Barriers to Later Retirement for Men: Physical Challenges of Work and Increases in the Full Retirement Age

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Abstract: Policy changes intended to delay retirements of older workers and extend their work lives may run up against barriers owing to rising physical challenges of work as people age. We examine whether physical challenges at work influence employment transitions of older male workers in the age range for which public policy is trying to extend work lives, and whether older male workers are able to mitigate these challenges while still remaining employed. The evidence indicates that physical challenges pose a barrier to extending work lives, although some older male workers with physically-demanding jobs are able to mitigate these demands – either at new jobs or with the same employer. Our findings suggest that greater accommodation of physical challenges faced by older workers would likely increase the success of policies intended to induce later retirement.

Keywords: Retirement, employment barriers, physical challenges, Social Security reform

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I. Introduction

Population aging in the United States has motivated numerous Social Security reforms intended to increase the labor supply of seniors. In the last decade there were phased increases in the full retirement age (FRA) – the age of eligibility for full benefits – from 65 to 67 (American Academy of Actuaries, 2002; Munnell et al., 2004), as well as reductions in benefits for those claiming benefits at age 62. The FRA will increase again for cohorts born between 1955 and 1959 until it reaches age 67 for those who are born 1960 or later.[1] There are also proposals to increase the FRA more, as well as to raise the early eligibility age (EEA) – the earliest age at which retirement benefits can be claimed.[2]

However, these supply-side policy changes intended to delay retirements of older workers and extend their work lives may run up against various forms of constraints. An important demand-side barrier is age discrimination,[3] and an important supply-side barrier is rising physical challenges of work as people age. Both types of barriers may impact the effectiveness of public policies intended to lengthen work lives of older individuals.

The relationships between physical challenges and labor market transitions are important with respect to efforts to delay retirement, because for some workers such efforts will create a tension between increased incentives to work and rising physical challenges from doing so. Thus, reservations about raising the FRA often focus on the difficulties some workers would face

[1] See https://www.ssa.gov/planners/retire/retirechart.html (viewed June 3, 2016).
[2] Three proposals have been made by the Social Security Advisory Board: (1) increase the EEA from 62 and the FRA from 67 at a rate of 1 month every 2 years starting in 2017 (EEA) and 2023 (FRA); (2) increase the FRA from 67 at a rate of 1 month every 2 years starting in 2023; and (3) increase the FRA from 67 to 68 at a rate of 1 month every 2 years. See https://www.ssa.gov/retirementpolicy/projections/retirement-age.html (viewed June 3, 2016). And the Simpson-Bowles plan proposed increasing the retirement age to 69 by 2075. See http://www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/TheMomentofTruth12_1_2010.pdf (viewed July 3, 2012).
[3] Lahey (2008) and Neumark et al. (2015) find experimental evidence of age discrimination in hiring against older workers (especially women).

from longer work lives (e.g., Rho, 2010). Coile et al. (2016) find that, on average, older individuals have substantial additional work capacity relative to earlier cohorts.[4] However, some older individuals with physical limitations, or in physically-demanding jobs, may find it difficult to remain on the current job, and their ability to change jobs or otherwise reduce physical challenges of work may impede efforts to delay retirement.

In this study, we focus on the physical challenges of older male workers, taking a dynamic approach to examine employment transitions of individuals at or near ages affected by increases in the FRA (which are, more generally, the target ages for efforts to lengthen work lives). We study how these transitions are influenced by physical challenges older male workers face, and the types of transitions made by workers with physical challenges.

Previous studies have found increases in employment for workers directly affected by increases in the FRA (Behaghel and Blau, 2012; Mastrobuoni, 2009; Neumark and Song, 2013). Here, we turn to the questions of how these types of employment increases come about, and how they differ for older male workers facing physical challenges. We might expect different pathways to extending work lives for the latter group of workers, given evidence that workers near conventional retirement ages frequently seek leave career jobs and seek new jobs before retiring fully, in part because of emerging health issues and other challenges associated with age (e.g., Cahill et al., 2006 and 2015; Johnson et al., 2009; Johnson, 2014).

Here, we take up some of these general issues with regard to male workers in the age ranges in which policymakers are trying to extend work lives. How do labor market transitions change in these age ranges (including for those workers directly affected by increases in the

[4] Their findings are based on estimates from two different methods. First, they calculated the employment rate if people today were to work as much as people with the same mortality rate in 1970-74 worked. Second, they calculated the employment rate if older individuals worked as much as their younger counterparts with the same health status. Both methods can be viewed as assuming that all additional life expectancy or health improvement are devoted to employment.

FRA)? How do transitions differ when older workers have physical challenges? Are they able to mitigate these challenges and remain employed, and if so, how – at the same employer, or by changing employer? Understanding the different pathways to lengthened employment, especially for those with physical challenges, is important in thinking about how best to achieve the longer work lives needed to confront the challenges of population aging.

II. Related Prior Research

There is relatively little research on how physical challenges at work influence labor market transitions of older workers, especially near retirement ages, although existing work documents the importance of physical challenges at work and their implications for retirement or labor force exit more generally. Case and Deaton (2005) and Morefield et al. (2011) provide evidence that low-paid service or manual work adversely affects health of lower-income workers. Filer and Petri (1988) show that jobs from which people tend to retire earlier pose greater physical demands (such as heavier physical work, climbing and balancing, and stooping and kneeling), and Hayward et al. (1989) find that an index of physical demands predicts earlier retirement. Loprest et al. (1995) find that labor force participation is lower among both men and women with more severe work-related physical limitations. McGarry (2004) finds that declines in subjective health assessments (and other adverse health conditions) decrease the likelihood that workers expect to work full-time after age 62. Most recently, Datta Gupta et al. (2016) find that physically demanding jobs lead to temporary work incapacity.

