Older Americans Would Work Longer If Jobs Were Flexible*

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Abstract

Older Americans, even those who are long retired, have strong willingness to work, especially in jobs with flexible schedules. For many, labor force participation near or after normal retirement age is limited more by a lack of acceptable job opportunities or low expectations about finding them than by unwillingness to work longer. This paper establishes these findings using an approach to identification based on strategic survey questions (SSQs) purpose-designed to complement behavioral data. These findings suggest that demand-side factors are important in explaining late-in-life labor market behavior and may be the most appropriate target for policy aimed at promoting working longer.

JEL classification: E24, J22, J26

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1 Introduction

In many advanced economies, the share of the population that is of working age (age 20–64) is projected to fall significantly in the coming decades. In the U.S., for example, the fraction of the population age 65 or older will rise from around 20 percent of the working age population in 2007 to 40 percent by 2050 (Gruber and Wise, 1998, 2007, OECD, 2006). This dramatic shift poses several economic challenges, notably increased financial strain on public pensions and Medicare (Fuchs, 1984, De Nardi, Imrohoroglu, and Sargent, 1999, Lee and Skinner, 1999, Kotlikoff, Smetters, and Walliser, 2002, Attanasio, Kitao, and Violante, 2007).

In response to population aging, many countries are starting to enact or at least consider policies that encourage older workers to work longer. The appropriate policy depends on whether observed patterns of late-in-life labor market behavior more reflect the demand or the supply side of the labor market. Given the importance of separately identifying supply- and demand-side forces, significant research effort has been dedicated to this question. Yet answers remain elusive because there is no obvious behavioral imprint of frustrated desires. On the supply side, lack of employment beyond historically normal retirement ages may represent older workers' low willingness to continue to work under current market and institutional incentives. On the demand side, employers might be unwilling to adapt pay or work schedules to accommodate changes in older workers' abilities or desires. Analyses of behavioral data typically require strong assumptions to generate estimates of structural parameters that separately identify causal factors. There is limited credible exogenous variation in the data concerning opportunities to work. Moreover little is known about the opportunity sets generating observed retirement behavior, and many of the choices are confounded by shocks, such as to health of workers or health of firms.

In this paper we introduce an approach to separating supply- and demand-side forces using strategic survey questions (SSQs). These are stated preference questions custom-designed to complement available behavioral data on labor market outcomes. Building on previous work using similar types of survey questions (Barsky, Juster, Kimball and Shapiro, 1997, Ameriks, Caplin, Laufer and van Nieuwerburgh, 2011, Ameriks, Briggs, Caplin, Shapiro and Tonetti, 2016), we designed the SSQs to be comprehensible and meaningful to respondents. We implemented the SSQs in the Vanguard Research Initiative (VRI), a panel of American Vanguard clients more than 55 years old. These SSQs are not confounded by perceived job opportunities. They directly control for job opportunities in hypothetical situations, which allows us to identify willingness to work independent from what workers can expect to find available in the actual labor market. Indeed, we explicitly pose questions that allow us to estimate willingness to work in arrangements that may not currently be prevalent, involving, in particular, a flexible schedule. The SSQ approach is particularly useful in the context of late-in-life work where the gap between the desired and available opportunities may play a more important role. In particular, given the evidence on part-time options being relatively more common among post-career bridge jobs (Maestas, 2010 and Rupert and Zanella, 2015) or self-employment (Ramnath, Shoven, and Slavov, 2017), we seek to answer whether older workers would take up jobs with flexible schedules even if that is not part of their current opportunity set.

We find that older workers would work longer if schedules were flexible. Based on the SSQs that

offer the option to work shorter hours, many workers would take up this option, even if it involved a more than proportional reduction in earnings. Older Americans, even those who are long retired, have a strong willingness to work, especially in a job with a flexible schedule.

- About 40 percent of retirees, mostly in their late 60s or 70s, are willing to work again at the time of the survey if all the conditions are the same as their last job, including hourly wage, total number of hours, and type of job.

- Willingness to work becomes much stronger if they can choose hours flexibly instead of having to work the same number of hours as in their last job on a fixed schedule. About 60 percent of retirees would be willing to return to work with a flexible schedule. Furthermore, 20 percent of retirees would be willing to take more than a 20 percent hourly wage reduction to do so. This preference for a flexible work schedule is also consistent with actual labor-market transitions of VRI respondents: A flexible schedule is more common in post-career, pre-retirement bridge jobs than career jobs and is commonly reported as a desired characteristic in respondents' post-career job searches.

If individuals would be willing to work longer were jobs flexible, what then explains the low equilibrium incidence of part-time work late in life? SSQs provide credible evidence of latent labor supply. Consequently, the findings of the paper strongly support the implication that employers do not find it profitable to employ older workers later-in-life on part-time schedules. Further research is required to establish the source of this low labor demand, e.g., declining productivity with age, lower productivity of workers when not on full-time schedules, or interactions of these factors. The implication that labor demand plays an important role is, however, not just supposition. This paper provides evidence that many older workers would be willing to trade lower wage rates for preferred work schedules. So even though the paper does not have direct evidence on labor demand, its price and quantity findings from the supply side quantify the strength of the demand-side factors needed to explain why the modal U.S. worker transitions directly from full-time work to complete retirement.

To quantify the supply and demand factors that generate labor market patterns, we use SSQs to estimate parameters of the late-in-life labor supply model developed in Rogerson and Wallenius (2013, RW hereafter). Many workers directly transition from a full-time career job to complete retirement. Preferences for smoothing leisure would imply a more gradual decline in labor supply. The RW model addresses the challenge this work pattern poses to standard theories of labor market outcomes. In the RW model, a preference for a smooth lifecycle profile of leisure consumption, and therefore distaste for abrupt retirement, can be overcome by either a very high intertemporal elasticity of substitution (IES) for labor or strong nonconvexity in production that limits part-time employment opportunities. As RW note, separately identifying these two factors is difficult, and the IES values estimated from retirement transitions critically depend on the strength of the assumed nonconvexities. In addition to providing new measures of willingness to work, the SSQs are (by design) particularly informative of structural parameters that govern late-in-life labor market behavior. Our estimates suggest preferences for smoothing labor that are generally in line with prior estimates, providing further evidence that a lack of acceptable job opportunities, likely due to a nonconvexity in production, accounts for the

discrete labor force exits. Furthermore, by directly estimating the IES using SSQs, we place bounds on the size of the production nonconvexities needed to explain observed labor market life-cycle patterns.

The remainder of the paper is structured as follows. In Section 2 we provide an overview of our sample and survey. In Section 3 we analyze the observed late-in-life labor market behavior of our sample, focusing on evidence that flexibility in the work schedule is associated with Americans working longer. Section 4 introduces the SSQs and documents the reservation wages at which workers would accept job offers of various types. In Section 5 we address the challenge of separately identifying demand- and supply-side factors based on the RW model and use the SSQs to place bounds on the nonconvexities on the production side that discourages part-time work. We discuss related literature in Section 6. Section 7 concludes.

2 Sample and Survey

This paper uses the Vanguard Research Initiative (VRI), a linked survey-administrative data panel drawn from account holders at The Vanguard Group, Inc., a leading investment management company. The VRI is composed of a sample of account holders at Vanguard who are at least 55 years old, have at least $10,000 at their Vanguard accounts (to ensure their non-trivial engagement with Vanguard), and have internet access enabling them to complete the online surveys. We refer to Ameriks, Caplin, Lee, Shapiro and Tonetti (2014) for more detailed descriptions of the sample selection criteria, summaries of demographic and financial variables, and comparison to other data sets.

VRI Survey 4, which studies labor market participation and retirement, is the primary data source for this paper.[1] This survey consists of two parts. The first gathers a detailed history of employment and search behavior, extending the job history battery from the Health and Retirement Survey (HRS) to cover retirement paths and employment in post-career bridge jobs. The second section of the survey comprises the SSQs analyzed in Section 4.

Before discussing our main survey results, we first provide summary statistics for the 2,772 respondents who completed VRI Survey 4. Table 1 shows selected sample characteristics including age, financial wealth, marital status, and education levels. This sample is wealthier, healthier, and more educated than a representative population. 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. Although these differences diminish when compared to the HRS subsample that meet the VRI sample selection criteria (Appendix Table A.1), the VRI remains slightly more educated and healthier. However, because VRI participants remain healthier longer and have higher human capital (as proxied by education), this sample represents a population strata that likely remain productive longer and for whom understanding sudden labor force withdrawals is particularly policy relevant.

Table 2 presents summary statistics on employment status and age at the time of the survey. Labor force participation patterns look broadly similar to those of the general population (see Appendix Table A.2 for comparison to HRS). In particular, we observe a significant decrease in participation

[1] To date, five VRI surveys have been administered. Survey 4 was administered in October 2015. See `http://ebp-projects.isr.umich.edu/VRI/survey_overview.html` for more details.

Table 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%

Notes: Survey 4 respondents. N=2,772. Financial wealth is from Survey 1 and adjusted to 2015 $.

between age 60 and 65, the primary ages at which individuals qualify for public and private pensions. Furthermore, the labor force participation rate falls to 27% between ages 65-69, and falls even further after age 70. Finally, among individuals who are not working, very few consider themselves not completely retired, with the relative share in this category diminishing with age.

Table 2: Labor force participation status

	By Age					Total
	55-59	**60-64**	**65-69**	**70-74**	**75+**	
Retired, completely (%)	11.0	32.8	68.1	82.6	90.3	64.7
Retired, not completely (%)	2.9	5.4	4.8	5.1	3.6	4.5
Not retired (%)	86.1	61.9	27.1	12.3	6.2	30.8
N	273	522	646	632	699	2,772

In the survey the career job is defined as the longest or main job respondents held after age 40, while a bridge job is any job held after leaving the career job.[2] Appendix Table B.1 presents key characteristics of career jobs of the sample, separately for those who retired from their career jobs and those who are still working on their career jobs. Most of the career jobs are full time jobs. The most common number of working hours is 2,080 per year, which is 40 hours per week for 52 weeks. Respondents typically worked for fairly long in their career jobs. More than half of the sample worked for more than 20 years. The most common industry is professional, scientific, and technical services

[2]When respondents have multiple bridge jobs, the survey focuses on the most recent one.

while the most common occupation is management. Self-employment is rare. Most did not have a flexible schedule. We find similar career job characteristics from the VRI-eligible HRS sample (see Appendix Table A.4).

In the next section we provide more details on the employment patterns, retirement paths, and job search decisions of our sample.

3 Labor Market Activity After a Career Job: The Role of Flexible Schedules

In this section we present two main findings from our measures of historical employment and job search behaviors. First, about half of our sample reveal interest in working after exiting a career job by either searching for or securing such employment. Second, when searching for post-career employment, older workers prioritize flexibility in their work schedule. These findings derive from data on bridge jobs, career jobs, and post-career job search behavior.

3.1 Bridge Jobs

Though a sudden withdrawal from the labor force around the typical retirement age is the most common retirement pattern in our sample, a significant fraction of the sample work beyond age 65 either on their career job or a bridge job.[3] Of 2,772 respondents, we find that 2,146 respondents have separated from their career jobs, with 811 of these individuals engaging in a post-career bridge job. Given that some might still return to the labor market, this is clearly a lower bound. Hence, the 38% of VRI respondents that had a bridge job in the VRI is roughly comparable to the 52% of HRS respondents documented in Maestas (2010).

Characteristics of bridge jobs and how they compare to those of career jobs hint at which job characteristics are valued by older Americans. Table 3 compares the the characteristics of the bridge jobs and career jobs for the respondents who did have a bridge job.[4] There are several notable patterns in this table. First, wages and hours of bridge jobs are both lower than those of the career job. Second, we observe that bridge jobs are more likely to be self-employed (23%, compared to 6% in career jobs) and more likely to have a flexible work schedule (54%, compared to 24% in career jobs). Third, bridge jobs are much less likely to provide health insurance, which may reflect older workers being eligible for Medicare. The share of bridge jobs with health insurance provision indeed drops at age 65, when workers become eligible for Medicare, from 54% to 35%. Taken altogether, Table 3 suggests that older workers desire a change to a job with less burden of work and greater flexibility in work schedule, but accept lower earnings and benefits.

