

# **Developments in Phased Retirement**

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### Abstract

Phased retirement may be defined as a transition path whereby an older employee shifts from full-time to part-time work without changing employers. An interesting aspect of phased retirement is that it sometimes occurs after the older employee officially “retires”. Then the recently retired employee is rehired, and the two events are sometimes separated by less than a week. This chapter makes use of a national survey of 950 establishments to address the question of why an employer might make use of such an arrangement. We find that most employers might be willing to informally-arranged reductions in hours *both* before and after official retirement, and few impose a formal “waiting-time” between official retirement and subsequent rehire. We test several hypotheses about why employers might prefer that phased retirement occur before and/or after official retirement. Our results suggest that pensions, existing employment arrangements, and organizational size play a role. It is likely that such individually-negotiated arrangements will become an ever-more important element of the evolving retirement paradigm.

## **Developments in Phased Retirement**

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Phased retirement is often seen as a way to encourage older workers to extend their time in the labor force. The essential idea of phased retirement is that employees then move from full-time work to part-time work without changing employers. One advantage is that older workers can reduce hours while maintaining existing skills and job relationships. However a curious feature of phased retirement is that it sometimes occurs after employees have “officially” retired. Even more curious is the fact that the time interval between official retirement and rehire is sometimes as short as a day. This seems odd, since there is no ready explanation for why working hours would be reduced in this way. That is, rehire with reduced hours might have just as easily occurred prior to official retirement.

In this volume, we explore why employers might permit phased retirement only after employees officially retire. We address the question with the help of interviews conducted with close to 1,000 establishments regarding their phased retirement policies. Employers were asked whether they would permit an older worker to reduce hours, and, if so, whether they favored reduction in hours before or after official retirement. Using these data, we evaluate the extent to which employers actually do favor one or the other. Interestingly, we find that many employers do not indicate a strong preference; rather, they seem open to informally-arranged reductions in hours, both before and after official retirement. We also use statistical methods to analyze what types of employers might permit hour reductions to occur before and/or after official retirement. Our findings suggest that the preference for retire-rehire is at the individual rather than the establishment level, often due to pension and other benefit plan inducements. We suggest that

government policy could enhance work/retirement flexibility by clarifying the meaning of what constitutes retirement under tax and labor law.

### **Setting the Stage**

Phased retirement appears to have many advantages for both the individual and the larger society, particularly given labor force aging (Mulvey and Nyce, this volume). Not only might phased retirement provide a more satisfying path to full retirement, but also it could preserve specific human capital and thereby enhance productivity. In light of such potential benefits, it is somewhat disappointing that phased retirement is so rare. Research from the 1980s reported that fewer than 10 percent of a retiree cohort took phased retirement; instead, most older workers moved directly from full-time work to full-time labor force withdrawal (Quinn et al. 1990; Ruhm, 1990). More recent data offer no evidence of a substantive change in the numbers (Chen 2003).

One plausible explanation for the low incidence of phased retirement is that employers may restrict opportunities for hours reductions. This suggestion is strengthened by surveys of older workers wherein respondents indicate a strong interest in phased retirement. For example, over half of the employed respondents age 55-65 said they would prefer to gradually reduce their hours of work as they age according to the Health and Retirement Study (HRS; USGAO 2001). Similarly, Abraham and Houseman (this volume) report that among older workers having retirement plans, many plan to cut back on work hours, instead of fully retiring. Hence it would appear that the low incidence of phased retirement may not be due to lack of worker interest.

There is an interesting contrast between the US and Japan in this regard. Large Japanese employers often provide work opportunities for some fraction of their employees who reach the

organization's mandatory retirement age (Rebick, 1995). Typically, these post-career jobs involve reduced hours with the current employer or an affiliate of the current employer, so they are very similar to phased retirement. A striking feature of these post-career jobs is that while many employees indicate an interest in them,<sup>1</sup> employers are often quite selective about which workers have the opportunity to take them. Accordingly, high-performing employees are more likely to gain access to the jobs in Japan. In this sense, if we could show that US employers are targeting phased retirement opportunities to specific types of workers, they are not unique; in this they are similar to Japanese practice.

If US employers do limit opportunities for phased retirement, the question arises as to why. One explanation, advanced by Gustman and Steinmeier (1983), hypothesized that these limits might be more prevalent where firms impose minimum working hours constraints. This occurs when employees are required to work a minimum number of hours per week, month and/or year. Various explanations might rationalize such minimum hours constraints, including a production process that requires the presence of a team of workers; in any event, the point is that employees in these jobs can only reduce hours by quitting and taking a different job. In this case phased retirement (or, for that matter, part-time work at any age) would simply not be feasible.

An important alternative hypothesis for reluctance to offer phased retirement focuses on the role of defined benefit (DB) pension plans. As a rule, these pensions base benefits on a formula which rewards pay and service; as such they are distinct from defined contribution (DC) pensions where benefits are tied to the amount of money in an individual account at the time of retirement. Several analysts suggest that workers with DB pensions face formidable obstacles to phased retirement, as compared to those with DC pensions or no pension at all (Quinn et al, 1990; Hurd, 1996; US GAO, 2001).

Defined benefit pension plans may constrain phased retirement for several reasons. First, DB plans sometimes base pension benefits on earnings during the final few years prior to retirement. In this event, work at half-time or at partial-pay before to retirement would potentially reduce all future pension benefits substantially, which in turn will discourage part-time work. The same issue does not arise as sharply in a DC plan, since the benefit formula is linked to the individual's account. Hence working half-time before retirement will not generate a similar loss in future pension benefits.<sup>2</sup>

A second concern is that Internal Revenue Service (IRS) tax regulations make it difficult for employees to combine salary income with pension benefits from the current employer's DB plan. Specifically, an *active* employee cannot receive DB benefits prior to the plan's normal retirement age (Purcel, 2004). By implication, a worker who took phased retirement before a DB plan's normal retirement age (and thus stayed with the current employer) might not be able to supplement earnings with payments from that plan. This is less of a concern for a DC plan inasmuch as the IRS permits active employees to draw DC pension benefits, with the only major federal limitation requiring that the employee be over age 59½.<sup>3</sup>

Our own previous work has also investigated the extent to which pensions and minimum hours constraints might influence phased retirement opportunities (Hutchens, 2003; Hutchens and Chen, 2004; Hutchens and Grace-Martin, 2004). This research relies on an employer survey, to be described in more detail below; in short, we ask a sample of close to 1,000 employers about their views on phased retirement and what conditions might have to be in place to permit it. Several interesting results flowed from that research. One finding was that it, generally speaking, employers appear to prefer informal over formal arrangements. This is because many employers want to maintain control over which employees are offered the opportunity for phased

retirement, the type of job they do as a part-timer, and when the work is performed (e.g., not during a period of diminished demand). In other words, employers are selective about who gets an opportunity for phased retirement (Hutchens and Chen, 2004). We have also, in our earlier research, evaluated the effects of minimum hours constraints and pensions, and while we find support for the minimum hours constraints, there is virtually no support for the pension hypothesis (Hutchens and Grace-Martin, 2004). In particular, employers with DB plans offer opportunities for phased retirement at roughly the same rate as do employers with DC plans. We also found that business conditions matter, a result that agrees with a Watson Wyatt (1999) survey where respondents indicated that “hiring retirees for part-time and temporary work” is the most common phased retirement arrangement.