Tying the demands of work to health and labor market transitions, Johnson (2014) reports that, among workers age 50 who report leaving their employer by age 70, 23% cite poor health and 58% report retirement as a reason. Perhaps reflecting health reasons, 36% of those age 50 who leave their employer by age 70 report changing occupations, although a higher percentage (50%) report moving to a different employer, and workers who change employers for reasons

related to poor health report less physically demanding and less stressful work on their new jobs, as well as fewer hours and more flexible schedules. Our analysis takes up similar questions, but focusing on those workers who have been, or in the future are likely to be, affected by increases in the FRA and related reforms.

III. Data and Empirical Analyses

We use Health and Retirement Study (HRS) data from 1992-2008. This period includes the first phase of increases in the FRA from age 65 for cohorts born in 1937 or earlier to age 65 and 10 months for the 1943 birth cohort.[5] We end our sample period in 2008 to exclude the Great Recession and its aftermath, focusing on examining retirement behavior in a steady state.[6] We study men only, to minimize complexity from issues pertaining to women's eligibility for Social Security retirement benefits.

We exploit the longitudinal nature of the data to measure employment transitions. We do this based mainly on employment status at each wave and information on whether a worker reported changing employers. Thus, for example, we measure whether a person was employed at wave *t*-2 but not at wave *t*, or whether a worker changed employers between waves *t* and *t*-2.[7]

The first part of the analysis focuses on overall labor market transitions of older workers – and in particular those caught by increases in the FRA. For subsets of the sample defined by employment status at wave *t*, and information on employment status and employer at waves *t*-2 and *t*, we define dummy variables for particular labor market transitions.

To fix ideas, consider the subsample of those employed at wave *t*-2, and define T_{ict} as a

[5] Our sample includes initial HRS and War Baby cohorts. Our results are generally similar when we include younger cohorts (see the on-line appendix).
[6] The impact of the Great Recession was particularly severe for older workers (Neumark and Button, 2014), and older workers' behavior changed during the Great Recession (Rutledge and Coe, 2012).
[7] HRS waves are two years apart.

dummy variable equal to one if working (or, for the multinomial logit model described below, as a vector of dummy variables for different employment states) for individual *i*, in birth cohort *c*, in year (wave) *t*.[8] We estimate a simple logit model for employment at wave *t*, as well as multinomial logit models for multiple employment states, which are difference-in-differences (DD) models based on differences between workers of different ages and differences between workers of the same age who face an FRA above 65 or equal to 65. In particular, aside from controls described below, the models include dummy variables for age 62 and over, 65 and over, and the FRA and over, interacted with whether one was affected by the increase in the FRA – the interactions needed to identify the DD estimator. For the logit model, the estimated model is:

$$(1) \qquad P(T_{ict} = 1) = exp^{X\theta}/[1 + exp^{X\theta}],$$

$$X\theta = \alpha + \gamma A62_{ict} \cdot IFRA_c + \beta A65_{ict} \cdot IFRA_c + \mu AFRA_{ict} \cdot IFRA_c + \sum_k A_{ict}^k \varphi_k + \sum_l B_{ict}^l \tau_l + X_{ict}\omega.$$

For the multinomial logit models there is a corresponding linear equation and set of coefficients for each employment state at wave *t* relative to the base category. In equation (1), *A62* is a dummy variable for those aged 62 and over, *A65* is a dummy variable for those aged 65 and over, and *AFRA* is a dummy variable for those whose age is equal to or greater than their FRA. *IFRA* is a dummy variable equal to one for cohorts that faced an FRA higher than age 65 (cohorts born 1938 and later).[9] Given these definitions, the interactions *A62·IFRA, A65·IFRA*, and *AFRA·IFRA* capture the effect of the increase in the FRA in the affected age ranges, which we also refer to as those who are caught by the increase in the FRA. In addition, A^k is a vector of

[8] One could think about analyzing the outcomes we study in this paper – does one remain employed, does one leave employment, does one exit to self-employment, etc. – as duration data, perhaps with competing risks. When event times are grouped into intervals, there is often a close relationship between conclusions drawn from duration models and dichotomous choice models (Abbott, 1985), although the competing risks case – when time in a spell can end in transitions to many possible states – is more complicated. Because this paper looks at a large number of outcomes in a somewhat exploratory fashion, we adopt a simple approach of estimating multinomial logit models for the different events occurring in the intervals captured by the HRS (usually two-year intervals).

[9] The main effect of *IFRA* is subsumed by the birth cohort fixed effects discussed below.

age dummy variables in two-month intervals, to control very flexibly for age, and B^l is a vector of birth year cohort dummy variables to control for any effects that are specific to each cohort. X is a vector of individual-level demographic controls and other controls (including self-reported health). In particular, in 2000, the retirement earnings test was eliminated for those reaching the FRA, which may have changed the employment behavior of older workers differentially before and after 2000. To isolate the effects of increases in the FRA for affected cohorts, we want to control for the elimination of the earnings test, so X also includes an interaction between a dummy variable for year 2000 or later and age between the FRA and 69 (and the main 2000 or later year effect).[10]

Equation (1) embeds three DD estimators. γ captures the shift in behavior for the affected cohorts at early retirement ages, β is the parallel effect for those aged 65 and over. And μ is for those at the FRA for their cohort or older. The identification of the effects of the increases in the FRA on employment transitions is compelling because we compare workers across very narrow age ranges in nearby years, helping us to rule out confounding effects not captured by our controls, including endogenous policy. Moreover, the policy variation we use is national, and was enacted long before the behavior we study.

The second part of the analysis studies the relationships between physical challenges at work and the dynamics of employment for workers in the age ranges affected by increases in the FRA and retirement reforms more generally. We expand our focus to those aged 62-65, 65-66, 66-68, and 68 and over. The next scheduled increases in the FRA will raise the FRA from 66 to 67, and there may be increases to a higher FRA subsequently.

