What Is Retirement? A Review and Assessment of Alternative Concepts and Measures*

Frank T. Denton[1] and Byron G. Spencer[1]

RÉSUMÉ

Puisque que la notion de *retraite* est à la mode dans la pensée populaire et dans les études théoriques, il serait utile de définir un concept analytiquement pertinent que l'on pourrait mesurer avec précision afin de comparer les modèles de retraite au fil du temps et selon les différents groupes de population. Le présent essai passe en revue et évalue les divers concepts et mesures qui ont été proposés, les regroupant dans les catégories suivantes : absence de participation ou participation réduite à la population active, prestataire de pension de retraite, emploi de fin de carrière, autoévaluation du statut de retraite et combinaison de ces caractéristiques. La conclusion est qu'il n'existe aucun consensus pour aucune de ces mesures. Au contraire, de nouvelles mesures continuent d'être proposées afin que l'on tienne compte des nouvelles améliorations apportées aux séries de données récemment parues, ce qui limite davantage les comparaisons possibles. Ce large éventail de définitions reflète les problèmes pratiques derrière la notion de retraite : c'est essentiellement un concept négatif, une notion qui réfère à ce que les gens ne font *pas*, c'est-à-dire au fait qu'ils ne *travaillent pas*. Une approche plus positive viserait à se concentrer plutôt sur ce que les gens *font*, en particulier sur les activités non rémunérées qui sont socialement productives, même si ces dernières ne contribuent pas au revenu national tel qu'il est conventionnellement mesuré.

ABSTRACT

Because the concept of *retirement* is prominent in both popular thinking and academic studies, it would be helpful if the notion were analytically sound, could be measured with precision, and would make possible comparisons of patterns of retirement over time and among different populations. This paper reviews and assesses the many concepts and measures that have been proposed, summarizing them in groupings that reflect non-participation or reduced participation in the labour force, receipt of pension income, end-of-career employment, self-assessed retirement, or combinations of those characteristics. It concludes that there is no agreed measure and that no one measure dominates. Instead, new proposed measures continue to take account of additional refinements as new data sets become available, thereby further restricting possible comparisons. The confusing array of definitions reflects the practical problem that underlies the concept of retirement: It is an essentially negative notion, a notion of what people are *not* doing – namely, that they are *not working*. A more positive approach would be to focus, instead, on what people *are* doing, including especially their involvement in non-market activities that are socially productive, even if those activities do not contribute to national income as conventionally measured.

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Introduction

Since the concept of retirement is prominent in both popular thinking and academic studies, it would be helpful if the notion were analytically sound, could be measured with precision, and would make possible comparisons of patterns of retirement over time and among different populations. Instead, the concept is inevitably fuzzy; in that regard, it bears some kinship to the difficulties encountered in defining "old age" (Denton & Spencer, 1999, 2002). The concept is also fluid, no doubt shifting over time as social conditions and individual expectations evolve. Our purpose here is to review and assess the many proposed concepts and measures of retirement.

Retirement usually refers to withdrawal from paid working life. That is generally consistent with the definition provided by the *Oxford English Dictionary* – "To withdraw from office or an official position; to give up one's business or occupation in order to enjoy more leisure or freedom (especially after having made a competence or earned a pension)." But if we take this approach, the notion is not only fuzzy, it is also complex. The stylized case of an individual who quit the paid labour force after a working life with one employer and never again sought paid work would seem to represent a straightforward instance of retirement, but that is not the norm. Most people change jobs several times in the course of a working life, sometimes with intervening spells of unemployment. McDaniel (1995, p. 86) argues that in the later part of the working life, "the transition from employment to retirement . . . is far from the smooth transition that . . . has long been presumed. [Instead] multiple transitions occur into and out of employment and into and out of the labour force." Beyond that, retirement as a social phenomenon is changing, with successive cohorts responding in different ways (see, for example, Han & Moen, 1999).

Such considerations create difficulties for the measurement of retirement. One might "retire" (e.g., from teaching or the Canadian Public Service at age 55) and then start a new career, full-time or part-time, perhaps doing work related to an earlier career or perhaps doing something entirely unrelated. And such a return could occur even after several years of being out of the labour force. Some who become unemployed or disabled may decide not to return to work but appear not to have retired because they receive employment-related benefits. Retirement can be voluntary or involuntary; it can be gradual or sudden; and it can be temporary or permanent. It is clear that the notion of retirement is complex and that no one definition will satisfactorily represent all situations.

A variety of concepts and measures of retirement have been suggested. Lazear, writing in 1986, commented that "no consensus exists on the most fruitful way to define retirement" (p. 310); a few years later, Ekerdt and DeViney (1990, p. 211) observed that "the operational definition of retirement . . . remains an unsettled issue in aging research."[1] Of course, what is "most fruitful" depends on the purpose at hand; a definition that serves well in one context might not suit in another. Nonetheless, it seems fair to say that more than two decades after Lazear's review, there is no general agreement on precisely how retirement should be defined, although most agree that it relates to withdrawal from the paid labour force. All would agree that measures of retirement, and comparisons across measures, are limited by the available data.

A Framework for Analysis

In his review paper on "Transitions to Retirement," Borland (2005) provided a useful organizing concept to help us think about retirement. He distinguished between the period in which "career employment" is one's main activity and a later period in which it is "retirement." In between is the "transition phase," which can start at various ages and can vary in length. It is characterized by a reduction in labour force attachment – some combination of fewer hours of work, a new location (possibly working from home), a less demanding job, and the receipt of pension benefits. That, of course, leaves open the matter of specifying precisely how to define a state of retirement – and what indicator to use if a measure is needed.

