Will Retiring from this Job Kill Me? The Health Effect of Retirement in Different Industries and Occupations

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ABSTRACT

Although retirement and health are both pressing concerns with an aging society, little research has been done examining potential health effects of retirement. This study uses a variety of different health measures to test for a general health effect of retirement along with specific effects by industry and occupation. The results suggest that retirement does not have a strong effect on health for men or women, although retirement may increase the likelihood of depression for men, particularly if retiring from a low-skill blue-collar occupation. In addition, there is some evidence that individuals who retire from jobs with worse working conditions benefit less from retirement than those who retire from jobs with typically better working conditions.

INTRODUCTION

In the current political climate perhaps the two most contentious areas of economics are retirement and health. Highly controversial reform proposals to the Social Security program as well as the failure of a few prominent traditional defined benefit pension plans have brought into question who should retire, when they should retire, and how they should pay for retirement. At the same time, skyrocketing health insurance costs for both businesses and individuals and reports of record obesity levels have heightened concerns about health preservation and health care provision. Interestingly, despite extensive research on retirement and health separately, economic research on the two topics jointly is incomplete: economists have examined the effect of health on retirement, but few have looked at the effect of retirement on health.

This paper analyzes the effect of retirement on health emphasizing differences across industry and occupation. Although anecdotal evidence has typically suggested that retirement has a negative effect on health due to the individual's loss of identity and purpose coinciding with the withdrawal from 'productive' labor, this view may be changing as retirement becomes a more accepted part of our society. There is also reason to believe that the effect may be different for individuals in different types of jobs, as specific job characteristics may make retirement more or less attractive depending on your occupation. The sparse research that does exist contains conflicting results with some finding the expected negative effect, others finding a positive health boost, and still others finding no effect from retirement at all. Whatever the direction of the effect, there are clear implications for businesses that provide pensions and retiree health care. If retirement boosts health, the cost of early retirement provisions in terms of increased pension liabilities may be partially offset by reduced future medical costs. On the other hand, if retirement harms an individual's health, later retirement ages may reduce future health care costs as well as pension liabilities.

To empirically test the effect of retirement on health the paper proceeds as follows. Section II briefly examines the existing literature on the topic. I present the empirical methodology and data that I use in Section III. Section IV presents the results while Section V concludes the paper with some directions for future research.

LITERATURE

Although the connection between retirement and health has not been examined extensively in economics, some literature does exist on the topic. Methodologically, the major issue in the literature is how to account for the fact that the retirement decision is likely endogenous. Jewell (1992) uses a simultaneous equations model and successive cross sections of data on men in the United States from the 1970s to check for a "shock" effect from the retirement transition. Using the health change measure "Health Compared to Others", Jewell finds tenuous evidence that there is a negative shock effect on men's health from the retirement transition, although the effect disappears and actually becomes positive as the sample ages. A different health change measure "Change in Own Health" displays the same pattern of results but is not statistically significant. While the study shows a potential effect on general health from retirement, the self-reported subjective health measures used by Jewell may be susceptible to justification bias: a need to justify retirement by reporting worse health than is actually experienced. This issue may be particularly strong given that it uses data from a time when retirement as an institution was less socially acceptable.

Two other studies use more recent data from the 1990s, but from the Netherlands (Kerkhofs and Lindeboom 1997; Kerkhofs, Lindeboom, and Theeuwes 1999). Using a fixed effects model to account for the endogeneity of retirement, the authors find some evidence that retirement improves, or at least preserves, the general health of individuals. While interesting, the estimation method assumes that the sources of the endogeneity are individual specific and time invariant, implying that they will drop out during estimation. If this is not the case, the fixed effect methodology may not correct for the endogeneity problem casting some doubt on the accuracy of the results. Even if the methodology does account for the endogeneity, given the distinctly different retirement systems and attitudes between the Netherlands and the United States, it is unclear how applicable the results are across countries.