In these analyses we estimate simpler models for employment dynamics, which capture how physical demands faced by workers on the job affect labor market transitions. (We also

[10] Throughout we cluster the standard errors at the individual level.

touch briefly on results looking at physical limitations reported by HRS respondents whether or not they work, but here we emphasize the analysis of physical demands, for which the evidence was stronger.) The models allow for differential effects of physical demands on those age 62-65, 65-66, 66-68, and 68 or older, all relative to younger individuals. We use largely the same notation as before, but now introduce a dummy variable *PD* for physical demands of the job. We look at alternative ways of capturing physical demands – whether the work imposed any of a list of physical demands included in the HRS survey, as well as specific physical demands. In these analyses, $X\theta$ in the logit model is of the form:

$$(2) \quad X\theta = \alpha + \delta A6265_{ict} \cdot PD_{ict} + \gamma A6566_{ict} \cdot PD_{ict} + \beta A6668_{ict} \cdot PD_{ict} + \rho A68_{ict} \cdot PD_{ict} + \pi PD_{ict} + \sum_k A_{ict}^k \varphi_k + \sum_l B_{ict}^l \tau_l + X_{ict}\omega.$$

In equation (2) the parameters and δ, γ, β, and ρ (and the expanded set of corresponding parameters for the multinomial logit model) measure the differences in labor market transitions associated with physical demands for the four older age groups that have been or could be affected by increases in the FRA, estimated for those initially working.

The models we estimate are always conditional on an initial employment state and on recent physical demands of jobs. In our view, these kinds of conditional estimates are important from a policy perspective, since policymakers need to understand the impact of retirement-related reforms and of physical limitations on the continuation of work. Admittedly, these factors can also have longer-term effects on when people work or make transitions to less demanding jobs, which are not reflected in our conditional, shorter-term estimates; such analysis is far more complex and beyond the scope of this paper.

In addition to estimating models for labor market transitions, we estimate models for changes in the physical demands of jobs. In particular, we define the outcome as a transition to a less physically-demanding job, and estimate linear probability models for these transitions for all

workers who remain employed, as well as separately for those who stay with the same employer and those who move to a different employer.[11]

IV. Results

Preliminary analyses

Table 1 reports descriptive statistics for our main analysis sample of those initially employed, broken out by subsequent employment status. Among other things, the table shows that there are sizable shares affected by increases in the FRA for each age bracket we examine.

One type of evidence on how increases in the FRA affect employment of affected workers can come from self-reported probabilities of working; of course this tells us more about awareness of the policy change and anticipated responses than about actual responses. In Table 2, we study self-reported probabilities of working after age 62 and age 65 by birth cohort. Columns (1)-(2) are based on the self-reported probability of working after age 62 and columns (3)-(4) are based on the self-reported probability of working after age 65. Recall that the 1938 birth cohort is the first cohort affected by the increase in the FRA. We do not observe a shift in the probability of working after age 62 for cohorts affected by the increase in the FRA, although we do observe a clear shift in the probability of working after age 65 – in particular for cohorts born 1939 or later. From these estimates, we can conclude that individuals are aware of the policy change, but we expect to see their behavioral response to the change after age 65 rather than age 62.

Labor market transitions of workers affected by increases in the Full Retirement Age

We next turn to actual labor market transitions of individuals affected by increases in the FRA. In Table 3, we start with three subsamples defined based on employment status as of wave t-2: employed (in a wage or salary job), self-employed, and not working. For each of these

[11] We estimate linear probability models in this case because there is no corresponding multinomial model.

subsamples we estimate multinomial logit models for four employment outcomes at wave t: (1) employed at the same employer, (2) employed at a different employer,[12] (3) self-employed, and (4) not working. We report the relative-risk ratios and the base category is the employment status at wave t-2. For example, in the first panel of Table 3, the base category is employed for the same employer because the employment status as of wave t-2 of this subsample is employed. We report only the key parameter estimates, in the form of the relative-risk ratios for the interactions between dummy variables for aged 62 and older, 65 and older, and greater than their FRA, and a dummy variable for whether one was caught by the increase in the FRA (based on birth cohort). We also report logit estimates for working, in the form of odds ratios.

For those aged 62 and over and caught by the increase in the FRA, the estimates in the first panel show that the relative odds of switching to a new employer rather than remaining at the same employer are 0.664 compared to those not affected by the increase in the FRA (so the likelihood of this transition is lower). However, there is a higher probability of a transition to self-employment for this group. In the second panel, for those who were initially self-employed, for those aged 62 and over caught by the increase in the FRA the probability of a transition to not working is lower (significant at the ten-percent level). In the third panel, for those initially not working, there is little evidence of differences associated with being caught by a higher FRA. Thus, for those aged 62 and over and already working, the response to the increase in the FRA was simply to remain in one's job or to switch to self-employment. There is no evidence that those initially not working enter employment in response to increases in the FRA. For those aged 65 and over there are no significant differences, and the overall odds of working are little changed; for those initially employed, though, the pattern of the estimates is similar.

[12] A self-employed worker who takes wage or salary employment is coded as switching to employment at a different employer.

The evidence that the effect of increases in the FRA is, if anything, to increase persistence at the current job could reflect the quite short-term nature of the adjustment the affected cohorts needed to make to work until the new FRA, given that the increases in the FRA ranged from two to a maximum of 10 months. On the other hand, some affected workers could have wanted to change jobs, perhaps to accommodate physical challenges at work, but found this difficult to do so – a difficulty that could have been exacerbated by age discrimination that deters hiring of older workers. Of course to the extent that remaining at the current job is difficult for older workers because of physical challenges at work – which we investigate below – then adjusting to increases in the FRA by remaining at one's current job may be less conducive to achieving more significant lengthening of work lives.[13]

Physical challenges at work and employment transitions of older workers

Table 4 provides descriptive information on the physical demands of jobs reported by workers. There is a generic "lots of physical work" measure and two more specific measures. We code an affirmative response when the respondent says he faces the demand all/almost all or most of the time. We also constructed an indicator for "any physical demand" for those who responded that they faced at least one of the three specific physical demands. Table 4 shows that physical demands are quite prevalent. It also shows declining physical demands with age, but of course this likely reflects selection in terms of who remains employed, as older workers who do *not* face physical demands at work are more likely to remain employed than older workers facing physical demands, per the literature noted in Section II.