Our analysis further revealed that industries differ according to the opportunities for phased retirement: these were higher in the service sector and lower in public administration (excluding health, education, and social services). In addition, smaller organizations were more likely to permit phased retirement. And finally, if a large percentage of the white-collar workforce was unionized, establishments were less likely to permit phased retirement. These last two results were surprising since neither organization size nor unions were suggested as important factors in the previous literature. Nevertheless, we find that unions tend to prefer the codification of a contract, and large bureaucracies favor the consistency imposed by formal personnel policies. These preferences for codified and consistent policies and practices may then limit opportunities for phased retirement.

### **Why Hours Reductions Might Occur after Official Retirement**

At first blush, there might seem to be no reason for employers to prefer workers to reduce their hour of work after, rather than before, “official” retirement. Either way, the same employee works the same hours, and there is no obvious reason to favor one over the other if the only difference is that one precedes the retirement party while the other does not. On the other hand, phased retirement is an uncommon event, and there might be costs of setting up the formal structure. Accordingly, if employers minimize costs when accommodating a request for phased retirement, it would likely be easier if there are already temporary or contract workers in the establishment. Similarly, if an employer has policies involving flexible hours (eg, the firm permits job-sharing or flexible starting times), then that employer should be more likely to permit phased retirement before official retirement because is already a mechanism for accommodating non-standard schedules. Accordingly we propose:

**Hypothesis 1** regarding Existing Employment Arrangements: Other things equal, employers who permit flexible hours and job sharing are more likely to permit phased retirement before official retirement. Employers who use temporary, contract, or contingent workers are more likely to permit phased retirement after official retirement.

As noted above, it may also be true that the form and shape of the employer’s pension offerings will influence whether phased retirement occurs before or after official retirement. One version of this argument focuses on the fact that some DB pensions base a retiree’s pension benefits on earnings during the final few years before retirement, so such a pension would impose a major benefit penalty on the employee who shifted to part-time work. As Hurd (1996: 7) notes, “a common way to avoid this problem is to have the worker retire, fixing the benefit, and then be rehired as a consultant or outside employee who has no benefits, and particularly no accrual of pension.”



In addition, the complex IRS regulations may make it difficult for active employees to receive benefits from their current employer's DB pension plan if they are younger than the plan's normal retirement age. In particular, the law is unclear about what constitutes a *bona fide* termination of employment, as noted by Penner et al. (2002:82):

In many cases, employers, particularly small employers, are unaware of this technical requirement. Others take advantage of the absence of clear guidelines and bestow retiree status liberally. There is little risk of detection and even less risk of enforcement. Few employees would sue as the arrangement only benefits them, and federal regulators would become aware of the issue only through a detailed plan audit, if even then. On the other hand, the penalty for being caught – possible plan disqualification and loss of tax benefits for all plan participants – is severe.

Similar legal complications do not arise with DC plans. As long as the employee is over age 59½, Federal law does not prohibit using benefits from a defined contribution plan to supplement salary either before or after official retirement. It follows that establishments with only a defined contribution plan would be expected to permit phased retirement both before and after official retirement. Accordingly we propose:

**Hypothesis 2** Regarding Pensions: Other things equal, employers with only a DB plan will tend to provide opportunities for phased retirement after official retirement. Employers with only a defined contribution plan will tend to provide opportunities for phased retirement both before and after official retirement. <sup>4</sup>

## **The Survey and the Key Questions**

To test these hypotheses empirically, we analyze survey of 950 establishments with 20+ more employees.<sup>5</sup> An establishment is defined as a single physical location at which business is conducted or services or industrial operations are performed; it may or may not be part of a larger organization (for example, General Motors has hundreds of establishments). The survey focused on white-collar workers, and the sample was restricted to non-agricultural establishments with twenty or more employees and at least two white-collar employees who age 55+.<sup>6</sup> This latter restriction ensures that questions about phased retirement are relevant to the establishment's current situation. The focus on white-collar workers is due to the need to conduct reasonably brief interviews.

The telephone survey was undertaken between June 2001 and November 2002 by the University of Massachusetts Center for Survey Research. The Center first contacted the establishment and asked for the person who was best able to answer questions about flexible work schedules and employee benefits (e.g. a human resource manager or benefits manager). In larger establishments, especially those that were part of a complex organization, it was sometimes necessary to rely on multiple respondents.<sup>7</sup> Our overall response rate was 61 percent, with most non-response arising when screening establishments for eligibility (e.g., all had to have at least two white-collar employees age 55+); selection thus occurred before respondents knew the purpose of the survey. Interviews were completed for 89 percent of the establishments that were successfully screened, a rate comparable to other establishment-level telephone surveys.<sup>8</sup>

After asking a series of question about the characteristics of the establishment and its human resource and pension policies, the interviewer posed the following question:

**Question 1.** Think of a secure full-time white-collar employee who is aged 55 or over. One day that person comes to you and says that at some point in the next few years he/she may want to shift to a part-time work schedule at this establishment. Could this person's request to shift to part-time employment be worked out in a way that would be acceptable to your establishment?

If the response was "yes" or "in some cases," then additional questions were asked about how this could be worked out. For example, the respondent was asked to explain what he or she meant by part-time, e.g., part-week, part-year, or something else.<sup>9</sup> There was also a question about the preferred timing of the phased retirement. Specifically:

**Question 2.** If the employee did shift from a full-time to a part-time work schedule, could he/she shift to part-time work before official retirement, would he/she have to officially retire first, or could he/she do either?

Results from both questions are tabulated in Table 1,<sup>10</sup> and they indicate that almost 70 percent of the establishments were willing to permit phased retirement, while a further 15 percent allowed it in some cases.<sup>11</sup> Only 14 percent of establishments would not permit phased retirement at all. Of the 779 establishments that said "yes" or "in some cases" to Q1, the great majority indicated that the reduction in hours could take place either before or after official retirement. Only 15 percent reported that full-time employees could only move to a part-time schedule before retirement, and 7 percent said that part-time was only possible after official retirement. The fact that so many establishments can accommodate phased retirement either before or after official retirement suggests that establishment characteristics may be less important than individual characteristics in influencing the timing of phased retirement.<sup>12</sup>

*Table 1 here*

One issue we seek to evaluate is whether employers who *claim* that they would permit phased retirement *actually do so* in practice. Accordingly, the survey included a question about whether, in the last three years, a white-collar worker age 55+ had actually shifted from a full-time to a part-time work schedule. For those employers who said that something could be worked out before official retirement, fully 36 percent said “yes,” someone had made that shift before official retirement. For those who indicated that something could be worked out after official retirement, 22 percent said “yes,” it had happened in the last three years. As one would expect, these percentages increase with size of establishment.<sup>13</sup> Thus, when these employers claim that something can be worked out, there is reason to believe them.