A final study by Charles (1999) pools various data sets to examine the effect of retirement on the well-being of men in the United States during the 1980s and 1990s. The pooled data allows Charles to use legislative discontinuities in the Social Security system, mandatory retirement provisions, as well as age specific pension incentives as instruments, an identification strategy that appears to be quite strong. Charles finds that retirement increases well-being, however, the connection between well-being and overall health is unclear. In addition, the pooled data forces Charles to limit his analysis to only men, and to only two measures of well-being, feelings of depression and loneliness. The narrow focus of the study further calls the applicability of the results to general health into question.

While the studies provide interesting findings examining a variety of different components of health, they do not arrive at any definitive consensus. The studies also do not explicitly examine whether there are different effects for workers retiring from different industries and occupations. Theoretically, there are a few reasons we might expect to see differential effects across different jobs. Using a model of health investment where purchased medical goods and leisure act as inputs in the health production process, retirement, and the corresponding reduction in work hours, alters the absolute and relative quantities of health inputs, potentially affecting health production. Norms concerning work hours in different jobs thus lead to different magnitude shifts in health inputs and health production from retirement. Differential health depreciation rates across jobs due to employment conditions may cause similar discrepancies. Depreciation rate differences between workers and retirees means that a given amount of health production will lead to different magnitude health changes, altering the cost of health improvements. For example, declines in depreciation rates with retirement would decrease the cost of health improvements. The larger the decline in the depreciation rate, the larger the decline in cost, leading to potentially different effects across jobs due to distinct employment conditions.

Examining recent literature across disciplines, only a few studies have examined the effect of retirement across industries and occupations. A British study (Mein, Higgs, Ferrie, and Stansfeld 1998) finds that those in administrative positions noticed greater health improvements after retirement than those in professional and clerical positions. Wheaton

(1990) finds that the mental health of workers retiring from low work stress jobs seems to be hurt by retirement, while the mental health of those retiring from high work stress positions seems to improve. Retiring from negative work conditions may actually be cathartic for these individuals. Finally, a Danish study (Moller 1987) reports that workers taking early retirement from jobs with negative working environments were more likely to report health improvements than those leaving more favorable environments. A cautionary note on these studies is that no effort was made to account for the endogeneity of retirement. Regardless, the studies suggest that retirement may play a different role in different occupations.

METHODOLOGY AND DATA

To test for the effect of retirement on health I estimate a two-stage linear probability model which instruments the retirement decision by exploiting exogenous variation in benefits across age in the Social Security system and the individual's private pension. The instrumentation strategy should account for the endogenous retirement decision and allow me to obtain consistent coefficient estimates. In addition to the endogeneity issues, another potential problem with previous retirement studies is that retirement is unlikely to change health instantaneously, but only after a period of time as the individual adjusts his or her health production behavior. To allow health time to adjust to the retirement transition I use three waves of longitudinal data following individuals across the retirement transition. I select my sample so that everyone is working (greater than 1,200 hours per year) when first observed, individuals retire or continue working by the second wave, and then experience a health change between the second and third waves. I also force individuals to stay in their respective labor force state between the second and third wave so that I am comparing health changes for those individuals who have stayed in retirement to those individuals who have continued working full time. Finally, I also estimate the model separately by sex to allow for differential impacts based on distinct patterns of labor force participation and health profiles between men and women. The econometric model takes the form:

$$HC_{t+2} = c + \beta X_t + \varphi F_t + \omega G_t + \alpha H_t + \gamma R_{t+1} + e_{t+2}.$$

In equation (1) HC is a dichotomous variable equal to 1 if the individual experiences a non-negative health change (health improving or staying the same) between period t+1 and t+2, and equal to 0 otherwise. With the variables defined in this manner any factor increasing the likelihood of a non-negative health change is conversely decreasing the likelihood of a health decline. I estimate the model using a variety of different health change measures, some of which are more subjective, based on self-reported information from individuals, and some of which are more objective, based on information reported by medical professionals. Including a variety of different health change measures allows me to capture different mechanisms through which retirement may alter health, but it also allows me to check for the presence of two types of reporting biases in the subjective health change estimates. Individuals may feel that they need to justify their retirement by reporting poor health, thus causing the subjective measures to show health declines for retirees even if they are not actually present. On the other hand, what may be called "role bias" may be an issue as well. Retirees may report that their health has improved after retirement, but this may not reflect actual health improvements but functional improvements as their retirement role is less physically demanding, causing them to feel better and feel less limited in daily activities than they did on the job. Comparing the subjective results to the more objective results based on doctor reported symptoms and conditions can help identify these biases, as agreement between the two types of results will suggest actual health changes rather than reporting biases. However, the test is not perfect; the subjective measures capture broader health changes that the more specific objective measures might miss. Thus, agreement between the two types of measures can lend support, but disagreement does not necessarily invalidate.