We now turn to the main analysis of the impact of physical challenges on labor market transitions among retirement-age workers whom policy is trying to influence. Specifically, we

[13] It is debatable whether we should control for self-reported health or not, since the self-reports can be endogenous with respect to employment. However, we verified that the results were similar omitting these controls (results available on request).

study the employment transitions of workers who face physical demands at work in the age ranges 62-65 (early retirement age), 65-66 (increased FRA), 66-68 (scheduled or possible increases in FRA), and age 68 or older (also possible increases in FRA).

Table 5 reports estimates of models for transitions from wage or salary employment to each of the four possible outcomes:[14] continued employment at the same employer, employment at a different employer, self-employment, or non-employment. The specification corresponds to equation (2). In the top panel, we focus on the simple indicator of whether the worker faces any physical demands. For those aged 66-68 and aged 68 and up we find that transitions differ for those with physical demands at work. Specifically, for these older age groups with physical challenges, the relative odds of remaining employed are 0.66 to 0.75 times those without physical challenges, and the relative odds of transitioning to not working are 1.36 to 1.48 times higher. The differential effects for those age 66-68 may be of particular concern because this is the age group includes those who will be affected by the next scheduled increases in the FRA.

The remaining panels of Table 5 examine similar evidence for different dimensions of physical demands. The estimates for those aged 66-68 and aged 68 and over are quite similar; in every case, physical demands at work are associated with likelihood of remaining employed (or, in the multinomial logit estimates, a higher likelihood of a transition to non-employment). In addition, for the physical demand in the last panel – stooping, kneeling, or crouching on the job – the evidence is qualitatively similar for those aged 62-65 and 65-66, although the estimates are smaller and generally not statistically significant. Finally, for the "lifting heavy loads" demand, the evidence points to a lower relative odds of a transition to a new employer, for the two 65-66 and 66-68 age groups. Thus, in general this evidence indicates that physical demands on the job are a challenge to remaining employed, a phenomenon that seems likely to take on even greater

[14] We restrict attention to those initially employed because only for them are physical demands of the job reported.

importance if attempts are made to lengthen work lives further.

Although we do not have a clear reason to expect the impact of physical demands to differ for those who are caught by the increases in the FRA, we directly examine this in Table 6. We estimated specifications where we added the indicators and interactions for those caught by the increases in the FRA. We augmented equation (1) to include triple interactions between physical demand indicators and the interactions already in the model capturing those caught by the increase in the FRA. We found no evidence that transitions associated with physical demands for the age groups we consider are different for those caught by an increase in the FRA. Again, this analysis could be done only for initially working groups as physical demands of the job are only measured for them.

In Table 7 we shift the focus from employment transitions to transitions to less physically-demanding jobs. We code this outcome as an unambiguous decline in physical demands – with at least one decreasing (to *not* being a demand of the job all/almost all or most of the time), and none increasing. In this analysis, we use linear probability models because we no longer have mutually exclusive outcomes. In the first column, we report estimates for declines in physical demands for all workers who remain employed, and in the second and third columns we report separate models for those who remain at the same employer and those who change employers. We can only do this analysis for those who remain employed, and the sample is restricted to those employed at a wage or salary in both waves.

The first column of the top panel, for any physical demand of the job, shows that for all four age groups, those with a physically-demanding job were more likely to report (relative to those of the same age without a physically-demanding job) a decline in the physical demands of the job. This probability is higher by about 0.05 for 62-65 year-olds, 0.10 for 65 year olds, 0.04 for 66-68 year olds, and 0.15 for those aged 68 and over. These estimates are statistically

significant except for 66-68 year olds. The estimates in the other columns suggest that the physical demand was mitigated in different ways depending on age. For those aged 62-65, the probability of a reduction in physical demands is larger for those who switch employers than for those who remain at the same employer, although both estimates are positive. For the other age groups, the estimated effects are larger for those who remained at the same employer. However, the estimates are statistically significant only (and in all four cases) for those who remained at the same employer.

In the remaining panels of the table, where we consider each of the three types of physical demands separately, the results are quite consistent for "lots of physical effort" and "stooping, kneeling, crouching," pointing to mitigation of physical demands of the job for workers remaining at the same employer, more so for the older groups. The one exception is for lifting heavy loads, for which all four age groups exhibit a large probability of mitigating this specific physical demand by moving to other jobs, and only for the oldest group for those staying at the same employer. We suspect this evidence indicates that jobs that require lifting heavy loads are not easily accommodated by the current employer.[15]

Thus, the evidence on physically-demanding jobs faced by older workers perhaps has a silver lining, as there appears to be considerable mitigation of physical challenges without having to change employers. On the other hand, the lack of declines in physical demands with job changes may be discouraging, given that workers near retirement age often do change jobs.

