

**RETIREMENT LITERATURE: AN INTERDISCIPLINARY REVIEW OF
PRERETIREMENT INFLUENCES
ON ATTITUDES AND DECISIONS REGARDING RETIREMENT**

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ABSTRACT

The environment in which those interested in retirement and pension research work has changed dramatically since 1990. The use of longitudinal data bases, more detail on pension plan coverage, use of retirement incentive variables calculated using forward-looking methods, changes in employer-sponsored pension plans from defined benefit to defined contribution plans, and reductions in employer-sponsored health care coverage, both pre- and post-retirement, are some of the most influential changes. This paper begins to update the summary of research knowledge from 1990, as defined by Costa (1998) and Gerhart & Milkovich (1992), to the present. This article reviews sixty papers written since 1990, and summarizes their important points under seven topic areas. The seven topics addressed are: Retirement Trends, Influences on the Retirement Decision, Participation Decisions, Effects of Employer-Sponsored Pension Plans, Effects of Health, Effects of Stock, and Effects of Pension Plans on Employee Attitudes and Behaviors.

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INTRODUCTION

The environment in which researchers interested in retirement and pension issues work has changed dramatically since 1990. The use of longitudinal data bases in research has become the norm, not the exception. The Health and Retirement Study (HRS), which began collecting data in 1992 and has revisited its original participant base every 2 years since, is the primary data source for much of the research done since the mid 1990s. The Survey of Consumer Finances is another important longitudinal data base currently being used by researchers. The HRS also began an era of more detail, more detail about participants and much more detail about pension plan coverage. The HRS requested detailed information from participants about their current and past employer-provided pension coverage and employer contact information to gain access to plan sponsor Summary Plan Descriptions and to provide matching ability of those SPDs with survey participants. The HRS also requested participant authority to match Social Security records to the participant-provided data. These two sources of additional information have provided an exceptional amount of pension plan coverage detail, both private and public, by participant, and allowed testing of the knowledge and plan specific effect of coverage on participants' decisions. Another major change for researchers has come from calculating retirement incentive variables using forward-looking methods, either Stock and Wise' (1990) Option Value method, which measures the utility gain from working to the optimal future retirement date, or a peak value method, which is equal to the discounted value of retirement wealth at its maximum value minus the current discounted value, instead of the yearly increase or accrual in plan benefit (Coile, 2003). The retirement and pension research environment has also changed due to external forces. Employers have dramatically changed the benefits they offer to employees. The number of employees covered by defined benefit plans has dropped dramatically (EBRI Databook), while the number covered by and contributions to defined

contribution plans have increased (Clark, Goodfellow, Schiefer, & Warwick, 2000). In addition, employers have drastically changed their policies with regard to health care coverage. Many employers have ceased providing health care coverage to employees at all, or are providing coverage only with higher employee cost-sharing provisions. The number of employers providing post-retirement health care coverage has also dropped dramatically (EBRI Databook). These changes significantly affect the retirement decisions employees make. Lastly, the roller-coaster ride of the stock market since the mid 1990s affected the retirement and pension research environment through its impact on employee investments, stock investment in general and employer-stock investment in particular, its likely impact on employee retirement decisions, and its impact on employers and their benefit plan designs.

Costa (1998) summarized and clarified the state of knowledge on retirement and pension research from 1880 through 1990 very well in her book entitled “The Evolution of Retirement.” Gerhart and Milkovich (1992) summarized the state of knowledge on employee benefit research as of 1990 in their book chapter entitled “Employee Compensation: Research and Practice” published in “The Handbook of Industrial and Organizational Psychology.” As described above, however, the research environment has changed dramatically since these important pieces were written. This paper is a start to updating the summary of research knowledge to the present. This paper reviews sixty articles written since 1990, and summarizes their important points under 7 topic areas. The sixty papers reviewed in the following sections were chosen from the more than one thousand papers written on retirement and pension issues since 1990. More than seven hundred of the written and published papers, both formal research and practitioner articles, are listed in a separate section of this report; this separate section, an extensive bibliography of articles written from 1990 through 2004, can be accessed on the Society of Actuaries website and can be searched based by author, by year published, and by topic addressed.

The following sections of this paper contain reviews of the sixty papers chosen, organized by important topics of research in the retirement and pension areas. The topics used for the narrative review below do not coincide exactly with the category definitions for the bibliographic listing of articles. The category definitions for the bibliographic article listing are described on the Society of Actuaries website, and are referenced thereafter as ‘a, b, c, d, e, f, g, h, i, j, and k.’ The topic headings for this narrative, with a brief description of the issues addressed under each heading and a note in parentheses of the corresponding bibliographic categorizations, are: Retirement Trends, which contains an update of normal (d) and early retirement (e) trends, trends of women (k), and phased or bridge employment trends (c); Influences on the Retirement Decision, which contains an update on the items that have been shown to influence normal (d) and early (e) retirement decisions; Effects of Employer-Sponsored Pension Plans, which contains an update on the influence of employer-sponsored pension plans on the retirement decision (d, e) and a section on the different effects of defined benefit as compared to defined contribution type plans (i); Effects of Health, which contains two sections, one of which updates the influence of health on the retirement decision (d, e, g) and the second of which contains a review of the influence of health care costs on the retirement decision (g).