The first subjective health variable (Sub) is derived from a question asking the individual how their health has changed since the previous wave. The second subjective variable (DSE) is derived from a question in each wave of the study asking the individual to rate their health on a scale of excellent, very good, good, fair, or poor. Using the difference in subjective ratings I am able to classify the individual as having a non-negative change if the health rating stays the same or improves. I also derive five objective health change measures. The first three measures are derived from questions about the functional ability of the individual and are constructed by summing responses that the individual has 'some difficulty' performing various tasks. The first variable collects information about certain tasks classified as Activities of Daily Living (ADLs), such as bathing, eating, or getting out of bed; the second variable asks questions about mobility such as walking a block or climbing a flight of stairs; while the third variable asks questions about large muscle activities such as stooping or getting up from a chair. If any of the indices improve or remain the same across the two waves of the survey the individual is given a non-negative health change. The final two measures are constructed similarly, but using questions from the Center for Epidemiological Studies Depression Scale (CESD) which asks questions about common symptoms of depression, and questions about the presence of certain health conditions such as high blood pressure, diabetes, and lung disease. Once again, improvements or no changes in the measures imply non-negative health changes. For all of the health change variables I categorize death between the second and third waves as a negative health change.

The control variables are all from time period t, and include information about demographics, occupation, and industry (X), financial status (F), genetic and early life factors (G), and initial health status and health behaviors (H). The potentially endogenous labor force variables are captured in R, and represent labor force status in period t+1. I include a dummy for retirement status (less than 1,200 hours worked per year) to capture the effect of retirement in general, but also include interactions of retirement with an indicator for longest tenure job in a goods producing industry, longest tenure job in a high-skill white-collar occupation, longest tenure job in a low-skill white-collar occupation, and longest tenure job in a high-skill blue-collar occupation (longest tenure job in a non-goods producing industry and in a low-skill blue-collar occupation are the base groups). The interaction terms are designed to capture differential effects of retirement from various jobs. While my main focus is retirement itself, I also estimate the model separately on a continuous measure of annual hours worked, and the corresponding interactions, to see if smaller magnitude changes in labor force participation also affect health.

To identify the model I exploit exogenous variation in pension benefits across age. The logic of the identification strategy is that retirement will be affected by benefit eligibility triggered by an individual reaching a certain chronological age, but that controlling for overall aging effects, reaching certain ages should not affect health. While an individual's health should decline as they age, we would not expect a systematic difference in health between an individual's 62nd birthday and the day before when they were only 61. Following this logic my instruments include indicators for the individual being between the ages of 62 and 65, and older than 70, as well as indicators for whether a spouse who has worked at least ten years is between 62 and 65, 65 and 70, or older than 70. These age brackets follow benefit patterns and employment earnings tests in the Social Security system. I also include indicators for whether the individual is past the early or normal entitlement age in their employer pension, and whether the individual is past the usual retirement age in their job. These indicators are also interacted with the occupation and industry categories.

To estimate the model I use data from the Health and Retirement Study, a longitudinal data set with biannual waves starting in 1992 and continuing through 2004.

Individuals in the survey were between the ages of 51 and 61 in 1992, although different cohorts of workers subsequently expanded the study's scope. Along with the longitudinal structure the study is perfect for this type of analysis because it includes the detailed information on demographics, finances, health, and labor force participation that is necessary to control for the variety of factors that may influence health. After employing the sample selection strategy described above, and cleaning missing variables, I arrive at samples of 7,548 men and 8,556 women. The means for the labor force and health change variables are presented in Table 1.