Borland notes, "generally it seems that retirement has been interpreted as . . . not being engaged in any paid work" (p. 2), but people with relatively low levels of engagement might also reasonably be deemed retired. Consider Figure 1, which shows the extent of engagement in paid work on the vertical axis (1 indicates "fully engaged"; 0 indicates "no paid work"; intermediate values indicate partial engagement on the way to full retirement).[2] Note that "fully engaged" need not

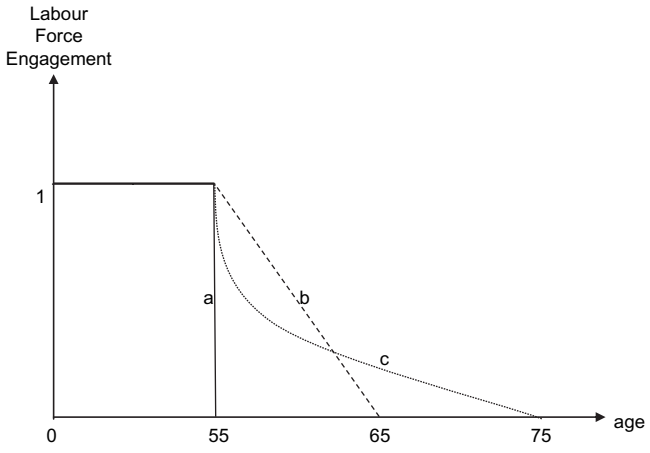

Figure 1: Transitions to retirement

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mean full-time, full-year employment; it could represent a sustained period of work for half of each year (perhaps in the forestry industry or fishing) or any other pattern that was sustained for a number of years and represented long-term "career" or typical working life experience for an individual. Note also that engagement could be measured in dollars of employment income or in time (e.g., hours or weeks per year).

At age 55, an individual *a* moves directly from a sustained career employment pattern ("full engagement") to a phase of "no paid work" and remains in that state; it is clear that such an individual would have "retired" at age 55. But what about individuals *b* or *c*, both of whom experience gradual disengagement from work activity? For individual *b*, the disengagement from work activity takes place over 10 years; the work-to-retirement process starts at 55 and only by 65 is the level of engagement zero. Perhaps we would want to think of that individual as retired at age 60, when engagement in employment fell to half its level before the transition began, or at age 64, when it was only 10 per cent; that is a matter of definition. Similar comments apply to individual *c*, who is not "fully retired" until age 75. Many other paths are possible, including returns to "full engagement."

What these comments emphasise is that in all but the simplest cases, such as that of individual *a*, there is a perhaps lengthy period in which a person might be classified as both "retired" and "working," a situation that complicates the notion of retirement and can even bring into question whether the concept itself is analytically useful. Even so, the idea of retirement remains strongly entrenched in both popular thinking and academic research.

What Concepts and Measures Have Been Proposed?

In the following discussion, we focus on retirement as the withdrawal of older workers from paid working life. This is the notion most commonly used and is generally consistent with popular, as well as more technical, usage of the term. At the same time, this notion is (perhaps surprisingly) difficult to observe and measure. In passing, we note that this usage excludes those (mainly women) who have spent little or no time in the labour force but may have made significant contributions in terms of home production. We concur with McDonald (2006, p. 129) who observes, "Historically, women were essentially invisible workers and therefore invisible retirees because they did not work for very long in the paid labour force."

Table 1 provides a summary of the ways in which retirement has been defined in practice in selected studies that were published in the last two and one half decades. A check mark (√) indicates either that the measure of retirement specified in the column was used in the empirical work in the study in that row or, in the case of conceptual or review studies, that the measure was proposed as one that might be used. For some of the studies referenced here, the central focus is not on retirement as such, but a definition of retirement is required for the analysis. We have attempted to locate Canadian studies that have defined retirement, either conceptually or for estimation purposes; 18 are reported in the table. But we have also looked to the literature more broadly[3] and have included 16 studies that work with data from the United States, three with data from the United Kingdom, one for each of Norway and Israel, and two that work with data from several OECD countries combined. A few other studies do not work with data (as indicated by "NA").

In practice retirement is something that happens mainly to older workers, and "older" is typically taken to mean over the age of 50 or 55, or even 60. The meaning of "withdrawal" is also elastic, as the previous section suggests. At one extreme is full withdrawal (i.e., no labour force activity and hence no hours of work and no earnings). At the other extreme would be a reduction in work effort deemed sufficiently large to qualify (e.g., by some arbitrary amount, at least one quarter or one half, say – but not necessarily all the way to zero).

The first three columns of the table are based on labour market measures. One definition of retirement is the complete absence of labour force participation; studies using this quite restrictive measure are listed in the first column. Those listed in the second and third columns are less demanding in terms of what an individual might do and still be regarded as retired. That is, they are consistent with *partial retirement* – one could be considered retired when time worked (and, hence, income earned) is reduced. However, the data requirements are greater since retirement is defined by a *reduction* in either hours worked or earnings (or both), not necessarily to zero (column 2), or by the requirement that hours worked and/or income earned be low (column 3), below a specified (and inevitably arbitrary) threshold.