DISCUSSION

RETIREMENT TRENDS

The labor force participation rates of men declined at all ages ≥ 50 from 1880 through 1990 (Costa, 1998). The downward trend since 1960 is apparent in the following table. Many researchers and practitioners have indicated that, due to many influences, this trend has leveled off, and even reversed itself. Current research does support a leveling-off, but not a reversal. Specifically, Quinn (2000) found that retirement rates, both normal and early, leveled off from 1985 to 1997. His 1997 retirement rates, calculated from the Health and Retirement Study data

for 1992 through 1996, are shown below as labor force participation rates (determined as 100 % minus the applicable retirement rate). Gustman and Steinmeier (2000, Table 10) found that retirement rates calculated from the Health and Retirement Study for 1992 through 1998, when compared to the Retirement History Study for 1969, show dramatic increases at all ages up to age 64, with large decreases in the offsetting labor force participation rates. Their results, for men only and based on self-reports of not retired plus partially retired, are shown below. Both Quinn's (2000) and Gustman & Steinmeier's (2000) results are reasonably close to the results shown by Costa (1998) for 1990, and reflect the leveling of labor force participation rates since 1990 with a possible reversal of rates at \geq age 65 when those partially retired (including those who returned to work either full or part time) are included in the labor force.

Labor Force Participation Rates for Men

Year Age	Costa- 1960	Costa – 1990	Quinn- 1985	Quinn – 1997	G & S – 1969	G & S – 1998
55	86%	80%	84%	83%		
58	83%	72%			90%	79%
60	80%	66%	71%	68%	84%	73%
62	75%	55%	51%	53%	70%	56%
65	64%	39%	31%	32%	36%	40%
68 (67 for G & S)	45%	26%	21%	22%	28%	45%
70	39%	21%	16%	22%		

An important caveat should be addressed at this point. The word 'retirement' does not have a universal meaning for either survey participants or researchers. Retirement can include those only fully retire based on self-reports, those fully and partially retired based on self-reports, those working less than a specified number of hours per week, or those receiving Social Security benefits. Although all the measures mentioned have been found to be strongly, positively correlated (about .80), they are not equivalent (Talage & Beehr, 1995). Labor force participation rates assessed at a specific point in time may also include or exclude those who have returned to work either part or full time. The retirement rates and offsetting labor force participation rates

will differ substantially depending on the definition of retirement. For instance, the Steinmeier & Gustman (2000) labor force participation rates shown in the table above are based on self-reports of those fully and partially retired, including those who have returned to work. The labor force participation rates for 1998 for those self-reported as not retired only are 69%, 61%, 37%, 18%, and 13% for ages 58, 60, 62, 65, and 67, respectively. Listing these rates in the above table leads to seriously questioning the reversal of retirement rates.

Retirement trends have also been examined through investigation of the hazard rate, the probability that a person of a certain age retires within a specific short time span of 1, 2, 4, or 6 years. The upward trend of hazard rates since 1960, and the current peaks at ages 62 and 65, are apparent in the following table. Coile & Gruber (2000) calculated new retirement hazard rates using the first 4 waves of the Health and Retirement Study; their rates are shown in the following table. Coile & Gruber's (2000) results are fairly close to Costa's (1990), except that a new peak appears at age 69. These researchers also tested the hazard rates they had calculated for sensitivity to changes in Social Security calculation rules; they found that the hazard rates would be slightly reduced at all ages, with the drop in rates peaking at age 65 (a drop of 1.61% if Social Security Normal Retirement Age was set to 67 or a drop of 2.7% if the delayed retirement credit became 8% per year for the entire sample), and then vanishing by age 69. Allen, Clark and Ghent (2003) also calculated hazard rates using the longitudinal administrative data of major southern university. Their rates are shown below. As expected, the retirement hazard rates for professors who are well-educated and highly paid are lower than those found by Costa (1998) and Coile & Gruber (2000) for ages 62 through 65; thereafter, the hazard rates for professors increase substantially, showing a peak at age 69 similar to that found by Coile & Gruber (2000) but larger. Several researchers have determined retirement hazard rates using the Health and Retirement Study, where the participant group in 1992 was aged 50 – 62. These researchers

found that 2-year hazard rates increased from 12.8% for men and 15.3% for women in the age range 50 - 64 (Johnson, Davidoff, & Perese, 2003), to 16% for all participants in the age range 50 - 66 (Rogowski & Karoly, 2001), to 19% for married men and 22% for married women in the age range 50 - 68 (Johnson & Favreault, 2001), to about 21% for all participants in the age range 54 - 68 (Johnson, 2002). Given that these are 2-year hazard rates and that they represent participants ranging in age from 50 – 68, they seem reasonably consistent with the 1-year rates provided below by Costa (1990) and Coile & Gruber (2000). Thus, in general, these hazard rates lend more support to the findings that the rates of retirement have stabilized, but have not reversed themselves.

