Income Security Programs
Literature Review of Public and Private Financial Incentives for Retirement

Strategic Evaluation and Monitoring
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1. Introduction

The existing literature on the determinants of the retirement decision can best be analyzed in terms of three dimensions: theoretical issues; empirical evidence; and data availability. Some studies focus only on the theory, others on the evidence, and others involve both. In reviewing the studies, however, it is useful to treat the theory and evidence separately since theoretical issues lay the groundwork for interpreting the evidence, and they provide insights for how best to empirically estimate the determinants of the retirement decision. Dealing with the empirical evidence separately enables a clearer focus on summarizing that evidence without confounding it with the theoretical issues.

2. Theoretical Issues

A theoretical framework for analyzing the determinants of the retirement decision should serve a variety of purposes. First and foremost, it should provide a comprehensive list of the determinants of the retirement decision and indicate their expected effect on that decision. It should indicate the appropriate functional form or way to enter those determinants (e.g., linear or non-linear, key interactions) as explanatory variables in, say, a multiple regression equation.

A theoretical framework should highlight how to incorporate such factors as life-cycle and family decision-making as well as institutional features such as mandatory retirement and public and private pensions. It should provide guidance as to the appropriate form of the dependent variable (i.e., the retirement decision) as well as how best to estimate the relationship between that decision and its determinants. Ideally, the theoretical framework will be linked to key policy concepts and issues, so that resultant analyzes can be easily linked to policy choices.

Concepts of Retirement: The literature on retirement decisions increasingly recognizes that retirement is not simply a discrete event of leaving the labour force, never to return.[1] It often involves transitions or bridges into retirement, including partial retirement, to use phrases that are increasingly used in the literature. This often occurs in such forms as hours reductions, changing jobs, or intermittent retirement, often involving non-standard employment such as through self-employment, contract work and part-time work.

While most studies tend to use one measure of retirement, some use a variety of alternative measures.[2] The following concepts of retirement have been used in the literature[3]:

1. Individual's statement of their planned retirement age.[4]
2. Self-reported response where the person indicates that they are retired.[5]
3. Left the labour force in the sense of no longer working or looking for work.[6]

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1 Doeringer (1990), Gustman and Steinmeier (1984), Fontana and Frey (1990), Herz (1995), Holden (1998), Honig (1985), Honig and Hanoch (1985), Marshall (1995), Monette (1996), OECD (1995), Parnes and Sommers (1994), Peracchi and Welch (1994), Ruhm (1990, 1991), Swank (1982), and William Mercer (1996).

2 Boskin and Hurd (1978), Gustman and Steinmeier (1984), Palmore, George and Fillenbaum (1982), and Parsons and Lees (1985a).

3 Discussion of different definitions are given in Fields and Mitchell (1984c), Fuchs (1982), Parnes and Less (1985a).

4 Anderson, Burkhauser and Quinn (1986), Luchak (1997).

5 Gower (1997), Hausman and Wise (1985), Quinn (1980, 1981).

6 Anderson and Burkhauser (1985), Anderson, Burkhauser and Quinn (1986), Bazzoli (1985), Burkhauser and Quinn (1983), Frenken (1991), Gordon and Blinder (1980), Hanoch and Honig (1983), Hurd and Boskin (1984), and Quinn (1977).

4. Reduced hours of work or pay, sometimes below a specific fraction of a previous norm.[7]
5. Left career or main employer, possibly to continue working in another job.[8]
6. In receipt of an employer-sponsored pension.[9]
7. In receipt of a public pension.[10]

Income-Leisure Choice Framework and Reservation Wages: The theoretical framework that is most often used to analyze the determinants of the retirement decision is the "income-leisure" choice perspective of economics, modified to account for the peculiarities of the retirement decision.[11] That perspective views individuals as choosing between retiring from paid labour market activities (i.e., engaging in leisure activities or household work) and continuing in paid employment (i.e., earning income). That decision essentially involves comparing utility or well-being in the alternative states, subject to various constraints such as those imposed by the individual's wealth and the market wage they can expect to receive.

The decision to retire can also be affected by institutional constraints such as mandatory retirement rules, and the incentive effects of public and private pensions (analyzed in more detail subsequently). The retirement decision can also be affected by demand side factors (e.g., labour market conditions and unemployment) that determine whether jobs are available.

