this lack of discontinuous employment change, we cannot examine the health impacts of retirement further. As a supplementary analysis, we examine the dynamic effects on health around age 65, but find little evidence that individuals' health worsens after this age. The results are available upon request.

References

Agarwal, Sumit, Jessica Pan, and Wenlan Qian. "Age of Decision: Pension Savings Withdrawal and Consumption and Debt Responses." *Management Science*, 2018.

Amromin, Gene, and Paul Smith. "What Explains Early Withdrawals from Retirement Accounts? Evidence from a Panel of Taxpayers." *National Tax Journal*, 56, 2003, 565–612.

Apouey, Bénédicte, and Andrew Clark. "Winning Big but Feeling no Better? The Effect of Lottery Prizes on Physical and Mental Health." *Health Economics*, 24(5), 2015, 516–38.

Argento, Robert, Victoria L. Bryant, and John Sabelhaus. "Early Withdrawals from Retirement Accounts During the Great Recession." *Contemporary Economic Policy*, 33(1), 2015, 1–16.

Armour, Philip, Michael D. Hurd, and Susann Rohwedder. "Trends in Pension Cash-out at Job Change and the Effects on Long-term Outcomes." In Insights in the Economics of Aging, edited by David A. Wise. 2015.

Barreca, Alan I., Melanie Guldi, Jason M. Lindo, Glen R. Waddell. 2011. "Saving Babies? Revisiting the effect of very low birth weight classification." *The Quarterly Journal of Economics*, Volume 126, Issue 4, pp. 2117–2123,

Barreca, A.I., Lindo, J.M. and Waddell, G.R. "Heaping-induced bias in regression-discontinuity designs." *Economic Inquiry*, 54(1), 2016. , 268-293.

Beshears, John, James J. Choi, Joshua Hurwitz, David Laibson, and Brigitte C. Madrian. "Liquidity in Retirement Savings Systems: An International Comparison." NBER Working Paper No. 21168, 2015.

Behncke, S. "Does Retirement Trigger Ill Health?" *Health Economics*, 21(3), 2012, 282–300.

Cesarini, David, Erik Lindqvist, Robert Östling, and Björn Wallace. "Wealth, Health, and Child Development: Evidence from Administrative Data on Swedish Lottery Players." *Quarterly Journal of Economics*, 131(2), 2016, 687–738.

Di Tella, R., and MacCulloch, R. "Some Uses of Happiness Data in Economics." *Journal of Economic Perspectives*, 20(1), 2006, 25–46.Fitzpatrick, Maria, and Timothy Moore. "The Mortality Effects of Retirement: Evidence from Social Security Eligibility at Age 62." *Journal of Public Economics*, 157, 2018, 121–37.

Gelber, Alexander, Timothy Moore, and Alexander Strand. "Disability Insurance Income Saves Lives." Working Paper, 2018.

Gorry, Aspen, Devon Gorry, and Sita Slavov. "Does Retirement Improve Health and Life Satisfaction." *Health Economics*, 27(12), 2018, 2067–86.

Graham, Carol. "Happiness and Health: Lessons—And Questions—For Public Policy." *Health Affairs*, 27(1), 2008, 72–87.

Gross, Tal, and Jeremy Tobacman. "Dangerous Liquidity and the Demand for Health Care: Evidence from the 2008 Stimulus Payments." *Journal of Human Resources*, 49(2), 2014, 424–45.

Grossman, M. "On the Concept of Health Capital and the Demand for Health." *Journal of Political Economy*, 80(2), 1972, 223–55. Hallberg, Daniel, Per Johansson, and Malin Josephson. "Is an Early Retirement Offer Good for your Health? Quasi-experimental Evidence from the Army." *Journal of Health Economics*, 44, 2015, 274–85.

Haushofer, Johannes, Chemin, M., Jang, C., and Abraham, J. "Peace of Mind: Health Insurance Reduces Stress and Cortisol Levels: Evidence from a Randomized Experiment in Kenya." Working Paper, 2018.

Kim, Seonghoon, and Kanghyock Koh. “Does Health Insurance Make People Happier? Evidence from Massachusetts’ Healthcare Reform.” IZA Discussion Paper 11879, 2018.

Kolesár, M. and Rothe, C. “Inference in Regression Discontinuity Designs with A Discrete Running Variable.” American Economic Review, 108(8), 2018, 2277-2304.