{TABLE 1 HERE}

RESULTS

I present the second stage coefficients for the labor force variables in Table 2 for men and in Table 3 for women. The top panels display the retirement variable and the interactions of retirement with the industry and occupation indicators, while the bottom panels display the results for annual hours worked and the industry/occupation interactions. Examining the results for men we see that there appears to be very little effect of retirement, regardless of industry or occupation. There is tentative evidence that retirement preserves health using the subjective health change measure shown in the first column. Increasing the probability of retirement by 25% at the mean decreases the likelihood of a health decline by just over 1%, although all of the interactions are insignificant. These results carry over to the annual hour measure, with a 25% reduction in annual hours decreasing the likelihood of a health decline by 4.33%. Reducing labor force participation by 25% in a low-skill white-collar occupation may preserve health relative to low-skill blue-collar jobs using the difference in subjective health ratings (DSE) measure in column 2, but these results are only significant at the ten percent level, and are relatively small in magnitude.

{TABLE 2 HERE}

The results for the depression measure (CESD) are somewhat stronger. By itself, retirement may increase the likelihood of depression, as a 25% increase in predicted retirement increases the likelihood of reporting depressive symptoms by 1.21%. It also appears that retiring from a low-skill blue-collar job may have the strongest effect on depression. All three of the occupation interactions are significant (at least at the ten percent level) and positive, suggesting that relative to low-skill blue-collar jobs, retirement from these types of occupations is less likely to result in increases in depressive symptoms. A similar pattern is seen using the annual hour variables, although annual hours by itself is no longer significant. Potentially the pattern of results could be due to differences between occupations in the ability to retain work-related social networks, or to the relative proclivity of individuals in different occupations to develop interests outside of work that preserve mental health.

Turning to the results for women presented in Table 3, we see that once again retirement and labor force withdrawal have little effect on health no matter how it is measured. For women, the only variables significant at any level are a few of the goods producing industry interaction terms. The coefficients on the retirement interaction using the difference in subjective evaluation, mobility, and large muscle health measures are all negative suggesting that working in a goods producing industry increases the likelihood that retirement will cause health to decline relative to not working in a goods producing industry. The annual hour variables show the same pattern with the ADL measure replacing the DSE measure in marginal significance.

{TABLE 3 HERE}

Overall, the lack of significant results for either sex suggests that the stereotype of retirement harming the health of individuals may not be true, although the opposite can not be claimed either. Men may receive some preservative effects of retirement although the evidence is tenuous as best, but retirement does appear to increase the likelihood of depression, possibly due to a strong attachment to the labor force during their working years. In contrast, the lack of results for women may be due to their labor market history, as less attachment may make retirement a less drastic shift in lifestyle. Women may be more used to moving in and out of the labor force causing retirement to be less stressful. The negative effect for women of retirement from a goods producing industry is somewhat contrary to expectations as it would appear that those workers who spent their lives working in worse conditions would have the most to gain from exiting the labor force. However, we do see some evidence of this same trend for men, as the coefficients on the better work condition occupation interactions are positive when significant. The combination of these results suggests that this may not be the case, and it is workers from better working condition jobs who benefit more from retirement.

CONCLUSION

Although the effect of retirement on health would appear to be something that economists would be greatly interested in, particularly with an aging society, little research has actually been conducted on the topic. This paper attempts to remedy this situation, focusing on the effect of retirement from various industries and occupations. Examining the results for men and women I found that retirement did not appear to greatly affect health regardless of industry or occupation.

Outside of the economic reasons for retirement displaying little effect, there are some more technical issues that could possibly be driving the results which could be remedied with future research. On potential explanation could be that the insignificant results are driven by weak instruments in the first stage estimation. It is well documented that weak instruments can lead to inconsistent results even with very large samples sizes, as well as relatively large standard errors. I did reject the null hypothesis of joint insignificance of the instruments in the first stage for all of the potentially endogenous variables, with F statistics ranging from 4.17 to 14.58. However, problems can still arise when the instruments are not 'strong enough', a situation which may arise with some of the variables. To check for this type of estimation problem stronger instruments should be identified and employed, although often times this is easier said than done.