The next three columns are not based on direct indicators of current labour market activity. Being in receipt of retirement income is all that is required to define retirement in the studies listed in column 4; newly in receipt would then characterize newly retired, whether or not the person was still working. The next two definitions relate to previous employment – leaving one's main or career employer (column 5) or changing employer or career (column 6). The idea here is that such a change in the later working years would be expected to indicate a marked reduction in labour force commitment (e.g., the

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Table 1: Alternative Measures of Retirement

Year	Author	non-participation in labour force	reduction in hours worked and/or earnings	hours worked or earnings < min	receipt of retirement income	left main employer	change of career or employment later in life	self-assessed retirement	combination of indicators	Country	Data Source*
		1	2	3	4	5	6	7	8		
1982	Hardy		√							United States	NLS
	Tracy	√								Canada	LFS
1983	Sharon & Argov	√								Israel	Small sample
1984	Fields & Mitchell				√	√				United States	RHLS, BAS
	Gustman & Steinmeier		√							United States	RHLS
	Hooker & Ventis								3&4	United States	Small sample
1985	Honig & Hanoch		√						2&7	United States	RHLS
	Palmore et al.			√				√	3&4	United States	7 longitudinal surveys
1986	Lazear	√	√		√			√		NA	NA
	Wanner & McDonald								1&4	Canada	Census
1990	Ekerdt & DeViney	√	√		√	√	√	√	yes	United States	Various
1995	OECD	√								10 OECD (excl Canada)	LFS
	Talaga & Beehr			√				√	3&4	United States	Individual firm
1996	Saint-Pierre	√								Canada	SCF
1997	Gower								1&7	Canada	LFS
1998	Blondal & Scarpetta	√								15 OECD	LFS
	Quinn & Smeeding			√	√				3&4	7 OECD	LIS
	Tanner	√						√	1&7	United Kingdom	RS
1999	Baker & Benjamin	√	√		√			√		Canada	LFS, SCF, SAD
	Lumsdaine & Mitchell	√	√		√		√	√		NA	NA
	Szinovacz & DeViney		√		√			√		United States	NSFH
	Tompa				√					Canada	LAD
2000	Gustman & Steinmeier		√	√	√		√	√		United States	HRS
2001	Compton	√								Canada	SLID
	Gustman & Steinmeier								2&3&5&7	United States	HRS
	Johnson & Favreault	√								United States	HRS
	Kieran								1&7	Canada	LFS

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2002	Habtu	√									Canada	LFS
	Pyper & Giles									1&5	Canada	SLID
	Rowe & Nguyen							√			Canada	LFS
2003	Baker, Gruber, & Milligan		√								Canada	LWF
	Maloney, Mirza, & Paris		√								Canada	Income tax returns
2004	Schellenberg & Silver							√			Canada	GSS 2002
	Shannon & Grierson	√									Canada	Census, LFS
2005	Asch, Haider, & Zissimopoulos					√					United States	Dept. of Defense
	Blekesaune & Solem		√								Norway	Combined admin & survey
	Borland		√								NA	
	Drolet									2&4	Canada	Quebec income tax returns
2006	Banks & Smith				√	√		√			United Kingdom	BPHS
	Cahill, Giandrea, & Quinn		√			√	√				United States	HRS
	Deschênes & Stone									1&4	Canada	SLID
	Haas et al.									3&4	United States	Census
2007	Arkani & Gough	√									United Kingdom	LFS & ELSA
	Bowlby							√		1&4,2&4	NA	NA
	Coile & Gruber		√					√			United States	HRS
	Wannell				√						Canada	LAD

*Key:

BAS	**Benefit Amounts Survey**	**NA**	**Not Applicable**
ELSA	**English Longitudinal Survey of Ageing**	**NLS**	**National Longitudinal Surveys of Labour Market Experience**
GSS	**General Social Survey**	**NSFH**	**National Survey of Families and Households**
HRS	**Health and Retirement Study**	**RHLS**	**Retirement History Longitudinal Survey**
LAD	**Longitudinal Administrative Database**	**RS**	**Retirement Survey**
LFS	**Labour Force Survey**	**SAD**	**Survey of Assets and Debts**
LIS	**Luxembourg Income Study**	**SCF**	**Survey of Consumer Finances**
LWF	**Longitudinal Worker File**	**SLID**	**Survey of Labour and Income Dynamics**

move from a full-time career as a school teacher to a part-time "retirement" activity as a real estate agent). The next column (column 7) relates to self-assessed retirement. Here individuals describe themselves as retired or not; all other information is ignored.

Still other studies define retirement based on a combination of characteristics (e.g., full withdrawal from the labour force [column 1] and also in receipt of pension income [column 4]). That case is indicated in column 8 by the entry "1&4." Among the 46 studies represented in the table, 31 propose one or more measures of retirement based only on a single defining characteristic, and 15 propose measures based on two or more characteristics. The most frequently proposed measures based on a single defining characteristic are nonparticipation in the labour force (15 studies), a reduction in hours and/or wages (13), and self-assessment (13). Of the 15 studies that propose a combination of characteristics be taken into account, 10 include receipt of pension income in combination with earnings or hours worked below a specified threshold (6 studies) or a reduction in participation, including nonparticipation (4 studies). One of these studies, Bowlby (2007, p 17), reported that Statistics Canada has a "standard definition" of retirement: "*retired* refers to a person who is aged 55 and older, is not in the labour force, and received 50 percent or more of his or her total income from retirement-like sources." Bowlby went on to note the practical difficulties in applying this definition empirically: Few Statistics Canada surveys provide the necessary information about both labour force participation and income. The two exceptions are the *Survey of Labour and Income Dynamics* and the *Census*.