An alternative formulation of the decision rule is that the individual will retire if their market wage is below their reservation wage.[12] Their reservation wage is essentially the implied value of their time in non-labour market activities such as retirement. It is higher, for example, if they have higher non-labour market income (e.g., assets, wealth, pension income) from which to enjoy retirement. This can include wealth effects from any intergenerational transfers that may be embedded in pay-as-you go public pension schemes such as CPP/QPP. An individual's reservation wage is also higher if their health or the nature of their work makes it difficult for them to engage in labour market activities. It is also higher if their family circumstances make retirement more attractive (e.g., if their spouse is retired or not working).

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7 Boskin (1977) used a change to quarter-time work or less, Burtless and Moffitt (1985) used a sudden and discontinuous drop in hours worked, Frenken (1991) used major source of income from pensions, Honig and Hanoch (1985) used half or highest annual earnings as a measure of partial retirement and zero earnings as fully retired, and Reimers and Honig (1989) used monthly earnings below 90 percent of peak lifetime monthly earnings to indicate partial retirement.

8 Bazzoli (1985), Burtless and Hausman (1982), Fields and Mitchell (1984c).

9 Burkhauser (1979).

10 Burkhauser (1979, 1980).

11 Early studies in that genre include Boskin (1977), Boskin and Hurd (1978), and Quinn (1977). Many subsequent studies have built on that framework.

12 Gordon and Blinder (1980).

The individual's market wage should be broadly construed to reflect the monetary returns to continued labour market employment. Those monetary returns are net of taxes and any transfer payments that may be affected by continued employment. Importantly, they should also reflect the expected public or private pension benefit accruals, or changes in expected pension wealth associated with continued labour market activity. The expected market wage should also be adjusted for demand side factors; that is, the probability of being able to retain or obtain a job.

Life-Cycle Dimensions: Building upon the earlier models that utilized the "income-leisure" choice perspective and reservations wages, subsequent theoretical work tended to emphasize the dynamic life-cycle nature of the retirement decision.[13] Such multi-period models often involved forward-looking calculations of individuals choosing an optimal retirement age. That optimal retirement age depends upon how they expect their utility associated with retirement versus continued labour force participation to change as they age, as well as how they expect their wages, wealth, health, and pension wealth to change. The life-cycle models emphasize that the retirement decision is not based simply on an evaluation of the different states at a given point in time. Rather, it is based on a more forward-looking approach that evaluates the expected remaining lifetime well-being associated with the alternative states, including the income streams associated with those states.

Re-evaluations and "re-optimization" can be allowed as individuals age and acquire new information.[14] As well, the life-cycle models allow individuals to engage in inter-temporal substitution of labour supply over their life-cycle in response to the changing incentives of the labour market and pension plans.[15]

Pension Wealth, Pension Capital Changes and Option Values: The life-cycle framework is also the basis for models that emphasize the importance of comparing the present value of streams of expected pension wealth[16] associated with the decision to retire or to continue to participate in the labour market. It is the present value of those alternative streams that matters, not just their current value at the point in time when the retirement decision may be made.

Changes in pension wealth have been calculated to illustrate this aspect of the incentives that employees could expect to experience if they retired from their particular job.[17] This

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13 Burbidge and Robb (1980), Burtless (1986), Burtless and Moffitt (1984, 1985, 1986), Crawford and Lilien (1981), Fields and Mitchell (1984a, 1984b, 1984c), Mitchell and Fields (1984, 1985), and Moffitt (1984, 1985, 1986).

14 This is done in the dynamic programming models such as Rust (1987, 1989) and Stock and Wise (1990b).

15 Such inter-temporal substitution of labour supply is emphasized in Burkhauser and Turner (1978, 1981, 1982, 1985), Gohmann and Clark (1989), and McElwain and Swofford (1986).

16 This was first emphasized in Burkhauser (1979, 1980).

17 Allen, Clark and McDermed (1988, 1993), Blinder, Gordon and Wise (1980, 1981), Burkhauser and Turner (1981), Burkhauser and Quinn (1983a, 1983b), Gordon and Blinder (1980), Ippolito (1985, 1986, 1987, 1991), and Kahn (1988).

is often calculated as the difference between their expected "stay" pension wealth if they were to remain in their job until the age of normal retirement, and their "quit" pension wealth if they were to leave their job. Pension capital losses can occur because employees who leave their job forgo the wage increases that would otherwise augment their pension wealth.

