Older Americans Would Work Longer If Jobs Were Flexible
Online Appendix

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A Appendix: VRI Sample Characteristics and Comparison with HRS Sample

This Appendix compares the VRI sample used in this paper, i.e., those who completed Survey 4, with the HRS sample from the 2012 wave, focusing on job characteristics. (See Ameriks, Caplin, Lee, Shapiro and Tonetti, 2014, for the more detailed comparisons using the entire VRI sample.) We consider the HRS sample who are at least 55 years old to match the age eligibility for the VRI sample ("age-eligible" sample). To account for the effects of the additional sampling screens used in the VRI, that the respondents need to have at least $10,000 in their Vanguard accounts and be internet eligible, we also consider the subset of the age-eligible HRS sample who have at least $10,000 in non-transactional accounts and have internet access ("VRI-eligible" sample).

Table A.1 presents selected sample characteristics for the VRI sample including age, financial wealth, marital status, and education levels. Ages are distributed approximately equally in age bins 55–59, 60–64, 65–69, 70–74, and 75+, the median household has about $800,000 of financial wealth, 67% have a partner, 34% are female, 76% have a college degree or higher, and 95% report having good health or better. Table A.2 summarizes the distribution of corresponding variables in the HRS sample. The VRI sample tends to be wealthier, more educated, more likely to be married and healthier, though a large part of this gap is explained by the screens imposed in the VRI sampling. After adjusting for sampling weights, 41% of the HRS sample satisfy the VRI sampling screens. Employment status patterns are also similar between the VRI (Table 1) and HRS (Table A.3), though the fraction of those working in a bridge job is higher in the HRS.

In terms of the characteristics of the career job (defined as the job with the longest tenure for the HRS sample), the age-eligible HRS sample (Table A.4) has similar length of tenure, similar working hours, and lower salary than the VRI sample (Table 2). The gap in the salary is smaller for the VRI-eligible HRS sample (Table A.5). The most common industries and occupations of the age-eligibile HRS sample also largely overlap with those from the VRI sample. Overall, these comparisons confirm that once the sampling screens for the VRI are imposed on the HRS sample, the two samples have similar job characteristics.

Table A.1: VRI respondent characteristics

	Age and Wealth					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Age:	60	64	69	75	79	70
Financial wealth:	172,665	394,041	821,252	1,495,714	2,621,855	1,248,491

Married		Education		
Yes	**No**	**< College**	**College**	**> College**
67%	33%	24%	32%	44%

Sex		Health		
		Excellent/		**Fair/**
Female	**Male**	**Very Good**	**Good**	**Poor**
34%	66%	73%	22%	5%

Source: VRI Survey 4 as explained in text.
Notes: Survey 4 respondents. N=2,772. Financial wealth is from Survey 1 and adjusted to 2015 $.

Table A.2: The HRS sample characteristics

A. Age eligible	**Age and Wealth**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Age:	56	60	66	75	83	68
Financial wealth:	-7,716	0	40,126	257,826	718,126	264,974

Married		**Education**		
Yes	**No**	**< College**	**College**	**> College**
50%	50%	72%	13%	15%

Sex		**Health**		
		Excellent/		**Fair/**
Female	**Male**	**Very Good**	**Good**	**Poor**
52%	48%	42%	32%	26%

B. VRI eligible	**Age and Wealth**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Age:	56	59	63	70	77	65
Financial wealth:	21,657	78,706	240,233	599,810	1,229,457	537,920

Married		**Education**		
Yes	**No**	**< College**	**College**	**> College**
67%	33%	51%	22%	27%

Sex		**Health**		
		Excellent/		**Fair/**
Female	**Male**	**Very Good**	**Good**	**Poor**
45%	55%	58%	29%	13%

Source: HRS 2012 wave as explained in text.

Notes: The first panel uses all the "financial respondents" (the respondents who answered questions regarding household finance in case there are multiple respondents in one household) who are age 55 or above (N=11,741). For the second panel we impose additional criteria that respondents are internet eligible and have at least $10,000 in non-transactional accounts (N=3,800). All tabulations are weighted using HRS sampling weights. Financial wealth is in 2015 $.

Table A.3: Employment status: the HRS sample

	By Age					Total
	55-59	**60-64**	**65-69**	**70-74**	**75-**	
A. Age eligible						
Employed (%)	73.6	57.9	39.7	29.2	14.9	43.7
In a career job (%)	41.1	26.8	14.9	8.5	2.8	19.6
In a bridge job (%)	32.5	31.1	24.8	20.7	12.1	24.1
Not employed (%)	26.4	42.2	60.3	70.8	85.2	56.3
Retired (%)	18.0	39.2	58.9	69.9	84.1	53.0
Not retired (%)	8.4	3.0	1.4	0.9	1.1	3.3
N	2,433	2,037	1,291	1,991	3,989	11,741
B. VRI eligible						
Employed (%)	84.5	69.6	47.0	36.2	18.0	58.4
In a career job (%)	50.0	32.2	18.3	10.4	4.4	28.3
In a bridge job (%)	34.5	37.4	28.7	25.8	13.6	30.1
Not employed (%)	15.5	30.5	53.0	63.8	82.1	41.5
Retired (%)	11.8	29.2	52.4	63.2	81.9	39.9
Not retired (%)	3.7	1.3	0.6	0.6	0.2	1.6
N	973	763	555	669	840	3,800

Source: HRS 2012 wave as explained in text.
Notes: See the notes for Table A.2.