If a respondent indicated that hours could be reduced after official retirement, the interviewer then sought to learn more about how this would be implemented. One question dealt with the nature of the employment relationship. As indicated in Figure 1, employers favor hiring white-collar retirees as part-time workers for a specific project or a specific length of time. Interestingly, however, the second most-favored option is to place the older employee into a regular part-time position; least favored is independent contractor. Only 22 percent of the establishments report that it is not at all likely that the person would be hired as an independent contractor.

*Figure 1 here*

Figure 2 examines the waiting period between official retirement and return to work. Most employers do not require a waiting period, and among those that do, the majority require fewer than two months. Even among employers with DB plans, the majority reported no waiting period. Workers can and do retire on Friday and return to the same employer as a part-timer on Monday. Finally, Figure 3 examines the form of part-time work that employers prefer for rehired

retirees. There is a preference for part-week over part-year or part-day. Still, there is a significant degree of flexibility here. At some establishments one can work out either a part-year or part-week arrangement.

*Figures 2 and 3 here*

To gain a better understanding of the results, Table 2 tabulates characteristics of employers who responded in different ways to Q2. Establishments in the first column only allow phased retirement before official retirement, those in the third column only allow phased retirement after official retirement, and those in the fifth column permit either type of phased retirement. For example, the first entry in Column 1 indicates that of those establishments that only allowed phased retirement *before* official retirement, three percent were in the construction industry. Similarly, the first entry in Column 3 indicates that of those establishments that only allowed phased retirement *after* official retirement, one percent was in the construction industry. By implication, the industry percentages in Column 1 sum to 100 percent as do the industry percentages in Column 3 and 5. Looking at the remaining industries, we see that industrial composition is quite similar across the three columns. The major exception is the service sector. In health, education, and social services, phased retirement is more likely to only be permitted before official retirement. The opposite is true in other services, where establishments tend to prefer what we shall term “retire-rehire.” The asterisk next to the Column 1 entry indicates that for both of these service industries, the difference between the averages in Column 1 and Column 3 is statistically significant at a 5 percent level. Table 2 also reveals an interesting regional pattern. Establishments in the South tend to be particularly likely to offer retire-rehire, while those in the West lean toward reduced hours before official retirement. Such results make one wonder whether this phenomenon is more a matter of taste than economic fundamentals.

*Table 2 here*

The results on establishment and organization size strongly suggest that the phenomenon is not simply a matter of taste. The size composition of the establishments in Columns 1 and 3 are similar (none of the differences are statistically significant at a 5 percent level), but the Column 5 results reveal that small establishments are more likely to say that phased retirement is allowed, both before and after phased retirement. As establishment size increases, employers move away from this “anything goes” response. Perhaps bureaucracy plays a role in the results: that is, effective functioning of large establishments may require formal rules and procedures, whereas small establishments may have more flexible policies and thereby be more likely to permit hour reductions either before or after official retirement.

This idea gains support from the data on organization size. Organization size differs from establishment size because, as noted above, an establishment may belong to larger organizations, e.g., a school building may belong to a larger school district. Fully 61 percent of the Column 3 establishments are part of a larger organization, while only 28 percent of the Column 5 establishments belong to a larger organization. As indicated by the dagger symbol (†) to the right of the .28 entries, this Column 5 average is statistically different from both the Column 1 and Column 3 average. Thus, establishments that are part of a larger organization are less likely to say “anything goes.” Such evidence is certainly consistent with the idea that bureaucracy plays a role in these results; establishments that are part of larger organizations are presumably more likely to have formal rules and procedures governing the path into retirement.

Part E of Table 2 examines pensions. Since pensions have been thought to be a key determinant of employer phased retirement policy, considerable effort was devoted to obtain accurate pension information. Respondents were asked whether older white-collar workers were

covered by a traditional DB plan, a cash balance plan, a DC plan, or something else. In addition, respondents were given a list of possible pension types (401-K, ESOP, etc.). We used this information to assess whether the establishment had a DB or DC pension. For example, if the respondent told us that the pension was a cash balance plan, then regardless of what the respondent said about the type of plan, the pension was classified as a DB pension. Since many firms have multiple plans (for example, a traditional DB as well as a 401-K), the interviewers also sought information on each of the plans. Some respondents were able to provide detailed answers; others had difficulty remembering their establishment's pension but we pursued these where possible.<sup>14</sup>

From the second hypothesis, we expect retire-rehire to be more likely in establishments with defined benefit plans. In fact, Column 1 and Column 3 are quite similar. While 34 percent of the "after" establishments in Column 3 had a DB plan and no DC plan, 32 percent of the "before" establishments had this arrangement. In contrast, a significant difference appears in Column 5 where only 20 percent of the "before or after" establishments were classified as having only a DB plan. A mirror image of this result is found for establishments that only had a DC plan; once again the Column 1 and Column 3 results are roughly similar while a significantly larger 51 percent of the Column 5 "before and after" establishments have only a DC plan. Thus, DC plans are evidently associated with greater flexibility in the timing of phased retirement. Of course, this could be related to the results on establishment and organization size. DC plans are often found in small establishments and organizations.

Part F of Table 2 examines selected characteristics of the establishment's workforce. The percentage of all employees who are white-collar is roughly the same across the three columns as is the percentage of white-collar workers who are part-time. That is not, however, the case for

the percentage of white-collar workers who are covered by a collective bargaining agreement. For the “before” establishments in Column 1, an average of 23 percent of the white-collar workers were covered by a collective bargaining agreement. This number is almost the same (25 percent) for the Column 3 “after” establishments.<sup>15</sup> It is, however, only 12 percent for the “before or after” establishments in Column 5. This is, of course, quite similar to the results for defined benefit pensions; it may simply reflect the fact that unions often negotiate DB pensions.

It is reasonable to expect flexibility in the timing of phased retirement to be associated with flexibility in the timing of when people come to work. Both types of flexibility imply an openness to alternative work schedules. Part G of Table 2 examines selected human resource policies of the establishment, where the data show that establishments where white-collar workers have flexible starting times are particularly likely to indicate that phased retirement can occur either before or after official retirement (Column 5). Further, they are much less likely to indicate that phased retirement can only occur after official retirement. One might similarly expect establishments that permit job sharing to be flexible in the timing of phased retirement. In fact, although the results on job sharing exhibit the same basic pattern as those for flexible starting times, the differences in column averages are not statistically significant. Finally, the survey asked whether in the last 12 months, the establishment has used temporary, contract, or contingent workers in white-collar positions. In line with the first hypothesis, it is reasonable to expect such establishments to be more open to retire-rehire. In such cases the employee can essentially return to the establishment as a temporary worker. While the Table 2 data are consistent with this, once again the differences in column averages are not statistically significant.