Although not reported in the tables, we also looked at similar specifications for physical limitations reported by HRS respondents, rather than physical demands of jobs. One potential

[15] We examined whether workers in jobs with physical demands might be helped via employer accommodations in the form of reductions in working hours. However, we did not find any evidence that these kinds of accommodations helped mitigate physical demands, perhaps because work schedules have less to do with the kinds of physical demands we study (see the on-line appendix). How physical demands are mitigated at work is an interesting question, but the HRS has very limited information on possible accommodations.

advantage of studying physical limitations is that these are reported by everyone, not just those with jobs. The HRS asks about a far greater number of physical limitations. However, the data on physical limitations pose problems, because they were not asked on a consistent basis throughout the HRS. In particular, they were asked differently in 1992 and 1994, which implies that using these data for the years for which they are consistent results in significantly smaller samples of workers. Nonetheless, we looked at a similar classification of whether workers have any limitations, as well as specific limitations grouped together based on evidence on correlations between them and how well they predicted whether respondents indicated that health limits work.[16] We found that for "any" physical limitation, or for limitations related to either stooping or getting up from a chair, or either lifting or pushing objects or reaching up with one's arms, there was no impact on those aged 65 or over, but those aged 62-65 were less likely to remain employed, and in some cases more likely to leave employment. In addition, there was some indication of transitions to less physically-demanding jobs (as defined in Table 4). In general, though, this evidence was much weaker and less consistent, and the finding that it was stronger for 62-65 year-olds than for those aged 65 and over makes us a little more cautious about the results. Of course, part of the issue may be that just because there is a physical limitation does not mean that a job is physically challenging. For these reasons, we focus on

[16] We also considered looking directly at the question on whether health limits work, and substituting that for physical demands. However, it seems likely that this variable is particularly difficult to view as exogenous with respect to whether or not a person is working. For example, it seems likely that someone not working, even if they have a health limitation that would limit work, does *not* respond that health limits work. (In addition, in 2004 the HRS did not ask this question of those who previously reported such a limitation – simply assuming that the limitation persists – even though these limitations could have diminished or been eliminated.)

physical demands of jobs.[17,18]

V. Conclusions and Discussion

The evidence on the labor market transitions of older men with physically-demanding jobs suggests that physical challenges faced by older male workers are a barrier to extending work lives. Among workers in the age ranges for which policy is trying to extend work lives, those who are in physically-demanding jobs are more likely to leave employment and less likely to remain at their employers. Moreover, there is no evidence that they are more likely to switch employers, perhaps as a way of reducing physical demands. On the other hand, there are some workers with physically-demanding jobs who are able to mitigate these demands, for the most part while staying with the same employer.

Although this paper presents descriptive evidence, it has potential policy implications. Policies already implemented, and additional policies likely to be considered aim to delay workers' retirement. Yet our evidence suggests that physical challenges at work pose a significant barrier to extending work lives, which could translate into lower responsiveness to supply-side incentives to work longer, such as increase in the FRA. There may be a need for complementary policies that make it easier for older workers with physical challenges to stay employed – such as flexible work arrangements (Hardy, 2008) and greater accommodation of the

[17] A second approach we tried was to try to link up the physical demands of jobs with physical limitations, since in some sense it is the *coincidence* of these that most likely presents physical challenges at work. Thus, in this analysis we defined an indicator of physical challenges at work when people reported both a physically-demanding job and physical limitations. These results to some extent paralleled the results for physical demands, but they were noisier and less consistent, perhaps because it is difficult to link up specific physical demands with specific physical limitations, and also perhaps because endogenous selection gets tricky, as those with physical limitations may be less likely to be employed in jobs with physical demands.

[18] In an earlier version of this paper, we also incorporated information on state age discrimination protections, to ask how responses to these demands are influenced by stronger protections against age discrimination. However, perhaps not surprisingly, we did not find evidence that stronger age discrimination protections alter labor market transitions of those with physically-demanding jobs. As discussed earlier, there is no strong prior that age discrimination laws should mitigate the labor market transitions of those physically-demanding jobs because age discrimination laws do not specifically require employers to provide reasonable accommodation to an employee or job applicant. See http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp265.pdf (viewed June 6, 2016).

normal challenges of aging. By the same token, it would be useful to have additional evidence on whether such policies – including perhaps those adopted at the firm level[19] – have made it easier for older workers with increasing physical challenges to remain employed.

Finally, there is a question of whether anti-discrimination protections could be strengthened in a way that might help. The federal Age Discrimination in Employment (ADEA) prohibits discrimination against older workers, but does not require employers to accommodate workers with physical challenges at work. Providing a reasonable accommodation is required under the federal American with Disability Act (ADA) for workers with disabilities. However, the ADA's definition of disability is somewhat stringent; a protected disability is physical or mental impairment that substantially limits one or more major life activities.[20] Although some studies (e.g., Neumark et al., forthcoming) suggest that disabilities that can limit work rise steeply at older ages, and that the ADA (or some stronger state versions) may provide some protections, one can easily imagine that for some workers the kinds of physical challenges this paper studies often would not entitle a worker to protection under the ADA (or the ADEA). In light of the need to encourage (and induce) longer work lives, it may, therefore, be worth considering whether either the ADEA or ADA could be strengthened to require accommodation for some of the more routine physical challenges of work associated with aging, or greater flexibility in adapting jobs to older workers, to reduce the barriers to employment posed by such challenges at ages at which we are enacting reforms to try to keep people working longer.

[19] For example, see Neumark et al. (2015) for evidence on employer accommodations of women with breast cancer.
[20] More precisely, under the ADA "disability means, with respect to an individual - (i) A physical or mental impairment that substantially limits one or more of the major life activities of such individual; (ii) A record of such an impairment; or (iii) Being regarded as having such an impairment as described in [the section]. See https://www.gpo.gov/fdsys/pkg/CFR-2011-title29-vol4/xml/CFR-2011-title29-vol4-part1630.xml (viewed June 3, 2016). Some states extend disability discrimination protections to states using a less stringent definition of disability (Neumark et al., forthcoming).