Option value measures[18] have also been used to provide a measure of the changing value of pension wealth associated with retirement versus continued employment. The option value captures the notion that a person who retires forgoes the opportunity to continue to work and accumulate additional pension benefit accruals from such factors as additional service credits, wage increases, and eligibility for early retirement provisions. Conversely, continuing to work one more year preserves the option of continuing to work another year, and so forth. This in turn preserves the option of qualifying for such factors as subsidized early retirement provisions. The option value of working each additional year is calculated as the difference in the present value of maximum pension benefits associated with working in that given year as opposed to retiring. Other studies have focused on the exogenous, unanticipated changes in Social Security wealth that has often occurred because of legislated changes in coverage and generosity.[19] Such changes are likely to facilitate retirement (i.e., reduce labour force participation) in large part by enabling individuals to better afford retirement.

Public Pension Plan Incentives: Much of the recent literature on the determinants of retirement decision is of U.S. origin and has focused on the incentive effects of public pensions, notably Social Security in the U.S. Of particular importance is the retirement test which essentially involves reductions or "clawbacks" of pension income for persons above a certain level of earnings who continue to earn income after reaching the age of entitlement for such pension benefits. These are likely to encourage retirement because they reduce the monetary returns to work. Other features, however, can encourage continued labour force participation, for example, so as to continue making contributions that will enhance subsequent benefits.[20]

In fact, the monetary incentives of public pension plans such as Social Security can be complex given the different rules and requirements of such programs. A number of studies[21] have calculated and analyzed the changes in expected pension wealth that occur at specific ages when those rules change.

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18 Cornwell, Dorsey and Mehrzad (1991), Lazear (1990), Lazear and Moore (1988), Lumsdaine, Stock and Wise (1990), Pesando, Hyatt and Gunderson (1992), Stock and Wise (1990a, 1990b).

19 Anderson, Burkhauser and Quinn (1986), Burtless (1986), Hausman and Wise (1985), Ippolito (1990), and Moffitt (1987).

20 These are emphasized in Anderson, Gustman and Steinmeier (1997), Blinder, Gordon and Wise (1980), and Gordon and Blinder (1980).

21 Anderson, Gustman and Steinmeier (1997), Blau (1994), Burtless (1986), Burtless and Moffitt (1984, 1985, 1986), Diamond and Gruber (1997), Gustman and Steinmeier (1991), Kahn (1988), Kruger and Pischek (1992), Lumsdaine and Wise (1994), and Moffitt (1984, 1987). Gruber (1997) documents the potential incentive effects from CPP/QPP and other retirement income programs in Canada, based on methodology outlined in Diamond and Gruber (1997).

Related regulations give rise to substantial abrupt changes (often termed spikes, kinks, non-linearities, notches) in Social Security wealth at particular ages of individuals. These can substantially affect the incentive to retire since the monetary incentive to work would be high at ages when there is a positive spike in expected pension wealth.

The asset or wealth value of public pension plans can have a different impact on the retirement decision than wealth from other sources. Wealth from public pension plans may have a strong influence in the retirement decision because it cannot be bequeathed to heirs, unlike other forms of wealth which older persons may be reluctant to use up (say, by retiring early) because it can otherwise be passed down as an inheritance (Boskin 1977).

Similarly, public pension income may have a strong effect on retirement decisions because it is received with a high degree of certainty, and often indexed for inflation (Burtless and Moffitt, 1984). Working in the other direction, public pension income may have a weaker effect on the retirement decision because it is not liquid. For example, low-income persons who are liquidity constrained are not able to borrow against future public pension income to retire early.[22]

The previous research refers to the effects of U.S. Social Security on the retirement decision. In comparison, *evidence on the impact of public pension plans in Canada is extremely scarce*. Baker and Benjamin (1997a) analyzed the impact of the removal of the earnings test (clawback of pension payments if the person continued to earn income in the labour market) in the CPP/QPP in the 1970s. Their analysis used the 1972-1980 family files of the Survey of Consumer Finances, conducted every two years. Their results indicated that the removal of the retirement test led to a large and statistically significant increase in weeks worked for those who were employed. Alternatively stated, the clawbacks of the retirement test would have reduced the work time of persons at that time.

Baker and Benjamin (1997b) also analyzed the impact of the early retirement options introduced into the QPP in 1984 and the CPP in 1987. Their analysis was based on the 1972-1980 family files of the Survey of Consumer Finances, conducted every two years. They found little effect of inducing early retirement in the short run, but that in the longer run (after 8 years) the early retirement provisions would have led to a "bunching up" of retirements around those early retirement dates.