Canadian Studies Using Longitudinal Data Files

If retirement is to be defined by a significant reduction in labour force attachment, it is natural to look to longitudinal surveys as the basis for measurement. Surveys, in which the same individuals are observed for a number of years, starting in their later working years, are especially helpful. Until recently few Canadian data files have collected longitudinal data; hence, there has been very little with which to work. The first such Canadian study, Tompa (1999), used administrative data, namely, the *Longitudinal Administrative Database*, better known as the *LAD*, which links individual income tax returns year-by-year for a large sample of income tax filers for the period since 1982. Tompa defined retirement by the receipt of Canada Pension Plan (CPP) benefits and investigated the impact of various characteristics (including level of income, marital status, and markers of health) on the age of retirement.

Subsequently, Maloney, Mirza, and Paris (2003) worked with longitudinal data from income tax returns, but not with *LAD*. Instead, they made use of access to the Finance Canada *CCRA Individual Tax Mini-Universe* database for the period 1995–2001. Their concern was to estimate the effect of the Canadian income security system on retirement. They worked with a sample of those who were aged 60 to 70 in 1995 and eligible to receive benefits under either the CPP, which applies outside Quebec, or the Quebec Pension Plan, QPP, which applies to residents of Quebec. Both the QPP and the CPP allow individuals to cease contributing and receive reduced pension benefits as young as age 60; alternatively they could elect to continue contributing up to a maximum of age 70 in order to receive larger benefits. The sample was further restricted to those who had positive employment income in 1995. Retirement was then defined on the basis of a year of positive employment income followed by a year of zero employment income.

Drolet (2005) also worked with longitudinal income tax returns, in his case those that were filed with *Revenu Québec* in the period 1991–2001. Drolet's particular goal was to infer the age of retirement. By making use of the longitudinal nature of the file, he measured retirement by a substantial drop in employment income combined with the receipt of pension income.

A recent study by Wannell (2007) concerned young pensioners, those who retire before the age of 60. The study used *LAD* and defined as retired a person who was in receipt of registered pension plan (RPP) benefits between the ages of 50 and 60 and had positive employment or self-employment income in the year preceding initial receipt. Excluded from the analysis were those who claimed the disability deduction or received either Canada or Quebec Pension Plan (C/QPP) benefits in the first two years of receiving RPP benefits (since that would indicate disability and, hence, possible difficulties in pursuing employment) and also those whose pension and superannuation income dropped to zero in the year following initial receipt (to eliminate those whose receipt of such income occurred when they changed employers and had to declare as income RPP assets that they were unable to transfer to a new plan).

Baker, Gruber, and Milligan (2003) also worked with longitudinal administrative data files, in their case the *Longitudinal Worker File* (*LWF*), which was developed by the Business and Labour Market Analysis (BLMA) Division of Statistics Canada. It is a 10 per cent random sample of Canadian workers for the period 1978–1996. The *LWF* combines information from three administrative data files, namely, the T4 file of Revenue Canada, the *Record of Employment* (*ROE*) file of Human Resources Development Canada, and the *Longitudinal Employment Analysis Program* (*LEAP*) file of BLMA.

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Baker et al. (2003) defined work based on the report of positive T4 earnings in two consecutive years; retirement, by the last year of positive earnings before a year in which earnings were zero.

Turning now to longitudinal survey data, Compton (2001), Pyper and Giles (2002), and Deschênes and Stone (2006) worked with data from the *Survey of Labour and Income Dynamics* (*SLID*). Compton (2001) worked with *SLID* for the years 1993–1996; she defined retirement for those over the age of 50 as being out of the work force for the entire year. Unlike Statistics Canada's use of the term, "out of the work force" is defined to include those who were unemployed. Compton noted (pp. 14–15), "The distinction between months spent in unemployment or outside the labour force may be blurred, especially for older persons. Individuals who lose their job may decide to retire, but find it more lucrative to remain officially in the labour force and collect their entitled EI [employment insurance] benefits prior to officially dropping out of the labour force and receiving CPP benefits." Hence, Compton defined all long-term withdrawals from employment as retirement.

Pyper and Giles (2002) also used *SLID* to focus on transitions to retirement. Their study analysed the labour force behaviour of those aged 50–67 whose full-time career jobs (jobs with minimum duration of 8 years) came to an end at least 24 months before the end of the five-year 1993–1997 data period. They found that "Almost half of older workers who ended a full-time career job between 1993 and 1997 began a new job within two years. The majority of these found a new full-time job, and a smaller but significant portion (10%) switched to part-time employment, suggesting that easing into retirement is a real phenomenon" (p. 15).

Deschênes and Stone (2006) worked with *SLID* for the six-year period 1996–2001. They defined a respondent as retired if she or he had left the labour market for good (which, in practice, means that the survey respondent was neither employed nor seeking work for at least one full year and had not returned to work by the end of the survey period) and was also in receipt of retirement income.

Rowe and Nguyen (2002) worked with data from the *Labour Force Survey* (*LFS*), but in a novel way related to the development of the LifePaths simulation model. More specifically, they used 20 years of monthly data from the *LFS* master files to follow the month-to-month changes in the labour force status of respondents. Rowe and Nguyen used these month-to-month transitions to construct cohort patterns of job separation and acquisition for those who turned 50 between 1976 and 1979. Such an approach is possible because households remain in the *LFS* for six consecutive months; hence, there are five one-month transitions for each respondent. "By tracking the cumulative incidence of job separation and job acquisition of selected cohorts between the ages of 50 and 65, it is possible to identify self-described retirement as well as other patterns of labour market activity" (p. 24). Rowe and Nguyen concluded: "Retirement as a self-reported event appears to be relatively infrequent. Only about 51 percent of men and 30 percent of women in the selected cohorts had retired from a job by age 65" (p. 24).