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Table 1: Descriptive Statistics

	Employment status at t-2		
	Employed	Self-employed	Not working
Cohorts affected by SS reform and Age ≥ 62	0.163 (0.369)	0.184 (0.388)	0.210 (0.408)
Cohorts affected by SS reform and Age ≥ 65	0.073 (0.260)	0.098 (0.298)	0.135 (0.342)
Cohorts affected by SS reform and Age ≥ FRA	0.060 (0.237)	0.084 (0.277)	0.118 (0.323)
High school	0.354 (0.478)	0.286 (0.452)	0.363 (0.481)
Some college	0.195 (0.396)	0.219 (0.414)	0.177 (0.381)
College	0.247 (0.432)	0.317 (0.465)	0.170 (0.375)
Very good health	0.336 (0.472)	0.344 (0.475)	0.230 (0.421)
Good health	0.333 (0.471)	0.292 (0.455)	0.302 (0.459)
Fair health	0.134 (0.340)	0.124 (0.330)	0.240 (0.427)
Poor health	0.035 (0.183)	0.033 (0.179)	0.141 (0.348)
Partnered	0.027 (0.161)	0.030 (0.170)	0.036 (0.186)
Divorced	0.112 (0.316)	0.098 (0.298)	0.178 (0.382)
Single	0.023 (0.151)	0.027 (0.161)	0.039 (0.195)
Black	0.126 (0.332)	0.088 (0.284)	0.164 (0.371)
Other race	0.041 (0.199)	0.024 (0.152)	0.035 (0.183)
N	12,431	4,508	11,768

Notes: Each column reports descriptive statistics for main variable of interest and individual level control variables included in our analysis. For the categorical demographic variables, all categories but one are shown. The sample period for this analysis is 1992-2008, and we restrict the sample to males born 1931-1943.

Table 2: Regressions for Self-Reported Probability of Working

	Prob. of working after age 62 (1)	Prob. of working after age 62 (more than 50%) (2)	Prob. of working after age 65 (3)	Prob. of working after age 65 (more than 50%) (4)
Cohort:				
1932	3.108	0.027	0.926	0.019
	(4.427)	(0.050)	(3.495)	(0.045)
1933	-3.248	-0.018	-1.591	-0.004
	(4.894)	(0.057)	(3.959)	(0.053)
1934	3.014	0.045	2.561	0.046
	(4.541)	(0.051)	(3.717)	(0.049)
1935	2.407	0.066	3.048	0.010
	(4.699)	(0.053)	(3.924)	(0.050)
1936	-2.857	0.003	4.098	0.048
	(4.522)	(0.052)	(3.774)	(0.049)
1937	3.471	0.050	7.758**	0.080
	(4.624)	(0.053)	(3.893)	(0.050)
1938	3.932	0.077	3.929	0.050
	(4.540)	(0.051)	(3.809)	(0.051)
1939	0.591	0.021	11.457***	(0.119)**
	(4.683)	(0.053)	(3.812)	(0.050)
1940	5.945	0.048	14.012***	0.144***
	(4.878)	(0.055)	(4.085)	(0.050)
1941	2.592	0.054	8.242**	0.081*
	(4.656)	(0.053)	(3.621)	(0.047)
1942	5.420	0.080	12.444***	0.153***
	(4.914)	(0.057)	(4.223)	(0.056)
1943	0.761	0.033	13.360***	0.133**
	(5.738)	(0.067)	(4.552)	(0.057)
N	2,194	2,194	2,824	2,824

Notes: Self-reported probability of working is based on "what do you think the chances are that you will be working full-time after you reach age 62 (or 65)?" The probability of working after age 62 (or 65) is given on a 0-100 scale. Columns (1) and (3) report linear regressions for the probability (scaled 0-100), and columns (2) and (4) report linear probability regressions for whether individuals report the probability of working is more than 50%. For columns (1)-(2), we restrict the ages to 60-62, and for column (3)-(4), we restrict the ages to 60-65.

Table 3: Effect of Social Security Reforms on Employment Transitions

	Outcome: current wave (t)				
	Employed (same employer) (1)	*Employed (different employer)* (2)	*Self-employed* (3)	*Not working* (4)	*Work* (5)
Previous wave (t-2)					
Employed					
Cohorts affected by SS reform ×					
Age ≥ 62	Base category	0.669**	1.664*	0.976	0.998
		(0.123)	(0.495)	(0.127)	(0.126)
		[0.027]	[0.087]	[0.849]	[0.987]
Age ≥ 65		0.602	1.388	0.958	1.000
		(0.245)	(0.853)	(0.250)	(0.256)
		[0.212]	[0.594]	[0.686]	[1.000]
Age ≥ FRA		0.942	0.571	1.046	1.089
		(0.409)	(0.353)	(0.287)	(0.116)
		[0.890]	[0.364]	[0.871]	[0.785]
			N=12,431		*N*=12,431
Self-employed					
Cohorts affected by SS reform ×					
Age ≥ 62	n.a.	0.620	Base	0.587*	1.636*
		(0.203)	category	(0.167)	(0.461)
		[0.144]		[0.061]	[0.081]
Age ≥ 65	n.a.	0.378		0.951	0.971
		(0.304)		(0.455)	(0.461)
		[0.226]		[0.917]	[0.951]
Age ≥ FRA		3.697		0.885	1.258
		(3.000)		(0.424)	(0.600)
		[0.107]		[0.880]	[0.630]
			N=4,508		*N*=4,508
Not working					
Cohorts affected by SS reform ×					
Age ≥ 62	n.a.	1.112	1.036	Base	1.099
		(0.267)	(0.336)	category	(0.219)
		[0.659]	[0.914]		[0.635]
Age ≥ 65	n.a.	0.547	1.353		0.848
		(0.258)	(0.655)		(0.285)
		[0.201]	[0.532]		[0.625]
Age ≥ FRA		1.201	0.505		0.792
		(0.566)	(0.239)		(0.264)
		[0.698]	[0.148]		[0.484]
			N=11,768		*N*=11,768