While suggestive, the above patterns do not clearly indicate workers' preference for more flexible employment. Alternatively, workers might need to change to industries or occupations where flexible schedules are more common to successfully find post-career employment. We indeed observe that a

[3]Recall that the survey defines the career job as the longest and most important job held since age 40. The survey asks about one subsequent job (if any)—either the current job for those still working or the last job. We define this post-career job as the bridge job for this analysis.

[4]See Appendix Table B.1 for characteristics of the career jobs for the entire sample.

Table 3: Comparison: bridge jobs vs. career jobs

Hours and Earning

	Ratio of Bridge/Career				
	10p	**25p**	**50p**	**75p**	**90p**
Hours	0.06	0.21	0.74	1	1
Hourly wage	0.19	0.44	0.80	1.14	1.7
Annual salary	0.03	0.10	0.44	0.87	1.18

Job Characteristics, Career to Bridge

Self-Employed		**Flexible Schedule**		**Health Insurance Provided**	
Career	**Bridge**	**Career**	**Bridge**	**Career**	**Bridge**
6.4%	23.3%	24.0%	53.5%	87.8%	41.0%

Notes: N=812. Characteristics of career versus bridge jobs for respondents with bridge jobs.

significant fraction of bridge jobs entail a change in industry (43.6%) or occupation (35.1%), though drastic changes in occupation characteristics are less common (Table 4, Panel A).[5]

To address these confounding effects, we examine whether the likelihood of obtaining flexibility in the work schedule on the bridge job depends on whether the worker changed industry or occupation (Table 4, Panel B). Those who change either industry or occupation are indeed more likely to have a flexible schedule on bridge jobs, but the difference is very small. Slightly more than half gained flexibility when they changed industry (51%) or occupation (53%). The numbers are smaller but similar for those who stayed in the same industry (44%) or in the same occupation (44%). Changing occupation category does not significantly affect the likelihood of gaining flexibility in the work schedule. In Appendix B.2 we provide more detailed analysis of the transitions between industries and occupations on the one hand and changes in the share of flexible jobs within each industry and occupation on the other hand, confirming this broad conclusion. We conclude that changes in industry or occupation do not explain the increased prevalence of flexible schedules in bridge jobs.

3.2 Job Search after Career Job

The willingness to work reflected in the actual job history analyzed above is likely underestimated, both because some workers may still find post-career-job employment after we fielded the survey and because some workers desiring bridge jobs might not have been able to find one. To provide further

[5]To examine changes in occupation characteristics, we classify occupations into three categories based on the type of abilities most required per occupation: human capital, social capital, and physical strength. The classification is based on a principal component analysis on the list of required abilities from ONET.

Table 4: Changes in industry/occupation and fraction who gained flexibility in schedule

A: Changes in Industry/Occupation

	Yes	No
Changed Industry	43.6%	56.4%
Changed Occupation	35.1%	64.9%
Changed Occupation Category*	26.7%	73.3%

B: Fraction Who Gained Flexibility

	Conditional on:					
	Changed Industry		Changed Occupation		Changed Occ. Category	
	Yes	No	Yes	No	Yes	No
Gained Flexibility:	51.1%	44.3%	53.0%	44.3%	47.7%	46.6%
Stayed Fixed-Schedule:	48.9%	55.7%	47.0%	55.7%	52.3%	53.4%

Notes. Panel A tabulates the share of workers who changed industry, occupation, or occupation category between career and bridge jobs. It includes every respondent who had a bridge job (N=812).
Panel B calculates the share of respondents who obtained flexibility in work schedule in the bridge job, conditional on whether they changed industry/occupation or not. The panel includes the subset who did not have a flexible schedule in their career jobs (N= 617).
*We define three broad occupation categories based on the type of abilities most required per occupation: human capital, social capital, and physical strength. The classification is based on a principal component analysis on the list of required abilities from ONET.

insight into willingness to work and more information on the job characteristics that are desired and not just found, we turn now to job search behavior.[6]

Among those who directly transitioned to complete retirement after their career jobs, only 11% (147 out of 1,336) report having looked for a new job opportunity. In contrast, 80% (657 out of 812) of those who had a bridge job actively looked for such an opportunity, while only 20% of workers received their bridge job passively. Thus, most workers who report having searched actively successfully found employment. This suggests either that most retirees are not interested in post-career employment or that they are not interested in the jobs they believe themselves likely to find.

Table 5 summarizes what job characteristics individuals looked for when they searched. We find further suggestive evidence that flexibility is an important characteristic for workers pursuing bridge jobs, with 40% wanting flexibility in deciding the number of hours and 31% wanting flexibility in how to allocate these hours. Furthermore, 33% wanted less responsibility, suggesting pursuit of jobs that are less burdensome, while 30% wanted to be more of their own boss. We also find strong heterogeneity in what older workers look for—there is no single characteristic that was searched for by more than

[6]See Faberman, Mueller, Sahin, and Topa (2017), who also field an original survey to study job search behavior and labor market outcomes.

40%, and all considered characteristics, except for better health insurance, were searched for by at least 10% of the sample.

Table 5: Search behavior: what workers looked for

Characteristic	% looked for
Change life:	
Different industry	23.5
Different occupation	27.4
Move to a better location	20.8
Flexibility:	
More flexible hours	39.9
More flexible schedule	31.0
Autonomy:	
Less responsibility	32.5
More of my own boss	29.7
Other job characteristics:	
More pay	19.9
Less commuting time	25.1
More job security	15.3
Better health insurance	7.8

Notes: N=804. Respondents who searched after career job.

Overall, these findings echo those from analyzing bridge jobs held: flexibility appears to be an important factor among those considering working after their career jobs.

4 Measurement of Willingness to Work Using SSQs

Both post-career employment and search behavior reflect not only older Americans' willingness to work but also their perception of available jobs in the market. In this section we introduce and analyze measures of individual preference parameters that identify factors affecting labor supply. The SSQs we pose directly control for job opportunities in hypothetical situations. This allows us to identify willingness to work independent of what workers expect to or are able to find available in the actual labor market. By measuring labor supply in different working environments, we can quantify workers' interest in considered job characteristics. In addition to presenting details of SSQ design and the information they contain on willingness to work, we also present a number of internal and external validation checks on the responses.

4.1 Design of SSQs

The basic structure of the SSQs is as follows. We construct the "reference job" based on the characteristics of the most recent job the respondent had (recorded from the first part of the survey). Hence, the reference job is the career job for those who did not have a bridge job and it is the last bridge job for those who had a bridge job. The hypothetical job opportunities in the SSQs are different from the reference job in at most one dimension at a time. Anchoring hypothetical job opportunities to the job characteristics from actual work history helps respondents put themselves in the hypothesized situation and also links their SSQ responses to the actual choices they have made.

For each hypothetical job opportunity, a respondent is first asked whether he would accept it at the suggested salary that is set to be the same as that in the reference job. If the respondent says he would accept the offer, then we further ask what is the lowest salary at which he would still accept the offer. If the respondent says he would not accept the offer, then we further ask what is the lowest salary at which he would switch to accepting the offer. This reservation wage allows us to quantify the willingness to work of the respondents under each circumstance.

We illustrate key features of the SSQs by presenting one in detail. The other SSQs are very similar, but differ either in terms of the timing of the offer or the considered job characteristics. In this SSQ, the hypothetical job characteristics are the same as those from the reference job except that the hypothetical job does not allow any flexibility in the work schedule. Respondents have to work exactly the same number of hours for the following year as in the reference job, regardless of whether the reference job actually allowed for flexibility in work schedule or not (we call this the "fixed schedule" scenario). The SSQ asks whether respondents would accept such a job opportunity if it were available at the time of the survey.

To be specific, the following is the text that is shown to the respondents:

> In the questions that follow, we are interested in what you would choose if you were to have certain decisions to make about your employment situation. While the choices that we describe are hypothetical, we ask you to do your best to assess what you would choose if you were to face these choices today.
>
> In the scenario that follows, you will be asked to make a choice between Options A and B. Option A will be to immediately accept a specified employment opportunity that will be open only for a short window (say one week) and will then become unavailable. Option B is instead to pursue other possibilities including searching for another employment situation or not working.
>
> - Option A is a new employment situation that involves a **fixed work schedule**. Other than this possible difference, the new employment situation matches **your reference employment situation** in terms of occupation, annual earnings, and all other characteristics.
>
> - Option B is instead to pursue other possibilities including searching for another employment situation or not working.

To better clarify the situation, the question provides additional details:

- Option A matches **your reference employment situation** not only in terms of occupation, annual earnings, and current work schedule, but also in all other aspects that are important to you that are not specified in the above table [that summarizes the reference job characteristics].
- If you choose Option B, Option A is no longer available.
- If you choose Option A you will be able at any later point to quit and to pursue other possibilities, including searching for another employment situation or not working.
- Pay in Option A changes over time as you would expect it to in **your reference position**.
- [Omitted if single] In this choice and in all that follow, please suppose that your spouse behaves in a manner that is consistent with your choices. If your spouse's employment situation would differ depending on whether you choose Option A or Option B, please take this dependence into account in answering the question.

Then the respondent is asked to choose between Option A and Option B. If the respondent chose Option A (Option B), he is further asked:[7]

- Starting at the **reference salary**, imagine that earnings for Option A were to decline (increase). What earnings level for Option A would be just low (high) enough that you would switch to Option B (Option A)?

To investigate what job characteristics older individuals value, we asked additional SSQs with alternative hypothetical job opportunities that are different than the above in one dimension at a time. 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). Table 6 lists the SSQs asked. Detailed scenarios for the other SSQs are available in Appendix C. In this section we focus on respondents who are currently not working, because our focus is on measuring willingness to come back to the labor market among retirees. Therefore we analyze SSQ1A and SSQ1B only. (The analysis of SSQ2, which was fielded to those who were employed at the time of the survey, is presented in Appendix D.) There are 1,771 retirees. We divide this group further into those who never had a bridge job and those who had a bridge job because these two groups may have different preferences for labor supply and the reference

[7] Feldstein and Poterba (1984), Holzer (1986), and Krueger and Mueller (2016) use a similar survey approach to elicit the reservation wages of unemployed workers.

job is different across these two groups (1,337 respondents without a bridge job and 434 respondents with a bridge job). The reference job is the career job for those who did not have a bridge job and it is the last bridge job for those who had a bridge job.

Table 6: 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	Retirees	1,740
SSQ 2	Survey	Fixed schedule, Flexible schedule Search after separation allowed Search after separation not allowed	Workers	754

Notes: Time refers to the reference period of the SSQ, which is either current (time of the survey), or retrospective (time of retirement). In SSQ 1A, 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 the current job if the characteristics of the job change in the way assumed in the scenarios. Respondents are allowed to skip the SSQs. The item non-response rate was almost zero conditional on completing the survey.

4.2 Willingness to Work at the Time of the Survey

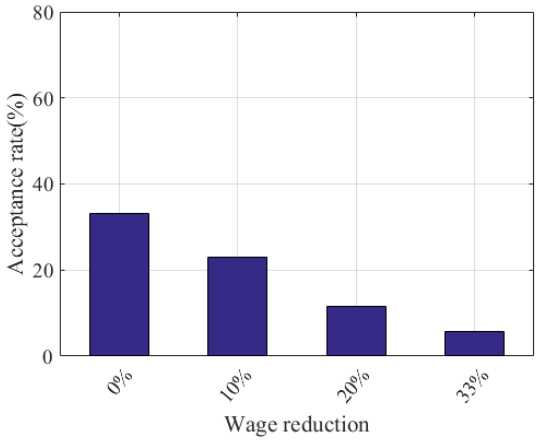
In this subsection, by using the SSQs with hypothetical job opportunities that are available at the time of the survey (SSQ1A), we confirm that older Americans have a strong willingness to work even when they cannot choose the number of hours they work. We also confirm that allowing a flexible work schedule boosts the willingness to work significantly further.