To evaluate whether these univariate results are robust to controls for other variables, we also estimated three Probit models with different dependent variables.<sup>16</sup> Specifically, we examine whether the employer only allows phased retirement before official retirement; whether the employer allows phased retirement both before and after official retirement; and whether the employer only allows phased retirement after official retirement.<sup>17</sup> Our goal is to understand why some employers prefer that phased retirement occur before or after official retirement, so we focus on establishments that answered “yes” or “in some cases” to Q1.<sup>18</sup>

Rather than focusing on specific results, here we summarize findings and provide detailed estimates in the Appendix for interested readers. One interesting finding pertains to whether the establishment is part of a larger organization; other things equal, the probability that an establishment *only* allows phased retirement before (after) official retirement is particularly high when the establishment is part of an organization with more than 1000 (fewer than 1000) employees. If an establishment is not part of a larger organization, then it is more likely to respond that phased retirement can occur *either* before or after official retirement. Another finding is that the economic and organizational environment within which the establishment operates are relatively unimportant; indeed most are not statistically significant at conventional significance levels.

Table 3 presents simulated probabilities for key variables assuming a base case where the establishment is not part of a larger organization and all other explanatory variables are set at the sample means. In this case, the probability that the establishment requires that phased retirement occur before official retirement is 15.5 percent, requires that phased retirement occur after is 5.1 percent, and permits both before and after is 76 percent.<sup>19</sup>

*Table 3 here*

Now suppose this establishment were integrated into a larger organization with fewer than 1000 employees. According to Table 4, this change would increase the “before” probability to from 15.5 to 16.6 percent, the “after” probability from 5.1 to 13.8 percent, and decrease the “either” probability from 76 to 63.2 percent. In essence the establishment moves away from an “anything goes” attitude toward rules governing the timing of phased retirement. If the organization had more than 1000 employees, then the increase in the “before” probability would be even greater. This supports the view that very large organizations tend to be bureaucratic with employment regulated through a set of formal rules. Not only do such organizations avoid phased retirement (Hutchens and Grace-Martin, 2003), but also the procedural requirements that surround hiring of new workers may lead them to avoid rehiring retired workers.

*Table 4 here*

We also explore variables that represent minimum hours constraints. We expect establishments with flexible starting times and job sharing to be more open to hours reductions prior to official retirement, and establishments that use temporary workers to favor retire-rehire outcomes. However our estimated models suggest a somewhat different relationship: thus we find that establishments with flexible starting times are more likely to offer phased retirement *either* before *or* after official retirement. Further, after controlling for other variables, there is a nonlinear relationship between the percentage of employees working part-time and the timing of phased retirement. In other words, establishments with only a few or no part-time workers tend to favor hour reductions *before* official retirement, but as the percentage of part-time workers rises, the establishment tends to become more open to hours reductions either before or after official retirement. Table 4 depicts this relationship, using the same simulation approach

employed in Table 3.<sup>20</sup> This unanticipated finding may be explained by the view that establishments with few part-time workers are willing to have retirees return to work but not as part-timers. Since most work schedules in the establishment are full-time, a retiree who wants to return will have to work a full-time schedule. If such an establishment were to accommodate an hour reduction by an older worker, then it will either do so before official retirement or not at all.

We also explore the type of pension offered by establishments and link it to key outcomes of interest. As we expected, establishments with DB benefit pensions (regardless of whether they have a DC pension) were more likely to offer opportunities for reduced hours after official retirement. This result is only statistically significant for establishments that combine DB and DC plans. Table 5 illustrates the magnitudes using methods similar to Tables 3 and 4. The majority of establishments with only DC plans allow phased retirement both before and after retirement, and those establishments with DB plans are more likely to offer phased retirement only after retirement. Curiously, these establishments are also slightly more likely to require that hour reductions occur before official retirement; this effect is not statistically significant but it is interesting. In an establishment with a DB plan, workers can reduce hours before they officially retire if (a) they supplement salary with pension benefits and are older than the DB plan's normal retirement age, or (b) they do not supplement salary with pension benefits. Perhaps these establishments with DB plans are avoiding the legal conundrum of deciding what constitutes a bona fide retirement. In effect, one either takes phased retirement before official retirement or not at all. And if salary is to be supplemented with pension benefits, then the worker simply must have reached the normal retirement age in the pension. While this simple rule avoids the above noted legal issues associated with paying pensions to rehired retirees, it probably also has the effect of discouraging phased retirement.

*Table 5 here*

In summary, our key empirical finding is that many employers are open to hours reductions both before and after official retirement. This “anything goes” position is particularly likely in establishments that are not part of a large organization, do not have unions, and have defined contribution pensions. Of course, we suspect that that does not really mean “anything goes;” rather, employers may have clear preferences when it comes to phased retirement options for specific workers. By this argument, employer preferences about the timing of phased retirement pertain to a specific individual doing a specific job. What matters is less the establishment characteristics, and more the characteristic of the individual worker, the pension, and the job.

Our two hypotheses provide a partial explanation for what is going on in the multivariate analysis. Both pensions and existing employment arrangements influence the timing of hour reductions relative to official retirement, but not in precisely the way anticipated by the hypotheses. Moreover, we found that establishments with few part-timers and that are part of large organizations tend to prefer that phased retirement occur before official retirement.

## **Conclusions**

This chapter asks why firms might only permit phased retirement after its workers officially retire. Our answer proves complicated. First, those employers who permit some form of phased retirement do not usually restrict it to rehiring of retirees. In fact, most employers say they are open to informally-arranged hours reductions both before and after official retirement. Second, we were surprised to find that neither univariate nor multivariate statistical methods provide strong support for the claim that either pensions or existing employment arrangements

drive an establishment level preference for retire-rehire. Also surprising was the result on organization size; all indications are that if an organization with more than 1000 employees permits some form of phased retirement, then it will tend to *not* prefer retire-rehire.

These results, along with the fact that employers favor informal arrangements, lead us to suspect that the real preference for retire-rehire is at the individual rather than the establishment level. In many establishments, both pensions and existing employment arrangements differ across jobs. Some workers are covered by defined benefit plans while others are not. Some workers are in jobs that employ temporary and contingent workers, while others are not. For this reason, it might not make sense to have an establishment-wide preference for retire-rehire. Rather, employers and employees may be interested in reducing hours in ways that meet their job and worker-specific needs. This could mean reduced hours before official retirement for one worker, but after official retirement for another.

It is likely that such individually-negotiated arrangements will become an ever-more important element of the evolving retirement paradigm. Like Japanese employers, Western employers often want to be selective about which older workers have an opportunity for continued work at reduced hours. This selectivity has the advantage of producing employment relationships beneficial to both employers and employees. It might also have the disadvantage of perceived inequity; thus a given employer might grant apparently similar workers very different opportunities for continued work.