Kuhn, Andreas, Stefan Staubli, Jean-Philippe Wuellrich, and Josef Zweimüller. “Fatal Attraction? Extended Unemployment Benefits, Labor Force Exits, and Mortality.” NBER Working Paper No. 25124, 2018.

Lindahl, Mikael. “Estimating the Effect of Income on Health and Mortality using Lottery Prizes as an Exogenous Source of Variation in Income.” *Journal of Human Resources*, 40(1), 2005, 144–68.

Picchio, Matteo, and Jan van Ours. “The Causal Effects of Retirement on Health and Happiness.” Tinbergen Institute Discussion Paper, Rotterdam, 2018.

Snyder, Stephen E., and William N. Evans. “The Effect of Income on Mortality: Evidence from the Social Security Notch.” *The Review of Economics and Statistics*, 88(3), 2006, 482–95.

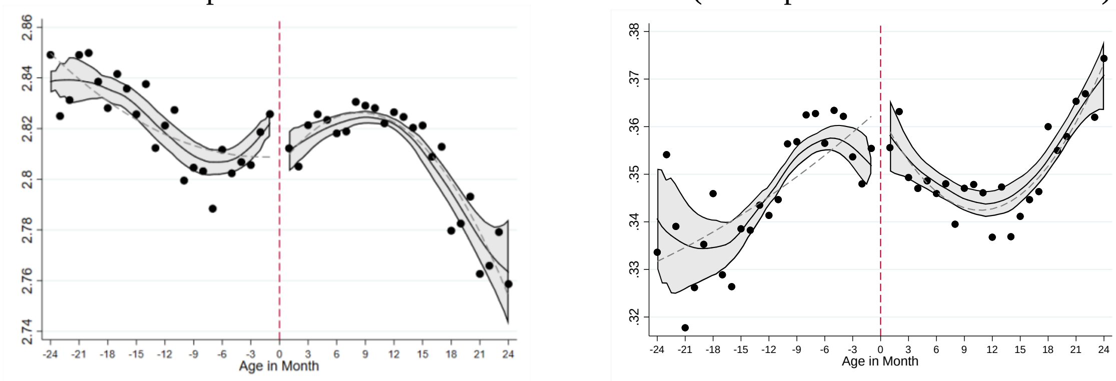
Steptoe, Andrew, Angus Deaton, and Arthur A. Stone. “Subjective Wellbeing, Health, and Ageing.” *Lancet*, 385(9968), 2015, 640–48.

Van Kippersluis, Hans, and Galama, Titus. “Wealth and Health Behavior: Testing the Concept of a Health Cost.” *European Economic Review*, 72, 2014, 197–220.