Another potential cause of the lack of significant of the industry and occupation interactions could be that the variable categories are too broad, encompassing too many types of jobs with strikingly different work conditions. Jobs in these categories may not display any consistent pattern of retirement effect because they are not similar enough to be grouped together. Differential retirement effects may be due to specific work conditions unrelated to industry or occupation. Future work should try to identify specific conditions of an individual's job, for example high stress or monotony, regardless of industry or occupation and examine retirement's effect in these groups rather than broad industry or occupation categories.

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Table 1: Means of labor force and health change variables

	Men		Women	
	Mean	Std. Error	Mean	Std. Error
Labor Force Variable				
1,200 Hour Retirement	0.2118	0.005	0.2160	0.004
Goods Producing Ind.*1200	0.0852	0.003	0.0365	0.002
White Col. High Skill*1200	0.0697	0.003	0.0598	0.003
White Col. Other*1200	0.0285	0.002	0.0797	0.003
Blue Col. High Skill*1200	0.0829	0.003	0.0278	0.002
Blue Col. Other*1200	0.0260	0.002	0.0484	0.002
Annual Hours	1.9562	0.013	1.7158	0.010
Goods Producing Ind.*Annual Hours	0.6837	0.013	0.2672	0.008
White Col. High Skill*Annual Hours	0.7043	0.013	0.6331	0.011
White Col. Other*Annual Hours	0.2892	0.009	0.6073	0.010
Blue Col. High Skill*Annual Hours	0.6816	0.013	0.1832	0.007
Blue Col. Other*Annual Hours	0.2360	0.009	0.2916	0.008
Health Change Variable				
Subjective	0.8128	0.004	0.8250	0.004
Difference Subjective Evaluations	0.7174	0.005	0.7464	0.005
Activities of Daily Living	0.9397	0.003	0.9432	0.003
Mobility	0.8364	0.004	0.7956	0.004
Large Muscle	0.7789	0.005	0.7535	0.005
CESD	0.7848	0.005	0.7525	0.005
N=	7,548		8,556	

Table 2: Second stage coefficients for labor force variables and the labor force/job type interactions - Men

	1,200 Hour Retirement Definition and Retirement/Job Interactions						
Labor Force Variables	Sub	DSE	ADL	Mobility	Large Muscle	CESD	Conditions
1,200 Hour Retirement	0.1570*	0.0081	-0.0939	-0.0147	-0.0396	-0.1786*	-0.0857
(std. er.)	(0.085)	(0.102)	(0.063)	(0.093)	(0.092)	(0.100)	(0.091)
Goods Producing Ind.	0.0087	-0.0378	0.0445	-0.0430	-0.0820	-0.0961	0.0223
(std. er.)	(0.061)	(0.071)	(0.037)	(0.057)	(0.065)	(0.065)	(0.067)
White Col. High Skill	-0.0357	0.0917	0.0845	0.0732	0.1340	0.2603**	-0.0008
(std. er.)	(0.091)	(0.108)	(0.065)	(0.097)	(0.099)	(0.103)	(0.099)
White Col. Other	-0.0106	0.2298*	0.0571	0.1231	0.0764	0.2263*	0.0125
(std. er.)	(0.114)	(0.125)	(0.075)	(0.110)	(0.115)	(0.117)	(0.115)
Blue Col. High Skill	-0.0929	0.0632	0.0404	0.0461	0.1584	0.2051**	0.0071
(std. er.)	(0.090)	(0.108)	(0.067)	(0.098)	(0.099)	(0.104)	(0.099)
	Annual Hours Definition and Hours/Job Interactions						
	Sub	DSE	ADL	Mobility	Large Muscle	CESD	Conditions
Annual Hours	-0.0720**	-0.0022	0.0220	-0.0022	0.0109	0.0543	0.0176
(std. er.)	(0.031)	(0.038)	(0.023)	(0.034)	(0.035)	(0.037)	(0.033)
Goods Producing Ind.	-0.0013	0.0164	-0.0156	0.0193	0.0298	0.0392	-0.0045
(std. er.)	(0.023)	(0.027)	(0.014)	(0.022)	(0.025)	(0.025)	(0.026)
White Col. High Skill	0.0224	-0.0379	-0.0270	-0.0251	-0.0399	-0.0891**	0.0074
(std. er.)	(0.034)	(0.041)	(0.024)	(0.037)	(0.038)	(0.039)	(0.037)
White Col. Other	0.0110	-0.0875*	-0.0157	-0.0370	-0.0190	-0.0752*	0.0010
(std. er.)	(0.042)	(0.047)	(0.027)	(0.041)	(0.043)	(0.043)	(0.042)
Blue Col. High Skill	0.0423	-0.0270	-0.0055	-0.0113	-0.0539	-0.0665*	0.0088
(std. er.)	(0.034)	(0.042)	(0.025)	(0.037)	(0.038)	(0.039)	(0.037)