Private Employer-Sponsored Occupational Pension Plan Incentives: Significant incentive effects can also be embedded in private, employer-sponsored occupational pension plans. A number of studies have "modeled" or calculated the changes in private pension wealth associated with such factors as the accumulation of age and service credits,

22 Burtless and Moffitt (1984), Kahn (1988), Nalebuff and Zeckhauser (1985), and Robb and Burbidge (1989).

early retirement features and postponed retirement features.[23] Such features can give rise to substantial changes in pension wealth in various forms: "backloading" or "deferral" of compensation; spikes in private pension wealth at the ages when early and special retirement features apply; and reductions in pension wealth if individuals postpone retiring past the normal retirement age of their plan.

In most cases, these studies simply modeled the *potential* incentive effects of the private occupational pension plans by calculating the pension benefit accruals at different ages for persons in representative pension plans. They usually were not able to link these to *actual* retirement decisions because the data sets on actual retirement decisions did not have detailed information on the private occupational pension plans. Studies that included features of the private occupational pension plans as determinants of the retirement decision are discussed later when the empirical evidence is reviewed.[24]

These incentive effects of private occupational pension plans can be an important strategic human resource tool for organizations since, in effect, they alter the compensation profile of individual workers. The backloading or deferral of compensation, for example, can reduce unwanted turnover and foster the "bonding" of the employee with the firm (because the employee wants to remain with the firm to receive the deferred compensation or pension benefit accruals). The spikes or large pension benefit accruals at certain ages can encourage early retirement at those ages. The negative pension accruals (i.e., penalties) if the person postpones retirement can discourage postponed retirement and in theory could potentially serve as a substitute for mandatory retirement.

Mandatory Retirement: Mandatory retirement obviously is an institutional rule that can affect — indeed dictate — the retirement decision. Mandatory retirement rules exist as part of company personnel policies or collective agreements, usually as part of employer-sponsored pension plans. They are rules that essentially terminate a particular employment arrangement at a given age. They do not require that the employee leave the labour force, although that may be likely if the alternative employment is unappealing or simply unavailable.

Mandatory retirement rules may exist for a variety of reasons. They may facilitate work sharing by opening job and promotion opportunities for younger workers in the organization. They may facilitate succession planning for the organization and retirement planning and "retirement with dignity" for the individual. They may also facilitate deferred compensation by providing a termination date to implicit or explicit

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23 In the U.S. such studies include Allen and Clark (1986), Burkhauser (1979), Fields and Mitchell (1984a, 1984b, 1984c), Gustman and Steinmeier (1989a), Ippolito (1986, 1989, 1990), Kotlikoff and Wise (1985, 1987, 1987, 1989), Lazear (1983), Hogarth (1988), Mitchell and Fields (1984, 1985), Mitchell and Luzadis (1988), and Pozzebon and Mitchell (1989). In Canada, they include Pesando and Gunderson (1988, 1991), Pesando, Gunderson and McLaren (1991), Pesando, Gunderson and Shun (1992), and Pesando, Hyatt and Gunderson (1992).

24 Allen, Clark and McDermed (1988, 1993), Burkhauser (1979), Fields and Mitchell (1992, 1984a, 1984b, 1984c), Kotlikoff and Wise (1985, 1987, 1989), Lazear (1983), Hogarth (1988), Mitchell and Fields (1984, 1985) for the United States, and Luchak (1997), and Pesando, Hyatt and Gunderson (1992) for Canada.

compensation arrangements whereby individuals are "underpaid" (relative to their productivity) when young in return for being "overpaid" when older. Such deferred compensation in turn can serve other positive purposes such as reduced employee turnover and increased bonding with, and commitment to, the firm (Ippolito, 1991; Lazear, 1979).

Whatever their rationale, mandatory retirement can obviously affect retirement decisions especially when they are defined as leaving one's career or long-term job. As such, the existence of a mandatory retirement policy is a relevant explanatory variable to include as a determinant of the retirement decision. Mandatory retirement policies are now banned in the United States. In Canada, however, the Supreme Court ruled in favour of allowing mandatory retirement policies. Such policies tend (but are not required) to apply at age 65 when normal retirement pension benefits are available.

The theoretically expected impact of a mandatory retirement policy on retirement, however, is not as straightforward as it would initially appear. This is so because when mandatory retirement exists an employer-sponsored occupational pension plan is invariably present, and the age of mandatory retirement (e.g., 65) usually corresponds to the age at which public pension plans become available (e.g., CPP/QPP).[25]

As such, it is extremely difficult if not impossible to disentangle the separate impact of mandatory retirement from the effect of public and private pension plans on the retirement decision. People may leave the labour force around the age at which they are subject to mandatory retirement not so much because of mandatory retirement per se, but because of the monetary incentives to retire as embedded in the associated public and private pension plans.[26] But, if mandatory retirement is highly correlated with the onset of public and private pension plans then it is impossible to disentangle the effects of pension features from mandatory retirement rules.