Fixed Schedule Scenario

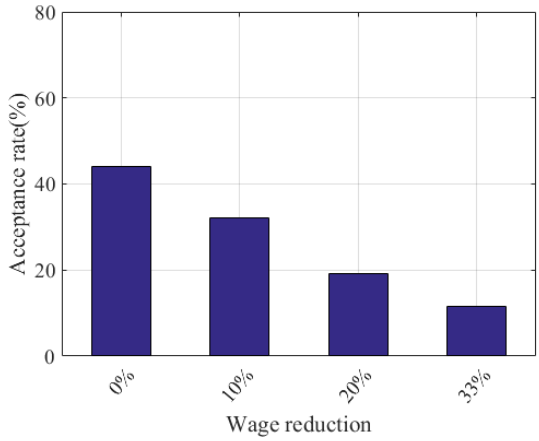
Even in the fixed schedule scenario, where the respondents have to work the same number of hours as in the reference job, the acceptance rate is fairly high. Figure 1 plots the acceptance rate in this scenario. About one third of those who retired with no bridge job (Panel (a)) accept this offer while 44 percent of those who had a bridge job (Panel (b)) accept it. Acceptance means that the respondent would come back to the labor market at a salary that is the same as in the reference job. The acceptance rate for the former group is surprisingly high, given that the vast majority of them (89 percent) did not even search for a new job opportunity after quitting their career jobs (and stayed retired until the time of the survey). This demonstrates that, at least for these individuals, non-participation in the labor force is driven not by their lack of interest in working, but by a (perceived) lack of job opportunities that are as attractive as their reference jobs. A non-negligible fraction of the sample are willing to work even at a lower wage than that they used to earn. Twenty percent of those who did not have a bridge job and 30% of those who did are willing to accept a 10% wage reduction to work in the hypothesized

Figure 1: Would current retirees return to work under a fixed work schedule?

(a) Sample had no bridge job



(b) Sample had a bridge job

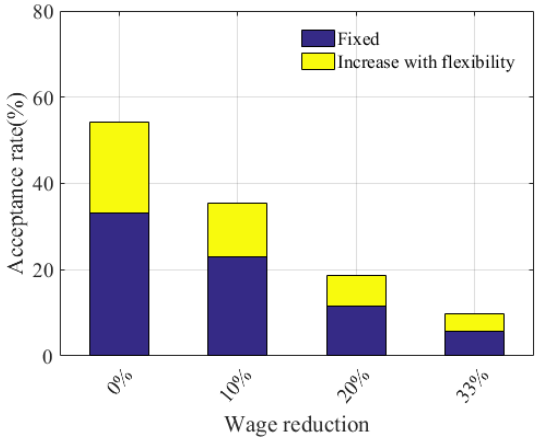


Note: N=1,337 for Panel (a) and 434 for Panel (b). Wage reduction is calculated relative to the wage of the reference job.

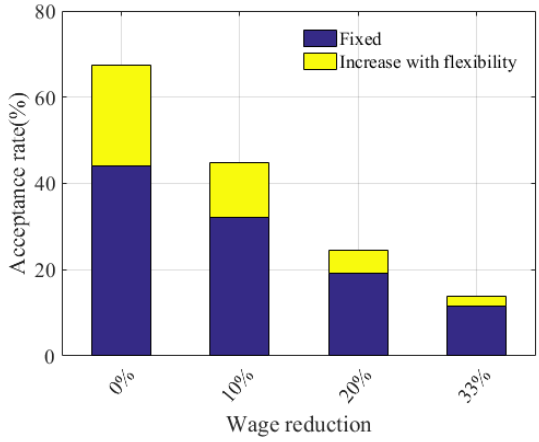
situation. Even with a 20% wage reduction, some respondents (10% and 20% respectively for each group) are still willing to work.

Figure 2: Would current retirees return to work under a flexible work schedule?

(a) Sample had no bridge job



(b) Sample had a bridge job



Note: N=1,337 for Panel (a) and 434 for Panel (b). Wage reduction is calculated relative to the wage of the reference job.

Flexible Schedule Scenario

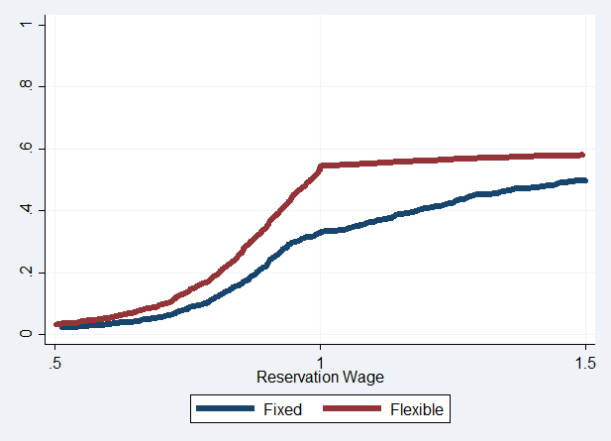
When the hypothetical offer adds flexibility by allowing the respondent to adjust the number of working hours, willingness to work increases even more. In Figure 2, the blue bar is the acceptance rate from the fixed schedule scenario, while the yellow bar is the increase in the acceptance rate in the flexible

schedule compared to the fixed schedule. When the schedule is flexible, at the reference hourly wage, more than half of the sample would accept the offer. This is half as many again as with the fixed schedule. The increase in the acceptance rate in both groups is about 20 percentage points. This means that 20% did not want to work under a fixed schedule at this hourly wage, but they are willing to work if they can choose the number of hours at the same hourly wage. Moreover, many are willing to accept a significant wage reduction as long as they can choose their own work schedule. About 10% more retirees are willing to take a 10% wage reduction compared to the fixed schedule scenario, for example.

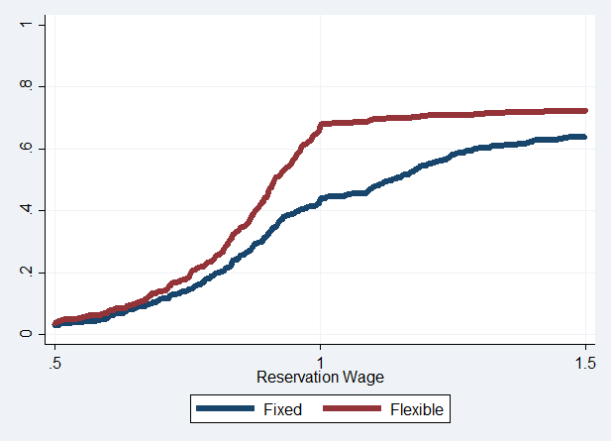
Figure 3 presents the full distribution of the reservations wages, normalized as a fraction of the wage from the reference job. For any value of the reservation wage between 50% and 150% of the reference wage, the acceptance rate is higher (i.e., the CDF is higher) when the offer comes with a flexible schedule. In both scenarios, the slope of the distribution, hence the extensive margin elasticity, is the largest going from 70% to 100% of the reference wage.

Figure 3: Reservation wage distribution of current retirees

(a) Sample had no bridge job



(b) Sample had a bridge job



Note: Reservation wage is calculated as a fraction of the wage they had in the reference job. The figure plots the CDF of reservation wages in the range between 0.5 and 1.5.

Conditional on accepting the offer with a flexible schedule at the reference hourly wage, we find an overall tendency to reduce work, with a large degree of heterogeneity in the desired change in hours worked (Table 7, Panel A). At median, they want 10% fewer hours than the reference schedule, showing that for most retirees, their preference for a flexible work schedule is associated with a modest desired reduction in the number of hours.

Alternative Occupation Scenario

The last scenario in SSQ1A allows a respondent to pick an alternative occupation. When asked whether they can think of any occupation that they prefer to what they used to have in the reference job, about 40% of retirees said yes. Conditional on having an alternative occupation in mind, the acceptance rate is much higher when the offer is made in that occupation: at the reference hourly

Table 7: Desired reduction in hours (%)

A. Time of the Survey (SSQ1A)	**10p**	**25p**	**50p**	**75p**	**90p**	**N**
Had no bridge job	-15.4	0	11.4	44.6	69.6	710
Had a bridge job	-11.8	0	9.4	39.7	62.5	291
B. Time of retirement (SSQ1B)	**10p**	**25p**	**50p**	**75p**	**90p**	**N**
Had no bridge job	-2.9	0	19.2	50.0	71.2	545
Had a bridge job	0	0	7.7	27.3	50.0	294

Notes: This table includes respondents who would accept the offer of a flexible schedule at the reference hourly wage.

wage, it is higher than 70% for both groups of retirees (see Appendix Figure D.1 for more detail.)

In summary, these SSQs allow us to identify a strong and prevalent willingness to work among older Americans who are already retired. At least one third of retirees report being willing to work again as long as they can find a job that has similar characteristics as the last job they had. Many of them are even willing to take a significant wage reduction to work again in that circumstance. This is a much stronger willingness to work than that revealed in the behavioral data only. In particular, for the group who never had a bridge job, only 11% of them searched for a job opportunity after quitting the career job, but one third of them would be willing to work again in a job that has similar characteristics as their last. By controlling for available job opportunities in hypothetical situations, the SSQs uncover additional willingness to work that was hidden behind individuals' low expectations of finding a suitable job in behavioral data.

We also find that older Americans have a strong preference for having control of their own work schedule. A majority of retirees would work if they could find a job with a flexible schedule in what is otherwise the same job as their last job. Indeed, many of them would take a significant wage reduction to work with their preferred schedule. For those who can think of a preferred alternative occupation to that which they used to have, allowing for a job opportunity in that occupation also boosts their willingness to work.

Strong willingness to work is not confined to a specific age group. Indeed we find that the acceptance rates in each scenario are fairly similar across all the age groups where we have dense observations (i.e., between early 60s and late 70s). This again suggests that demand-side factors play an important role for the sudden withdrawal from the labor force of individuals in their mid to late 60s.

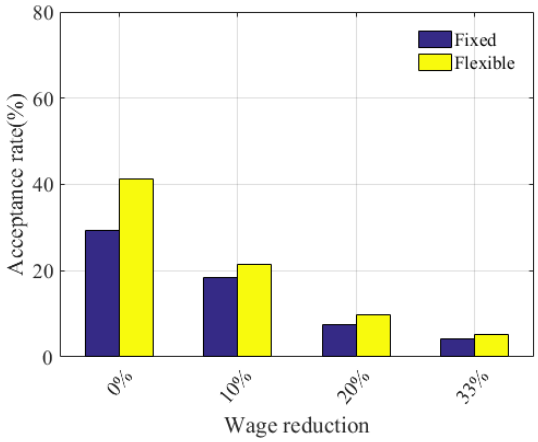
4.3 Willingness to Work at the Time of Retirement

The second set of SSQs (SSQ1B) concern hypothetical job opportunities that were made available at the time of retirement (i.e., immediately after they separated from their last job).[8] The intention is to investigate which hypothetical job opportunities would have changed their decision to retire. The survey employed the same three scenarios as in SSQ1A: fixed schedule; flexible schedule; and alternative occupation.

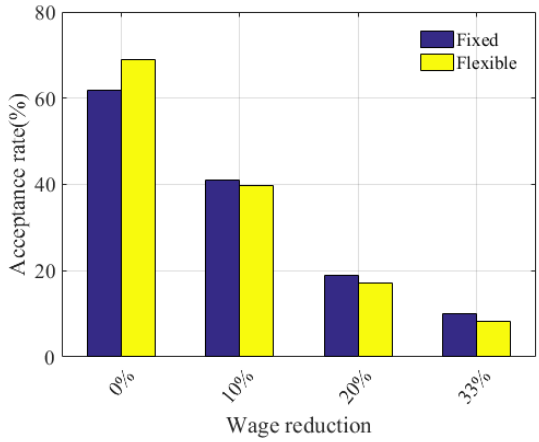
Figure 4 summarizes the acceptance rates from the fixed and flexible schedule scenarios. Overall patterns are similar to what we found from SSQ1A. Even when the offer does not allow for any flexibility in schedule, the acceptance rate is fairly high at the reference wage. It is 30% for those who retired from their career jobs and 60% for those who retired from their bridge jobs. Some are willing to take a significant wage reduction if they could have such a job opportunity right after they left their last job. 20% of those who retired from their career jobs and 40% of those who retired from their bridge jobs are willing to take at least a 10% wage reduction.

Figure 4: Would current retirees have continued to work?