Canadian Studies Using Cross-Sectional Data Files

Others who have worked with the *LFS* typically have not taken advantage of the (very short) longitudinal sequences that are available for each respondent. Instead, they have worked with the more standard cross-sectional versions of the files. The purposes of these studies vary, but the definition of retirement is the same, simply "not in the labour force." Blondal and Scarpetta (1998) used this measure and worked with survey data generally similar to the Statistics Canada *Labour Force Survey*, but from 15 OECD countries, including Canada.

Shannon and Grierson (2004) used the same measure as they worked with both *LFS* and *Census* files to focus attention on the employment rate (the ratio of employed to population). Their concern was the effects that mandatory retirement legislation had on employment. Census files were also used by Wanner and McDonald (1986), who defined as retired those not in the labour force who are also in receipt of retirement pension income.

Baker and Benjamin (1999) used the *LFS* in much of their descriptive analysis, employing the same "not-in-the-labour-force" definition of retirement, but their econometric work was based on successive cross-sections of the *Survey of Consumer Finances*. Their concern was to analyse the effects of the introduction of early retirement provisions in the CPP and QPP. The fact that the provisions were introduced at different times in Quebec (1984) and the rest of Canada (1987) allowed them to apply a difference-in-differences approach to investigate the impact on labour supply behaviour. Baker and Benjamin assessed the responses of two groups of males, those aged 60–64 and those aged 55–59, using several measures of labour market attachment and participation. Their most direct measure of retirement was determined by respondents' self-reported activity while out of the labour force – by this measure, only those who were neither employed nor searching for work and who indicated they were either "retired or voluntarily idle" were classified as "retired." Baker and Benjamin also considered alternative measures of labour market attachment – employed, weeks worked if employed, unemployed, and in receipt of unemployment insurance.

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Saint-Pierre (1996) also worked with data from the *Survey of Consumer Finances*. His concern was with whether earnings continued to increase until retirement, and he focused on *newly* retired men, defined as those who were not in the labour force as of the survey date but were full-time, full-year workers for at least one week during the previous calendar year.

The studies by Gower (1997) and Kieran (2001) were both concerned with the age at which retirement occurred, and both defined retirement by being both out of the labour force and self-reported as retired. Habtu (2002) used measures based on "not in labour force" (i.e., neither employed nor unemployed) and calculated labour market inactivity rates (the ratios of those not in the labour force to the population). She refined the inactivity rates to reflect different durations since last employment.

Finally, among the studies using Canadian data, only Schellenberg and Silver (2004) worked with the *General Social Survey* (GSS). Their concern was with "the characteristics and experiences of individuals who have made a recent transition to retirement" (2004, p. 2). They used the *GSS* subjective definition of retirement; it included those who stated that their main "activity" during the previous 12 months was "retired," as well as those whose responses to other questions indicated that the designation was appropriate.

International Studies

Almost all U.S. studies have worked with longitudinal data. Even in the early 1980s, Hardy (1982) was able to define the onset of retirement based on a reduction of annual hours worked, as reported in four waves of the U.S. *National Longitudinal Surveys of Labor Market Experience* (*NLS*). The *Retirement History Longitudinal Survey* (*RHLS*) was the basis for other studies in the mid-1980s. By way of examples, using that survey, retired was defined by Gustman and Steinmeier (1984) based on a reduction in hours, by Fields and Mitchell (1984) based on both leaving one's main employer and receiving retirement income,[4,5] and by Honig and Hanoch (1985) in two ways – a reduction in hours, alone or in combination with self-assessment as retired. Palmore, Burchertt, Fillenbaun, and Wallman (1985) also worked with the *RHLS*, as well as (remarkably) six other longitudinal surveys, and defined retired in three ways – based on self-assessment, on working few hours, and on working less than full-time and receiving pension income.[6]

Starting around 2000, research on retirement in the United States using longitudinal data files has concentrated on the analysis of the *Health and Retirement Study* (*HRS*). As its name suggests, the *HRS* was developed specifically to study retirement; the range of questions that were asked of respondents, in combination with the linkage to Social Security administrative files, made possible the empirical application of many definitions. Five such studies are listed in Table 1 and, as the table indicates, these studies worked with a variety of definitions.

Almost all measures of retirement were based on a single criterion, although some studies provided several such measures. Johnson and Favreault (2001) and Cahill et al. (2006) used non-participation in the labour force as their only criterion. Gustman and Steinmeier (2000) and Coile and Gruber (2007) provided measures based either on reduction in hours and/or earnings or on self-assessed retired status. Gustman and Steinmeier (2000) also provided three other measures based on a single criterion – minimum hours or earnings, receipt of pension income, or change of career in later life. Only one study identified here was based on a combination of characteristics – that of Gustman and Steinmeier (2001), who suggested combining five criteria.

Another U.S. study, that of Asch, Haider, and Zissimopoulos (2005), used longitudinal data from the administrative files of the Department of Defense; its measure of retirement is departure from the Department. Other studies have worked exclusively with cross-sectional data. We note here the one by Haas et al. (2006), based on data from the *2000 Census*. That study was concerned specifically with comparing alternative definitions of retirement for older migrants. The "traditional" measure was strictly age-based – retired migrants were those aged 60 or older who resided in another state five years before the census. The alternative definitions for which estimates were provided related to similar individuals age 50 or older who indicated retirement status not solely by the change in location, but also by a reduction in work time and being in receipt of relevant Social Security benefits (definition 1) or by not being in the labour force and being in receipt of relevant social security benefits (definition 2).