Table A.4: Career Job Characteristics: Age-Eligible HRS

A. Retired from career job	**Years worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	6	10	18	28	34	19
Most common industries:	**Manufacturing**					17.3%
	Health care and social assist					11.0%
	Retail trade					8.6%
Most common occupations:	**Office and admin support**					13.1%
	Sales and related					11.2%
	Management					11.1%

B. Working on career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	7	13	21	32	37	22
Salary (in 2015$):	13,716	27,820	50,557	80,249	119,345	68,367
Hours worked (per year):	1,000	1,800	2,080	2,340	2,750	2,015
Self-employed:	**Yes**					24.3%
	No					75.7%
Most common industries:	**Health care and social assist**					14.9%
	Manufacturing					11.2%
	Professional, scientific, tech. services					11.2%
Most common occupations:	**Management**					14.4%
	Sales and related					11.7%
	Office and administrative support					9.4%

Source: HRS 2012 wave as explained in text.
Notes: Career job is defined as the job with the longest tenure. This table uses all the financial respondents who are age 55 or above and reported the tenure on their longest job (N=8,940 for Panel A and N=1,891 for Panel B).

Table A.5: Career Job Characteristics: VRI-Eligible HRS

A. Retired from career job	**Years worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	8	12	20	29	35	21
Most common industries:	**Manufacturing**					18.7%
	Health care and social assist					11.8%
	Educational services					8.1%
Most common occupations:	**Management**					18.5%
	Office and admin support					14.6%
	Sales and related					12.9%

B. Working on career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	9	15	22	32	37	23
Salary (in 2015$):	20,165	39,887	64,199	95,682	144,037	84,124
Hours worked (per year):	1,144	1,820	2,080	2,392	2,860	2,047
Self-employed:	**Yes**					24.1%
	No					75.9%
Most common industries:	**Professional, scientific, tech. services**					14.4%
	Health care and social assist					13.7%
	Manufacturing					12.1%
Most common occupations:	**Management**					18.3%
	Sales and related					11.5%
	Business and financial operation					10.5%

Source: HRS 2012 wave as explained in text.
Notes: Career job is defined as the job with the longest tenure. This table uses all the financial respondents who are VRI-eligible and reported the tenure on their longest job (N=2,890 for Panel A and N=910 for Panel B).

B Appendix: Additional Results from Behavioral Data

B.1 Career Job Characteristics: Workers, by Age Group

Table B.1 tabulates career job characteristics, among those who are still working on their career jobs, for three different age groups: not older than 62, between 63 and 65, and older than 65. The share of workers who are self-employed or have a flexible schedule increases with age, in particular after 65. Only 9% of workers were self-employed before age 63 while 34% of those older than 65 are self-employed. The share having a flexible schedule changes from 36% to 71% between these two age groups. This finding suggests that it is primarily the selection effect that makes these characteristics more common among those who are still on their career jobs compared to those who have separated from their career job. This, in turn, suggests that these characteristics are preferred by older workers and hence encourage them to work longer, consistent with the findings by Ramnath, Shoven, and Slavov (2017).

There are other patterns that are notable. The number of hours worked decreases significantly, in particular in the left tail, after age 65. This suggests again that flexibility in the work schedule is more valued in late life. Being able to reduce the work burden at the beginning of the pathway to retirement seems to be appreciated by older workers. There is no noticeable change in hourly wage. This might be a result of two competing forces: older workers being less productive putting downward pressure on measured earnings and workers with higher wages selecting into working longer putting upward pressure on measured earnings. Note also that the share of jobs with health insurance provision drops significantly at age 65. This may reflect older workers becoming eligible for Medicare at this age.

There are also changes in the distribution of industries and occupations across the age groups. Those working in the manufacturing or transportation and warehousing industries are less likely to stay longer while those who work in professional, scientific, and technical services or educational services are more likely to stay longer. Those who have management positions tend to stay shorter while those who have education-related occupations tend to stay longer.

These findings hint at the job characteristics that encourage workers to stay in their career jobs, even after the normal retirement ages. Having control over their own work schedules (either through self-employment or by having a flexible schedule) seems to be an important factor, and being able to reduce the work burden at the beginning of the pathway to retirement turns out to be a key reason workers want flexible hours.

B.2 Career to Bridge Job Transition and Gaining Flexibility in Work Schedule

In this appendix we provide a more detailed decomposition of the share of bridge jobs with flexible schedules. In particular, we investigate how much of the increase in the share of jobs with flexible schedules from career jobs to bridge jobs is driven by transitions into an industry or occupation where having a flexible schedule is more common and how much is due to an increase in the share of flexible jobs within each industry or occupation. In Table B.2, we list the common industries and occupations for the sample who ever had a bridge job, along with the share of career and bridge jobs in each category (second and third columns) and the share of jobs with flexible schedules among the jobs in

each category (the last two columns).[1]

We find that increases in the share of flexible jobs in each sector dominates the effect of transitions to more flexible industries and occupations. The share of flexible jobs varies across industries and occupations and there is indeed a tendency to switch to industries and occupations that are more likely to offer a job with flexible schedule. For example, older workers tend to leave the manufacturing industry, which has the lowest share of flexible jobs, while educational services, other services, and retail trade, which have higher shares of flexible jobs, attract more workers in late life. The extent of such switches, however, turns out to be too small to explain the large increase in the share of flexible jobs among bridge jobs. On the other hand, there is an increase in the share of flexible jobs within each industry, and the size of that increase is comparable to the overall difference in the share of flexible jobs between the bridge and career jobs. The same pattern also holds for occupations. Hence we conclude the reason a greater fraction of bridge jobs offer flexible schedules is mainly because people move to jobs with more flexibility while staying within their industry or occupation and is not primarily due to transitions to more flexible industries and occupations.