Retirement Hazard Rates for Men

Year Age	Costa- 1960	Costa – 1990	Coile & Gru- ber – 2000	Allen, Clark & Ghent – 2000
55	1%	4%	3.23%	4.2%
57	1.5%	2%	2.79%	4.0%
60	2%	5%	5.00%	7.7%
62	2%	15%	16.82%	9.9%
65	16%	24%	22.3%	17.1%
68	13%	8%	8.77%	13.7%
70/69 for G & C and for A, C, G	12%	15%	21.24%	27.8%

With regard to women’s retirement and labor force participation rates, the trend is still being determined. Costa (1998) did not include any data for women in her extensive review of retirement issues. The Health and Retirement Study does provide a substantial data base to study the behavior of working and non-working women over time. Quinn (2000) found that the early and normal retirement rates for women decreased slightly from 1985 to 1997. Specifically, for age groups 55 – 59 and 60 – 64, he found that, from 1985 to 1997, the rates dropped from 52% to 43% and from 68% to 63%, respectively. Mulvey (2003) also found that labor participation rates

for women \geq age 65 increased by about 2% from 1983 – 2001. This indicates increasing labor force participation for women, likely due to changing labor market conditions (Quinn, 2000). Other researchers calculating retirement hazard rates using the Health and Retirement Study found higher hazard rates for women than for men. Specifically, Johnson, Davidoff, & Perese (2003) found that 2-year hazard rates for women in the age range 50 - 64 were 15.3% while those for men were 12.8%, Coile (2003) found that 2-year hazard rates for married women in the age range 52 - 69 were 18% compared to 17% for married men, and Johnson & Favreault (2001) found that 2-year hazard rates for married women in the age range 50 - 68 were 22% compared to 19% for married men. These results are likely due partially to married women retiring earlier to spend leisure years with their older married husbands; Gustman & Steinmeier (2004) found that, on average, wives retire at ages about 2 years younger than their husbands. Coile (2003) also noted that married women who choose to retire were, on average, 2 years younger than retiring married men. As a contradiction to differences by gender, Quinn (2000) found that, once the data was conditioned on holding a career job, gender did not affect the likelihood of taking a bridge job as compared to going directly into full retirement; in his study, gender still did affect the labor force participation rate, however. Talaga and Beehr (1995) investigated the different influences on retirement decisions of men and women through a survey sent to current and former employees of a manufacturing firm. They found differences in behavior by gender, specifically finding that women were much more likely to have retired (based on self report of retired) if a) there were more dependents living in the house, b) their husbands were in poor health, and/or c) their husband was retired. The effect of a spouse's health on the retirement decision is a major item of investigation by current researchers and has been shown by many to differ by gender; this topic is discussed in depth in the section entitled "Effects of Health." They (Talaga & Beehr, 1995) also found that, even when women self-reported themselves as retired,

they worked more hours as retirees than did the men and were less likely to be receive a pension, either private or public. Until women's labor force participation, in general, and work in career jobs, in particular, has stabilized over several years, we will likely need to continue to investigate the differences in trends and in influences on these trends by gender.

With regard to bridge employment, also known as phased or partial retirement, Costa (1998) summarized that only about 25% of all retirements in 1990 were from full-time work to bridge employment. Current research has found that the trend to full retirement through a bridge job has been increasing dramatically, especially when those who have returned to part-time work after accepting retirement are considered. Specifically, Gustman & Steinmeier (2000, Table 10) found that retirement rates calculated from the Health and Retirement Study for 1992 through 1998, when compared to the Retirement History Study for 1969, show dramatic increases in partial retirement rates at all ages. In particular, the partial retirement rates in 1998 at all ages except 65 are approximately two times the 1969 rates. Their results, for men only and based on self-reports of fully and partially retired, are shown below; the partial retirement rates for women also show increases of 2 – 5% at all ages. Allen, Clark & Ghent (2003) calculated hazard rates using the longitudinal administrative data of a major southern university. Their rates are shown below. Their phased retirement rates, when viewed as a percentage of full plus phased retirements, are fairly consistent with Gustman & Steinmeier's (2000) results; for example, in the age range of 62 – 65, both sets of data find that about ¼ of all participants elect phased retirement instead of full retirement. At age 67, the participants studied by Allen, et al. (2003) show a drop in choice of phased retirement, but, at age 70, a dramatic increase occurs. Also, both sets of data find very large percentages choosing phased retirement at ages < 62, with approximately 1/3 up to almost 60 % of all participants electing partial instead of full retirement.

PHASED RETIREMENT RATES

Year Age	Full – 1969 -G & S	Full – 1998 – G & S	Part – 1969 – G & S	Part – 1998 – G & S	Full*– 2000 – A, C, G	Part*–2000 - A, C, G
55					4.2%	1.3%
58	9%	21%	5%	10%	4.2%	5.3%
60	13%	27%	6%	12%	7.7%	3.6%
62	28%	43%	10%	19%	9.9%	3.7%
65	62%	59%	17%	22%	17.1%	6.3%
67	72%	55%	17%	33%	17.5%	3.6%
70					13.0%	10.9%