Figures and Tables

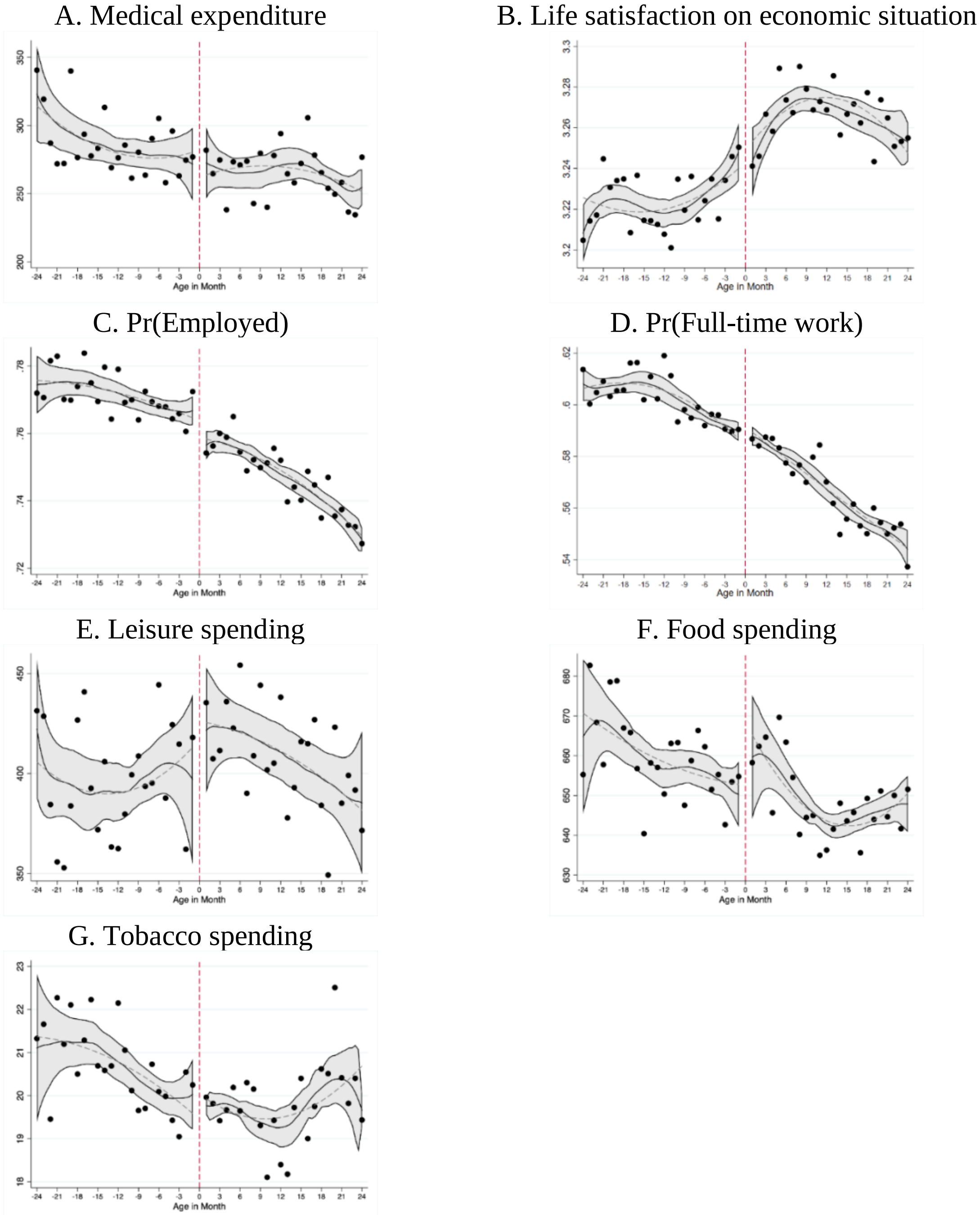
Figure 1. Age Profiles of Health Status

A. Self-reported health status B. Pr(self-reported health status≤fair)



Notes: The horizontal axis represents distance from the month of the 55th birthday. The vertical axis is self-reported health status scores and the probability that self-reported health status is lower than fair in panels A and B, respectively. Dots indicate average of health status in each age in month. Black line is a local linear regression fit separately computed on either side of zero using the Epanechnikov kernel and a bandwidth of 3 months. Shaded area indicates 95% confidence intervals of the local linear regressions. Dashed line is a second order polynomial fit separately computed on either side of zero.

Figure 2. Age Profiles of Medical Expenditure, Life satisfaction, Labor Supply, and Other Consumption Spending



Notes: The horizontal axis represents distance from the month of the 55th birthday. Dots indicate the averages of outcome variables in each age in month. Black line is a local linear regression fit separately on either side of zero using the Epanechnikov kernel and a bandwidth of 3 months. Shaded area indicates 95% confidence intervals of the local linear regressions. Dashed line is a second order polynomial fit separately computed on either side of zero.

Table 1. Early Access to CPF Wealth

Variable	Respondent Age		
	(1)	(2)	(3)
	50-54	55	56-65
Probability of withdrawing any CPF balances when reaching 55	0.41 (0.38)	N/A	N/A
Any withdrawal when reaching 55	N/A	0.45 (0.50)	0.40 (0.49)
Expected amount to withdraw when reaching 55 (conditional on the positive probability of any CPF withdrawal)	23743 (55772)	N/A	N/A
Amount withdrawn conditional on withdrawal when reaching 55	N/A	32852 (61863)	42686 (78769)

Notes: The statistics are based on the SLP Wave 15 (October 2016). Standard deviations are reported in parentheses.