Government policy might enhance this labor market flexibility by clarifying the meaning of a *bona fide* retirement. As noted above, it is legal for workers to retire, begin receiving DB pension benefits, and then be rehired by their former employer as long as he had reached the plan's normal retirement age. Further, even if he were younger than this age, the transition would

be legal so long as the worker's retirement was *bona fide*. Unfortunately the IRS provides no clear definition of what constitutes a bona fide retirement, and employers might fear penalties for an incorrect interpretation of the regulations. Clarifying these rules could reduce uncertainty and thereby facilitate efficient transactions, a result of potentially large importance for large organizations likely to be targets of government scrutiny.

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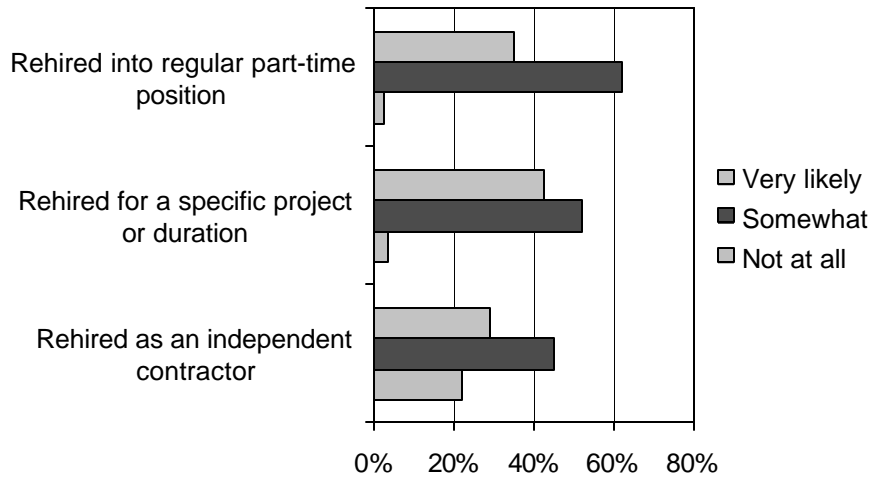
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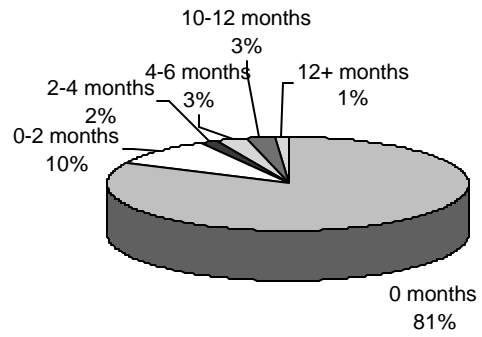
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**Figure 1: Nature of the employment relationship in establishments that rehire retirees as part-time workers**



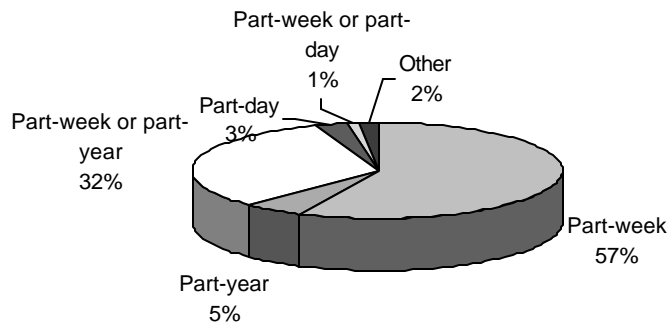
Source: Authors' calculations.

**Figure 2: Minimum Time between Retire and Rehire: Establishments that Rehire Retirees as Part-time Workers**



Source: Authors' calculations.

**Figure 3: Possible Employment Arrangements for Rehired Retirees**



Source: Authors' calculations.

**Table 1: Responses to Questions about Availability and Timing of Phased Retirement**

Whether phased retirement is available	When phased retirement may occur in relation to official retirement				Total
	Before	After	Either	Not specified	
Yes	119	48	435	39	641
In Some Cases	25	15	81	17	138
No	–	–	–	–	131
Not Specified	–	–	–	–	40
Total	144	63	516	56	950

Source: Authors' calculations.

**Table 2: Response to Questions About Timing of Hours Reduction Relative to Official Retirement**

Variable	When phased retirement may occur in relation to official retirement					
	Before		After		Either	
	Mean (1)	S.D. (2)	Mean (3)	S.D. (4)	Mean (5)	S.D. (6)
<b>A. Industry of Establishment</b>						
Construction	0.03	0.01	0.01	0.01	0.02	0.01
Manufacturing	0.12	0.03	0.14	0.04	0.15	0.02
Transportation, Communications, and Utilities	0.03	0.02	0.02	0.02	0.04	0.01
Wholesale and Retail Trade	0.11	0.03	0.06	0.03	0.14	0.02
Finance	0.03	0.02	0.04	0.02	0.07	0.01
Health, Education, and Social Services	0.18*	0.03	0.04	0.02	0.17	0.02
Other Services	0.39	0.04	0.64*	0.06	0.36	0.02
Public Administration	0.11	0.03	0.06	0.03	0.05	0.01
<b>B. Region of Establishment</b>						
East	0.19	0.03	0.13	0.04	0.18	0.02
Central	0.31	0.04	0.36	0.06	0.30	0.02
South	0.24	0.04	0.40*	0.06	0.30	0.02
West	0.26*	0.04	0.11	0.04	0.22	0.02
<b>C. Size of Establishment</b>						
Fewer Than 50 Employees	0.27	0.04	0.34	0.06	0.46	0.02
50 to 99 Employees	0.29	0.04	0.29	0.06	0.24	0.02
100 to 249 Employees	0.21	0.03	0.20	0.05	0.19	0.02
250 to 999 Employees	0.15	0.03	0.13	0.04	0.08	0.01
1000 or More Employees	0.07	0.02	0.04	0.02	0.04	0.01
<b>D. Other Establishment Characteristics</b>						
Establishment is Part of a Larger Organization	0.43	0.04	0.61*	0.06	0.28 <sup>†</sup>	0.02
With Fewer Than 1000 Employees	0.14	0.03	0.33*	0.06	0.11	0.01
With 1000 or More Employees	0.30	0.04	0.28	0.06	0.17	0.02
Establishment is Non-Profit	0.58	0.04	0.65	0.06	0.44 <sup>†</sup>	0.02
<b>E. Pension Type</b>						
Defined Benefit Only	0.32	0.04	0.34	0.06	0.20 <sup>†</sup>	0.02
Defined Contribution Only	0.36	0.04	0.29	0.06	0.51 <sup>†</sup>	0.02
Both DB and DC	0.16	0.03	0.25	0.05	0.10	0.01
No Pension, NA	0.16	0.03	0.12	0.04	0.18	0.02
<b>F. Characteristics of Workforce</b>						
Proportion of Employees that are White Collar	0.63	0.03	0.68	0.04	0.62	0.01
Proportion of White Collar that are Union	0.23	0.03	0.25	0.05	0.12 <sup>†</sup>	0.01
Proportion of White Collar that work Part Time	0.08	0.01	0.11	0.02	0.11	0.01
<b>G. Human Resource Policies</b>						
Flexible Starting Time is Possible	0.63*	0.04	0.40	0.06	0.73 <sup>†</sup>	0.02
Job Sharing is Possible	0.46	0.04	0.42	0.06	0.51	0.02
Uses Temp, Contract, or Contingent Workers	0.51	0.04	0.59	0.06	0.43	0.02