U.K. studies were also able to benefit from access to longitudinal survey data. Tanner (1998) worked with two waves of the *Retirement Survey*; Banks and Smith (2006), with 13 waves of the *British Household Panel Survey*. Arkani and Gough (2007) worked with the first (hence cross-sectional) wave of the *English Longitudinal Survey of Ageing* (*ELSA*), as well as with the (cross-sectional) *Labour Force Survey*. Arkani and Gough (2007) defined retirement in only one way: not in the labour force. Tanner (1998) provided three measures – not in labour force, self-assessed as retired, and both together. Banks and Smith (2006) provided three single-criterion measures – one based on receipt of retirement income,

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one based on leaving main employer, and one based on self-assessment.

We found only one study that worked with data for Israel. Sharon and Argov (1983) worked exclusively with cross-sectional data, a sample of 300 men who had been classified as retired in that they were not in the labour force, but who nonetheless applied for work at an employment agency. Sharon and Argov's concern was to identify the factors associated with successful paid work after retirement.

Finally, we note the work of Blekesaune and Solem (2005), which combined survey and longitudinal administrative data for Norway. In that regard, it resembles the *HRS* in the United States, which was able to combine survey data with administrative data from the Social Security Administration, but it appears that the Norwegian study had access to a wider range of administrative data. It defined retirement by a sufficient drop in work-related income. We note that combining survey and administrative data can be very helpful when addressing research questions, including those relating to retirement. A particular advantage of some administrative files is the long time series of information that they can provide right away, without having to wait until many years of survey data have been collected. Longitudinal administrative records can be of particular value in cases where accuracy is important and the information can change substantially over time (e.g., the level and sources of income). The advantages are especially great when administrative records can be linked to survey data that provide additional information about other characteristics often missed in administrative records (e.g., level of education).

Helpful Constructs Related to Measures of Employment and Retirement

The summary in the previous section indicates the range of measures that have been proposed and applied. We turn now to consider some measures that could be derived based on information that is available in the Statistics Canada *Labour Force Survey* and its *Longitudinal Administrative Database* (*LAD*). From the *LFS*, and specifically the labour force participation rates based on that survey, one can calculate transitions for pseudo-cohorts (e.g., the probabilities of leaving the labour force [hazard rates] or, alternatively, of remaining). As an extension, one could also calculate both the expected years of working life remaining at ages before retirement and the expected years of retirement.

We turn now to *LAD*. Because the *LAD* includes only information that is available from individual income tax returns, one is restricted to income-based measures of retirement. However, a major advantage follows from the *LAD*'s longitudinal nature: Detailed information is available for the income of each tax filer since 1982, or whenever the taxpayer first filed a tax return. At this time, the latest information relates to the 2005 tax year. That means that we have records of annual income for a period of up to 24 years, including the amount of income in each of several categories (such as income from employment, from retirement pension, from investment). Hence, measures of retirement can be derived that relate to the receipt of income from employment (including self-employment) over a number of years. For those with a history of employment income, retirement could be defined as one or two years with no earnings or a specified decline in earnings (e.g., by 50%, by 75%), and the sensitivity of the measure of retirement to changes in the definition could be assessed. This means that measures generally consistent with those identified in the first three columns of Table 1 could be derived. In addition, of course, we know from *LAD* whether a person has retirement income (the fourth column), and this measure could be taken into account also.

A question remains about what should be included in the measure of "employment income." In particular, should it include unemployment (EI) benefits? Baker, Gruber, and Milligan (2003) included EI benefits in one of their retirement definitions. Using a different database, they defined a person as retired in the year preceding the year in which combined earnings and unemployment benefits were zero.

Discussion

We have found in the social science literature a range of definitions that have been proposed and/or used as indicators of retirement and have classified these definitions under eight headings in Table 1. Which measure is used in a particular study depends primarily on its purpose – the question to be answered – but the choice of measure is likely to be conditioned also by the data available. The appropriateness of a measure can be assessed, too, from a more theoretical perspective. In this context, it is helpful to distinguish whether the focus is at the level of an individual person or employer, on the one hand, or at the level of the society as a whole, on the other. We draw on that distinction in the following discussion.

A relatively clean measure of retirement is possible if *work* is associated with market activity, and specifically with the provision of labour services in exchange for employment income. Retirement is then indicated by the withdrawal of those services. That is what most measures of retirement emphasise, and hence most researchers have defined retirement based on labour force

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status. Such a measure is appropriate if the concern is at the level of the society as a whole – the *social* level – and perhaps with the productive capacity of the economy as indicated by such standard measures as potential gross domestic product (GDP).[7] After all, being in the labour force adds to the economy's productive capacity, whereas withdrawing from the labour force reduces it. Hence, understanding retirement in the sense of withdrawal from the labour force, and the historical trends in market-based measures of retirement, will inform projections of their future paths. In particular, those concerned with the future rate of growth of GDP will want to assess the impacts likely to be associated with the extraordinary and much anticipated levels of retirement of the baby boom generation (e.g., see Denton & Spencer, 2000). For this purpose, they will want to use a measure based on labour force status – such as those in the first three columns of Table 1.

Measures in the first column of Table 1 define retirement by **non-participation** in the labour force. Using this measure, each individual is counted as either *in* the labour force (and hence not retired) or *out* of the labour force (and hence presumed to be retired). Such is the approach taken by Shannon and Grierson (2004), who are concerned with the effects of mandatory retirement legislation in Canada on the employment of older workers, and Arkani and Gough (2007), who are concerned with the impact of occupational pensions on the age at which people retire in the United States, to take two examples. This approach ignores the more subtle changes in the intensity of participation. Of course, taking into account the *extent* of withdrawal is of practical importance, because not everyone makes "an abrupt transition from full-time work to full-time retirement" – although Blondal and Scarpetta (1998, p. 6) found an abrupt transition to be the usual, though not universal, pattern in a study of 15 OECD countries.