Notes: The multinomial logit model is used for estimation in columns (1)-(4), and we report relative risk ratios. The logit model is used for estimation in column (5), and we report odds ratios. Separate models are estimated for each panel. The base category is defined in terms of employment status at t-2 (i.e., base category for the top panel is employed, middle panel is self-employed, and bottom panel is not working). Standard errors of odds or relative risk ratios are reported in parentheses are clustered at the individual level, and are calculated as the product of odds or relative risk ratios and the standard errors of the coefficients from the multinomial and logit models. ***, **, and * indicate that the estimates are statistically significant from one at the one-, five-, or ten-percent level. P-values for the model coefficients are reported in square brackets. "Employed" in this table refers to working for a wage or salary. All specifications include dummy variables for age in months (by two-month increments), cohort dummy variables, and dummy variables for race, marital status, education level, and self-reported health. Race includes white, black, and other; marital status includes married and married with spouse absent, partnered, separated/divorced/widowed, and never married; education includes less than high school, GED or high school graduate, some college, and college or above; self-reported health includes excellent, very good, good, fair, or poor. The models also include a dummy variable for whether the year is 2000 or beyond and an interaction between this dummy variable and a dummy variable indicating that age is greater than or equal to the FRA and less than or equal to 69. This captures the effects of the elimination of the earnings test in 2000, for those between the FRA through age 69. (This interaction does increase the likelihood of working, consistent with past work on the elimination of the earning test, such as Figinski and Neumark, forthcoming). The sample period for this analysis is 1992-2008. We restrict the sample to males born 1931-1943.

Table 4: Descriptive Statistics on Physical Demands of Jobs, by Age

	Age 61 or younger	Age 62	Age 63	Age 64	Age 65	Age 66	Age 67	Age 68	Age 69 or older
Lots of physical work	0.396	0.427	0.390	0.397	0.347	0.389	0.309	0.337	0.301
Lifting heavy loads	0.181	0.183	0.179	0.169	0.154	0.167	0.137	0.143	0.132
Stooping, kneeling, or crouching	0.291	0.314	0.285	0.296	0.251	0.284	0.238	0.271	0.240
Any physical demands of jobs	0.454	0.485	0.450	0.456	0.409	0.442	0.383	0.420	0.373
N	8,439	1,357	1,221	1,001	925	789	663	510	1,666

Notes: Information on physical demands is based on responses of those who are either fully or partly employed (including self-employment) to the following question: "I'll read some statements that are true for some people's jobs, but not for other people's jobs. Thinking about your job, please tell me how often these statements are true. My job requires [physical demands specified in column]." The answers to these questions are all/almost all the time, most of the time, some of the time, or none/almost none of the time. If the respondent answers either all/almost all the time or most of the time, then they are coded as 1, and otherwise they are coded as 0. "Any physical demands of jobs" is a dummy variable equal to 1 if they report having any one of the three physical demands. Means are reported for all males born between 1931-1943 in the data. We have restricted the sample to respondents who report on all three physical demands of jobs, but have not otherwise restricted the sample to those for whom information used in other tables is available.

Table 5: Employment Transitions and Physical Demands of Jobs, by Age

	Subsample: employed at wave t-2 Outcome: current wave (t)			
	Employed (different employer) (1)	*Self-employed* (2)	*Not working* (3)	*Working* (4)
Age ≥ 62 and < 65 × Any physical demand	1.092	1.257	1.033	0.985
	(0.183)	(0.347)	(0.126)	(0.117)
	[0.602]	[0.407]	[0.788]	[0.899]
Age ≥ 65 and < 66 × Any physical demand	0.646	0.547	1.019	0.891
	(0.192)	(0.300)	(0.213)	(0.182)
	[0.142]	[0.271]	[0.928]	[0.572]
Age ≥ 66 and < 68 × Any physical demand	0.841	1.198	1.483**	0.661**
	(0.221)	(0.414)	(0.256)	(0.111)
	[0.509]	[0.602]	[0.023]	[0.014]
Age ≥ 68 × Any physical demand	1.114	1.353	1.364**	0.747*
	(0.274)	(0.505)	(0.212)	(0.113)
	[0.660]	[0.418]	[0.046]	[0.054]
Age ≥ 62 and < 65 × Lots of physical effort	1.048	1.190	1.030	0.981
	(0.181)	(0.339)	(0.128)	(0.119)
	[0.788]	[0.541]	[0.811]	[0.874]
Age ≥ 65 and < 66 × Lots of physical effort	0.770	0.412	1.072	0.865
	(0.236)	(0.270)	(0.229)	(0.181)
	[0.394]	[0.177]	[0.746]	[0.489]
Age ≥ 66 and < 68 × Lots of physical effort	0.784	1.519	1.603***	0.618***
	(0.221)	(0.539)	(0.283)	(0.106)
	[0.388]	[0.239]	[0.008]	[0.005]
Age ≥ 68 × Lots of physical effort	1.070	1.307	1.344*	0.754*
	(0.280)	(0.520)	(0.218)	(0118)
	[0.797]	[0.501]	[0.068]	[0.071]
Age ≥ 62 and < 65 × Lifting heavy loads	1.157	1.324	0.982	1.049
	(0.248)	(0.559)	(0.157)	(0.163)
	[0.495]	[0.506]	[0.910]	[0.756]
Age ≥ 65 and < 66 × Lifting heavy loads	0.064***	0.407	0.927	0.847
	(0.066)	(0.421)	(0.252)	(0.226)
	[0.008]	[0.385]	[0.781]	[0.532]
Age ≥ 66 and < 68 × Lifting heavy loads	0.407**	1.563	1.119	0.827
	(0.187)	(0.760)	(0.252)	(0.181)
	[0.050]	[0.358]	[0.616]	[0.386]
Age ≥ 68 × Lifting heavy loads	1.011	2.456*	1.411**	0.696**
	(0.386)	(1.269)	(0.231)	(0.111)
	[0.977]	[0.082]	[0.036]	[0.023]
Age ≥ 62 and < 65 × Stooping, kneeling, or crouching	1.177	1.204	1.267*	0.812
	(0.217)	(0.376)	(0.170)	(0.106)
	[0.376]	[0.552]	[0.078]	[0.111]
Age ≥ 65 and < 66 × Stooping, kneeling, or crouching	0.606	0.606	1.137	0.799
	(0.221)	(0.407)	(0.270)	(0.185)
	[0.169]	[0.456]	[0.588]	[0.333]
Age ≥ 66 and < 68 × Stooping, kneeling, or crouching	0.900	1.261	1.484**	0.670**
	(0.272)	(0.496)	(0.287)	(0.126)
	[0.727]	[0.555]	[0.042]	[0.033]
Age ≥ 68 × Stooping, kneeling, or crouching	1.0424	1.665	1.794***	0.571***
	(0.307)	(0.694)	(0.310)	(0.096)
	[0.888]	[0.222]	[0.001]	[0.001]