Source: Authors' calculations.\* indicates that the mean in Column 1 (3) is greater than the mean in Column 3 (1) at a 5 percent significance level. <sup>†</sup> indicates that the mean in Column 5 is different from both the Column 1 and 3 means at a 5 percent significance level.

**Table 3: Simulated Effects of Organization Size from Probit Models**

	Probability of Phased Retirement		
	Only Before Official Retirement	Before and After Official Retirement	Only After Official Retirement
Establishment is Not Part of a Larger Organization	0.155	0.760	0.051
Establishment is Part of a Larger Organization:			
With Fewer Than 1000 Employees	0.166	0.632	0.138
With 1000 or More Employees	0.247	0.674	0.052

Source: Authors' calculations

**Table 4: Simulated Effects of Part-Time Percentage from Probit Models**

	Probability of Phased Retirement		
	Only Before Official Retirement	Before and After Official Retirement	Only After Official Retirement
Percentage of White Collar that Work Part Time:			
0 percent	0.224	0.680	0.061
10 percent	0.148	0.754	0.064
20 percent	0.106	0.803	0.061
30 percent	0.086	0.833	0.052
40 percent	0.080	0.848	0.039
50 percent	0.088	0.850	0.026

Source: Authors' calculations

**Table 5: Simulated Effects of Pensions from Probit Models**

	Probability of Phased Retirement		
	Only Before Official Retirement	Before and After Official Retirement	Only After Official Retirement
Defined contribution only	0.165	0.761	0.044
Defined benefit only	0.193	0.720	0.051
Both DB and DC	0.202	0.615	0.138
Cannot classify pension	0.166	0.821	0.010
No pension	0.155	0.700	0.113

Source: Authors' calculations

### Appendix Table 1: Probit Analysis of Employer Response to Question About Timing of Hours Reduction Relative to Official Retirement

(Dependent Variable Equals 1 if Response is “Only Before”)

Variable	Model 1		Model 2		Model 3		Model 4	
Industry of Establishment								
Manufacturing	0.172	(0.30)	0.114	(0.20)	0.224	(0.38)	0.154	(0.26)
Transport, Communication, and Utilities	-0.155	(0.24)	-0.126	(0.19)	-0.102	(0.16)	-0.085	(0.13)
Wholesale and Retail Trade	0.005	(0.01)	0.048	(0.08)	0.061	(0.10)	0.085	(0.14)
Finance	-0.687	(1.00)	-0.570	(0.82)	-0.598	(0.86)	-0.503	(0.72)
Health, Education, and Social Services	0.250	(0.43)	0.319	(0.55)	0.335	(0.56)	0.378	(0.64)
Other Services	-0.263	(0.44)	-0.155	(0.26)	-0.191	(0.32)	-0.103	(0.17)
Public Administration	0.167	(0.27)	0.249	(0.40)	0.213	(0.34)	0.287	(0.45)
Region								
Central	-0.211	(1.13)	-0.249	(1.31)	-0.219	(1.17)	-0.254	(1.32)
South	-0.230	(1.18)	-0.340	(1.68)	-0.236	(1.20)	-0.343	(1.69)
West	0.013	(0.06)	0.006	(0.03)	0.011	(0.06)	0.008	(0.04)
Establishment Size								
50 to 99 Employees	0.195	(0.98)	0.230	(1.13)	0.199	(1.00)	0.236	(1.15)
100 to 249 Employees	0.243	(1.32)	0.269	(1.40)	0.241	(1.30)	0.270	(1.41)
250 to 999 Employees	0.322	(1.59)	0.350	(1.64)	0.303	(1.48)	0.345	(1.61)
1000 or More Employees	0.157	(0.52)	0.179	(0.56)	0.122	(0.40)	0.161	(0.50)
Establishment is Part of a Larger Organization								
With Fewer than 1000 Workers	0.140	(0.57)	0.063	(0.25)	0.116	(0.47)	0.046	(0.18)
With More than 1000 Workers	0.378	(2.34)*	0.346	(2.11)*	0.358	(2.20)*	0.331	(2.01)*
Other Establishment Characteristics								
Establishment is Non-Profit	0.332	(1.74)	0.356	(1.80)	0.293	(1.51)	0.323	(1.60)
Prop. that are White Collar (WC)	0.001	(0.32)	0.001	(0.30)	0.001	(0.22)	0.001	(0.25)
Prop. of WC that are Union	0.002	(0.89)	0.001	(0.45)	0.002	(0.82)	0.001	(0.41)
Proxies for Minimum Hours Constraints								
Prop. of WC that work Part Time			-0.033	(2.98)**			-0.033	(2.90)**
Square of Prop. Part Time			0.000	(2.83)**			0.000	(2.77)**
Permits Job Sharing			-0.052	(0.37)			-0.046	(0.32)
Permits Flexible Start Time			-0.313	(2.08)*			-0.317	(2.09)*
Uses Temporary, Contract, or Contingent Workers			0.156	(1.08)			0.137	(0.94)
Pensions								
Defined Benefit only					0.165	(1.02)	0.106	(0.64)
Both DB and DC					0.151	(0.75)	0.140	(0.67)
Cannot classify pension					0.047	(0.15)	0.005	(0.02)
No pension, NA					-0.072	(0.32)	-0.042	(0.18)
Constant	-1.214	(2.01)*	-0.915	(1.51)	-1.284	(2.08)*	-0.965	(1.56)
Number of Observations	552		552		552		552	
Likelihood Ratio Chi-Squared Test (P-Value)	32.50	(0.03)	49.05	(0.00)	34.10	(0.06)	49.87	(0.01)
Pseudo R-Squared	0.059		0.089		0.062		0.091	

Source: Authors' calculations. The excluded industry is construction, the excluded region is East, the excluded establishment size is 20-49, and the excluded pension is defined contribution. Absolute value of  $z$ -statistic shown in parentheses. \* denotes significance at the 5 percent level; \*\* denotes significance at the 1 percent level.