* = hazard rates, not retirement trends

Researchers have also been examining the variables that influence the decision to elect phased or partial retirement, and the consequences of this election. Kim & Feldman (2000) found that characteristics influencing the choice to not pursue bridge employment include poor health, no working spouse or dependent children, lower tenure, higher salary at time of retirement, and having declined previous early retirement windows. They also found that the amount of the employer-sponsored pension benefit was not significantly related to the bridge employment decision. In an earlier study (Kim & Feldman, 1998), they found that the opportunity for future bridge employment did increase the likelihood of acceptance of an early retirement window. It appears that acceptance of an early retirement window is positively correlated with future bridge employment. Allen, Clark & Ghent (2003) found that productivity, based on a proxy of size of merit raise, and hours of teaching, based on a proxy of level of institution where employed, both significantly influenced the likelihood of choosing phased retirement. If a participant's average merit raise was 0%, the probability of electing phased retirement was 4.3% as compared to 1.7% for those with an average raise of 8%; those working at a doctoral-level institution had a probability of electing phased retirement of 4.0%, whereas those working at a research-1 level school had a probability of 1.6%. Based on an extensive analysis of HRS participant movement between states of employment across waves of data, Quinn (2000) found that a) about 75% of those in bridge jobs were working in the same job

category as they had been in during their career employment (highly skilled vs less-highly skilled and white vs blue collar), b) about 1/3 of those in bridge jobs were in the same wage category as they had been in for their career employment, while about ½ had dropped a wage category or more when they went to bridge employment, and c) the number self-employed increased in bridge employment, with this partial retirement category composed of about 71% of those self-employed in their prior careers and about 23% of those previously employed in wage/salary positions. Due to many influences, the partial retirement trend seems to be increasing, especially for those < age 62.

INFLUENCES ON THE RETIREMENT DECISION

There are many factors that influence the retirement decision. Several of these have been well researched over the years, including those considered pull factors such as Social Security, employer-sponsored pension plans, and reduction in earnings, and those considered push factors such as shifts in the labor force, poor job opportunities, and ill health (Costa, 1998). The current state of research regarding the influence of employer-sponsored pension plans is discussed in the section entitled “Effects of Employer-sponsored Pension Plans.” The current state of research regarding the influence of personal asset accumulation is discussed in the section entitled “Participation Decisions.” Costa’s (1998) review of research assessing the elasticity of labor force nonparticipation due to U.S. government programs found that “elasticity appears to have fallen from 0.47 in 1910, to 0.25 – 0.42 in 1940 and 1950, to 0 in recent years.” However, much of this research was based on analysis of cross-sectional data through the 1980s. Current researchers using cross-sectional data with detailed plan and employee characteristics have again found influences of government-provided benefits on retirement decisions. Mulvey (2003) found that the Social Security early eligibility date positively influenced the probability of retirement, especially for those in the lowest 3 wage quartiles and those in the lowest 1 of 3

performance groups. Mulvey (2003) also found that the number of non-elderly receiving Social Security Disability Income benefits and/or payments under the SSI program had more than doubled from 1984 to 2000 (7.7 million in receipt in 2000), significantly reducing labor force participation rates. Geller (1999) and Cutler (2003), based on an extensive review of research literature through 1998 and a review of several current studies, respectively, both found that availability of Social Security benefits, particularly the early eligibility date, and employer-sponsored pension plans influenced the decision to retire. Talaga and Beehr (1995) also found that social security eligibility negatively influenced the number of hours worked.

Two major advances in assessing the influence of government programs on the retirement decision occurred with the use of longitudinal data bases and the calculation of forward-looking retirement incentives, based on both Stock and Wise's option value and the peak value. Using the longitudinal data available from the Health and Retirement Study (HRS), several researchers have found that government-provided benefits continue to influence retirement decisions. Gustman, Mitchell, & Steinmeier (1994), using the first wave of the HRS, and Gustman & Steinmeier (2000, 2), using four waves of the HRS, found that receipt of Social Security benefits did influence the retirement decision. Gustman & Steinmeier (2000, 1), also found that the probability of receipt of Social Security benefits exceeded the probability of a participant self-reporting him/herself as retired; they assumed this was due to the elimination of wage limits for those collecting Social Security benefits prior to age 65, allowing some to elect partial retirement while still collecting Social Security benefits. Coile and Gruber (2000) and Coile (2003), using HRS data waves 1 through 4 and 1 through 5, respectively, and calculating forward-looking retirement incentives as a peak value and as a peak value or as Stock and Wise's option value, respectively, found that individuals recognize the future path of Social Security incentives and take this into account when making a retirement decision. Coile and Gruber (2000) found that a

\$1,000 increase in future peak value reduced the probability of retirement by 0.47%; they also found that changes in Social Security benefit calculations that are currently being phased in will likely change, reduce, future retirement hazard rates (see paragraph 3 under Retirement Trends). Coile (2003) found that both a participant's retirement incentive and his/her spouse's retirement incentive reduced the probability of retirement, except for wives who were not influenced by their husbands' retirement incentives; an increase in own retirement incentive of \$1,000 based on Stock and Wise's option value definition of retirement incentive resulted in a decrease in the probability of retirement by .04% - .06%. Anderson, Gustman, & Steinmeier (1999) tested the effect of changes in Social Security benefit calculation rules using data from the Survey of Consumer Finances. They found that if current Social Security rules had always been in effect, retirement from full time work at \geq age 65 would be 5.6% lower. Baker (2002) and Baker & Benjamin (1999) investigated Canadian government programs using the Survey of Consumer Finances data bases for Canada. Baker & Benjamin (1999) found that addition of early retirement benefits increased the receipt of benefits over a 2 year period from 8% to 30% for the Quebec Pension Plan and from 13 to 25% for the Canadian Pension Plan. They also found that many of those who took advantage of these new provisions were basically unemployed, working 0 hours. Baker (2002) found that men and women in couples eligible for a new Spouse's Allowance benefit, which is an increase to GIS and OAS general government retirement benefits, decreased labor force participation relative to non-eligible control groups; the amount of decrease in participation for men was about 11% while the decrease for women was between 9% - 3.7%. It appears that individuals do take into account the pull of Social Security benefits when making retirement decisions, although it is likely based on an estimate of forward-looking peak values instead of single-year accrual rates.