Table 2. RD Estimates of Effects of Early Access to Pension Wealth on Self-reported Health

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent variable: Self-reported health status							
1[Age > 55]	-0.006	0.003	0.020*	0.027*	0.036**	0.044*	0.083***
	(0.009)	(0.010)	(0.010)	(0.014)	(0.017)	(0.026)	(0.024)
Observations	78,138	74,636	71,129	67,638	64,126	60,664	57,238
R-squared	0.023	0.022	0.022	0.022	0.022	0.021	0.021
B. Dependent variable: Pr(Self-reported health status≤Fair)							
1[Age > 55]	0.0001	-0.002	-0.016*	-0.026***	-0.030***	-0.036**	-0.050***
	(0.006)	(0.009)	(0.009)	(0.009)	(0.010)	(0.015)	(0.015)
Observations	78,138	74,636	71,129	67,638	64,126	60,664	57,238
R-squared	0.013	0.013	0.013	0.013	0.013	0.013	0.013
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

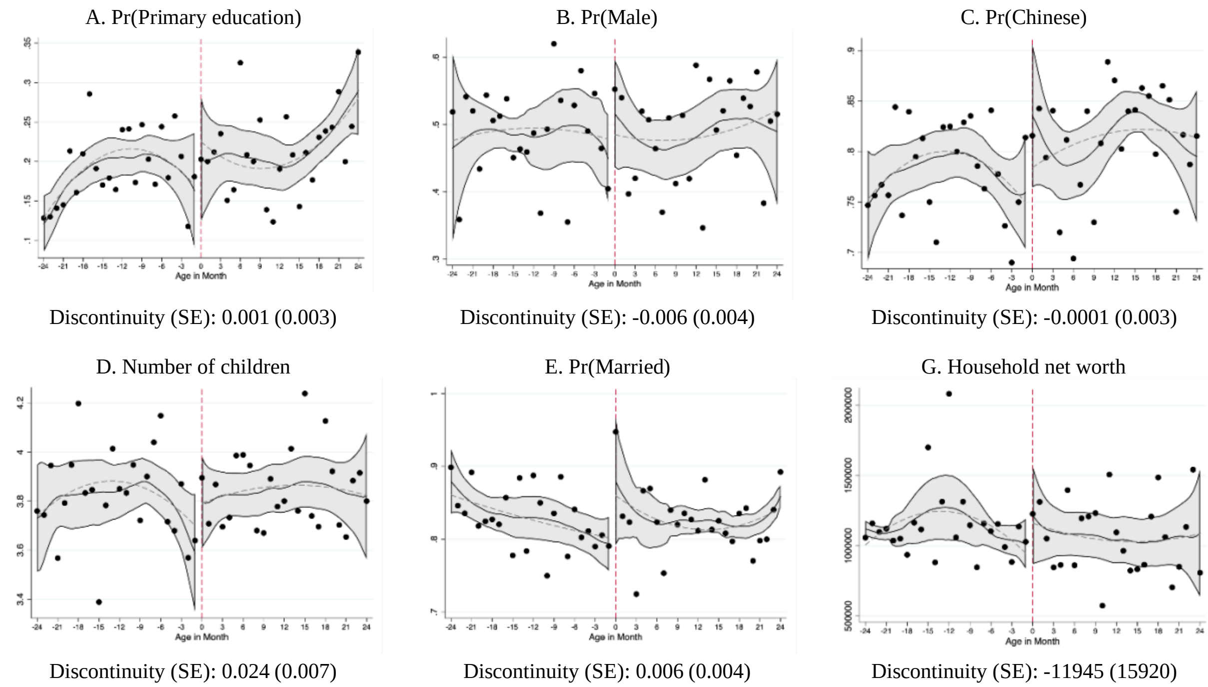
Table 3. RD Estimates of Effects of Early Access to Pension Wealth on Medical Expenditure, Life Satisfaction, Labor Supply, and Other Consumption Spending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent variable: Medical expenditure							
1[Age > 55]	-16.72	-27.22	-31.26	-59.21*	-32.19	-73.40*	-58.16
	(13.14)	(17.15)	(25.42)	(30.31)	(38.40)	(41.12)	(54.84)
Observations	74,286	70,974	67,635	64,313	60,968	57,673	54,425
R-squared	0.041	0.041	0.041	0.041	0.042	0.042	0.041
B. Dependent variable: Life satisfaction on economic situation							
1[Age > 55]	0.004	0.017	0.038**	0.050**	0.061***	0.064***	0.077**
	(0.011)	(0.014)	(0.014)	(0.020)	(0.020)	(0.023)	(0.034)
Observations	78,092	74,593	71,088	67,599	64,089	60,627	57,202
R-squared	0.039	0.039	0.039	0.039	0.039	0.038	0.038
C. Dependent variable: Pr(Employed)							
1[Age > 55]	-0.008**	-0.002	-0.001	0.000	0.001	-0.006	-0.008
	(0.004)	(0.003)	(0.004)	(0.006)	(0.008)	(0.010)	(0.013)
Observations	78,018	74,520	71,018	67,535	64,026	60,568	57,148
R-squared	0.066	0.067	0.067	0.067	0.068	0.068	0.068
D. Dependent variable: Pr(Full-time work)							
1[Age > 55]	0.011***	0.015***	0.016**	0.018**	0.019*	0.022*	0.022
	(0.004)	(0.004)	(0.006)	(0.008)	(0.010)	(0.012)	(0.016)
Observations	70,776	67,589	64,413	61,252	58,065	54,933	51,820
R-squared	0.073	0.074	0.074	0.074	0.074	0.075	0.075
E. Dependent variable: Leisure spending							
1[Age > 55]	13.912	10.753	-14.840	3.212	11.149	-11.958	8.809
	(22.948)	(32.026)	(25.847)	(35.892)	(51.138)	(62.467)	(63.322)
Observations	78,604	75,072	71,541	68,026	64,489	61,003	57,553
R-squared	0.060	0.060	0.059	0.060	0.060	0.062	0.061
F. Dependent variable: Food spending							
1[Age > 55]	12.319**	15.385**	15.798	12.260	28.820*	18.618	14.410
	(5.132)	(7.061)	(9.610)	(13.633)	(14.830)	(18.694)	(24.575)
Observations	78,604	75,072	71,541	68,026	64,489	61,003	57,553
R-squared	0.161	0.162	0.163	0.163	0.163	0.164	0.165
G. Dependent variable: Tobacco spending							
1[Age > 55]	-0.185	0.149	0.748	0.736	0.129	-1.015	-1.422
	(0.567)	(0.718)	(0.771)	(1.043)	(1.383)	(1.870)	(2.795)
Observations	74,791	71,444	68,080	64,731	61,368	58,041	54,773
R-squared	0.012	0.012	0.012	0.012	0.012	0.011	0.011
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Figures and Tables