## Appendix Table 2: Probit Analysis of Employer Response to Question About Timing of Hours Reduction Relative to Official Retirement

(Dependent Variable Equals 1 if Response is “Either Before or After”)

Variable	Model 1		Model 2		Model 3		Model 4	
Industry of Establishment								
Manufacturing	-0.017	(0.03)	0.038	(0.08)	-0.062	(0.13)	0.002	(0.00)
Transport, Communication, and Utilities	0.346	(0.62)	0.362	(0.64)	0.290	(0.52)	0.297	(0.53)
Wholesale and Retail Trade	0.279	(0.55)	0.235	(0.47)	0.238	(0.47)	0.203	(0.40)
Finance	0.679	(1.19)	0.532	(0.92)	0.588	(1.03)	0.430	(0.74)
Health, Education, and Social Services	0.126	(0.25)	0.072	(0.14)	0.053	(0.11)	0.020	(0.04)
Other Services	0.257	(0.50)	0.188	(0.37)	0.165	(0.32)	0.097	(0.19)
Public Administration	0.088	(0.16)	0.030	(0.05)	0.028	(0.05)	-0.042	(0.08)
Region								
Central	0.017	(0.10)	0.038	(0.21)	0.006	(0.03)	0.025	(0.14)
South	0.017	(0.09)	0.139	(0.74)	0.019	(0.10)	0.145	(0.76)
West	-0.044	(0.23)	-0.041	(0.21)	-0.055	(0.29)	-0.053	(0.27)
Establishment Size								
50 to 99 Employees	-0.064	(0.35)	-0.086	(0.45)	-0.081	(0.44)	-0.105	(0.55)
100 to 249 Employees	-0.185	(1.11)	-0.178	(1.02)	-0.183	(1.09)	-0.183	(1.04)
250 to 999 Employees	-0.499	(2.75)**	-0.486	(2.56)*	-0.503	(2.74)**	-0.510	(2.66)**
1000 or More Employees	0.059	(0.21)	0.076	(0.25)	0.126	(0.43)	0.120	(0.39)
Establishment is Part of a Larger Organization								
With Fewer than 1000 Workers	-0.445	(2.07)*	-0.402	(1.81)	-0.408	(1.88)	-0.371	(1.65)
With More than 1000 Workers	-0.295	(1.96)	-0.279	(1.83)	-0.267	(1.76)	-0.257	(1.67)
Other Establishment Characteristics								
Establishment is Non-Profit	-0.249	(1.42)	-0.305	(1.68)	-0.181	(1.01)	-0.249	(1.34)
Prop. that are White Collar (WC)	0.000	(0.10)	0.001	(0.35)	0.001	(0.25)	0.001	(0.43)
Prop. of WC that are Union	-0.003	(1.46)	-0.002	(1.03)	-0.003	(1.36)	-0.002	(0.93)
Proxies for Minimum Hours Constraints								
Prop. of WC that work Part Time			0.024	(2.37)*			0.024	(2.42)*
Square of Prop. Part Time			-0.000	(1.91)			-0.000	(1.88)
Permits Job Sharing			0.163	(1.26)			0.164	(1.25)
Permits Flexible Start Time			0.392	(2.83)**			0.403	(2.87)**
Uses Temporary, Contract, or Contingent Workers			-0.263	(2.00)*			-0.232	(1.73)
Pensions								
Defined Benefit only					-0.201	(1.33)	-0.127	(0.83)
Both DB and DC					-0.431	(2.32)*	-0.419	(2.21)*
Cannot classify pension					0.095	(0.32)	0.209	(0.67)
No pension, NA					-0.131	(0.65)	-0.187	(0.89)
Constant	0.793	(1.54)	0.425	(0.81)	0.921	(1.77)	0.520	(0.99)
Number of Observations	552		552		552		552	
Likelihood Ratio Chi-Squared Test (P-Value)	38.46	(0.01)	61.33	(0.00)	44.89	(0.00)	67.69	(0.00)
Pseudo R-Squared	0.058		0.092		0.068		0.102	

Notes: See Appendix Table 1

### Appendix Table 3: Probit Analysis of Employer Response to Question About Timing of Hours Reduction Relative to Official Retirement

(Dependent Variable Equals 1 if Response is “Only After”)

Variable	Model 1		Model 2		Model 3		Model 4	
Industry of Establishment								
Manufacturing	-0.170	(0.28)	-0.231	(0.38)	-0.195	(0.32)	-0.270	(0.44)
Transport, Communication, and Utilities	-0.341	(0.49)	-0.475	(0.67)	-0.322	(0.46)	-0.422	(0.60)
Wholesale and Retail Trade	-0.612	(0.95)	-0.653	(1.01)	-0.625	(0.96)	-0.672	(1.03)
Finance	-0.294	(0.42)	-0.301	(0.42)	-0.227	(0.32)	-0.202	(0.28)
Health, Education, and Social Services	-0.847	(1.28)	-0.896	(1.35)	-0.842	(1.27)	-0.917	(1.38)
Other Services	-0.016	(0.02)	-0.082	(0.13)	0.059	(0.09)	0.012	(0.02)
Public Administration	-0.490	(0.67)	-0.531	(0.73)	-0.539	(0.73)	-0.570	(0.76)
Region								
Central	0.392	(1.49)	0.439	(1.60)	0.446	(1.65)	0.492	(1.73)
South	0.440	(1.63)	0.410	(1.45)	0.457	(1.64)	0.419	(1.42)
West	0.125	(0.43)	0.154	(0.51)	0.160	(0.53)	0.185	(0.59)
Establishment Size								
50 to 99 Employees	-0.235	(0.88)	-0.245	(0.88)	-0.189	(0.69)	-0.195	(0.68)
100 to 249 Employees	-0.034	(0.15)	-0.109	(0.46)	-0.030	(0.13)	-0.105	(0.43)
250 to 999 Employees	0.407	(1.74)	0.337	(1.38)	0.472	(1.96)	0.428	(1.70)
1000 or More Employees	-0.550	(1.12)	-0.636	(1.26)	-0.668	(1.27)	-0.724	(1.36)
Establishment is Part of a Larger Organization								
With Fewer than 1000 Workers	0.564	(2.28)*	0.547	(2.14)*	0.562	(2.22)*	0.547	(2.09)*
With More than 1000 Workers	-0.010	(0.05)	-0.004	(0.02)	-0.009	(0.04)	0.007	(0.03)
Other Establishment Characteristics								
Establishment is Non-Profit	-0.059	(0.23)	0.021	(0.08)	-0.128	(0.48)	-0.017	(0.06)
Prop. that are White Collar (WC)	-0.003	(0.89)	-0.003	(1.14)	-0.003	(1.06)	-0.004	(1.30)
Prop. of WC that are Union	0.003	(1.17)	0.003	(1.09)	0.003	(0.99)	0.003	(0.87)
Proxies for Minimum Hours Constraints								
Prop. of WC that work Part Time			0.009	(0.54)			0.006	(0.33)
Square of Prop. Part Time			-0.000	(0.91)			-0.000	(0.87)
Permits Job Sharing			-0.306	(1.67)			-0.351	(1.86)
Permits Flexible Start Time			-0.212	(1.14)			-0.248	(1.28)
Uses Temporary, Contract, or Contingent Workers			0.288	(1.63)			0.264	(1.44)
Pensions								
Defined Benefit only					0.126	(0.60)	0.070	(0.32)
Both DB and DC					0.622	(2.58)**	0.617	(2.48)*
Cannot classify pension					-0.414	(0.78)	-0.612	(1.08)
No pension, NA					0.397	(1.44)	0.497	(1.73)
Constant	-1.349	(2.09)*	-1.137	(1.73)	-1.522	(2.34)*	-1.249	(1.88)
Number of Observations	552		552		552		552	
Likelihood Ratio Chi-Squared Test (P-Value)	34.46	(0.02)	44.35	(0.01)	43.77	(0.01)	55.26	(0.00)
Pseudo R-Squared	0.101		0.130		0.129		0.163	