An expanding line of research is investigating the desire for leisure time as an influence on the retirement decision. The percent of men who indicated they prefer leisure to work increased steadily from 1941 to 1982, going from 3% to 48%, respectively (Costa, 1998). However, it is uncertain whether this phenomenon is due to retirees voicing a socially acceptable reason, or due to an actual increase in the demand for leisure by those retired. It has been found that the expenditure elasticity of recreational goods has fallen; for husbands \geq age 65, the recreational expenditure elasticity has fallen from 1.58 to 1.31 from 1972 to 1991 for those in the 50th income percentile, and from 1.63 to 1.44 for those in the 25th percentile (Costa, 1998). This is similar to the change in recreational expenditure elasticity for those $<$ 65. Additionally, the group that has benefited the most from this drop in recreational costs (and/or improvement in available types and means of recreation) is the elderly (Costa, 1998). Current research lends additional support to the theory that individuals retire to enjoy leisure time. Gustman & Steinmeier (2000) investigated the joint retirement decision of spouses. They found that the joint decision of a couple to retire is significantly influenced by the age of each, whether the wife is retired, health limitations, and both the wife's and husband's leisure preferences (which had about 5 times the effect of their ages), and the interaction of their leisure preferences (which had 33 – 50% of the effect of their ages). In this and a subsequent study (Gustman & Steinmeier, 2004), they also found that the retirement of the spouse affects the husband's retirement decision and increases the husband's utility for retirement but does not affect the wife's decision or utility. In essence, they found that it was very important for husbands to have more time to spend with their wives in retirement (significantly increased utility), thus spreading the peak in retirement ages at age 62 to surrounding ages for couples, but that the same was not true for wives. Johnson & Favreault (2001), found that 'retirement attitude' did positively increase a woman's likelihood of retiring, even after considering the effects of the husband's working status and health, own

health, financial wealth, and availability of an employer-provided pension plan. This ‘retirement attitude’ variable did not significantly affect a husband’s likelihood of retiring.

The push factors with regard to the retirement decision include shifts in the labor force (changes in needed job skills and job requirements), poor job opportunities, and ill health. The current state of research regarding ill health is discussed in the section entitled “Effects of Health;” this section also contains a detailed review of one of the most recent lines of research, the effect of the cost of post-retirement health coverage on the retirement decision. The current state of research regarding job opportunities is addressed in the last part of the section entitled “Retirement Trends,” as part of the discussion on bridge or phased retirement. The influence of employment characteristics other than job opportunities continues to be investigated as an important element of the retirement decision, but such characteristics are often combined into a generic ‘control variable’ category where individual effects are not given. An important current job skill addressed by one researcher is computer use; Friedberg (2003) found that computer non-users are about 25% more likely to retire than users. Allen, Clark, & Ghent (2003) found that the probability of choosing phased retirement was influenced positively by working at a doctoral, masters, or bachelor-level school instead of at a research 1 level institution, negatively by receiving a higher average merit raise, positively by being an associate or assistant professor as compared to a full professor, positively by having a higher salary, and positively by having more years of service. Adams & Beehr (1998) found that intent to retire was significantly, positively influenced by perceptions of retirement, age, and negatively by organizational commitment. Mollica & DeWitt (2000) found that employees who declined early retirement windows had significantly lower perceptions of caretaking generosity with regard to the window offer than did the employees who were not eligible for the window.

EFFECTS OF EMPLOYER-SPONSORED PENSION PLANS

Based on past research, employer-provided pension plans are known to encourage retirement and are estimated to have large effects, larger effects than Social Security benefits (Costa, 1998; Gustman, Mitchell, & Steinmeier, 1994). However, there is disagreement about the effect size of employer-sponsored pension plans on retirement trends. Gustman, Mitchell, & Steinmeier (1994), based on a literature review, show that studies using longitudinal data on retirement flows have found that employees with generous pensions retire somewhat earlier; Stock & Wise (1990) estimate that raising private plan, subsidized early retirement ages from 55 to 60 would reduce the number of pre-60 retirees by 35%. Three major advances occurred in the 1990s to help assess the influence of employer-sponsored pension plans on the retirement decision; these include the accumulation of longitudinal data bases, most notably the Health and Retirement Study (HRS), the accumulation of detailed pension plan information by the HRS with the ability to match employer Summary Plan Descriptions to individual participants, and the calculation of forward-looking retirement incentives. Using the longitudinal data available from the Health and Retirement Study (HRS), several researchers have found that employer-sponsored pension plans do influence retirement decisions, increasing the likelihood of retirement for both men and women (Coile, 2003; Johnson, Davidoff, & Perese, 2003; Gustman & Steinmeier, 2000; Gustman, Mitchell, & Steinmeier, 1994). Burkhauser, Couch, and Phillips (1996) found that receipt by the participant or another household member of an employer-sponsored pension influences the decision to elect early Social Security benefits at age 62. Kim & Feldman (1998), investigating early retirement windows offered by the University of California system, found that the likelihood of accepting an early retirement incentive was positively influenced by the amount of pension benefits, but negatively influenced by the expectation of future early retirement incentives. Dwyer (2001) found that the presence of an employer-sponsored pension benefit

increased a participant's expectation in 1992 to retire before 2000, but did not affect the subsequent decision to retire earlier than expected. In contradiction to the positive influences cited, Friedberg (2003) found that eligibility for an employer-sponsored pension, either immediately or in the future, influenced the decision to delay retirement.