(a) Sample had no bridge job



(b) Sample had a bridge job



Note: N=1,226 for Panel (a) and 432 for Panel (b). Wage reduction is calculated relative to the wage of the last job.

Allowing for a flexible schedule again increases willingness to work, but the effect is smaller at the time of retirement than at the time of the survey. At the reference wage, it increases the acceptance rate by 10 percentage points for both groups compared to the fixed schedule scenario, which is still significant but smaller than the 20 percentage point increase we saw from the questions asked at the time of the survey. The effect is even smaller when there is a wage reduction of 10% or more.

For those who retired directly from their career job, the smaller effect is due to a lower acceptance rate for a job with a flexible schedule at the time of retirement. This may suggest a certain amount of burn-out (Maestas and Li, 2007, Jacobs and Piyapromdee, 2016): some respondents did not even

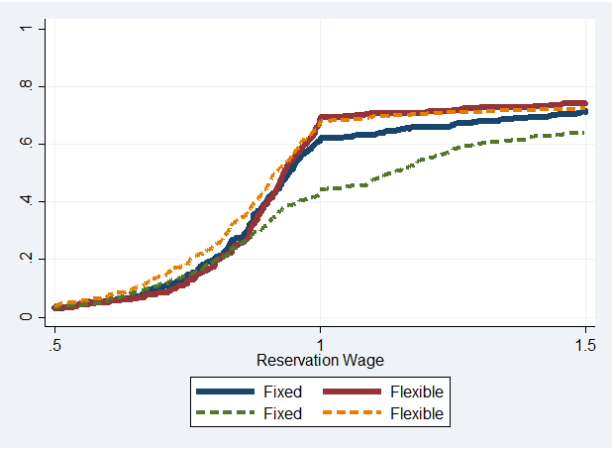
[8]For those who are retired within the last two years, the survey did not ask SSQ1B because for them the situation in SSQ1B is similar to that in SSQ1A.

want to work part time immediately after leaving their career job. Indeed, the acceptance rate for the opportunity with a flexible schedule at the time of the survey (SSQ1A) was 10% lower among those who have been in retirement for less than two years than that from those who have been in retirement for longer, further suggesting burn-out. On the other hand, for those whose reference job is a bridge job, the smaller effect is due to a higher acceptance rate for a fixed schedule job. This may suggest that they had already adjusted hours as desired in the bridge job.[9] These patterns are also clear from the full distribution of the reservation wages (Figure 5). At the time of retirement (the solid curves), the reservation wages tend to be lower when the offer comes with a flexible schedule, but the gap between the two curves is smaller than that from the time of the survey (the dashed curves). The extensive margin elasticity is again the largest from 70% to 100% of the reference wage.

Figure 5: Reservation wage distribution at the time of retirement

(a) Sample had no bridge job

(b) Sample had a bridge job



Note: Reservation wage is calculated as a fraction of the wage they had in the reference job. The figure plots the CDF of reservation wages in the range between 0.5 and 1.5. The figure also shows the distributions from SSQ1A for the corresponding scenarios and groups in dashed curves for comparison.

The responses to the alternative occupation scenario are also very similar to those from SSQ1A. About one third of the respondents could think of an occupation that they preferred to their reference occupation, and conditioning on having a preferred occupation, about two thirds of them would have accepted the offer at the reference wage (see Appendix Figure D.2 for more details).

4.4 Robustness and Credibility

Credibility of the findings in this paper hinges on the quality of responses to the SSQs. In the absence of a pecuniary incentive to elicit truthful and accurate survey responses as is typical in field experiments (e.g., Mas and Pallais, 2016), careful design of survey questions and ex-post tests on responses are necessary to make sure that respondents paid enough attention to and understood the hypothesized

[9] Conditional on being willing to accept the offer at the reference hourly wage, the desired reduction in working hours at the time of retirement is slightly larger for those who retired from a career job and slightly smaller for those who retired from a bridge job, compared to what it was at the point of answering the survey (Table 7, Panel B).

situations and also that the responses reflect true preferences as manifested in measured behavior. As part of the survey design, we implemented a pilot survey with a small sample who provided us detailed feedback on the SSQs that helped improve the main survey. In addition, we support credibility of the SSQ responses using a number of internal and external consistency tests. This subsection reports the results of five such tests. The first two tests confirm internal consistency of the SSQ responses. The third test confirms understanding of the hypothetical situation by reporting results from the comprehension tests that were implemented during the survey. The last two tests show that the SSQ responses are related to certain observed behaviors in a reasonable manner.

4.4.1 Consistency in Responses

SSQ1A and SSQ1B ask about the same types of job but differ in the timing of the offer: SSQ1A asks at the time of the survey and SSQ1B asks 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 between SSQ1A and SSQ1B.

For both fixed and flexible schedule scenarios, the extensive margin choices are strongly positively correlated between SSQ1A and SSQ1B. If a respondent accepts the offer in SSQ1A then he is more likely to do the same in SSQ1B. The correlation between the SSQ1A and SSQ1B responses 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.

4.4.2 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 8, 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.

4.4.3 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 or associated rules correctly. If the respondents do not correctly answer all questions on at the first trial, the questions they missed are repeated. If they missed after the second trial, they are told the right answer.

Table 9 summarizes the results of the comprehension tests (the number of questions correctly

Table 8: Reasonable Responses: Share of unreasonable changes in responses (%)

	Share of unreasonable changes in responses	
	Among all responses	**Among switchers**
SSQ1A (Allowing for flexible schedule)	1.9	7.9
SSQ1A (Allowing for alternative occupation)	1.7	6.1
SSQ1B (Allowing for flexible schedule)	3.3	18.8
SSQ1B (Allowing for alternative occupation)	3.5	16.6

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

answered after the second trial). Median respondents answer almost all questions correctly even in the first trial. At the second trial, 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 9: Comprehension test results

	10p	**25p**	**50p**	**75p**	**90p**	**N**
SSQ1A-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
SSQ1A-Flexible schedule						(Best score: 4)
First trial	2	3	4	4	4	2,757
Second trial	3	4	4	4	4	2,757
SSQ1A-Alternative occupation						(Best score: 3)
First trial	2	2	3	3	3	1,264
Second trial	3	3	3	3	3	1,264

Note: Married are respondents who are married or in a relationship sharing financial decisionmaking. Best score means all the answers are correct.

4.4.4 Search Behaviors and SSQ Responses

As external validation, we also examine whether the SSQ responses are consistent with respondents' actual post-career-job search behaviors. Table 10 compares the acceptance rate of the offer under different scenarios in SSQ1A (job offer at the time of the survey), for respondents grouped based on

their search behavior.[10] Allowing for a flexible schedule in the SSQs indeed had the largest impact on those who actually searched for a flexible schedule. The increase in the acceptance rate due to flexibility in work schedule for that group (26 percentage point) is larger than that for those who never searched (18 percentage point) and for those who searched for other job characteristics (20 percentage point). We observe the same pattern for the scenario with a preferred alternative occupation.[11] Those who actually looked for a job either in a different occupation or a different industry are more likely to be able to think of an alternative occupation in the SSQ and are more likely to accept an offer conditional on being able to think of an alternative. As a result, the impact of allowing an alternative occupation on the acceptance rate is the largest for this group. The consistency between the SSQ responses and actual search behavior suggests that the SSQ responses contain information on individuals' true preferences.

Table 10: Search behaviors and SSQ responses: SSQ1A acceptance rate

	N	Acceptance rate		
Searched for		**Fixed**	**Flexible**	**Alternative**
Did not search	1,188	33.7	51.5	
Flexibility	63	34.9	71.4	
Other than flexibility	84	33.3	64.3	
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.

4.4.5 Reasons for Separation and SSQ Responses

The first part of the survey includes a battery of questions adapted from the HRS concerning the reasons for separation from the previous job. Respondents are asked to choose the most important reason from options such as retirement, family obligation, health issues, etc. Most retirees (in particular 90% of those who retired from the career job) report that they quit to retire.[12] Yet, some indicate that they left involuntarily by reporting exogenous reasons such as being laid off, discharged, and employer

[10] We run this test only for the retirees who did not have a bridge job. For those who had a bridge job, what they were looking for after quitting the career job, e.g., fewer working hours, might have already been reflected in the bridge job they actually had, which serves as the reference job in the SSQ. If that is the case, allowing for further flexibility in the SSQ may have limited effect for them.

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

[12] We debated whether or not to include retirement on the list of choices because it obscures the reason for retirement, but for comparability with the HRS we included it.

closing or selling the business.

We expect those who left their last job involuntarily to be more likely to accept an offer made at the time of that separation. Table 11 confirms that this is indeed the case. In both fixed and flexible schedule scenarios in SSQ1B (job offer at the time of retirement), the acceptance rate is higher for those who report being involuntarily separated from the last job. The difference is larger for those who retired directly from their career jobs. This pattern suggests that many who separated voluntarily wanted to have at least some time off while those who separated involuntarily would have been more likely to continue working as long as they found a reasonably good offer.

Table 11: Reasons for separation and SSQ responses: SSQ1B acceptance rate

Group	Separation reason	Fixed	Flexible	N
Retired, no bridge job	**involuntary**	50.4	57.0	130
	voluntary	29.9	43.1	1,105
Retired, had a bridge job	**involuntary**	67.0	73.0	100
	voluntary	60.5	66.6	334

Notes: A separation is classified as involuntary if the respondent mentioned any of "laid off", "discharged", "employer closed business", "employer sold business." If a separation is not classified as involuntary it is considered to be voluntary.

4.5 Summary

The SSQs reveal a strong and prevalent willingness to work among older Americans. One third of retirees report being willing to work again at the time of the survey, even if they could not choose the number of working hours, as long as they could find a job that has the similar characteristics as the last job they had. Many of them also report being willing to take a significant wage reduction to have such a job opportunity. The estimated willingness to work is much stronger than what one could infer from the behavioral data only. This demonstrates the importance of controlling for the demand-side factors, or workers' perceptions of those factors, in measuring willingness to work late in life.

The SSQs also suggests older workers' strong preference for flexibility in their work schedules. Allowing for flexibility not only increases the acceptance rate at the reference wage (by 20 percentage points at the time of the survey) but also increases the wage reduction the workers are willing to accept. This suggests that the increase in the share of jobs with a flexible schedule among bridge jobs documented in the previous section is at least in part driven by workers' preferences.

Though the SSQs are asked with hypothetical job opportunities, ex-post tests of the credibility of the responses suggest that such purpose-designed questions can elicit reasonable information about respondents' true preferences.

5 IES Estimation Using the SSQs

SSQ responses indicate a stronger preference for reduced hours and greater flexibility among older Americans than observed retirement patterns imply. Furthermore, as recently highlighted in Rogerson and Wallenius (2013, RW hereafter), the prevalence of abrupt retirements is puzzling in the context of standard models of labor supply. In RW's model, production nonconvexities and the intertemporal elasticity of substitution of labor supply (IES) determine retirement but are not separately identified. For IES values consistent with most empirical estimates, large nonconvexities are necessary to generate abrupt retirement. In this section we extend this work by combining SSQ responses with RW's model to identify IES independently from production nonconvexities and estimate the IES for each respondent. Our estimates suggest IES values consistent with previous micro-estimates, providing further evidence that demand side constraints or production nonconvexities are responsible for the prevalence of binary labor force exits.

We first document the relationship between production nonconvexities, the IES, and hour-profiles/labor force exit, as well as the challenge in identifying the IES in the presence of nonconvexities. We then show that SSQ responses identify the IES independent of production nonconvexities and present our estimated IES distribution. Finally, as a credibility check, we show that the IES estimates are intuitively correlated with search behavior.

5.1 The Identification Problem with Behavioral Data Alone

The IES is a key parameter in studying retirement behavior, as it determines how individuals want to allocate the hours they work over their lifetime. An individual with a low IES wants to smooth hours worked over time, while an individual with a high IES is comfortable with highly variable hours worked over the life cycle, including possibly periods of full time work and full retirement.