Health, Age, Labour Market Conditions and Other Determinants: The theoretically expected effect of other factors, such as health and labour market conditions, on the retirement decision are fairly straightforward, and studies that use those variables will be discussed later in this report, in the review of the empirical studies.

Ill health likely makes labour market work more difficult and encourages retirement. The retirement-inducing effect of ill health may be particularly strong if individuals also have the income that enables them to afford to retire; that is, health status may interact with other variables to affect the retirement decision.

Labour market conditions, especially the unemployment rate, can affect the retirement decision, albeit in a theoretically indeterminate way. On the one hand, high unemployment may discourage individuals from remaining in the labour market and looking for work.

25 A discounted CPP/QPP can be obtained as early as age 60.

26 Burkhauser and Quinn (1983).

On the other hand, high unemployment may compel others to remain in the labour market to maintain what otherwise may be declining family income associated with the higher unemployment. As well, these are, respectively, the discouraged and added worker effect[27] that higher unemployment can have on the labour force participation (and hence retirement) decision.

Periods of high *unemployment*, downsizing and mass layoffs can particularly affect older workers because they are often more "expensive" workers and may have difficulty adjusting to the restructuring that is often associated with downsizing.[28] If laid off, they may have particular difficulty in finding another job and hence may leave the labour force for retirement.

The *composition of jobs* and growing *wage inequality* may also affect retirement decisions.[29] The composition of jobs may be shifting towards ones with typically lower retirement ages. Low-wage individuals may not be able to afford to retire, but their lack of viable job opportunities may induce their retirement.

27 This is the inducement to increased labour force participation by another family member.

28 Davidson, Worrell and Fox (1996), and Hutchens (1988).

29 Peracchi and Welch (1994).

3. Empirical Evidence[30]

Much past empirical work on the determinants of the retirement decision has largely involved survey studies by the U.S. Social Security Administration, essentially asking people why they retired. The responses typically involved statements about ill health or employer-initiated layoffs.[31] They emphasized the involuntary nature of retirement, down playing any notion that retirement may be a voluntarily chosen state, especially in response to increased wealth or incentives embedded in public and private pensions.

Such survey responses may be subject to retrospective or recall bias because the questions are asked of persons who were already retired, often after a considerable period of time. Given their age, retired persons may be in ill health when asked the question, and hence may be prone to respond about their current state rather than the state of their health when they retired. This is further complicated by the fact that involuntary retirement because of ill health may be regarded as more socially acceptable than voluntarily retiring because one can afford to do so, or because features of the public and private pension system reduced the monetary incentive to continue working.

The earliest econometric studies[32] of the actual retirement decision tended to find that features of the Social Security system induced retirement. Specifically, the pension wealth enabled people to afford to retire, and the retirement test or clawback of pension income if people continued to work and earn above a threshold level of income, discouraged continued labour market activity. Subsequent empirical studies[33] that focused on whether changes in Social Security wealth could explain the decline in labour force participation, tended to find that Social Security was a contributing factor, but its overall effect was often quantitatively small.[34]

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30 Earlier studies that reviewed some of the empirical evidence up to the time of their studies include Boskin (1977), Campbell and Campbell (1976), Gustman, Mitchell and Steinmeier (1994), Hurd (1990), Ippolito (1990), Lazear (1986), Lumsdaine and Wise (1994), Mitchell and Fields (1982) and Quinn, and Burkhauser and Myers (1990).

31 Such studies are reviewed in Boskin (1977), Campbell and Campbell (1976) and Quinn, and Burkhauser and Myers (1990).

32 Boskin (1977), Quinn (1977), Boskin and Hurd (1978), and Burkhauser (1979, 1980).

33 Anderson, Burkhauser and Quinn (1986), Anderson, Gustman and Steinmeier (1997), Blau (1994), Blinder, Gordon and Wise (1980), Burkhauser and Turner (1978), Burtless (1986), Hausman and Wise (1985), Gustman and Steinmeier (1986a), Ippolito (1990), Kruger and Pischek (1992), and Moffitt (1984, 1987). Hurd and Boskin (1984) are an exception.