[1] Among 20 industry categories and 23 occupation categories used in the survey, we present the most common 8 industries and occupations.

Table B.1: Career Job Characteristics: Workers, by Age Group

A. Age $\leq$ 62	**Salary, hours worked, hourly wage**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Salary (in 2015$):	30,000	57,000	85,000	123,782	177,964	101,169
Hours worked (per year):	1,440	2,080	2,080	2,340	2,600	2,062
Hourly wage (in 2015$):	19	28	40	58	85	51
Self-employed:	**Yes**					8.8%
	No					91.2%
Had a flexible schedule:	**Yes**					36.3%
	No					63.7%
Health insurance provision:	**Yes**					83.0%
	No					17.0%
B. Age 63-65	**Salary, hours worked, hourly wage**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Salary (in 2015$):	32,000	52,000	85,000	120,917	200,000	107,770
Hours worked (per year):	884	1820	2,080	2,250	2,600	1,944
Hourly wage (in 2015$):	19	28	42	58	120	62
Self-employed:	**Yes**					11.0%
	No					89.0%
Had a flexible schedule:	**Yes**					50.9%
	No					49.1%
Health insurance provision:	**Yes**					85.4%
	No					14.6%
C. Age $\geq$ 66	**Salary, hours worked, hourly wage**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Salary (in 2015$):	3,500	15,500	50,000	94,000	155,000	64,202
Hours worked (per year):	156	480	1,540	2,080	2,160	1,337
Hourly wage (in 2015$):	14	23	44	64	99	61
Self-employed:	**Yes**					33.7%
	No					66.3%
Had a flexible schedule:	**Yes**					71.2%
	No					28.8%
Health insurance provision:	**Yes**					39.2%
	No					60.8%

Source: VRI Survey 4 as explained in text.
Notes: N=321 for group A, N=117 for group B, and N=163 for group C.

Table B.1: Career Job Characteristics: Workers, by Age Group (Continued)

D. Share of selected industries	**Age group**		
	≤62	**63-65**	**≥ 66**
Professional, scientific, and technical services	17.7%	17.1%	21.5%
Manufacturing	12.8%	12.0%	5.5%
Transportation and Warehousing	11.8%	8.6%	3.1%
Health Care and Social Assistance	6.2%	12.8%	8.6%
Educational Services	7.5%	6.8%	12.9%
E. Share of selected occupations	**Age group**		
	≤62	**63-65**	**≥ 66**
Management	21.5%	22.2%	12.3%
Business and financial operations	9.4%	12.8%	14.1%
Computer and mathematical	9.0%	6.8%	10.4%
Office and administrative support	8.7%	10.3%	8.6%
Education, training, library	4.4%	3.4%	11.0%

Source: VRI Survey 4 as explained in text.
Notes: N=321 for group A, N=117 for group B, and N=163 for group C.

Table B.2: Industry and Occupation: Prevalence and Flexibility

A: Industry	Prevalence (%)*		Share of flexible jobs (%)**	
	Career	Bridge	Career	Bridge
Professional, scientific, and technical services	23.0	20.6	26.7	59.9
Manufacturing	12.6	6.3	8.8	25.5
Educational services	9.7	11.3	31.7	52.2
Finance and insurance	9.4	9.6	17.1	51.3
Health care and social assistance	8.6	9.1	45.7	59.5
Public administration	8.1	7.0	15.2	31.6
Other services	4.7	8.6	34.2	67.1
Retail trade	3.1	5.5	32.0	62.2
B: Occupation	**Prevalence (%)***		**Share of flexible jobs (%)****	
	Career	Bridge	Career	Bridge
Management	26.2	18.6	20.7	49.0
Business and financial operations	11.1	12.7	23.3	63.1
Computer and mathematical	8.9	8.3	20.8	47.8
Architecture and engineering	8.5	6.7	17.4	51.9
Education, training, and library	7.5	9.2	39.4	60.0
Office and administrative support	6.9	9.1	14.3	37.8
Sales and related	6.4	8.1	21.2	51.5
Healthcare practitioners and technical	5.7	5.7	52.2	67.4

Source: VRI Survey 4 as explained in text.

Notes: * Prevalence is defined as the share of career and bridge jobs that are in each industry/occupation among the VRI sample who had a bridge job (N=812).

** This share is defined as the share of jobs with flexible schedule among the jobs in each industry/occupation in the entire VRI sample, separately for career and bridge jobs.

C Appendix: Detailed SSQ Scenarios

The SSQs asked in VRI Survey 4 vary in terms of job characteristics, timing of the job offer, and the sample that received the questions. Table C.1 provides the complete list of the SSQs asked. Considered alternative characteristics include allowing for a flexible schedule (respondents can choose the number of hours per year instead of having to work for the same number of hours as in the reference job) and allowing for an alternative occupation (the opportunity comes with an occupation that is different than the reference occupation and is the most preferred one by respondents). The SSQs also vary in terms of the timing of the offer (offer available at the time of the survey, SSQ1A, versus a retrospective offer assumed to have been available at the time of retirement, SSQ1B). They also vary in whether the offer is a new employment situation (SSQ1A, SSQ1B) or a continuation of the current employment situation (SSQ2). In SSQ1A, those who are employed at the time of the survey are asked to imagine that their current employment situations immediately terminate in a manner that does not affect their prospects for future employment. The intention is to make them actively consider post-career employment situations. In SSQ2, they are asked whether they would continue to work in their current job if the characteristics of the job change in the way assumed in the scenarios.