*** significant at .01 level ** significant at .05 level * significant at the .10 level

Table 3: Second stage coefficients for labor force variables and the labor force/job type interactions - Women

	1,200 Hour Retirement Definition and Retirement/Job Interactions						
Labor Force Variables	Sub	DSE	ADL	Mobility	Large Muscle	CESD	Conditions
1,200 Hour Retirement	0.0550	0.0110	0.0413	0.0003	0.0179	-0.0420	-0.0252
(std. er.)	(0.105)	(0.114)	(0.070)	(0.114)	(0.116)	(0.101)	(0.106)
Goods Producing Ind.	-0.0485	-0.1976*	-0.0914	-0.2135*	-0.2972**	0.0959	0.0731
(std. er.)	(0.093)	(0.115)	(0.059)	(0.110)	(0.125)	(0.097)	(0.092)
White Col. High Skill	0.1103	0.0397	0.0176	0.0386	-0.0089	-0.0817	0.0336
(std. er.)	(0.103)	(0.110)	(0.064)	(0.106)	(0.109)	(0.103)	(0.103)
White Col. Other	0.0125	0.0638	0.0650	0.0283	-0.0436	-0.0884	0.0419
(std. er.)	(0.100)	(0.108)	(0.066)	(0.105)	(0.108)	(0.097)	(0.100)
Blue Col. High Skill	0.0688	0.2647	0.0558	0.1355	0.2788	0.0189	-0.0712
(std. er.)	(0.156)	(0.172)	(0.095)	(0.169)	(0.174)	(0.152)	(0.154)

	Annual Hours Definition and Hours/Job Interactions						
	Sub	DSE	ADL	Mobility	Large Muscle	CESD	Conditions
Annual Hours	-0.0257	0.0035	-0.0131	0.0035	-0.0048	0.0249	0.0084
(std. er.)	(0.051)	(0.055)	(0.033)	(0.054)	(0.055)	(0.049)	(0.050)
Goods Producing Ind.	0.0315	0.0785	0.0450*	0.0943**	0.1241**	-0.0330	-0.0261
(std. er.)	(0.041)	(0.049)	(0.027)	(0.047)	(0.053)	(0.042)	(0.039)
White Col. High Skill	-0.0410	-0.0194	-0.0053	-0.0197	0.0011	0.0202	-0.0117
(std. er.)	(0.049)	(0.053)	(0.030)	(0.050)	(0.052)	(0.049)	(0.048)
White Col. Other	-0.0059	-0.0330	-0.0337	-0.0206	0.0155	0.0276	-0.0173
(std. er.)	(0.049)	(0.053)	(0.032)	(0.051)	(0.053)	(0.048)	(0.048)
Blue Col. High Skill	-0.0395	-0.1087	-0.0283	-0.0553	-0.1117	-0.0349	0.0262
(std. er.)	(0.069)	(0.076)	(0.043)	(0.073)	(0.074)	(0.068)	(0.066)

*** significant at .01 level ** significant at .05 level * significant at the .10 level