34 Anderson, Gustman and Steinmeier (1997), for example, find that changes in social security and employer pension plans accounted for approximately one-quarter of the reduction in full-time work by men in their early 60s, but none of the trend for men age 65 in the U.S. Their simulation analysis is based on a previously estimated structural model of the retirement decision (Gustman and Steinmeier 1986a, 1986b) that enabled them to link that decision to features of the individual's occupational pension plan and to their seniority and earnings history and other factors that can affect expected pension benefit accruals under such plans.

Econometric studies that focused on the impact of mandatory retirement found that the features of public and private pension systems were more important than mandatory retirement policies in inducing retirement.[35]

In fact, what appeared in these studies to be the impact of mandatory retirement in compelling retirement was largely the effects of public and private pension systems that tended to reduce the monetary incentive to work around the typical age of mandatory retirement policies.

Econometric studies[36] that modeled more precisely the incentive effects of the various detailed features of Social Security tended to find that the sharp spikes in public pension wealth that occurred at specific ages when the features applied, were associated with sharp spikes in retirement around those ages, as well as with substantial reductions of hours of work for those who did not leave the labour force. Reductions in public pension wealth associated with continued labour force activity past the age of normal retirement also induced retirement.

Similar incentive effects were found to exist in features of private, employer-sponsored, occupational pension plans.[37] Those features generally discouraged quits and turnover because of the substantial "backloading" of pension benefit accruals; that is, the benefits occur later in the employees' careers when pensions are based on age and/or service credits and perhaps earnings in their final years.

In those studies, early retirement was found to be induced at the ages when subsidized early and special retirement would apply, and postponed retirement was discouraged by penalties associated with continued employment past the normal retirement age.

Research studies point to many other factors in the retirement decision: I*ll health* is almost invariably found to encourage retirement.[38] This is especially the case if the individual had sufficient pension or other income to be able to afford to retire. *High unemployment rates* and adverse labour market conditions also tend to encourage retirement.[39] This suggests a dominance of discouraged worker effect over added worker effect. A small number of

35 Burkhauser and Quinn (1983).

36 Burtless (1986), Burtless and Moffitt (1984, 1985, 1986), and Moffitt (1984, 1987).

37 Allen, Clark and McDermed (1988, 1993), Burkhauser (1979), Fields and Mitchell (1992, 1984a, 1984b, 1984c), Kotlikoff and Wise (1985, 1987, 1989), Lazear (1983), Hogarth (1988), Mitchell and Fields (1984, 1985) for the United States, and Luchak (1997) for the United States, and Pesando, Hyatt and Gunderson (1992) for Canada.

38 Anderson and Burkhauser (1985), Bozzoli (1985), Boskin and Hurd (1978), Burtless (1987), Butler, Anderson and Burkhauser (1989), Chirikos and Nestal (1991), Kingson (1982), Lowe (1991), Luchak (1997), Parnes and Less (1985a, 1985b), Parsons (1982), Quinn (1977), Sammartino (1987), Sickles and Taubman (1986), and Stern (1989).

39 Anderson, Burkhauser and Quinn (1986), Beck (1985), Herz and Rones (1989), Hutchens (1986, 1988), Peracchi and Welch (1994), and Shapiro and Sandell (1987), although Parnes and Less (1985) find local labour market conditions to be relatively unimportant.

empirical studies have also documented that the determinants of retirement tend to be different for women than for men.[40] Specifically, the retirement decision of women tends to be influenced more by their *household circumstances*, especially by the health of their husband, than by their own economic circumstances.

The empirical evidence also suggests that the dominant form of retirement still tends to be an all-or-nothing decision, of exiting completely from the labour market versus continuing to work. Nevertheless, bridging into phased or partial retirement is common and it is becoming increasingly common in a wide range of forms: reduced hours, part-time work, self-employment, contract work, shifts from a career job to other jobs, and even return to work after retirement.[41] Based on Canadian data, for example, Monette (1996) documents that 13 percent of retirees returned to paid employment following initial retirement. The likelihood of returning to work was higher amongst younger retirees and those with more education. Most of those who re-entered the labour market did so as part-time employees. Their reasons for returning were varied, and included financial reasons, occupying free time and personal preferences. While the return to work decision is important, and likely growing in importance, the relatively modest numbers that are involved nevertheless suggest that this group merits special analysis, rather than being part of a more general analysis of the retirement decision.

40 Anderson, Clark and Johnson (1980), George, Fillenbaum and Palmore (1984), Hanoch and Honig (1983), Honig (1985) and Pozzebon and Mitchell (1989).