Table C.1: SSQs

Name	Time	Considered job characteristics	Sample asked	Sample size
SSQ 1A	Survey	Fixed schedule, Flexible schedule Alternative occupation	All	2,758
SSQ 1B	Retirement	Fixed schedule, Flexible schedule Alternative occupation	Non-workers	1,658*
SSQ 2	Survey	Fixed schedule, Flexible schedule Search after separation allowed Search after separation not allowed	Workers	754

Source: VRI Survey 4 as explained in text.
Notes: Time refers to the reference period of the SSQ, which is either current (time of the survey), or retrospective (time of retirement).
* For those who are retired within the last two years, the survey did not ask SSQ1B because for them the situation at the time of retirement is too similar to that at the time of the survey.

In Section II.A, we presented details of the scenario offering a job with a fixed schedule at the time of the survey (SSQ1A). In the remainder of this Appendix we present details of the other scenarios, focusing on the differences between the various scenarios.

C.1 SSQ1A: Choices at the Time of the Survey

Flexible Schedule Scenario

This scenario is the same as the fixed schedule scenario except that respondents are allowed to choose the number of hours to work.

- Option A is a new employment situation that involves a **flexible work schedule**. Other than this possible difference, it matches **your reference employment situation** in terms of all other characteristics.

Then respondents are provided with more detailed rules, precisely defining what a flexible work schedule means.

- You can change your regular work schedule at the start of each year but not again until the start of the next year.
- You would have to let your employer know your choice of regular work schedule at the start of the year and you would be expected to meet these work commitments. For example, if you wanted to work half time, you could specify this as half days, or for half as many weeks as usual on a seasonal basis.
- The annual pay is adjusted in proportion (from your reference salary) if you choose to work more or less.
- If you choose option A, there are no restrictions on what you would do with the time that you are not working.

Respondents are then asked about their preferred number of hours per week and number of weeks per year for the following year. The reference salary is adjusted in proportion, and then respondents are asked whether they would accept the offer or not, and then asked to report the reservation wage that makes them indifferent between Option A and B.

Alternative Occupation Scenario

This scenario starts with the following question:

- Would there be an employment situation with a different occupation that you would prefer to **your reference employment situation** under any circumstances?

If the answer is no, respondents skip this scenario. If the answer is yes, then Option A becomes:

- Option A is a new employment situation that involves a **fixed work schedule** in your most preferred alternative occupation. Other than this, the employment situation matches **your reference employment situation** in terms of annual earnings, as well as in as many other characteristics, to the maximum extent possible.

The remainder of the scenario is identical to the fixed schedule scenario.

C.2 SSQ1B: Choices at the Time of Retirement

The structure of SSQ1B is identical to that of SSQ1A except that it concerns choices over hypothetical opportunities if they had been available at the time of retirement from the last job.[2] SSQ1B starts with the following preamble:

- In the questions that follow, we are interested in the employment situations that might have been of interest to you **in the past**. Specifically, we will ask you to report the decision you would have made **immediately after your reference employment situation ended**.
- While it may be hard, we ask you not to answer in light of your current knowledge of what happened since that time, but rather to answer in terms of how you would have behaved if faced with particular employment opportunities at that time. The alternative should be as you would have viewed it at that time, not as you now see it.

Other than the time at which the opportunity was available, there is no difference between SSQ1B and SSQ1A. SSQ1B poses three scenarios, fixed schedule, flexible schedule, and alternative occupation, structured precisely as in SSQ1A.

C.3 SSQ2: Options Allowed for the Current Job

In SSQ2, the opportunities to be considered involve possible continuation of the current job when its characteristics are altered in various ways.[3] Not accepting the offer means that the respondent has to quit the current job immediately and pursue other possibilities including searching for another employment situation or not working. In addition to the value of having a flexible schedule, SSQ2 also measures the option value of being able to search for another job opportunity after quitting the current job, by examining how responses change when respondents are allowed versus not allowed to search after quitting the current job. SSQ2 considers four scenarios, (i) fixed schedule **not** allowing for search after the current job, (ii) flexible schedule **not** allowing for search after the current job, (iii) fixed schedule allowing for search after the current job, and (iv) flexible schedule allowing for search after the current job.

The first scenario, in which the respondent has to work a fixed schedule and is not allowed to search after the current job if they decided to stay in the current job, is presented as follows:

[2] Hence SSQ1B is asked only to the non-workers.
[3] Hence SSQ2 is asked only to those who are currently working.

We are interested in the conditions under which you would want to **stay in your reference employment situation** with a **fixed work schedule**. In the following scenario you must decide between keeping your reference employment situation and instead quitting your current employment situation immediately.

More specifically, you must choose between two options:

- Option A is to **keep your reference employment situation** with a **fixed work schedule**. You may hold this employment situation for as long as you like. Once you exit this employment situation you can no longer be employed in any other employment situation, and must exit the labor force permanently.
- Option B is instead to pursue other possibilities including searching for another employment situation or not working.