Figure A1. Age Profiles of Individual Characteristics

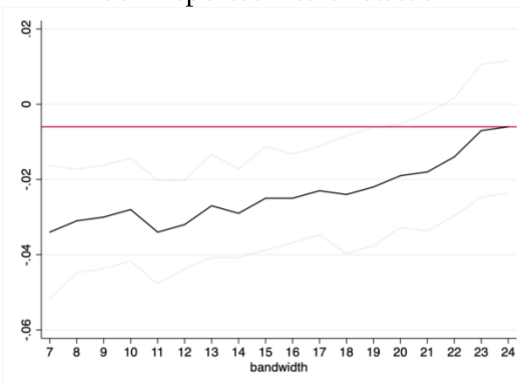


Notes: The horizontal axis represents distance from the month of the 55th birthday. The vertical axis is individuals' demographics. Dots indicate average of health status in each age in month. Black line is a local linear regression fit separately on either side of zero using the Epanechnikov kernel and a bandwidth of 3 months. Shaded area indicates 95% confidence intervals of the local linear regressions. Dashed line is a second order polynomial fit separately computed on either side of zero.

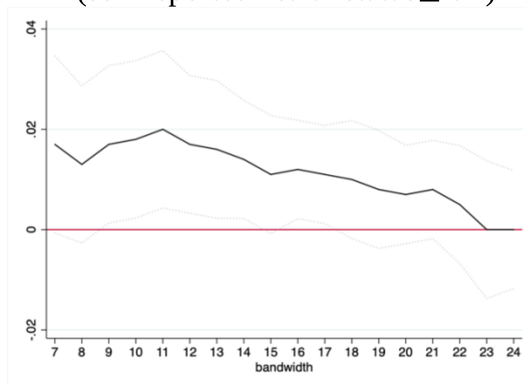
Figure A2. RD Estimates using Alternative Bandwidth