As noted in RW, there is an inconsistency between the low IES commonly estimated in micro studies and that typically needed in models to rationalize observed retirement behavior: generating an abrupt retirement requires an IES much larger than one, but most of the empirical studies (leveraging labor supply responses to tax changes) suggest an IES much smaller than one (see Keane, 2011, for a survey). To reconcile this inconsistency, RW propose introducing a nonconvexity in production that limits workers' desire to choose to work part-time in route to labor force exit. Of course, this suggests that inferring the IES from behavioral data is contingent on the assumed strength of production nonconvexity. In fact, for any observed retirement behavior, any value of the IES may be justified if one can freely choose the strength of production nonconvexity.

The model used in RW is as follows. In a general version of their model with age-dependent preferences and wages, nonconvexity in production, and time and expenditure fixed costs of work, a household chooses c_t and h_t to solve:

$$\max \int_{t=0}^{T} \left[U(c_t) + \alpha_t \frac{(1 - e\bar{h} - h_t)^{1-1/\gamma}}{1 - 1/\gamma} \right] dt \tag{1}$$

$$\text{s.t.} \int_{t=0}^{T} (c_t + e\bar{c}) dt = \int_{t=0}^{T} w_t h_t^{(1+\theta)} dt + Y, \tag{2}$$

where t is the age subscript, h_t is the amount of labor supplied (normalized as a fraction of the total time endowment), γ parameterizes the intertemporal elasticity of substitution for leisure consumption (the IES is $\gamma\frac{1-h_t}{h_t}$), α_t is the weight on utility from leisure, θ captures the nonconvexity in production, w_t is the scalar that determines the age-profile of wage, e is an indicator function for currently working, $\bar{h}$ and $\bar{c}$ are time and expenditure fixed costs of working, and Y is the entire life-time resources other than labor earnings. Let ω_t denote the hourly wage. It is an increasing function of the number of hours worked ($\omega_t = w_t h_t^{\theta}$), which captures the disadvantage to part-time working. For simplicity, it is assumed that there is no uncertainty, no time discounting, and that the interest rate is zero.

Suppose that either α_t is increasing or w_t is decreasing over age. Then households would want to work more when younger and less when older. More importantly, given the values of the fixed costs of working ($\bar{c}$ and $\bar{h}$), if the IES is high or the nonconvexity in production (θ) is strong, then this incentive is sufficiently strong to generate a direct transition from working full-time to retirement. The exact condition that characterizes this relationship is:

$$\theta \geq (1-\hat{c})h_0(1-1/\gamma)\frac{1}{(1-\bar{h}-h_0)^{1/\gamma}(1-(1-\bar{h}-h_0)^{1-1/\gamma})} - 1, \tag{3}$$

where h_0 is the number of hours on the full-time job.[13] This equation relates the IES and θ. When the IES is higher, the household is more sensitive to the disadvantages associated with part-time working (the fixed costs and nonconvexity in production), so it is more discouraged from working part-time and more likely to choose a direct transition to retirement. In addition, when θ is higher, the hourly wage reduction associated with part-time working becomes larger, so the household faces a larger disadvantage to part-time working. Thus, for a higher θ, direct retirements can be rationalized with a lower value of the IES.

Figure 6 presents this trade-off graphically by plotting equation 3, with the shaded region corresponding to the parameter space that can generate abrupt retirements.[14] Following RW, we assume that the fixed cost of working in terms of foregone leisure is 4% of time endowment ($\bar{h} = 0.04$) and the fixed cost in terms of expenditure is 14% of the full-time earning ($\hat{c} = 0.14$, where $\bar{c} = \hat{c}w_0 h_0^{(1+\theta)}$). We use these values as our baseline calibration for all following exercises.[15] In addition to highlighting the role of the IES and nonconvexity in production in generating retirement from full-time work, this figure also reveals the identification challenge associated with using behavioral data only (the direct transition to retirement in this case). While the observed behavior excludes certain combinations of these two factors—all of the parameter values outside of the green area can be ruled out—there remains a substantial area of the parameter space that can rationalize transitions from full-time work to retirement. Any value of the IES can be consistent with the observed behavior depending on the assumed value of θ. For example, if θ is 0.3, then the IES needs to be higher than 0.9 to explain the observed retirement (blue line in Figure 6). But if θ is 1, then the IES can be as low as 0.4 (red line in Figure 6). The opposite is also true: any value of θ can be justified depending on the value of the

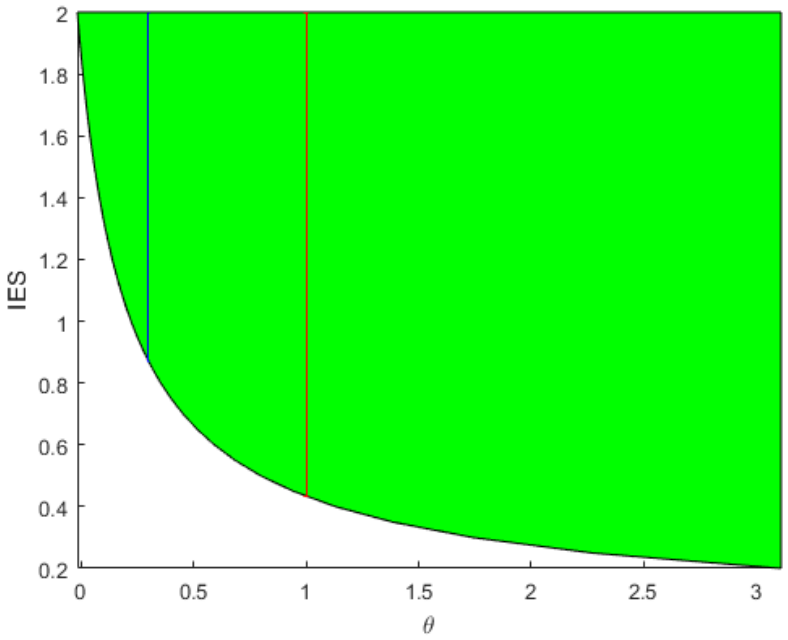
[13] We can abstract from changes in α_t and w_t as long as these profiles are continuous, since we are focusing on a transition that happens at a moment in a continuous time model.

[14] In this example, full-time work is calibrated as 2,000 hours per year, or $h_0 = 0.385$, which is common among career jobs of the VRI sample as well as the HRS sample.

[15] In Appendix D we report results from alternative calibrations.

IES. If we can pin down one of the two parameters using an additional source of information, then the observed behavior places bounds on the values the other parameter can take. This motivates our estimation of the IES using the SSQs.

Figure 6: Required IES and θ to generate retirement from full-time work



Note: The green area contains the combinations of the IES and θ that are consistent with a direct transition from full-time work to retirement when full-time work is calibrated as $h_0 = 0.385$ (2,000 hours per year). The boundary of the area corresponds to equation (3).

5.2 Identifying IES using SSQ Responses

The SSQs collect two different wage and hour pairs (under a fixed and flexible schedule) that make an individual indifferent to working or exiting the labor market. In this section we demonstrate that this is sufficient to identify an individual's IES, independent of the nonconvexity in production. Relative to the reference job, a respondent with a low IES would be willing to accept a large wage reduction to be able to work less hours. Intuitively, this is because such a response suggests a steeper increase in the marginal disutility of work, which in turn signals a lower IES. We formally derive this relationship below.

First, suppose that h_0 is the number of hours respondents have to work in the fixed schedule scenario and ω_{fixed} is the hourly wage that makes respondents indifferent between accepting this job offer and not working for the considered moment. If we assume that the marginal value of resources, λ, is not affected by this choice (which is a good approximation for the VRI sample because they have high financial wealth and relatively short remaining time to work), the reservation wage is defined

such that:

$$\alpha_t \left(\frac{1}{1-1/\gamma} - \frac{(1-\bar{h}-h_0)^{1-1/\gamma}}{1-1/\gamma} \right) = \lambda(h_0 \omega_{fixed}(1-\hat{c})), \tag{4}$$

where α_t may depend on the time the question concerns (i.e., the time of the survey as in SSQ1A vs. the time of retirement as in SSQ1B). The left-hand side is the foregone utility from giving up leisure to work the fixed number of hours, while the right-hand side is the value of income from this job.

Second, let h_{flex} be the number of hours chosen under the flexible schedule scenario and ω_{flex} be the hourly wage that makes respondents indifferent between accepting this offer and not working for the considered moment. At the reservation wages, the utility level is the same between working on a fixed schedule and working on a flexible schedule, yielding the following relationship:

$$\alpha_t \left(\frac{(1-\bar{h}-h_{flex})^{1-1/\gamma}}{1-1/\gamma} - \frac{(1-\bar{h}-h_0)^{1-1/\gamma}}{1-1/\gamma} \right) = \lambda(h_0 \omega_{fixed} - h_{flex}\omega_{flex}), \tag{5}$$

where the left-hand side is the foregone leisure by working longer hours and the right-hand side is the value of additional income from working longer.

By dividing equation (4) by equation (5) and rearranging terms, we get:

$$\frac{\omega_{flex}}{\omega_{fixed}} = \frac{h_0}{h_{flex}} \left(1 - \frac{(1-\hat{c})((1-\bar{h}-h_{flex})^{1-1/\gamma} - (1-\bar{h}-h_0)^{1-1/\gamma})}{1-(1-\bar{h}-h_0)^{1-1/\gamma}} \right). \tag{6}$$

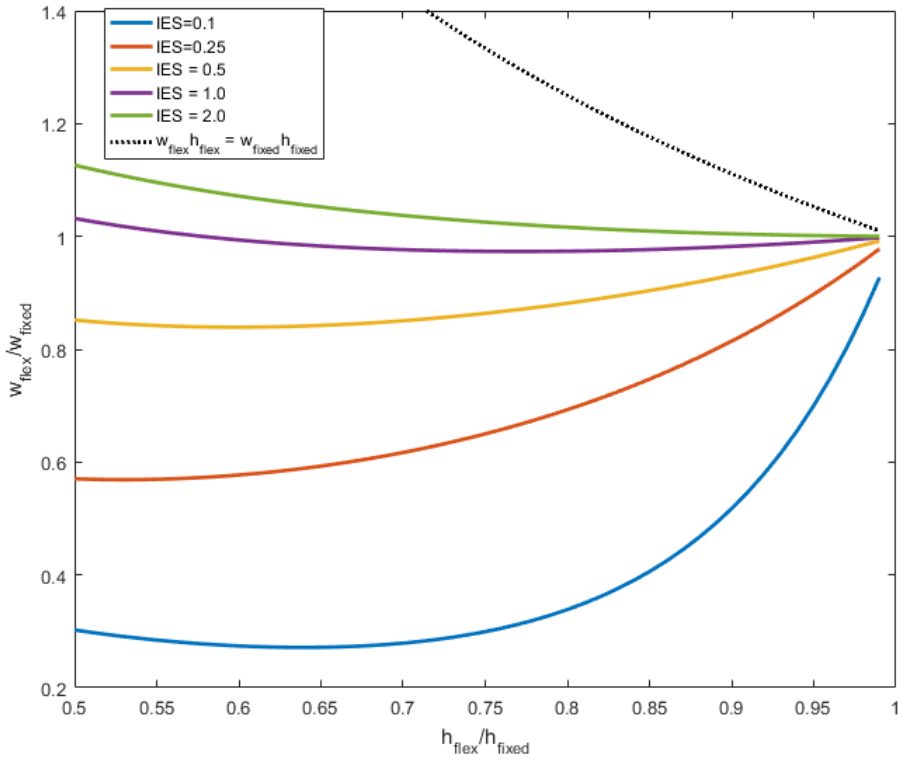
Since we are using two questions that place the individual at the same point in time, the time-varying weight on leisure-utility (α_t) and the marginal utility of income (λ) cancel out. Under the calibrated values of fixed costs of working ($\bar{h}$ and $\hat{c}$), the only unknown variable in equation 6 is γ, so we can determine its value using this condition and observed responses h_{flex}, ω_{fixed}, and ω_{flex}.