Notes: The multinomial logit model is used for estimation, and we report relative risk ratios. The logit model is used for estimation in column (4), and we report odds ratios. The base category is employed at t-2. Notes to Tables 3 and 4 apply. The only exceptions are that the earnings test elimination controls are not included, and main effects for the physical demands variables are included. *N*=12,431.

Table 6: Effect of Social Security Reforms and Physical Demands of Jobs on Employment Transitions

	Subsample: employed at wave t-2 Outcome: current wave (t)			
Outcome	*Employed (different employer)* (1)	*Self-employed* (2)	*Not working* (3)	*Work* (4)
Cohorts affected by SS reform ×				
Age ≥ 62 × Any physical demand	1.037	0.762	0.736	1.327
	(0.361)	(0.430)	(0.186)	(0.328)
	[0.916]	[0.630]	[0.225]	[0.252]
Age ≥ 65 × Any physical demand	0.321	0.319	0.568	1.542
	(0.270)	(0.395)	(0.265)	(0.704)
	[0.177]	[0.357]	[0.225]	[0.343]
Age ≥ FRA × Any physical demand	2.600	5.593	1.842	0.629
	(2.166)	(6.498)	(0.841)	(0.282)
	[0.251]	[0.138]	[0.181]	[0.301]

Notes: The multinomial logit model is used for estimation, and we report relative risk ratios. The logit model is used for estimation in column (4), and we report odds ratios. The base category is employed at t-2. Notes to Tables 3 and 4 apply. *N*=12,431.

Table 7: Transition to Job with Less Physical Demands

	Subsample: employed wave t-2 and wave t		
Outcome	*Less physically-demanding job*	*Less physically-demanding job (different employer)*	*Less physically-demanding job (same employer)*
Age ≥ 62 and < 65 × Any physical demand	0.045***	0.109	0.035**
	(0.017)	(0.069)	(0.016)
Age ≥ 65 and < 66 × Any physical demand	0.095**	-0.054	0.113***
	(0.038)	(0.126)	(0.040)
Age ≥ 66 and < 68 × Any physical demand	0.039	0.044	0.052*
	(0.030)	(0.126)	(0.030)
Age ≥ 68 × Any physical demand	0.149***	0.047	0.175***
	(0.029)	(0.107)	(0.031)
Age ≥ 62 and < 65 × Lots of physical effort	0.039**	0.110	0.029*
	(0.019)	(0.074)	(0.018)
Age ≥ 65 and < 66 × Lots of physical effort	0.056	-0.070	0.062
	(0.040)	(0.132)	(0.044)
Age ≥ 66 and < 68 × Lots of physical effort	0.046	0.082	0.060*
	(0.033)	(0.131)	(0.034)
Age ≥ 68 × Lots of physical effort	0.140***	-0.076	0.183***
	(0.032)	(0.115)	(0.035)
Age ≥ 62 and < 65 × Lifting heavy loads	0.042	0.221**	-0.004
	(0.028)	(0.091)	(0.025)
Age ≥ 65 and < 66 × Lifting heavy loads	0.084	0.459**	0.098
	(0.061)	(0.179)	(0.061)
Age ≥ 66 and < 68 × Lifting heavy loads	0.029	0.359*	0.044
	(0.045)	(0.188)	(0.046)
Age ≥ 68 × Lifting heavy loads	0.172***	0.277*	0.199***
	(0.048)	(0.151)	(0.051)
Age ≥ 62 and < 65 × Stooping, kneeling, crouching	0.025	0.049	0.016
	(0.021)	(0.079)	(0.020)
Age ≥ 65 and < 66 × Stooping, kneeling, crouching	0.116**	-0.080	0.143***
	(0.048)	(0.162)	(0.052)
Age ≥ 66 and < 68 × Stooping, kneeling, crouching	0.025	-0.131	0.053
	(0.035)	(0.147)	(0.037)
Age ≥ 68 × Stooping, kneeling, crouching	0.146***	0.245	0.156***
	(0.037)	(0.123)	(0.040)
N	9,771	1,178	8,096
Means of the dependent variable			
Overall	0.112	0.336	0.083
Age < 62	0.089	0.325	0.057
62 ≤ Age < 65	0.130	0.400	0.092
65 ≤ Age < 66	0.158	0.261	0.140
66 ≤ Age < 68	0.144	0.359	0.121
Age ≥ 68	0.180	0.290	0.173

Notes: The linear probability model is used for estimation. Standard errors reported in parentheses are clustered at the individual level. ***, **, and * indicate that the estimates are statistically significant at the one-, five-, or ten-percent level. We estimated separate linear probability models corresponding to the outcome in each column. Notes to Tables 3, 4, and 5 apply (and the notes from Table 5 describe the controls). A job is coded as less physically demanding if the respondent reported a decrease in at least one of the three physical demands of the job, and did not report an increase in any of the physical demands.