A. Donut hole: 0 month

Self-reported health status

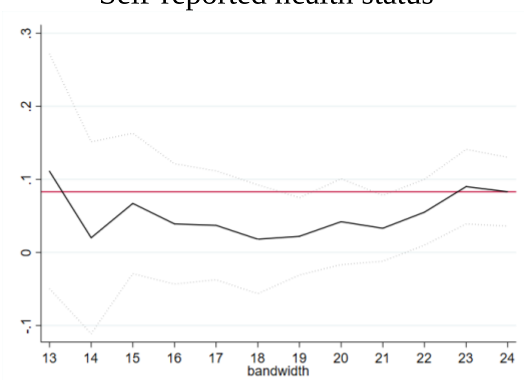


Pr(self-reported health status≤fair)

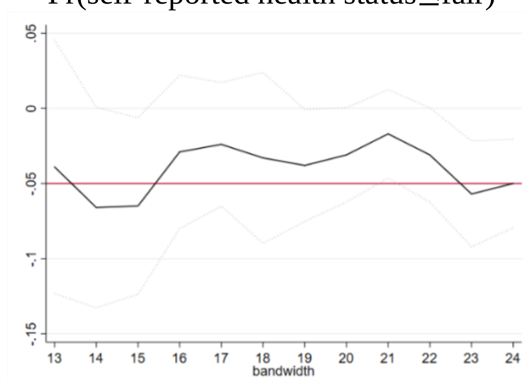


B. Donut hole: 6 months

Self-reported health status



Pr(self-reported health status≤fair)



Notes: The horizontal axis represents the size of bandwidths. The vertical axis represents the magnitude of coefficient estimates. The horizontal red line denotes the coefficient estimate of the baseline estimate in which the bandwidth is 24 months. The black line represents the RD estimate for each bandwidth. Dotted lines represent the 95% confidence intervals.

Table A1. Allocation of CPF Contributions by Account and Age

Employee's age (years)	Allocation Rates from 1 Jan 2016 (for monthly wages ≥ $750)			
	Ordinary Account (% of wage)	Special Account (% of wage)	Medisave Account (% of wage)	Total
35 and below	23	6	8	37
Above 35 to 45	21	7	9	37
Above 45 to 50	19	8	10	37
Above 50 to 55	15	11.5	10.5	37
Above 55 to 60	12	3.5	10.5	26
Above 60 to 65	3.5	2.5	10.5	16.5
Above 65	1	1	10.5	12.5

Source: CPF Board (2016)

Table A2. Maximum CPF balances allowed to withdraw upon reaching 55th birthday

Individuals can choose to withdraw the remaining CPF balances (excluding top-up monies, government grants, and interest earned in your Retirement Account) after setting aside the Full Retirement Sum or the Basic Retirement Sum with sufficient CPF property charge/pledge. Or, they can withdraw up to $5,000 of Ordinary and Special Account savings if they are unable to set aside the Full Retirement Sum (FRS) or the Basic Retirement Sum (BRS) with sufficient CPF property charge/pledge. The FRS is the required balance to receive a life annuity (called CPF Life) after the claiming age in Singapore. The BRS is the less generous version of the CPF Life annuity with a lower required amount. The Full Retirement Sum or the Basic Retirement Sum has been gradually increasing over the years as follows:

55th birthday on or after	Full Retirement Sum
1 July 2015	$161,000
1 January 2017	$166,000
1 January 2018	$171,000
1 January 2019	$176,000
1 January 2020	$181,000

Table A3. RD Estimates of Effects of Early Access to Pension Wealth on Self-reported Health
Excluding Control Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent variable: Self-reported health status							
1[Age > 55]	-0.011	-0.007	0.015*	0.018	0.026	0.038	0.081***
	(0.009)	(0.012)	(0.008)	(0.013)	(0.018)	(0.026)	(0.019)
Observations	82,203	78,509	74,824	71,144	67,426	63,795	60,196
R-squared	0.000	0.000	0.001	0.001	0.001	0.001	0.001
B. Dependent variable: Pr(Self-reported health status≤Fair)							
1[Age > 55]	0.002	0.003	-0.013	-0.018**	-0.021**	-0.030**	-0.044***
	(0.007)	(0.010)	(0.008)	(0.008)	(0.010)	(0.013)	(0.015)
Observations	82,203	78,509	74,824	71,144	67,426	63,795	60,196
R-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Table A4. RD Estimates of Effects of Fake Early Access to Pension Wealth