Other scenarios are presented as simple variations of this scenario where the respondent either can work a flexible schedule or is allowed to search after quitting the current job (or both).

D Appendix: Additional Results from the SSQs

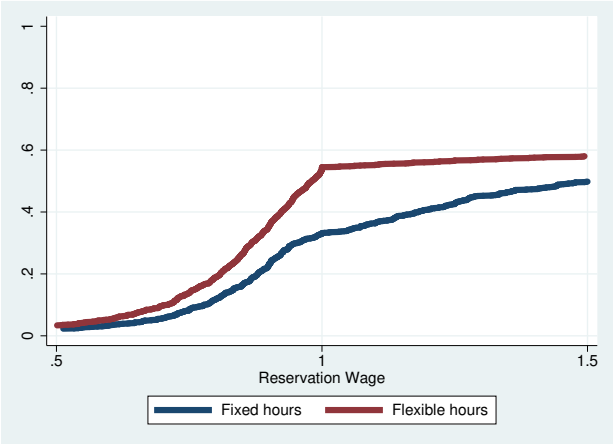
D.1 Full Distribution of Reservation Wages

This Appendix shows the full distribution of reservations wages for all the SSQ scenarios that are asked to non-workers, separately for those who did and who did not have a bridge job (Figure D.1 for offers at the time of the survey and Figure D.2 for offers at the time of retirement).[4] Reservation wages are normalized as a fraction of the reference salary. A reservation wage less than or equal to 1 means the respondent accepts the offer. Figures focus on the range of the reservation wages between 0.5 and 1.5. For Panel C and D, reservation wages under an alternative occupation are plotted only for those who could think of some preferred alternative occupation.

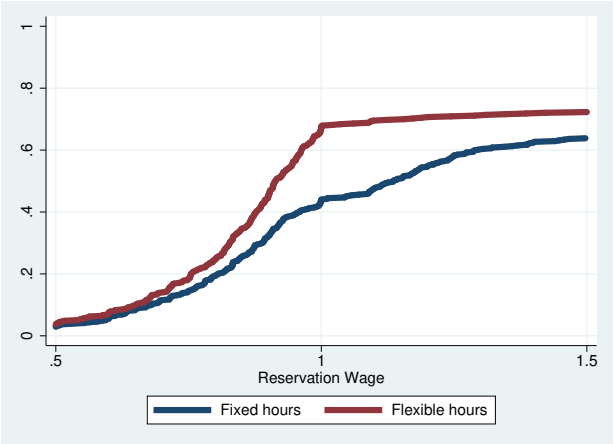
[4]Panel A and B of Figure D.1 and D.2 are included in the main text but also presented here for completeness in describing the SSQ results.

Figure D.1: Reservation wage distribution at the time of the survey

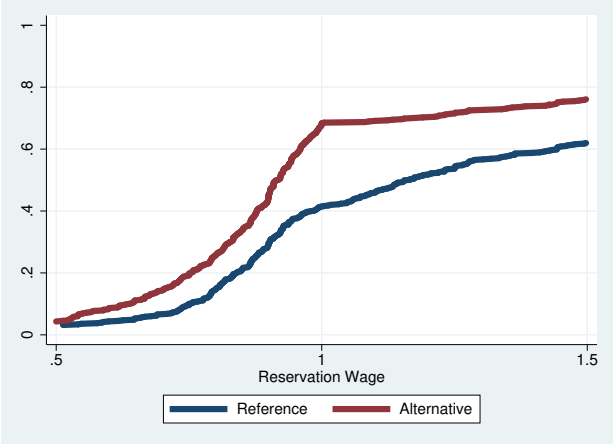
A. Fixed vs. flexible schedule: had no bridge job



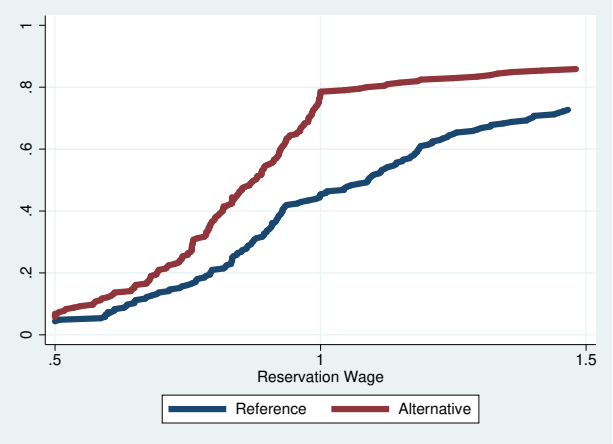
B. Fixed vs. flexible schedule: had a bridge job



C. Alternative vs. reference job: had no bridge job



D. Alternative vs. reference job: had a bridge job

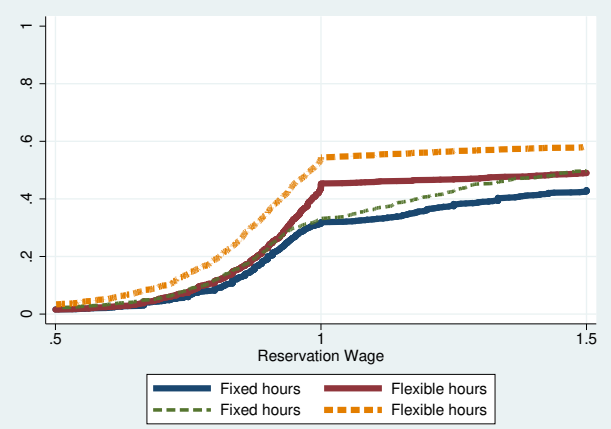


Source: VRI Survey 4 as explained in text.