Equation (6) is basically an indifference curve. For a given value of the IES (or γ), it determines the pairs of $\{\frac{h_{flex}}{h_0}, \frac{\omega_{flex}}{\omega_{fixed}}\}$ that make the individual indifferent between working under the fixed schedule and the flexible schedule.[16] Figure 7 plots the indifference curves for various values of the IES. The lower is the IES, the steeper is the indifference curve. The marginal disutility of work increases faster with a lower IES, hence a worker with a lower IES would accept a larger wage reduction for a given reduction in hours. As the IES increases, the curve becomes flatter.[17] This demonstrates why the IES is a key parameter in explaining the retirement behavior in RW's model. When the IES is low, the workers would still want to work part-time as long as the penalty for part-time working coming from the nonconvexity in production is not too large, since the reservation wage reduces significantly when the number of hours is reduced. On the other hand, for those with a high IES, a small penalty for part-time working is enough to discourage them from working part-time and hence to induce them to choose retirement instead.

[16] The level of ω_{fixed} is fixed to satisfy equation (4).

[17] In the absence of fixed costs of working, the curves are always upward-sloping and it converges to the horizontal curve as the IES goes to infinity. Fixed costs of working create negative slopes either when the IES is very high or the reduction in the number of hours is large, to compensate for the increase in the average cost of working when the number of hours are reduced.

Figure 7: SSQ responses and IES: Indifference curves



Note: Each curve connects the pairs of $\{\frac{h_{flex}}{h_{fixed}}, \frac{\omega_{flex}}{\omega_{fixed}}\}$ that make the worker with the considered value of IES indifferent between working under the fixed schedule and flexible schedule scenario, under $h_0 = 0.385$, $\bar{h} = 0.04$, and $\hat{c} = 0.14$. The figure zooms in the range $[0.5, 1.0]$ for $\frac{h_{flex}}{h_0}$ where most of the responses fall.

Under the baseline calibration, some responses cannot be rationalized with any value of the IES. For some of these responses, we can assign them either top- or bottom-coded values of the IES, by extending the logic of the RW model and allowing the fixed costs to be heterogeneous. Some respondents (4%) choose a number of hours under a flexible schedule that is too small to be justified under the baseline fixed costs. But such responses can be rationalized with lower fixed costs and a low IES. Thus, we assign a low value of IES (0.05) to these responses. On the other hand, some respondents (10%) demand an hourly wage increase for working less hours that is too large to be justified under the baseline fixed costs. Such responses can be rationalized with larger fixed costs and a high IES. We assign a high value of the IES (10) to such responses. However, those responses where total earnings from working less hours is greater than or equal to that from working full time ($\omega_{flex} h_{flex} \geq \omega_{fixed} h_0$, the area above the dotted curve in Figure 7) cannot be justified under any labor supply model with utility value of leisure regardless of the values of the fixed costs, so they are dropped from the analysis (10% of the sample).

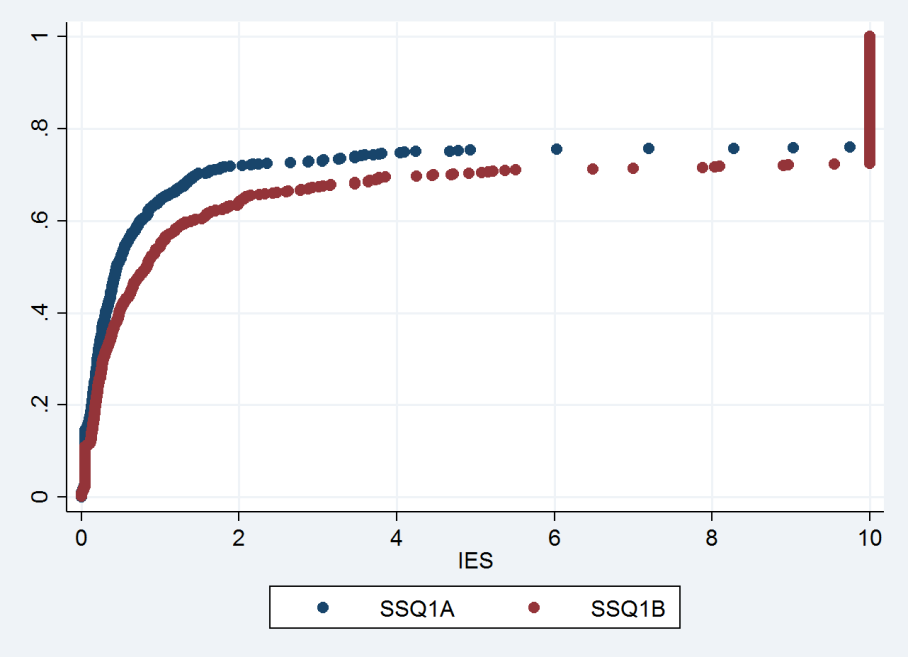
Furthermore, some responses do not reveal relevant information for the IES estimation so they are not included in the estimation. Those who choose to reject both offers at any reasonable wage

do not provide relevant information for the estimation (37% of the sample).[18] These individuals may indeed have low IES since allowing flexibility does not change their decision to retire, though it is not operational because they also have low preference for work later in life (high α_t). Respondents who report the same number of hours and reservation wages in both scenarios provide only one effective observation, which is not enough to construct the indifference curve needed for estimation (10% of the sample).

5.3 IES Estimates

Figure 8 shows the cumulative distribution of the estimated IES under the baseline calibration of the fixed costs.[19] The median estimates are 0.45 from SSQ1A and 0.83 from SSQ1B. These are well in line with findings from the microeconomic literature: the average among the estimates from the studies examined in Keane (2011) is 0.31. Recent works including Domeij and Floden (2006) and Chetty (2012) show that accounting for frictions such as credit constraints and adjustment costs can lead to a larger estimate: Chetty (2012) suggests 0.5 as a reasonable estimate. RW argues that under the values of the nonconvexity in production that are often used in the literature the IES needs to be at least 0.75 to explain the observed retirement behavior.

Figure 8: Distribution of IES estimates



Notes: The curves represent CDFs of the estimated IES. N=796 for SSQ1A and N= 668 for SSQ1B.

Our estimates do not rely on the strength of the nonconvexity in production. In fact, given the RW model, our estimates provide a range of the nonconvexity in production that are in line with a

[18] If the reservation wage is given in one scenario but not in the other, we assume a high reservation wage for the latter (twice of the reference wage).

[19] See Appendix Figure D.4 for the results from alternative calibrations.

transition from full time work to retirement. According to Figure 6, the median IES estimate from SSQ1A (0.45) suggests that θ needs to be larger than one to generate such a retirement pattern while that from SSQ1B (0.83) suggests a range above 0.35 (c.f., French, 2005, uses 0.4). Any value below this threshold cannot be consistent with a retirement from full-time work for more than half of the sample.

We also estimate significant heterogeneity in the IES. For about a quarter of respondents, the IES is less than 0.2 while for another quarter it is larger than 5. The former group will find part-time working attractive even when θ is as high as 3. The latter group will choose retirement over part-time work even in the absence of the nonconvexity ($\theta = 0$) since the fixed costs are enough to discourage them from working part-time.

5.4 IES Estimates and Measured Search Behavior

The RW model we build upon predicts that individuals with a lower IES value part-time options more. Relying on this relationship, we provide evidence supporting the validity of our IES estimates by examining whether the IES estimates predict searching for flexibility, conditional on searching for a job opportunity, after a career job exit.[20] To avoid confounding the analysis due to differences in reference job type (bridge vs. career), we study those who had a bridge job.[21] We use a tobit regression to account for the top- and bottom-coding of the IES. Because the IES is right skewed, we consider a log specification.

Table 12 reports the association between the log of the IES estimates and searching for a flexible schedule controlling for key demographic variables including gender, marital status, and age, last job characteristics such as whether had a flexible schedule or not and the number of hours, and a dummy variable for the SSQ from which the IES is estimated. The point estimate suggests that, as predicted by the model, those who searched for flexibility indeed have a lower IES. They have on average 50% lower IES than those who did not look for flexibility. Notwithstanding the small sample size, the estimate is statistically significant at the 10% level. This result provides evidence that the estimated IES distribution captures true heterogeneity in preferences. The other coefficients, though some with large estimated effects, are statistically insignificant. Since the IES estimates are based on SSQs that are designed to extract preferences, the insignificance of these coefficients is a desired outcome.

6 Related Literature

This paper relates to a number of literatures. First, we contribute to empirical literature that examines employment patterns late in life, both by documenting the post-career-job work history and search behaviors of the VRI sample and by eliciting their willingness to work using hypothetical questions. Beginning with Ruhm (1990) and more recently documented by Maestas (2010) and Rupert and Zanella (2015), it has long been established that not taking a typical retirement path (i.e., direct transition from full time career job to full retirement) is becoming more common, with Cahill, Giandrea and

[20] We focus on what they searched for instead of what they have found, since the latter is more affected by the available jobs in the market.

[21] The vast majority of those who did not have a bridge job did not search.

Table 12: IES estimates and search behavior

Variable	Coefficient	Standard error
Searched for flexibility	-0.566*	(0.309)
Single male	0.565	(0.538)
Coupled male	0.349	(0.407)
Coupled female	-0.692	(0.552)
Age	0.017	(0.023)
Number of hours in the last job	-0.000	(0.000)
Having a flexible schedule in the last job	-0.066	(0.348)
Social capital occupation	-0.097	(0.317)
Physical capital occupation	0.399	(0.585)
SSQ1B dummy	0.963*	(0.289)

Note: N = 363. The dependent variable is the log of IES estimates. * indicates significance under 10% level.

Quinn (2006) noting that post-career employment resembles initial labor market engagement decades earlier. Many of these jobs are part time or lower paid, with the classical hump-shaped wage profile reflecting workers willingness to take lower wages for less work (Cassanova, 2013). Furthermore, many workers return to employment to gain access to employer sponsored health plans in particular before becoming eligible for Medicare at age 65 (Madrian, Burtless and Gruber, 1994, Blau and Gilleski, 2008). Self-employment associated with fewer hours and lower earnings is also used as a transition path to full retirement (Ramnath, Shoven, and Slavov, 2017). Of course, some returns to work do not reflect workers' preferences, with Chan and Stevens (2001) noting the volatile employment of workers that are fired after age 50, and a number of studies noting the labor demand side constraints that hinder post-career employment (e.g., Hurd, 1996, Scott, 2004, Kantarci and van Soest, 2008). This paper documents that either having a bridge job before full-retirement or searching for such an opportunity is not rare, but also that using behavioral data alone leads to under-estimation older individuals' willingness to work.

There exists a literature that empirically examines the effect of institutional incentives on late-in-life labor supply. Many of these studies rely on aggregate data leveraging cross-country differences or historical changes within countries in public pension benefit system (see for example Blondal and Scarpetta, 1999, Gruber and Wise, 1999, Johnson, 2001, and Duval 2003). Others use variation in retirement incentives across households that arise from public or private pension systems and public medical insurance (see for example Blundell, Meghir and Smith, 2002, Gruber and Wise, 2002, Euwals, van Vuuren, and Wolthoff, 2012, and Gustman, Steinmeier and Tabatabai, 2016). While informative, reactions to such policy incentives still combine the older individuals' willingness to work and job availability for them. This paper contributes to this literature by proposing an approach to disentangle the roles played by supply- and demand-side factors behind the observed changes in the labor market activities. The results in this paper show that for a policy to be effective in encouraging working longer

it should address demand-side constraints.

There is a literature that matches structural models to observed retirement patterns to estimate the importance of various institutions and policies in determining retirement behavior. Beginning with Berkovec and Stern (1991), a number of papers subsequently highlighted the importance of minimum hours constraints (Gustmanand and Steinmeier, 1984), social security (Gustmanand and Steinmeier, 1994, Rust and Phelan, 1997, French, 2005, Blau and Gilleskie, 2006, Van der Klaauw and Wolpin, 2008), and public and private health insurance (French and Jones, 2011). These papers also suggests ways to overcome the identification issue associated with using only behavioral data. For example, French (2005) addresses the selection bias in estimating the wage profile among older workers by generating the same selection process from the model. Identifying all the key supply- and demand-side parameters relying only on behavioral data is still challenging and these studies have to make assumptions either on the level or distribution of certain key parameters. A key example is assumptions on nonconvexity parameters as in French (2005). This paper contributes to this literature by providing an alternative method to separately identify supply- and demand-side structural parameters separately, so that a lifecycle model can provide better-informed predictions on the effectiveness of considered policies.