In practice, participation can be full or partial, with changes in intensity measured either by a *reduction in work activity* (such as the number of hours worked per week) *or in income earned from employment*, our columns 2 and 3 in Table 1. It is obvious that the more common it is for retirement to be gradual rather than abrupt, the less satisfactory are measures that fail to take account of the transition itself in suggesting the associated impact on the economy's productive capacity. In that connection, the finding of Cahill et al. (2006, p. 514) that "a majority of older Americans with career jobs retire gradually, in stages, rather than all at once" and a similar finding for Canada by Pyper and Giles (2002) are of particular note.

How the transition has changed historically is less clear, but it is obvious that trends towards more abrupt or more gradual retirement practices would bias measures of change that fail to make appropriate allowance. That could be important for the future. For example, Coile and Gruber (2007, p. 234) find that the expected pension benefits associated with both public and private plans affect retirement decisions and, hence, that policy changes could reduce the exit rate of older workers. In addition, we note the potential importance of taking into account systematic differences in rates of retirement that are related to income level or eligibility for private pension benefits.

Although these measures are useful as *social* indicators of retirement status, they are also useful as reasonable indicators of retirement from an *individual* perspective – an older person who is no longer working, or who has a much reduced labour force attachment, might reasonably be classified as "retired."

The fourth indicator, in column 4, is based entirely on the *receipt of retirement income*; this is the approach Wannell (2007) took for Canada and Banks and Smith (2006) took for the United Kingdom. Inasmuch as the initial receipt of pension income is often associated with departure from the labour force, or at least with a substantial reduction in labour force activity, it too could provide a rough indicator of retirement – and from both the individual and social perspectives. By way of example, those who are eligible by virtue of employment history to receive C/QPP retirement pension benefits can elect to have those benefits start at any age from 60 to 70. The benefit level adjusts to reflect the age chosen. Because the receipt of benefits is associated with the end of contributions, the age at which individuals opt to *retire* in this sense will have an impact on the assets and financial viability of the plans. When the plans have universal coverage, as in the case of the C/QPP, this definition has relevance from a social perspective.

Choice regarding the age of benefit take-up is a feature of many private pension plans as well. For them the perspective is much more at the individual employer level. At the same time, it must be recognized that the receipt of pension benefits, whether from a public plan or from a private plan associated with a particular employer, does not necessarily mean that the person has withdrawn from active participation in productive activity. That suggests a deficiency, from a social point of view, in measures of retirement that depend exclusively on the receipt of pension benefits.

Indeed, there are many examples of people receiving pensions while remaining in the labour force and continuing to work. Until recently the compulsory retirement age from the Canadian military was 55 (it was raised to 60 in 2004). Many retire when younger. Those leaving the service typically accept the retirement pension but often take up other employment. Beyond that,

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many people who have pension benefits as a result of taking "early retirement" have retired from one employer but subsequently started to work for another. Others continue to work for the original employer, perhaps with a reduced work schedule, while receiving pension benefits. In such cases, individuals might properly be "retired" from the perspective of an individual employer, but not from the perspective of the society as a whole – or of the individual.

The next two indicators of "retired," namely *left main employer*, column 5, and *change of career or employment later in life*, column 6, are closely related. They capture the idea that retirement is marked by the end of a long period of employment with the same employer. Neither of these indicators appears to have been used in Canadian studies, but *left main employer* was used in the United States by Asch et al. (2005) and in the United Kingdom by Banks and Smith (2006). With these indicators, one would be "retired" even if further employment – possibly of quite a different nature – were pursued subsequently. Hence for example, teachers are often thought of as retired when they quit teaching at age 55 or 60, and may describe themselves in that way, even if they are actively engaged in another form of employment or, for that matter, continue to teach on a part-time basis.

This is relevant for an understanding of the determinants of retirement from the perspective of an individual employer – something about which employers would like to have better knowledge as one aspect of overall personnel management. When the concern is with a single company, the measure is appropriately based on whether or not an individual continues to be employed by that company: an individual who takes up post-retirement employment elsewhere would still be deemed *retired* by the original employer. That would be the case if one's concern were with understanding the age at which employees in a company elect to take pension benefits to which they are entitled. The interest may be motivated, for example, by the need to project the overall cost of the stream of benefits to which retirees are entitled and the asset position of the pension fund. Similar questions arise on a larger scale when the concern is with the future stream of benefit payments and contribution flows under the C/QPP. However, the measure is deficient from a broader societal perspective because it fails to take into account whether an individual pension recipient is still engaged in productive activity.

That brings us to our final single-factor indicator, *self-assessed retirement*, in column 7, a concept used in recent studies for the United States (Coile & Gruber, 2007), the United Kingdom (Banks & Smith, 2006), and Canada (Schellenberg & Silver, 2004). The idea here is that people declare themselves as "retired" or "not retired," and all other information is ignored. Hence, for example, and as noted above, the person who quit teaching may describe herself as retired even though she is now working two or three days a week as a substitute teacher. In such a case, being self-assessed as retired may be a good indicator of her state of mind, but hardly a good indicator of her economic contribution.[8]

Finally, retirement could be defined by a *combination of indicators*, our column 8. As one example, a person might be classified as retired only if she or he were both a non-participant in the labour force and in receipt of pension income or only if she or he worked less than a specified number of hours or earned less than a specified amount and also received pension income. As another example, Gustman and Steinmeier (2001) proposed a measure of retirement based on satisfying four criteria – to be retired, a person must have left his or her main employer, be working fewer hours than before, those hours must fall below some minimal level, and the person must regard himself or herself as retired. Hence, both objective and subjective indicators can be combined to suggest retirement status and perhaps get closer to a measure that reflects both an individual's perception and the extent of attachment to the market economy.