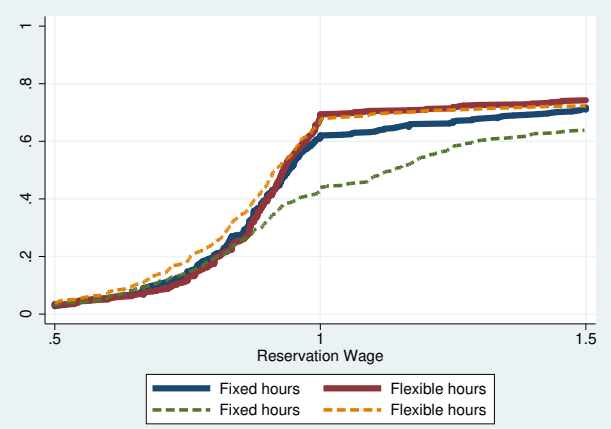
Note: Reservation wage is calculated as a fraction of the wage the respondent had in their reference job. The vertical axis represents CDF. The figure shows the range of reservations wages between 0.5 and 1.5. For Panel C and D we include only those respondents who could think of any alternative occupation.

Figure D.2: Reservation wage distribution at the time of retirement

A. Fixed vs. flexible schedule: had no bridge job

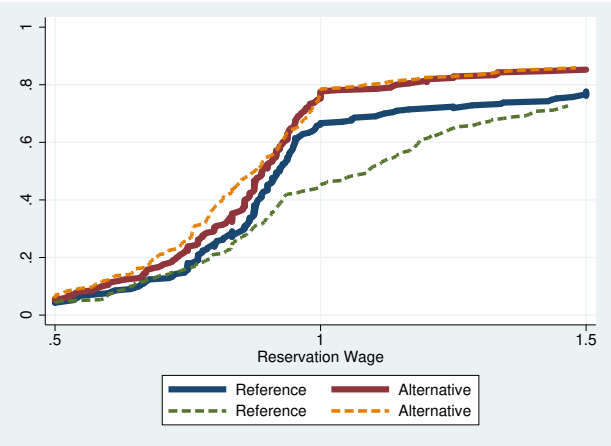


B. Fixed vs. flexible schedule: had a bridge job



C. Alternative vs. reference job: had no bridge job

D. Alternative vs. reference job: had a bridge job



Source: VRI Survey 4 as explained in text.

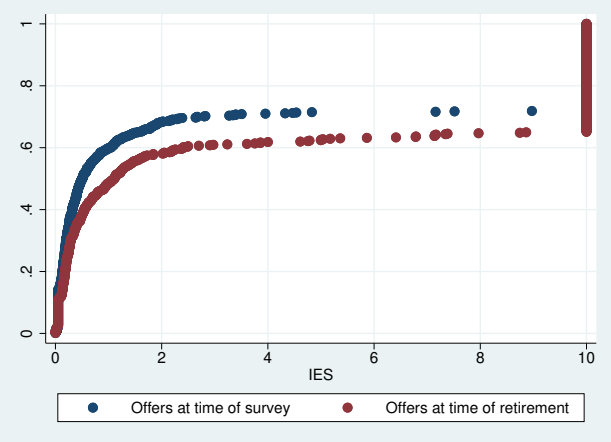
Note: Reservation wage is calculated as a fraction of the wage the respondent had in their reference job. The vertical axis represents CDF. The figure shows the range of reservations wages between 0.5 and 1.5. For Panel C and D we include only those respondents who could think of any alternative occupation. The figure also shows the distributions from the offers at the time of the survey for the corresponding scenarios and groups in dashed curves for comparison.

D.2 IES Estimates under Different Calibrations of Fixed Cost of Work

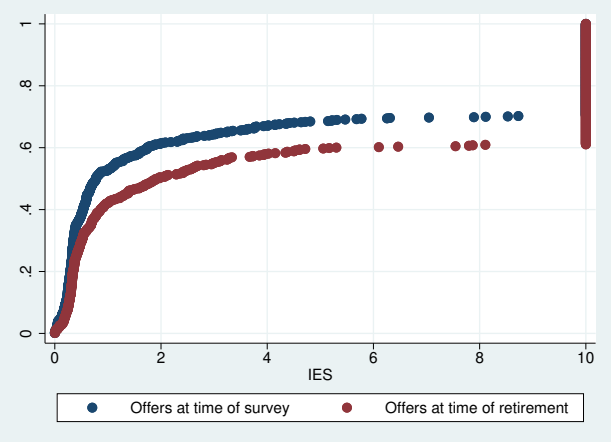
In Figure D.3 we show the distribution of the IES estimates under different calibrations: no fixed cost of work in terms of foregone leisure ($\bar{h} = 0$ and $\hat{c} = 0.14$, Panel A), no fixed expenditure cost of work ($\bar{h} = 0.04$ and $\hat{c} = 0$, Panel B), and no fixed cost of work at all ($\bar{h} = 0$ and $\hat{c} = 0$, Panel C). The estimates tend to be larger in the absence of fixed costs, though the overall pattern of the distribution is not sensitive to the assumed values of fixed costs.