Dependent variable: self-reported health status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Cutoff age (c): 52 years							
1[Age > c]	0.014	0.032	0.025	0.003	-0.000	0.077	0.092
	(0.020)	(0.023)	(0.029)	(0.042)	(0.056)	(0.060)	(0.096)
Observations	39,340	37,745	36,148	34,540	32,931	31,333	29,756
R-squared	0.022	0.022	0.021	0.021	0.021	0.021	0.021
B. Cutoff age (c): 53 years							
1[Age > c]	-0.003	0.013	0.023	-0.003	-0.001	0.048	0.079*
	(0.015)	(0.019)	(0.026)	(0.022)	(0.034)	(0.035)	(0.045)
Observations	55,713	53,264	50,817	48,382	45,931	43,497	41,087
R-squared	0.023	0.023	0.023	0.023	0.023	0.023	0.024
C. Cutoff age (c): 54 years							
1[Age > c]	-0.016	-0.035***	-0.032**	-0.044***	-0.049**	-0.026	-0.044
	(0.012)	(0.009)	(0.012)	(0.015)	(0.021)	(0.023)	(0.029)
Observations	69,687	66,621	63,534	60,443	57,370	54,296	51,211
R-squared	0.024	0.025	0.025	0.025	0.025	0.026	0.026
D. Cutoff age (c): 56 years							
1[Age > c]	0.003	0.001	-0.000	-0.006	-0.008	-0.038*	-0.039
	(0.007)	(0.008)	(0.010)	(0.015)	(0.022)	(0.022)	(0.026)
Observations	82,435	78,971	75,534	72,079	68,644	65,179	61,711
R-squared	0.021	0.021	0.021	0.021	0.022	0.021	0.022
E. Cutoff age (c): 57 years							
1[Age > c]	0.013	0.018*	0.020	0.019	0.053***	0.062**	0.047**
	(0.010)	(0.010)	(0.014)	(0.021)	(0.018)	(0.026)	(0.018)
Observations	82,635	79,131	75,689	72,233	68,766	65,277	61,793
R-squared	0.019	0.019	0.019	0.019	0.019	0.019	0.020
F. Cutoff age (c): 58 years							
1[Age > c]	-0.024***	-0.023**	-0.029**	-0.036**	-0.038*	-0.009	0.001
	(0.007)	(0.009)	(0.012)	(0.016)	(0.020)	(0.021)	(0.028)
Observations	81,015	77,532	74,066	70,619	67,156	63,744	60,320
R-squared	0.015	0.015	0.015	0.015	0.015	0.016	0.016
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Dependent variable: Pr(self-reported health status ≤ fair)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Cutoff age (c): 52 years							
1[Age > c]	-0.005	-0.010	-0.006	0.008	-0.005	-0.047	-0.089*
	(0.009)	(0.013)	(0.018)	(0.020)	(0.029)	(0.037)	(0.045)
Observations	39,340	37,745	36,148	34,540	32,931	31,333	29,756
R-squared	0.013	0.013	0.013	0.013	0.013	0.013	0.013
B. Cutoff age (c): 53 years							
1[Age > c]	0.015	0.005	-0.008	0.004	0.008	-0.016	-0.068***
	(0.011)	(0.010)	(0.011)	(0.013)	(0.020)	(0.029)	(0.021)
Observations	55,713	53,264	50,817	48,382	45,931	43,497	41,087
R-squared	0.014	0.014	0.014	0.014	0.014	0.014	0.015
C. Cutoff age (c): 54 years							
1[Age > c]	0.010*	0.017***	0.020**	0.026**	0.017	0.002	0.018
	(0.006)	(0.006)	(0.009)	(0.012)	(0.015)	(0.016)	(0.019)
Observations	69,687	66,621	63,534	60,443	57,370	54,296	51,211
R-squared	0.014	0.014	0.014	0.015	0.015	0.014	0.015
D. Cutoff age (c): 56 years							
1[Age > c]	-0.006	-0.009	-0.004	0.001	0.002	0.014	0.008
	(0.006)	(0.006)	(0.007)	(0.008)	(0.011)	(0.013)	(0.014)
Observations	82,435	78,971	75,534	72,079	68,644	65,179	61,711
R-squared	0.013	0.013	0.013	0.013	0.013	0.013	0.014
E. Cutoff age (c): 57 years							
1[Age > c]	-0.001	-0.002	-0.002	-0.009	-0.028***	-0.032**	-0.026**
	(0.006)	(0.007)	(0.010)	(0.014)	(0.009)	(0.014)	(0.012)
Observations	82,635	79,131	75,689	72,233	68,766	65,277	61,793
R-squared	0.011	0.011	0.011	0.011	0.012	0.012	0.012
F. Cutoff age (c): 58 years							
1[Age > c]	0.009*	0.011*	0.016**	0.021**	0.023*	0.016	0.007
	(0.005)	(0.006)	(0.007)	(0.009)	(0.012)	(0.018)	(0.026)
Observations	81,015	77,532	74,066	70,619	67,156	63,744	60,320
R-squared	0.010	0.010	0.010	0.010	0.011	0.011	0.011
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Table A5. RD Estimates of Effects of Early Access to Pension Wealth on Self-reported Health
Using the Foreigner Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent variable: Self-reported health status							
1[Age > 55]	0.066	-0.199	-0.365	-0.481*	-0.744**	-0.584	-0.522
	(0.189)	(0.174)	(0.234)	(0.281)	(0.321)	(0.426)	(0.672)
Observations	249	237	227	217	206	196	186
R-squared	0.215	0.222	0.219	0.213	0.216	0.209	0.210
B. Dependent variable: Pr(Self-reported health status≤Fair)							
1[Age > 55]	0.065	0.195	0.095	0.050	0.254	0.035	-0.054
	(0.108)	(0.126)	(0.159)	(0.193)	(0.233)	(0.334)	(0.472)
Observations	249	237	227	217	206	196	186
R-squared	0.153	0.156	0.154	0.154	0.159	0.157	0.171
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Table A6. RD Estimates of Effects of Early Access to Pension Wealth on Self-reported Health
Using the Sample of Self-employed or Unemployed Individuals