Concluding Remarks

We have considered various indicators of retirement and, as we have seen, each indicator has its merits, as well as its deficiencies; no one measure dominates those that have been proposed. Indeed, the field appears to be wide open, with each researcher free to introduce new measures that take advantage of newly available data. That often means that the measures are based on only one data set, thereby restricting the scope for comparisons. Ideally, one would like to have a concept of retirement that is analytically sound, that can be measured with precision, and that makes possible comparisons of retirement patterns over time and how they differ among jurisdictions.

In Canada, there are only a few data sets on which one could base measures that approach that ideal, and all of them are available through Statistics Canada. The two leading contenders are the *Labour Force Survey* and the *Longitudinal Administrative Database*. Given the nature of the *LFS*, any measure of retirement would necessarily be based (almost) exclusively on current labour force status; information about sources of income is not available. By contrast, measures based on the *LAD* would, of necessity, rely (almost) exclusively on information about income and its sources; direct information about labour force status is not available. Offsetting the limitations of measures based on either survey

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would be the advantages they bring in terms of relatively long time periods and samples that are both large and representative. In addition, the *LAD* makes it possible to base analyses on the income experience of the same individuals over time. That cannot be done with the *LFS*, although the retirement patterns of pseudo-cohorts can be derived. A natural question is how different would be the measures of retirement based on these two data sources. It may, of course, turn out that the two data sources yield similar rates of retirement, which would be reassuring.

However, as we have seen, in deciding whether to classify individuals as retired, researchers often want information about both labour force status and sources of income (specifically, the receipt of retirement pension income). That means either merging individual records from the *LFS* and *LAD* or, more likely, considering alternative data sources. There are two such alternatives, each of which presents practical problems.

The first of these is the *Survey of Labour and Income Dynamics (SLID)*, which makes available high-quality longitudinal data on both labour force status and annual income by source, starting in 1992. A difficulty, however, is that the *SLID* sample size is relatively small when it comes to examining the retirement process. There are simply too few observations of individuals who retire in any one year, too few on which to base reliable estimates, although Goshev (2008) has made some headway by pooling successive panels. The second data source is the *Census of Population*. However, the census is taken only every fifth year, and moreover there may not be strict comparability between consecutive censuses.

We conclude by noting that although the concept of retirement is prominent in both popular thinking and academic studies, there is no unique measure that we can attach to it. The problem is that what underlies the concept of retirement is the essentially negative notion of attempting to define what people are *not* doing – namely, that they are *not* working. In almost all cases, the underlying notion is that working time has been withdrawn from the market economy. But measures that reflect the absence of market-oriented activities ignore what people are actually doing. The fact is that much non-market activity is socially productive even though it is not included in standard measures of national income. One could be outside the labour force (using standard definitions), hence not engaged in market activities and not contributing to the measured national income, but still be contributing to the well-being of the society.

This might happen through provision of volunteer services, a topic that has been explored in Robb et al. (1999) and Lian et al. (2000), who in both cases were concerned to assign values to such services. There are many examples. Among them is the provision of volunteer services in hospitals or working with new immigrants to improve their language or workplace skills. Another is working with children, including those from underprivileged backgrounds. It is clear that similar services could be provided through the market, in which case they would be included in the conventional measures of output.

These examples emphasise the essentially negative nature of the standard notion of retirement in that it emphasises what people are not doing. That limitation is a natural consequence of restricting measures to those that reflect market activities and ignoring other activities that have social value. An alternative would be to place more emphasis on what people *are doing*, whether or not they might be classified as "retired." A natural complement to market-based measures of retirement would be measures based on time use surveys, including not only the numbers of hours spent working for pay, but also hours engaged in productive household activities, in caring for others, and so on. We do not explore this issue further here but note that there is a considerable literature on the topic; for a recent review see Boarini, Johansson, and d'Ercole (2006).

Endnotes

1 The problem goes back even further. Donahue, Orbach, and Pollak (1960, p. 330, quoted in Ekerdt & DeViney [1990, p. 211]) refer to "a certain degree of vagueness and lack of clarity as to its meaning."

2 Haas and Streib (1994, p. 241) developed an alternative representation of retirement trajectories; we are grateful to a referee for this reference.

3 We undertook an extensive literature search centred on the use of *EconLit*, *Google Scholar*, and *Ageline*. The keywords on which searches were conducted include:

- retirement definition
- definition of retirement
- retirement in Canada
- retirement decision
- "measurement of retirement"
- early retirement

Beyond that, we have tracked down references cited in relevant articles and books.

4 Fields and Mitchell (1984) worked also with the *Benefit Amounts Survey*.

5 We note also that in a still earlier study, Atchley (1976, p. 1) defined retirement conceptually as a "condition in which an individual . . . is employed less than full-time . . . and in which his income is derived at least in part from a retirement pension", but he did not apply the concept to survey data.

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6 We note also the related work on "normal aging" associated with Palmore (1970, 1974, 1981, 1985).

7 However, we note that such conventional measures take no account of work in the home or voluntary work; we return to that matter below.

8 Surveys typically restrict the choices to retired or not; respondents might instead be given a wider range of possible states from which to choose – "partially retired" or "retired and working part-time," for example.

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