Finally, this paper relates to two branches of survey literature. First, the SSQ survey instruments we use in this paper reflect a methodological approach to surveys that attempt to structure survey questions to inform preferences and model parameters in meaningful ways (Barsky, Juster, Kimball and Shapiro, 1997, Ameriks, Caplin, Laufer and van Nieuwerburgh, 2011, Brown, Goda and McGarry, 2015, Ameriks, Briggs, Caplin, Shapiro and Tonetti, 2016, Ameriks, Briggs, Caplin, Shapiro and Tonetti, 2017, Fuster and Zafar, 2016, among others). Second, we relate to a number of studies that attempt to use surveys to measure factors that affect late-in-life labor supply decisions, including but not limited to shares of older workers (Blau and Shvydko, 2011), career attachment and job satisfaction (Gobeski and Beehr, 2009), pension and hours arrangements (van Soest, Kapteyn and Zissimopoulos, 2007, van Soest and Vonkova, 2014, Kantarci and van Soest, 2015), and disability (Kapteyn, Smith and van Soest, 2007). Our study differs however due to the level of detail we include in our hypothetical scenarios and the resulting quantitative measures that this approach delivers which can be directly used to estimate parameters in retirement models.

7 Conclusion

By combining new behavioral data on late-in-life employment and job-search activity with hypothetical SSQs, we find a strong and prevalent willingness to work among older Americans. At the time of the survey, many individuals, even those years removed from their last job, would like to return to work if they found a job similar to the last job they held. Individuals also expressed a willingness to continue working at the time of retirement. The willingness to work is stronger when jobs offer a flexible choice of hours worked. Individuals are willing to take substantial earnings reductions to gain hour flexibility. From these findings we conclude that older Americans' labor force participation near and after normal retirement ages is limited more by a lack of acceptable job opportunities or low expectations about

finding them, in particular jobs with part-time or flexible schedules, than by unwillingness to work longer. Thus, demand-side factors (e.g., a nonconvexity in production that discourages part-time hires) are likely to be important in explaining current late-in-life labor market behavior and may be an appropriate target for policies aiming to promote working longer.

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A Appendix: 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 the 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 summarizes the key characteristics of the HRS sample (corresponds to Table 1 from the VRI 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. Labor force participation status is also similar between the VRI (Table 2) and HRS (Table A.2), though the fraction of not completely retired respondents 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.3) has similar length of tenure, similar length of working hour, and lower salary than the VRI sample (Table B.1). The gap in the salary is smaller for the VRI-eligible HRS sample (Table A.4). The most common industries and occupations of that 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 sample have similar job characteristics.

Table A.1: The HRS sample characteristics

A. Age eligible	**Age and Wealth**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Age:	57	60	66	75	82	68
Financial wealth:	-935	520	62,358	311,790	774,279	305,135

Married		**Education**		
Yes	**No**	**< College**	**College**	**> College**
51%	49%	71%	17%	12%

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	64	70	77	65
Financial wealth:	35,336	101,889	283,690	685,939	1,296,840	600,788

Married		**Education**		
Yes	**No**	**< College**	**College**	**> College**
69%	31%	29%	41%	22%

Sex		**Health**		
		Excellent/		**Fair/**
Female	**Male**	**Very Good**	**Good**	**Poor**
44%	56%	60%	28%	12%

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=12,492). For the second panel we impose additional criteria that they are internet eligible and have at least $10,000 in non-transactional accounts (N=3,478). All the tabulations are weighted using the HRS sampling weights.

Table A.2: Labor force participation status

	By Age					Total
	55-59	**60-64**	**65-69**	**70-74**	**75-**	
A. Age eligible						
Retired, completely (%)	16.9	36.7	57.2	70.6	86.1	52.3
Retired, not completely (%)	4.9	9.0	15.2	13.9	5.9	8.9
Not retired (%)	78.2	54.3	27.6	15.5	8.0	38.8
N	2,502	2,144	1,378	2,076	4,392	12,492
B. VRI eligible						
Retired, completely (%)	10.3	26.6	47.8	63.0	81.7	38.2
Retired, not completely (%)	6.2	10.9	20.5	19.2	10.8	12.5
Not retired (%)	83.5	62.5	31.7	17.8	7.5	49.3
N	852	687	517	635	787	3,487

Notes: See the notes for Table A.1.

Table A.3: Career Job Characteristics: Age-Eligible HRS

A. Retired from career job	**Years worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	5	10	18	27	35	19
Most common industries:	**Manufacturing**					15.3%
	Health care and social assist					14.8%
	Retail trade					8.9%
Most common occupations:	**Office and admin support**					13.5%
	Production					9.8%
	Sales and related					9.2%

B. Working on career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	5	11	20	30	37	21
Salary (in 2015$):	10,947	21,874	40,523	69,360	102,050	51,108
Hours worked (per year):	900	1,664	2,080	2,236	2,600	1,953
Self-employed:	**Yes**					22.0%
	No					78.0%
Most common industries:	**Manufacturing**					17.4%
	Health care and social assist					11.6%
	Retail trade					7.4%
Most common occupations:	**Office and admin support**					11.9%
	Management					11.1%
	Sales and related					9.6%

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=8,831 for Panel A and N=1,844 for Panel B).

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

A. Retired from career job	**Years worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	8	13	20	29	35	21
Most common industries:	**Manufacturing**					17.6%
	Health care and social assist					11.5%
	Educational services					9.0%
Most common occupations:	**Management**					19.3%
	Office and admin support					14.2%
	Sales and related					10.6%

B. Working on career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	10	15	23	32	37	23
Salary (in 2015$):	19,992	37,572	61,200	92,820	134,640	81,777
Hours worked (per year):	1,040	1,820	2,080	2,392	2,750	2,033
Self-employed:	**Yes**					24.1%
	No					75.9%
Most common industries:	**Health care and social assist**					15.3%
	Professional, scientific, tech. services					13.6%
	Manufacturing					13.0%
Most common occupations:	**Management**					17.4%
	Office and admin support					11.9%
	Business and financial operation					9.5%

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=2,693 for Panel A and N=930 for Panel B).

B Appendix: Additional Results from Behavioral Data

B.1 Career Job Characteristics

Table B.1 presents key characteristics of career jobs of the VRI sample, separately for those who retired from their career jobs and those who are still working on their career jobs. Most of the career jobs are full time jobs. The most common number of working hours is 2,080 per year, which is 40 hours per week for 52 weeks. Note that the average salary of those who are still working tends to be lower due to reduced hours of some workers. More than half of the sample worked for more than 20 years. The most common industry is professional, scientific, and technical services while the most common occupation is management. Self-employment is rare as is having a flexible schedule. In short, this paper examines labor market transitions of those who were mainly employed on a long, full time career job, that are typically more professional and less physically demanding, and typically had no flexibility in their schedules. We find similar career job characteristics from the VRI-eligible HRS sample (see Appendix Table A.4).

The career job characteristics are overall similar between those who have already quit and those who are still working on their career jobs, though the latter group is more likely to be self-employed and more likely to have a flexible schedule. This may be confounding two effects. On the one hand, it maybe due to selection, that these are characteristics that encourage to work longer, so those who had such job characteristics are more likely to stay in their career jobs. On the other hand, those who are still working are also more likely to be in younger cohorts and those characteristics might be related to that cohort. To disentangle these factors, we examine career job characteristics for those who are still working on their career jobs over different age groups.

Table B.2 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. It goes up to 34% by age 65. The share of having a flexible schedule changes from 36% to 71% between these two age groups. This finding shows 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 already quit it. 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 on 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 older workers being of lower productivity and therefore earning less and workers with higher wages selecting into working longer canceling out each other. 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 manufacturing or transportation and warehousing industries are less likely to stay longer while those 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 they want to have it.

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 it is driven by transitions into an industry or occupation where having flexibility in schedule is more common versus increase in the share of flexible jobs within each industry or occupation in bridge jobs compared to career jobs. In Table B.3, we list the common industries and occupations among 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).[22]

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 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 that bridge jobs being more flexible is driven mainly by jobs in each industry and occupation being more flexible not by transitions to more flexible industries and occupations.

[22] 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

A. Retired from career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	8	14	22	31	37	22
Salary (in 2015$):	30,866	58,253	91,467	133,398	196,379	111,698
Hours worked (per year):	1,260	1,924	2,080	2,184	2,600	2,027
Self-employed:	**Yes**					6.9%
	No					93.1%
Had a flexible schedule:	**Yes**					27.6%
	No					72.4%
Health insurance provision:	**Yes**					86.2%
	No					13.8%
Most common industries:	**Professional, scientific, and technical services**					17.8%
	Manufacturing					14.5%
	Educational services					12.7%
Most common occupations:	**Management**					25.6%
	Education, training, library					10.6%
	Business and financial operations					9.8%

B. Working on career job	**Years worked, salary, hours worked**					
	10p	**25p**	**50p**	**75p**	**90p**	**Mean**
Years worked:	8	14	21	30	38	22
Salary (in 2015$):	14,089	44,000	78,000	117,000	165,000	92,428
Hours worked (per year):	480	1,664	2,080	2,080	2,600	1,842
Self-employed:	**Yes**					15.9%
	No					84.1%
Had a flexible schedule:	**Yes**					47.7%
	No					52.3%
Health insurance provision:	**Yes**					72.0%
	No					28.0%
Most common industries:	**Professional, scientific, and technical services**					18.6%
	Manufacturing					10.7%
	Educational services					10.5%
Most common occupations:	**Management**					19.1%
	Business and financial operations					11.3%
	Computer and mathematical					9.0%

Notes: N=2,149 for Panel A and N=601 for Panel B.

Table B.2: 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%

Notes: N=321 for group A, N=117 for group B, and N=163 for group C.

Table B.2: 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%

Notes: N=321 for group A, N=117 for group B, and N=163 for group C.

Table B.3: 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

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

In Section 4.1, we presented details of the scenario with the fixed schedule, asked as of the survey date (SSQ1A). In this Appendix we present the details of the other scenarios, focusing on 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 the 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.[23] 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.[24] Not accepting the offer means that the respondent has to quit the current job immediately and pursue other possibilities including searching for anther employment situation or not working. In addition to the value of having a flexible schedule, SSQ2 also considers 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 searching after the current job, (ii) flexible schedule **not** allowing for searching after the current job, (iii) fixed schedule allowing for searching after the current job, and (iv) flexible schedule allowing for searching 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 decided to stay in the current job, is presented as follows:

[23] Hence SSQ1B is asked only to the retirees.

[24] 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

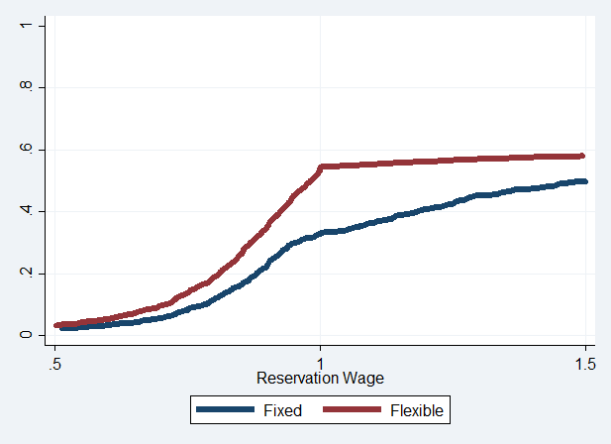
This Appendix shows the full distribution of reservations wages for all the SSQ scenarios, separately for those who did not and who had a bridge job (Figure D.1 for SSQ1A, Figure D.2 for SSQ1B, and Figure D.3 for SSQ2).[25] Reservation wages are normalized as a fraction of the reference salary. It being 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.

In Figure D.4 we show the distribution of IES estimates under different calibrations than the baseline: no fixed cost of work in terms of foregone leisure (Panel (a)), no fixed expenditure cost of work (Panel (b)), and no fixed cost of work at all (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.