As noted above, researchers have begun to investigate the influence of employer-sponsored pension plans on the retirement decision by calculating retirement incentives using forward-looking measures based on either Stock and Wise' (1990) option value or a peak value instead of yearly accruals. Coile and Gruber (2000) found that a \$1,000 increase in future peak value, computed based on the future path of Social Security plus employer-provided pension incentives, reduced the probability of retirement by 0.25%. This is a smaller effect than the future peak value calculated using the future path of Social Security incentives only (0.47%). Coile (2003) found that both a married participant's retirement incentive and the retirement incentive of the spouse, if the spouse was a female, reduced the probability of retirement; wives who were not influenced by their husbands' retirement incentives. In this study, an increase in own retirement incentive of \$1,000, based on the future path of Social Security plus employer-sponsored pension plan incentives calculated using Stock and Wise' (1990) option value definition of a retirement incentive, resulted in a decrease in the probability of retirement by .04% - .06%. Allen, Clark & Ghent (2003) found that both the probability of choosing phased and full retirement were positively influenced by defined benefit plan coverage, but that having a higher, future peak value in a defined benefit plan or having future defined contribution accruals reduced the probability of choosing phased retirement. Anderson, Gustman, & Steinmeier (1999) tested the effect of changes in employer-sponsored pension plan rules, both elective and legally mandated, using data from the Survey of Consumer Finances. They found that if current pension plan characteristics had always been in effect, retirement from full time work at \geq age 65

would be 1.4% lower. They (Anderson, Gustman, & Steinmeier, 1999) also tested the effect of changes in Social Security benefit calculation rules, finding that if current calculation rules had always been in effect for the group studied, retirement from full time work at \geq age 65 would be 5.6% lower. Thus, contrary to prior results, current research based on calculation of forward-looking retirement incentives, using either Stock and Wise' (1990) option value or a peak value, have found that Social Security incentives have a larger influence on the retirement decision than employer-sponsored pension plans.

Another important consideration regarding the influence of employer-sponsored pension plans on the retirement decision is whether defined benefit as compared to defined contribution plan coverage influences the decision differently; this could explain the discrepancies in the effect size of employer-sponsored pension plans on retirement trends. Researchers have begun to address this question and, so far, the answer appears to be 'yes, they influence the decision differently.' Johnson (2002) and Johnson and Favreault (2001) both found that coverage by a defined benefit plan had a large, significant positive effect on the likelihood of retirement (for husbands only in the 2001 study), while coverage by a defined contribution pension plan had either a negative or no significant influence on the retirement probability. Anderson, Gustman, and Steinmeier (1999) found that, if all employees covered by a defined benefit plan were to become covered under a defined contribution plan, while continuing to work in the same industry, retirement from full time work would decrease by 0.3% at age 60, 0.6% at age 62, and 1.4% at age 65. Rogowski and Karoly (2001) found that the baseline probability of retirement within 4 years increased by 7.1% for those covered by a defined benefit plan and by 11.4% for those covered by both a defined benefit and a defined contribution plan; they did not investigate those covered by only a defined contribution plan. Coile and Gruber (2000) also found that men covered by defined benefit plans are somewhat more responsive to retirement incentives,

determined as both peak values and option values. Mulvey (2003) found differences in the probability of retirement based on specific defined benefit and defined contribution plan provisions. Specifically, he found that the probability of retirement is influenced by defined benefit early retirement provisions, and by the interaction of these provisions with participants in different wage quartiles or in different performance groups. For example, if the plan provides for a reduction of $\leq 2.5\%$ per year for early commencement of benefits, the probability of retirement is increased by 9.5%, with a 15.5% increase in probability for those in the second wage quartile and an 11.6% increase for those in the top performance group; also, he found that the richness, defined by the level of employer matching contribution, of a defined contribution plan has no significant influence on retirement behavior, but the availability of 401(k) type plan loans does decrease the probability of retirement by 4.8% for all employees and by 11.3% for those who are top performers. In another study, Allen, Clark, and Ghent (2003) investigated retirement behavior at a southern university where, several years prior to the period studied, professors had been able to choose coverage by a defined benefit or a defined contribution plan. For those who chose coverage by a defined benefit plan as compared to the defined contribution participants, full retirement rates were always higher and were much higher at age 67, phased or partial retirement rates were about the same until age 63 when the phased retirement rates became somewhat less for all future ages, and, for the entire employee group, the probability of both full and phased retirement was higher (Allen, Clark, and Ghent, 2003). It appears that there is greater reward to continued work with a defined contribution plan, or did those who knew they would not want to retire until late choose defined contribution coverage?