41 Butler, Anderson and Burkhauser (1989), and Doeringer (1990), Gustman and Steinmeier (1984a, 1984b, 1986a, 1986b), Honig (1985), Honig and Hanoch (1985), Parnes and Less (1985a, 1985b), Peracchi and Welch (1994), Quinn (1980, 1981), Quinn, Burkhauser and Myers (1990), Ruhm (1990), and Swank (1982).

4. U.S. Survey Data[42]

As indicated previously, the earliest U.S. studies tended to use surveys conducted by the Social Security administration — surveys that asked people for the *reasons* that they retired. Most of the more recent U.S. empirical work on the determinants of the actual retirement decision has been based on a small number of data sets, each with their strengths and weaknesses.

Longitudinal Retirement History Study (LRHS): Beginning in 1969, the U.S. Social Security Administration began compiling a large micro data set, the Longitudinal Retirement History Study (LRHS)[43] that followed a large sample of individuals over a period of time, re-interviewing them every two years. It contains detailed information on their retirement patterns as well on their demographic characteristics and such factors as work status, annual earnings, assets, dependants, health status, current Social Security benefits, and current and expected future employer pension benefits. It also contains information on the individual's earnings record which enables calculations of the individual's expected Social Security public pension wealth.

With respect to private employer-sponsored occupational pension plans, however, the available information pertains to coverage, age of eligibility and the size of the annual benefit. Answers on the pension question are often incomplete, especially with respect to the expected pension amount (Quinn, Burkhauser and Myers, 1990). Information on the specific plan features that can be so important in influencing the retirement decision is also not available.

Occasionally, researchers have tried to approximate expected private pension benefits by making assumptions about institutional details of pension plans. For example, Burkhauser and Quinn (1983a) assumed that the individual would be eligible for the one-digit industry average actuarial adjustment for reduced early retirement benefits. That information, in turn, was obtained from the Bureau of Labor Statistics Level of Benefits Study (discussed subsequently). Fields and Mitchell (1984b) also used industry average benefits. Allen, Clark and McDermed (1988) used modal industry-occupation formulas with National Longitudinal Survey (NLS) data (discussed below).

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42 Much of the empirical work on this area has been carried out in the United States. See background paper by Morley Gunderson, also for Strategic Evaluation and Monitoring, Human Resources Development Canada, "Review of Alternative Data Sets and Modeling Approaches for the Evaluation of Public and Private Financial Incentives for Retirement and Related Issues," for information on Canadian data sets and possible models for this kind of analysis.

43 The initial 1969 data was used by Quinn (1977) and the first two waves (1969 and 1971) were used by Boskin and Hurd (1978). Subsequent users include Anderson and Burkhauser (1985), Anderson, Burkhauser and Quinn (1986), Anderson, Gustman and Steinmeier (1997), Blau (1994), Burkhauser and Quinn (1990, 1983), Burtless (1986), Burtless and Moffitt (1984, 1985), Clark and Johnson (1980), Fields and Mitchell (1984b, 1984c), Fuchs (1982), Gohmann and Clark (1989), Gordon and Blinder (1980), Gustman and Steinmeier (1984a, 1985b, 1986a, 1986b, 1994), Hausman and Wise (1985), Honig and Hanoch (1985), Hurd and Boskin (1984), Pozzebon and Mitchell (1989), Reimers and Honig (1985), Quinn (1980, 1981, 1985), and Quinn, Burkhauser and Myers (1990).

Health and Retirement Survey (HRS): Recently, a new U.S. survey has become available, the Health and Retirement Survey (HRS), which sampled approximately 7600 individuals in 1992 where at least one family member was between the ages of 51 and 61. The HRS essentially replaced the LRHS, and will follow the individuals for at least 10 years. The data set has information on employer-sponsored pension plans as well as earnings histories. However, the employer pension plan information is in the process of being merged with the individual's survey record. As well, since the oldest age of the respondents was age 61 in 1992, the initial waves of that survey would not capture persons around the "normal" retirement age of 65, and it would certainly not capture persons who may have postponed retirement. Analysis based on that survey are now beginning to emerge.[44]

National Longitudinal Surveys (NLS): The other micro data set that tends to be used is the National Longitudinal Survey of Labor Market Experience (NLS), conducted out of the Center for Human Resource Research at the Ohio State University and sponsored by the U.S. Department of Labor.[45] This survey began in 1966 with one of the demographic groups being men age 45 to 59. The survey continued for 17 years until 1983, so that this group was 67 to 76 years of age when the survey ceased. The respondents were interviewed approximately 10 times over that period. Like the LRHS data, the NLS data contains a wealth of information on individual characteristics and their retirement patterns. However, it lacks information on the private employer-sponsored occupational pension plans of the individuals.