Notes: See Appendix Table 1

## Endnotes

<sup>1</sup> See <http://www.asahi.com/english/business/TKY200406100152.html>. We thank Olivia Mitchell for pointing out this article.

<sup>2</sup> This is not to say there will be no effect; the half-time worker usually contributes less to the account and thereby accrues a smaller pension asset than an equivalent full-time worker.

<sup>3</sup> This is the essence of the key regulations, but they are quite complex. For example, in one type of defined contribution plan (a money purchase plan) benefits are treated just as are traditional DB benefits. For a more complete treatment see Fields and Hutchens (2002) and Penner et al. (2002).

<sup>4</sup> Hypotheses 1 and 2 are formulated at the establishment level, but they could just as easily apply to the individual. For example, if temporary and contract workers take on tasks similar to those of a current employee, then phased retirement by that employee may more easily be accommodated after official retirement. Similarly, different workers in the same establishment can have different types of pension coverage; some may be covered by a 401(k) plan, others by a traditional DB pension, and still others by both plans. In such a situation, the employer might prefer that some workers move to part-time before official retirement, while other workers make a similar shift after official retirement.

<sup>5</sup> The sample universe was the Dun and Bradstreet Strategic Marketing Record for December 2000. These data primarily come from credit checks, although information is also obtained from the United States Postal Service, banks, newspapers, yellow pages and other public records. In order to ensure adequate numbers of large establishments, the sample was stratified by establishment size; most of the results are weighted to ensure representative samples.

<sup>6</sup> The 1999 Census Bureau County Business Patterns indicates that, excluding government, railroads and the self-employed, approximately 15 percent of all establishments have 20 or more employees and 75 percent of all employees work in establishments with 20 or more employees.

<sup>7</sup> Interviews were conducted with a Computer Assisted Telephone Interviewing (CATI) system, thereby permitting an interview to be completed over several telephone calls. The median number of telephone calls required to complete an interview was 10, with 10 percent of the interviews requiring 30 or more calls to complete.

<sup>8</sup> The response rate was 64 percent in the Educational Quality of the Workforce National Employers Survey administered by the United States Bureau of the Census as a telephone survey in August and September 1994 to a nationally representative sample of private establishments with more than 20 employees (see Lynch and Black 1998). The response rate was 65.5 percent in Osterman's 1992 telephone survey of establishments with more than 50 employees (see Osterman (1994). Holzer and Neumark (1999) reported a response rate of 67 percent for establishments that were successfully screened in a telephone survey undertaken between June 1992 and May 1994.

<sup>9</sup> If the respondent said that part-time could not be worked out, the survey made certain by asking whether part-year might be possible.

<sup>10</sup> Application of weights has virtually no effect on these numbers.

<sup>11</sup> These numbers differ from those in Hutchens (2003) because Table 1 includes respondents in the "Not Specified" category.

<sup>12</sup> Our results indicate more availability of phased retirement than the Watson Wyatt (1999) study. We have no ready explanation for the difference, though the two surveys undoubtedly ask

different questions and the samples are surely distinct (our sample appears to have more smaller organizations). The AARP (2000) also suggests that their response rate may have been low.

<sup>13</sup> Small establishments may employ only a handful of people over 55, so if no one was interested in phased retirement, the right answer to the question would be “no” regardless of the opportunity. This is less likely in large establishments with more workers age 55+. In fact, for establishments with 500 or more employees, the comparable percentages are 67 percent of the “before” employers and 71 percent of the “after” employers.

<sup>14</sup> For example, one respondent told us that the pension was the Arkansas teacher retirement plan. In that case we checked with Arkansas to find out whether the plan was a DB or DC plan.

<sup>15</sup> Health insurance may also play a role. Therefore employers who required that phased retirement occur after official retirement were, in contrast to those who required that it occur before official retirement, particularly likely to provide retiree health insurance and particularly unlikely to provide health insurance to part-timers. These differences were not statistically significant but the pattern suggests that employers who practice retire-rehire tend to provide health insurance in a way that reinforces the practice.

<sup>16</sup> Results using an ordered Probit model indicated that the data did not follow the hierarchical structure imposing by the ordering so we rely on the simple Probits here.

<sup>17</sup> As is the case with any survey, some respondents did not answer all of the questions. In our multivariate work we use listwise deletion of observations with missing data. As a result, the analysis is based on 552 rather than 723 observations. See Allison (2002) for a discussion of the advantages of listwise deletion. Hutchens-Grace Martin (2004) uses multiple imputation to address missing data issues in this survey. Those results indicated that missing data does not seriously bias coefficients.

<sup>18</sup> In statistical terms, this can be viewed as a problem involving a marginal and conditional probability. Thus,  $\Pr(Y_{2i} = k) = \Pr(Y_{2i} = k|Y_{1i} = 1)\Pr(Y_{1i} = 1)$ , where  $\Pr(Y_{2i} = k)$  is the probability that  $Y_{2i}$  equals  $k$  with  $k = 0,1,2$  (the three answers to Q2) for establishment  $i$ ;  $\Pr(Y_{2i} = k|Y_{1i} = 1)$  is the probability that  $Y_{2i}$  equals  $k$  conditional on  $Y_{1i}$  equals 1 (the “conditional probability”), and  $\Pr(Y_{1i} = 1)$  is the probability that  $Y_{1i}$  equals 1 (the “marginal probability”), where  $Y_{1i}$  equals 1 when the answer to Q1 is “yes” or “in some cases.” This paper estimates the conditional probability, while Hutchens and Grace-Martin (2004) estimate the marginal probability.

<sup>19</sup> For purposes of this illustration, probabilities are predicted with the “before” and “either” Probit, and the “after” probability calculated as a residual. Computations were done this way because the “before” and “either” categories have larger sample sizes. If we use the “after” Probit for predictions, qualitative results are similar.

<sup>20</sup> The table stops at 50 percent part-time because very few establishments in the sample exceed that percentage.