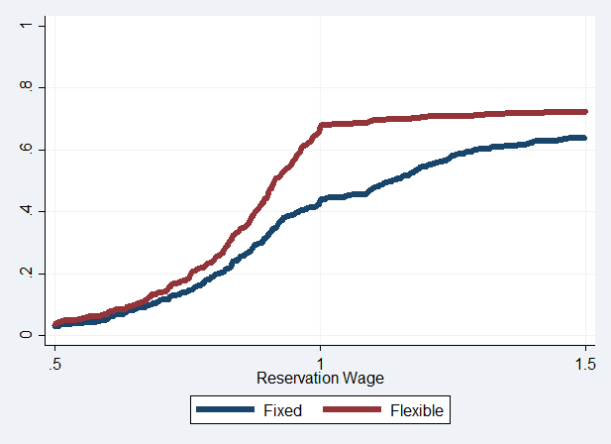
[25] Panel (a) and (b) of Figure D.1 and D.2 are included in the main text but also presented here for completeness in describing the SSQ results.

Figure D.1: Reservation wage distribution at the time of the survey (SSQ1A)

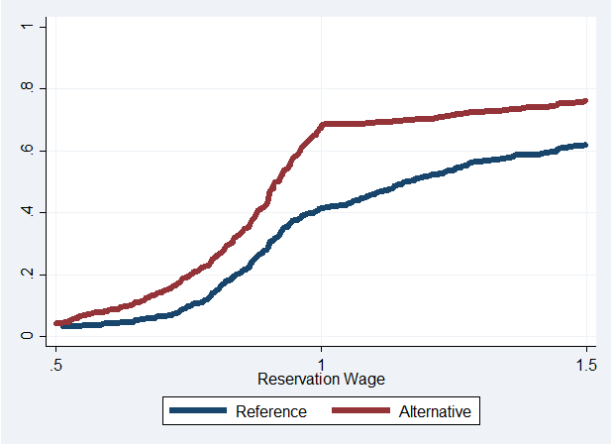
(a) Fixed vs. flexible schedule: had no bridge job



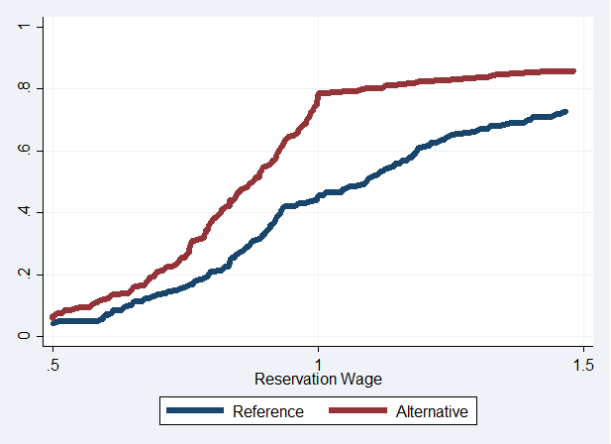
(b) Fixed vs. flexible schedule: had a bridge job



(c) Alternative vs. reference job: had no bridge job



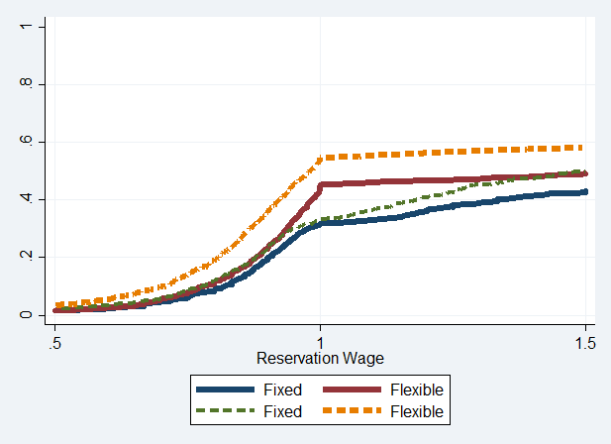
(d) Alternative vs. reference job: had a bridge job



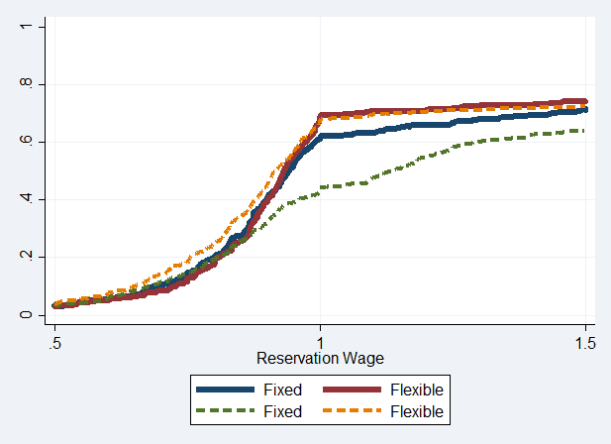
Note: Reservation wage is calculated as a fraction of the wage they had in the reference job. The vertical axis represents CDF. The figure shows the range of reservations wages between 0.5 and 1.5. For Panel (c) and (d) we include only those respondents who could think of any alternative occupation.

Figure D.2: Reservation wage distribution at the time of retirement (SSQ1B)

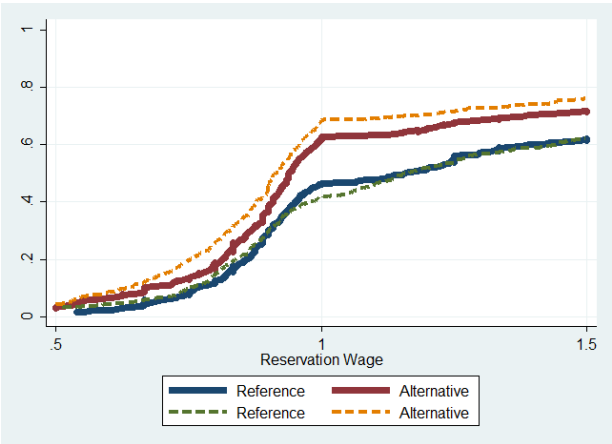
(a) Fixed vs. flexible schedule: had no bridge job



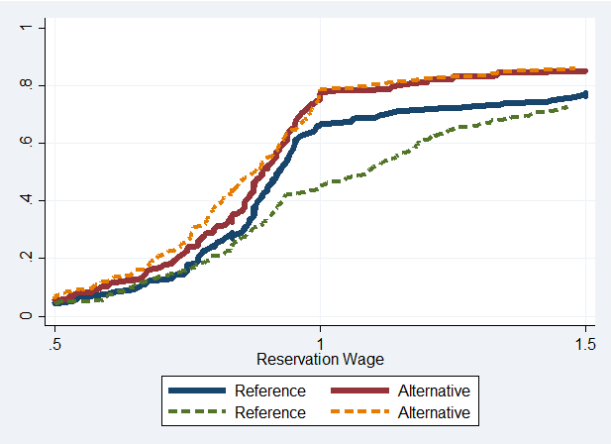
(b) Fixed vs. flexible schedule: had a bridge job



(c) Alternative vs. reference job: had no bridge job



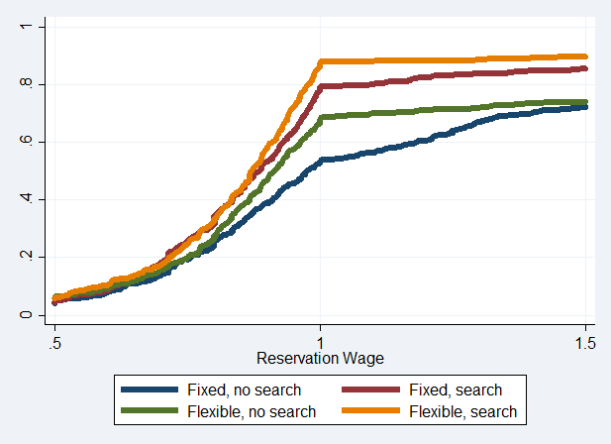
(d) Alternative vs. reference job: had a bridge job



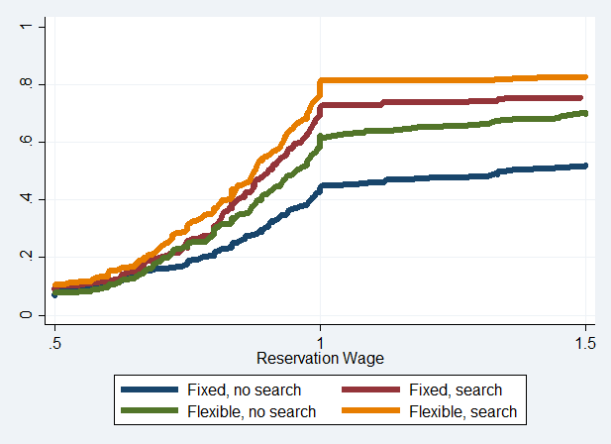
Note: Reservation wage is calculated as a fraction of the wage they had in the reference job. The vertical axis represents CDF. The figure shows the range of reservations wages between 0.5 and 1.5. For Panel (c) and (d) we include only those respondents who could think of any alternative occupation. The figure also shows the distributions from SSQ1A for the corresponding scenarios and groups in dashed curves for comparison.

Figure D.3: Reservation wage distribution for continuing the current job (SSQ2)

(a) Had no bridge job



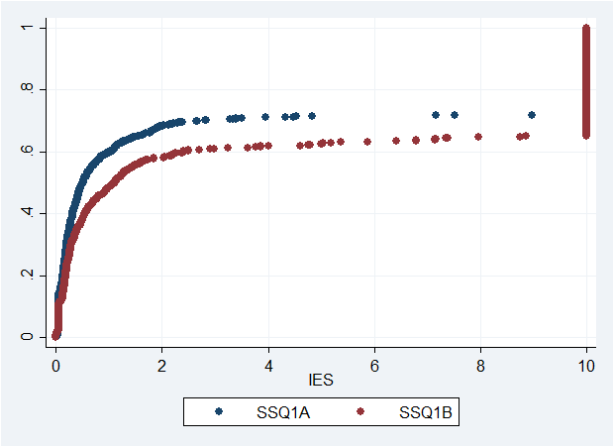
(b) Had a bridge job



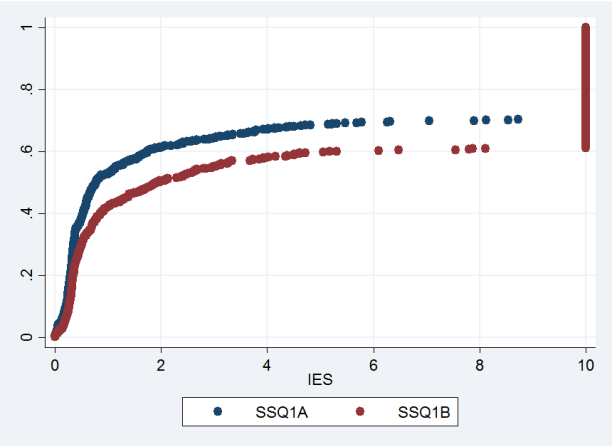
Note: Reservation wage is calculated as a fraction of the wage they had in the reference job. The vertical axis represents CDF. The figure shows the range of reservations wages between 0.5 and 1.5.

Figure D.4: Distribution of IES estimates: alternative calibrations

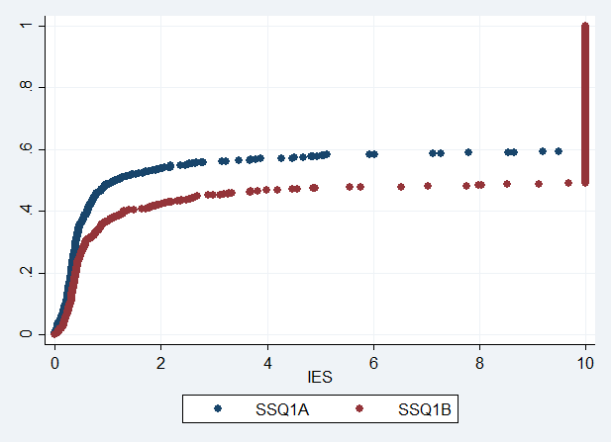
(a) No fixed leisure cost



(b) No fixed expenditure cost



(c) No fixed cost



Notes: The curves represent CDFs of the estimated IES. N=796 for SSQ1A and N= 668 for SSQ1B.