Figure D.3: Distribution of IES estimates: alternative calibrations

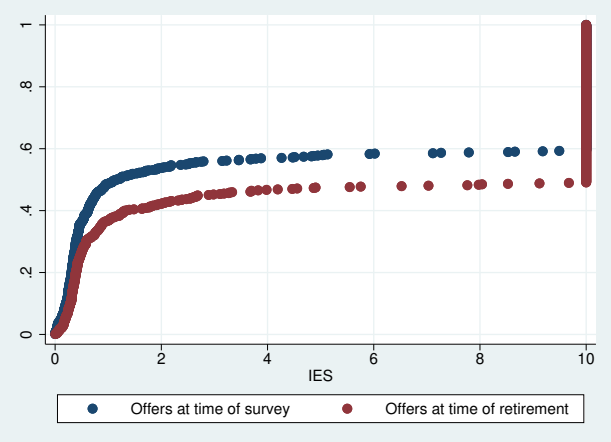
A. No fixed leisure cost



B. No fixed expenditure cost



C. No fixed cost



Source: VRI Survey 4 as explained in text.
Notes: The curves represent CDFs of the estimated IES. N=796 for SSQ1A and N= 668 for SSQ1B. Panel A assumes $\bar{h} = 0$ and $\hat{c} = 0.14$, Panel B assumes $\bar{h} = 0.04$ and $\hat{c} = 0$, and Panel C assumes $\bar{h} = 0$ and $\hat{c} = 0$.

D.3 IES Estimation under a Nonseparable Utility Function

In the main text we estimate the IES from SSQ responses assuming a separable utility function between consumption and leisure. In this Appendix we show that the equation used for the estimation is the same as equation (9) derived from a nonseparable utility function.

The online Appendix of Rogerson and Wallenius (2013) consider a nonseparable utility function used in Trabandt and Uhlig (2009) and Shimer (2010):

$$\frac{1}{1-\eta}c^{1-\eta}\left[1-\kappa(1-\eta)(e\bar{h}+h)^{1+\frac{1}{\phi}}\right]^{\eta}, \tag{D.1}$$

where η, κ, and ϕ are all positive. Note that this utility function is different from the one in equation (1) not only in that consumption and leisure are nonseparable but also in that the marginal utility of leisure when $h = 0$ is zero. Not to confound the effects of these two differences, we change the above nonseparable utility function to:

$$\frac{1}{1-\eta}c^{1-\eta}\left[1+\kappa(1-\eta)\frac{(1-e\bar{h}-h)^{1-1/\gamma}}{1-1/\gamma}\right]^{\eta}, \tag{D.2}$$

where the marginal utility from leisure is nonzero when $h = 0$ and the IES is $\gamma\frac{1-e\bar{h}-h}{h}$ as in (1). By taking the limit $\eta \to 1$ after subtracting a constant term $\frac{1}{1-\eta}$, (D.2) becomes the separable utility function used in (1).

As in the main text, suppose that the choices in SSQs do not affect the marginal value of resources (λ). The household decides consumption such that the marginal utility from consumption is equal to λ. Then the optimal current consumption for a household whose labor supply is h is:

$$c^*(h) = \lambda^{-1/\eta}\left[1+\kappa(1-\eta)\frac{(1-e\bar{h}-h)^{1-1/\gamma}}{1-1/\gamma}\right]. \tag{D.3}$$

Plugging this into the utility function, we get the current flow utility for a household whose labor supply is h as:

$$u(c^*(h),h) = \frac{1}{1-\eta}\lambda^{\frac{-(1-\eta)}{\eta}}\left[1+\kappa(1-\eta)\frac{(1-e\bar{h}-h)^{1-1/\gamma}}{1-1/\gamma}\right]. \tag{D.4}$$

Then the indifference condition between working for the fixed number of hours and not working can be written as:

$$\lambda^{\frac{-(1-\eta)}{\eta}}\kappa\left(\frac{1}{1-1/\gamma}-\frac{(1-\bar{h}-h_{fixed})^{1-1/\gamma}}{1-1/\gamma}\right) = \lambda(h_{fixed}w_{fixed}(1-\hat{c})+c^*(0)-c^*(h_{fixed})), \tag{D.5}$$

where the right hand side now takes into account not only the value of additional earnings but also that of any difference in the consumption between when not working and when working h_{fixed}. By

plugging (D.3) into (D.5), we get:

$$\lambda^{\frac{-(1-\eta)}{\eta}}\kappa\eta\left(\frac{1}{1-1/\gamma}-\frac{(1-\bar{h}-h_{fixed})^{1-1/\gamma}}{1-1/\gamma}\right)=\lambda(h_{fixed}w_{fixed}(1-\hat{c})). \tag{D.6}$$

Similarly, the indifference condition between working for the fixed number of hours and working for the number of hours chosen by the respondent can be written as:

$$\lambda^{\frac{-(1-\eta)}{\eta}}\kappa\eta\left(\frac{(1-\bar{h}-h_{flex})^{1-1/\gamma}}{1-1/\gamma}-\frac{(1-\bar{h}-h_{fixed})^{1-1/\gamma}}{1-1/\gamma}\right)=\lambda(h_{fixed}w_{fixed}-h_{flex}w_{flex}). \tag{D.7}$$

Note that equations (D.6) and (D.7) are the same as equations (7) and (8) except for that (D.6) and (D.7) have $\lambda^{\frac{-(1-\eta)}{\eta}}\kappa\eta$ instead of α_t multiplied on the left hand side. But this is a term that cancels out when dividing one indifference condition by the other, so in the end the equation used for estimation is the same equation (9).