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Dependent variable: Self-reported health status							
1[Age > 55]	-0.035**	-0.025	0.009	0.009	0.002	0.013	0.032
	(0.016)	(0.022)	(0.015)	(0.020)	(0.027)	(0.040)	(0.045)
Observations	26,799	25,628	24,437	23,258	22,066	20,907	19,757
R-squared	0.023	0.023	0.023	0.022	0.021	0.020	0.020
B. Dependent variable: Pr(Self-reported health status≤Fair)							
1[Age > 55]	0.016	0.011	-0.011	-0.023	-0.038*	-0.043	-0.052
	(0.012)	(0.018)	(0.019)	(0.016)	(0.020)	(0.029)	(0.037)
Observations	26,799	25,628	24,437	23,258	22,066	20,907	19,757
R-squared	0.011	0.011	0.011	0.012	0.011	0.011	0.011
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Table A7. RD Estimates of Effects of Early Access to Pension Wealth on Self-reported Health *by Income*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Using individuals whose average income is below median							
1[Age > 55]	0.008	0.031	0.058***	0.081***	0.086***	0.087**	0.128***
	(0.018)	(0.020)	(0.019)	(0.023)	(0.025)	(0.037)	(0.040)
Observations	35,540	33,981	32,411	30,846	29,271	27,736	26,207
R-squared	0.020	0.020	0.020	0.020	0.020	0.020	0.019
B. Using individuals whose average income is above median							
1[Age > 55]	-0.017*	-0.022**	-0.014	-0.021	-0.012	0.003	0.042
	(0.008)	(0.011)	(0.013)	(0.015)	(0.022)	(0.031)	(0.036)
Observations	42,245	40,317	38,398	36,486	34,564	32,654	30,772
R-squared	0.019	0.018	0.018	0.018	0.018	0.017	0.017
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.

Table A8. RD Estimates of Effects of Early Access to Pension Wealth on Overall Life Satisfaction

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1[Age > 55]	0.006	0.017	0.030**	0.041**	0.039	0.036	0.062
	(0.009)	(0.010)	(0.012)	(0.016)	(0.024)	(0.035)	(0.046)
Observations	78,189	74,680	71,167	67,675	64,161	60,701	57,271
R-squared	0.044	0.043	0.043	0.043	0.042	0.041	0.041
Donut hole Size	0 month	1 month	2 months	3 months	4 months	5 months	6 months

Notes: We restrict the sample to citizens and permanent residents. We include a second order of polynomials of age in month and its full interactions with 1[Age > 55]. Standard errors are clustered at age in month level and corrected for heteroskedasticity. Other controls include education attainments, gender, Chinese ethnicity, number of children, year dummies, and household net worth. *** p<0.01, ** p<0.05, * p<0.1.