In commenting on the LRHS and the NLS data sets, Quinn, Burkhauser and Myers (1990, p. 78) state: "These sources provide large representative samples of older Americans and a wealth of demographic, social, economic, and financial data for each respondent. A major drawback of both, however, is the paucity of private pension details. Employer pensions are complicated agreements, and these data sets do not begin to capture the complexities of the individual plans."

Benefits Amounts Survey: Beginning in 1978, the U.S. Department of Labor developed a data set, the Benefit Amounts Survey (BAS), that does contain detailed information on plan characteristics for retired individuals. The pension plan information is based on a sample of summaries of pension plan information submitted by employers as required by law. It contains detailed information on the plan characteristics, including the benefit calculation formulas. The age and year of retirement of pension recipients is also provided. The Social Security Administration then linked these with information on their earnings histories and some limited demographic details.

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44 For a discussion of the potential use of this emerging data set in incorporating features of both public and private pensions to analyze their impact on retirement decisions, see Gustman, Mitchell and Steinmeier (1995). For studies that are beginning to use that data set see the other articles in that special issue of Journal of Human Resources.

45 The data set is described in Parnes (1981) and Parnes et al. (1985) and is used in a variety of studies cited in those sources. Other studies using the NLS include Allen, Clark and McDermed (1988), Diamond and Hausman (1984), Nestel (1985), and Shapiro and Sandell (1987).

In spite of this detail, this information generally has to be supplemented by information from other sources such as collective agreements to construct the pension benefit formulas necessary to compute changes in employer pension benefits. Fields and Mitchell (1984c), for example, were able to do this for 10 firms with defined benefit pension plans that also had enough detailed information on retirees so as to analyze the effect of these employer pensions on retirement behavior.

In commenting on the BAS, Quinn, Burkhauser and Myers (1990, p. 78) state: "These data include the specific benefit calculation rules missing from the micro data sets. Their disadvantages are the smaller, non-representative samples of recipients and the lack of much other information on the individuals involved. With this research strategy, we learn much more about pensions and much less about everything else." In their analysis of data needs in the pension and retirement area, Gustman and Mitchell (1992) also point to the absence of micro data sets that incorporate details of the individual's employer-sponsored pension plan, and pension-related information on the individuals, to enable calculating the incentive features of such plans and relating those features to their retirement decision.

In the same vein, Gustman, Mitchell and Steinmeier (1995, p. S70) state: "To date, nationally representative retirement surveys have not supplied high quality data on company-provided pensions and health insurance. This is an important omission inasmuch as benefits are believed to influence retirement patterns profoundly, because they comprise a major portion of older worker's wealth, and because benefit rules impart large discontinuities to older workers' budget constraints."

Case Studies: Clearly, there are extreme difficulties in incorporating information on employer pension plans into micro data sets which have detailed information on retirement decisions and on other characteristics of potential retirees. In part, for this reason, the few studies that have analyzed the incentive effects of employer pension plans have either analyzed the *potential* incentive effects by illustrating the spikes and abrupt changes in pension benefits at key ages, and additionally, they have linked these to actual retirement decisions in specific case studies. In this vein, the study by Fields and Mitchell (1984c) cited above can be regarded as being based on 10 case studies, although single case studies are more common.[46]

46 Burkhauser (1979), Burtless and Hausman (1982), Fields and Mitchell (1984a), Kotlikoff and Wise (1985, 1987, 1989), Lumsdaine, Stock and Wise (1990), Mitchell and Luzadis (1988), Stock and Wise (1990a, 1990b), and Pesando, Hyatt and Gunderson (1992).

5. *Summary Observations*

The existing theoretical and empirical literature on the determinants of retirement highlights that retirement decisions generally respond to market incentives such as the person's expected wage and job opportunities as well as pension benefits from public and private plans. As well, they are sensitive to the persons particular circumstances, especially their health and wealth (and hence ability to afford to retire).

But existing data, however, has serious weaknesses, in part because all of the determinants of retirement are not available in a single data set. In particular, it is generally very difficult to incorporate the features of public and especially employer pension plans into data sets that have other determinants of retirement. The weakness is particularly pronounced with respect to employer plans, especially because they have a wide range of features that are designed specifically to influence retirement decisions.