In addition, one can easily show that the relationship between the necessary nonconvexity in production to explain an abrupt retirement and the IES is not affected by introducing nonseparability in the utility function. If we redo the exercise in online Appendix C of Rogerson and Wallenius (2013) using (D.2) instead of (D.1), we find that the condition for the minimum value of θ required to generate an abrupt retirement is exactly the same as equation (6).

E Appendix: Additional Robustness and Credibility Checks on the SSQ responses

This Appendix reports results from the additional tests on robustness and credibility of the SSQ responses that are not reported in the main text. The first test shows external consistency of the SSQ responses under the alternative occupation scenario by comparing them to actual search behavior. The next two tests confirm internal consistency of the SSQ responses. The last test confirms understanding of the hypothetical situation by reporting results from the comprehension tests that were implemented during the survey.

E.1 Search Behaviors and SSQ Responses: Alternative Occupation

We find consistency between the responses to the SSQs under the alternative occupation scenario and actual search behavior. Those who actually looked for a job either in a different occupation or a different industry are more likely to accept the offer in the SSQ that allows for an alternative occupation.[5] As a result, the impact of allowing for an alternative occupation on the acceptance rate is the largest for this group.

Table E.1: Search behaviors and SSQ responses: Alternative Occupation

	N	**Acceptance rate**	
Searched for		**Reference occupation**	**Alternative occupation**
Did not search	1,188	33.7	26.2
Alternative occupation/industry	53	39.6	47.2
Other than alternative occupation/industry	94	30.9	33.0

Notes: The tabulation includes only retirees who did not have a bridge job. In calculating the acceptance rate for an alternative occupation scenario, those who cannot think of any alternative occupation are considered as not accepting the job. Hence the acceptance rate is calculated as the multiplication of two probabilities: whether they can think of a preferred alternative occupation and whether they will accept the offer made in the preferred occupation.

E.2 Consistency in Responses

The SSQs ask about the same types of job but differ in the timing of the offer: one at the time of the survey and the other at the time of retirement. If the responses truly reflect the respondents' preferences, we expect there to be a positive correlation between the responses for the same job characteristics offered at different times.

For both fixed and flexible schedule scenarios, the extensive margin choices are strongly positively correlated between the SSQs asked at different times. If a respondent accepts the offer at the time of

[5] Those who cannot think of an alternative occupation are included as not accepting an offer in that scenario.

the survey then he is more likely to do the same at the time of retirement. The correlation between the responses to the offers at different times is 0.42 for a fixed schedule scenario and 0.45 for a flexible schedule scenario, where the t-statistic for the null of no correlation is 19.7 for the former and 21.1 for the latter.

E.3 Reasonableness of Responses

If the response switches from accept to do not accept when we make the offer more attractive either by allowing for a flexible schedule or an alternative occupation under the same level of offered salary, then it can be considered unreasonable. In Table E.2, we calculate the share of unreasonable responses, in various questions.

We find that the share of unreasonable responses is small. It is less than 4 percent under any comparison. The share is still small even when we consider only the switchers, defined as responses that change at the extensive margin between the two scenarios considered. For each comparison, between one fifth to a quarter of respondents switched their responses. More than 80% of switchers switch in the expected direction, in all cases.

Table E.2: Reasonable Responses: Share of unreasonable changes in responses (%)

	Share of unreasonable changes in responses	
	Among all responses	**Among switchers**
Time of the survey		
Allowing for flexible schedule	1.9	7.9
Allowing for alternative occupation	1.7	6.1
Time of retirement		
Allowing for flexible schedule	3.3	18.8
Allowing for alternative occupation	3.5	16.6

Note: Switchers are defined as those who change their responses between the two scenarios considered.

E.4 Comprehension Test Results

Given the intensive use of hypothetical situations in the SSQs, it is important to check whether the respondents fully understood the assumed scenarios before they answered the SSQs. Whenever the survey introduces a new type of scenario, it asks a set of comprehension tests to verify that respondents understood the assumed scenario and associated rules correctly. If the respondents do not correctly answer all questions on their first try, the questions they missed are repeated. If they incorrectly answer any questions on their second try, they are told the correct answer.

Table E.3 summarizes the results of the comprehension tests (the number of questions correctly answered after their second try). Median respondents answer almost all questions correctly even on their first try. On their second try, respondents rarely miss any of the questions. This confirms that

the respondents were paying attention during the survey and they did not have much difficulty in understanding the assumed hypothetical scenarios.

Table E.3: Comprehension test results

	10p	25p	50p	75p	90p	N
Fixed schedule (Best score: 7 for married and 6 for singles)						
First trial (married)	3	4	6	6	7	1,835
Second trial (married)	5	6	7	7	7	1,835
First trial (singles)	3	4	5	6	6	923
Second trial (singles)	5	5	6	6	6	923
Flexible schedule					(Best score: 4)	
First trial	2	3	4	4	4	2,757
Second trial	3	4	4	4	4	2,757
Alternative occupation					(Best score: 3)	
First trial	2	2	3	3	3	1,264
Second trial	3	3	3	3	3	1,264

Source: VRI Survey 4 as explained in text.
Note: Table shows the number of correct answers from the comprehension tests for the first and second trials. Best score is the total number of questions asked and it varies across scenarios. Married are respondents who are married or in a relationship sharing financial decisionmaking. For the fixed schedule scenario the best score is different between married and single respondents as the test asked one more question to the married respondents.