Other researchers have investigated the different effects of defined benefit versus defined contribution coverage on other variables. Specifically, Gustman and Steinmeier (1999) found that participants covered by a defined benefit plan stated fairly accurate current pension values in

the 25th through the 75th percentiles, while participants covered by a defined contribution plan understated current pension values by > 10% over all percentiles. Gustman, Mitchell, Samwick, and Steinmeier (2000) and Gustman and Steinmeier (1999) both found that defined contribution plans provide lower replacement rates, especially for females at age 60, that defined contribution accrual rates are less for all HRS respondent ages 50 – 61, and that, as a percent of accumulated earnings, the value of defined benefit pensions has changed very little over 10 years (comparison of two different groups of participants) while the value of defined contribution pensions has decreased slightly. Dulebohn, Murray, and Sun (2000) investigated employees' choice of plan type, and found that those who choose defined benefit plans prefer survivor benefits and benefit determination, those who choose the hybrid cash balance plan prefer portability but not investment choice, while those who choose a defined contribution plan prefer investment choice and risk preference. In conclusion, it appears that defined benefit and defined contribution plans do affect participants differently, and that these effects do result in different retirement probabilities, where those covered by defined benefit plans, especially when the plans offer highly-subsidized early retirement provisions, retire somewhat to much earlier.

EFFECTS OF HEALTH

As Costa (1998, pg. 60) noted, "In virtually all studies, poor health leads to retirement." Based on an in depth analysis of the effect of health on labor force participation, using the Body Mass Index (BMI) as a health proxy, she found that health has decreasing importance to the retirement decision in 1991 as compared to 1900; specifically, she found that the elasticity of labor force nonparticipation with respect to BMI was 0.28 in 1991 as compared to an elasticity, adjusted for differences in BMI, of 0.88 in 1900. Costa (1998) speculated that this reduced role of health in the retirement decision was due to the changing nature of chronic health conditions, technological advances in the management of chronic conditions, and/or greater workplace

accommodation. In spite of her findings, the effect of an individual's health on the retirement decision is still a major item of investigation by current researchers. Researchers in the early 1990s found that early retirement decisions were positively influenced by poor health (Feldman, 1994; Karoly & Rogowski, 1994). Burkhauser, Couch & Phillips (1996), on the other hand, found that poor pre-retirement health is strongly correlated with unemployment, but does not seem to strongly influence the decision to take early Social Security benefits. More recent research, much of it based on detailed analysis of health conditions provided on a longitudinal basis by the HRS, has found fairly significant influences of health. Coile (2000) found that fair to poor health as compared to good health significantly increased the probability of retirement; in a detailed health analysis, she found that the likelihood of full retirement in a 2 year period was positively influenced by a recent or past (men only) acute event, a new or past chronic illness, difficulty with some of the seventeen activities of daily living (ADLs), an increase in difficulty with ADLs, and the interaction of an acute event with an increase in difficulty with ADLs. Dwyer (2001) found that the expectation to retire before 2000 and the actual decision to retire are significantly, positively influenced by functional health decline; he also found, regardless of the type of analysis used, that the strongest predictors of retiring earlier than expected were functional health decline, the availability of retiree health insurance, and employer-provided health insurance (a negative influence). Johnson (2002) found significant, positive effects of the index of physical impairments on the likelihood of retirement, while Johnson, Davidoff, & Perese (2003) found large, positive effects of an increase in functional limitations, of the number of functional limitations, and of a decline in health status from 1992 – 94 on the probability of retirement, with larger effects for men than for women.

Health has been shown to have not only direct effects on the retirement decision, but also indirect effects on other variables that affect the likelihood of retirement. Some health factors

have been found to influence the likelihood of savings shortfalls and the size of the prescribed savings rate, if a shortfall occurs (Mitchell, Moore, & Phillips, 2000). For example, they found that for single individuals, difficulty with ADLs implied a decrease of 12% in the likelihood of having a savings shortfall, while ever smoking implied an increase of 4% in the prescribed savings rate. For a married couple, either the individual or the spouse ever smoking implied an increase of 3% (each) in the likelihood of having a savings shortfall while having > 3 drinks per day implied a decrease of 7% in the likelihood of having a savings shortfall. Rosen & Wu (2003) found that poor health significantly reduces the probability of owning retirement assets, bonds, and risky assets, reducing the probabilities by approximately 2.1%, 0.2%, and 1.7%, respectively, for single households and by approximately 15.4%, 0.2%, and 4.0%, respectively, for married households.

For married individuals, the health of the spouse also has an influence on the retirement decision, but the amount of influence is affected by both the level of the spouse's health problems and the gender of the individual, male as compared to female. Gustman & Steinmeier (2000 and 2004) found significant positive effects on the joint retirement decision of couples of health that limits the amount or kind of work for the wife or for the husband and found significant influences on the utility value of retirement of own poor health and of spouse's poor health (husband's poor health increases wife's utility, but wife's poor health reduces husband's utility). Coile (2003) found that the likelihood of full retirement in a 2 year period is influenced by the spouse's health; specifically, a recent acute event reduces the likelihood of retirement while the interaction of a recent acute event with an increase in difficulty with ADLs increases the likelihood of retirement for wives with sick husbands only. She also found that if the sick spouse has generous retiree health insurance coverage or receives disability benefits (husbands only with sick wives), the healthy spouse seems to reduce labor supply. Consistent with Coile's

(2003) findings, if the spouse, a husband (wife), is not employed and reports health problems, Johnson & Favreault (2001) find a significant decrease, 4 – 5% (7 – 9%), in the likelihood of retirement; they attribute this decrease to the income effect, which implies that the participant reduces the likelihood of retirement to work and replace the income of the unhealthy spouse.

Another important influence of health on the retirement decision is an indirect effect through the cost of health care coverage. Current researchers have found that the provision of both pre- and post-retirement health care coverage by an employer significantly influences the retirement decision, with retiree coverage having a strong, positive influence and pre-retirement coverage having a negative influence (Gustman & Steinmeier, 1994; Karoly & Rogowski, 1994; Friedberg, 2003; Coile, 2000; Cutler, 2002). Researchers have, in fact, found that those without any employer-provided health care coverage are about as likely to retire as those with both pre- and post-retirement coverage, and more likely to retire than those with only pre-retirement coverage (Coile, 2000; Rogowski & Karoly, 2001). Johnson, Davidoff, & Perese (2003) found that, if employees with pre- but without post-retirement health coverage had retiree health coverage, men's retirement rates would increase by 26% and women's would increase by 31%. Dwyer (2001) found that the expectation to retire before 2000 and the actual decision to retire are significantly influenced by retiree health insurance (positive influence) and employer-provided pre-retirement health insurance (negative influence); he also found, regardless of the type of analysis used, the strongest predictors of retiring earlier than expected were functional health decline, the availability of retiree health insurance, and employer-provided health insurance (a negative influence). Two researchers have found that the probability of retirement is also influenced by the generosity of the retiree health insurance coverage (Mulvey, 2003; Johnson, 2002). Specifically, Mulvey (2003) found that if retiree contributions are < 25% of total premiums, then the probability of retirement increases by 17.1% (by only 5.6% if higher retiree

contributions are required), with even higher increases for those in the second wage quartile or in the lowest two out of three performance tiers. However, if retiree health insurance coverage is based on employee service, with higher contributions required for lower service, then the probability of retirement decreases by 13%, with greater decreases for those in the first and second wage quartiles or those in the lowest performance tier. Johnson (2002) found that the likelihood of retirement increased as the level of employer-cost-sharing increased, that COBRA coverage increased retirement hazard rates by 32% for both men and women, and that the net premium cost associated with retirement, the present value of all future health coverage costs to be incurred by an employee retiring before Medicare eligibility, reduced retirement rates for those age 51 – 61 with elasticities of -0.22 for men and -0.24 for women. It seems clear that the total effect of health, including own health, spouse's health, cost of pre-and post-retirement health care coverage, and cost in savings shortfalls, does still significantly influence retirement decisions.

METHODOLOGY

First, an extensive search occurred for articles that addressed the original topics of interest. The original list of topics of interest included all articles addressing: a) influences on early retirement decisions, b) influences on normal retirement decisions, c) plan participation decisions, d) effects of health and/or post-retirement health care coverage on retirement decisions, e) employee understanding about employer-sponsored pension plans, f) employee satisfaction with employer-sponsored pension plans, g) other employee attitudes and/or behaviors, including the decision to continue working, influenced by employer-sponsored pension plans, h) differences in retirement decisions by age groups, i) different effects of defined benefit as compared to defined contribution plans, j) the influence of stock in retirement plans, and k) differences by demographic characteristics. Major research and practitioner journals were

searched, as well as the websites of major research organizations involved in retirement issues, to locate articles. More than a thousand relevant articles were located, and more than seven hundred of these articles are listed in an extensive Bibliography that is available on the Society of Actuaries website. This Bibliography is contained on an Excel worksheet that allows the article list to be sorted by author, by year of publication, and by type of topic covered.

Sixty relevant articles from among the more than seven hundred listed were chosen by the author to be thoroughly read, reviewed, and summarized. The articles were chosen based on their year of publication (most were published from 1999 through 2004), the number of topics of interest addressed by the article, the history of the author(s) work in the area of interest, and an attempt to review some articles covering each of the original topics of interest. A summary of each article, including a summary of findings, list of dependent variables and hypotheses, theoretical support, type of analysis, and data detail, is contained on an Excel worksheet, with the above mentioned Bibliography, that is available on the Society of Actuaries website.

This paper contains the narrative review of the sixty articles chosen, with the review categorized by important topics in 1990 research and reviews. The categories for this narrative report are: Retirement Trends, which contains an update of normal and early retirement trends, trends of women, and phased or bridge employment trends; Influences on the Retirement Decision, which contains an update on the items that have been shown to influence normal and early retirement decisions; Effects of Employer-Sponsored Pension Plans, which contains an update on the influence of employer-sponsored pension plans on the retirement decision and a section on the different effects of defined benefit as compared to defined contribution type plans; Effects of Health, which contains two sections, one of which updates the influence of health on the retirement decision and the second of which contains a review of the influence of health care costs on the retirement decision. Within each category, the state of research as of 1990 is briefly

discussed and then updated based on the findings in the reviewed articles that address that topic. Additional topics that are of current interest and importance, as addressed by the reviewed articles, are added to the existing sections.

CONCLUSION

This paper has reviewed sixty articles written since 1990, and summarized important points from each under seven topics relevant to research on retirement and pensions. The sixty papers reviewed barely skims the surface of the more than one thousand papers written on retirement and pension issues since 1990. Additional reviews need to be undertaken in each of the seven topic areas to assure that knowledge of the tremendous amount of research done in these areas is available to all parties interested in pre-retirement influences on attitudes and decisions regarding retirement and, even more important, that the results already found by the many researchers involved are taken into account in future research projects.

CITATIONS

See the Bibliography, published as an Excel worksheet, which is available on the Society of Actuaries website.