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How are Pension Integration and Pension Benefits Related?

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Abstract

Pension integration is the ability to allow differentiated pension benefits across earnings groups.

In the academic literature, it is often described as a way for firms to reduce pension benefits (and

therefore costs). Justified by the requirement that firms pay half of Social Security payments,

integrated pensions are typically found to reduce benefits for lower income workers. Data on

retirees from the Health and Retirement Study, however, reveal a more complex picture where

some individuals receive *more* benefits when one of their pension plans is integrated, *ceteris*

paribus. Some reasons are discussed why this might be the case.

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How are Pension Integration and Pension Benefits Related?

1. Introduction

At a time when Social Security reform is being debated, investigating factors that affect the economic well-being of retirees are critically important to inform the policy debate. While much research has focused on the role of personal savings, Social Security benefits, and employer pensions on well-being, there has been little research on the interrelationships between benefits from Social Security and employer pensions. This is a potentially important omission given that pension legislation allows these benefits to be interrelated by permitting so-called 'integrated pensions' to modify the generosity of employer pension benefits by offering differentiated benefits between high and low income workers within limits. Employers justify this differentiation by saying that since they pay half the Social Security tax, they should not have to pay as much into the employer pension for worker pay under the Social Security taxable maximum earnings level. As a result, workers with substantial earnings below the taxable maximum and with these integrated pensions realize a smaller fraction of their income replaced by employee pensions, *ceteris paribus*.

While it is clear that the purpose of pension integration is to offer relatively higher benefits for higher paid workers covered under that particular plan, what is not clear is whether integration increases or decreases pension generosity relative to similar workers in other firms with pension plans that are not integrated. For example, are those with low incomes and integrated plans receiving higher or lower benefits than low income workers with nonintegrated pensions, *ceteris paribus*? On the other hand, are high income workers with integrated plans receiving higher or lower benefits than other high income workers with nonintegrated plans?

While previous research has focused on the relative generosity within integrated plans, this paper is the first to examine the latter two issues – namely, how do pension benefits compare across integrated and nonintegrated plans?

The following section briefly describes pension integration and the small academic literature that examines this type of pension. A third section details the data and reports the primary results, along with a series of robustness checks. A final section concludes.

2. Background on Pension Integration

The first legislation on pension integration was in the Revenue Act of 1942, and the last major change occurred in the 1986 Tax Reform Act.[1] Data from the National Compensation Survey from the U.S. Department of Labor show that 28 percent of workers with a defined benefit pension had integration provisions in their defined benefit plans in 2005 (U.S. Department of Labor, 2007). While a sizeable number of workers, it is a select sample since it does not include workers with no pension or defined contribution plans only and workers in the public sector,[2] all of which have relatively low proportions of workers with integrated plans. Using a more representative, although older, sample, Bender (1999) finds that over 32 percent of civilian workers with pensions have integrated pensions, which translates into 13.7 percent of civilian employees in 1992.

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[1] See Anderson (1976), Dyer (1977), and Kollmann *et al.* (1994) for a discussion of the early history of pension integration.

[2] Graham (1994) and Foster (1997) track integrated defined benefit pensions in the state and local government sectors and find that the incidence of pension integration in this sector has fallen from eight to four percent in the early 1990s. The Federal government's pension plan is not explicitly integrated with Social Security.

Both defined benefit (DB) and defined contribution (DC) pensions can be integrated. DB plans can be integrated by either the offset or excess-rate (sometimes called step-rate) method. The offset method reduces employer pensions by up to 50 percent of a worker's employer pension benefit, whereas the excess-rate method has accrual rates that differ by the level of earnings. Using data from 1997, Perun (2002) finds that nearly 27 percent of all DB plans are integrated. This integration is found primarily in larger plans resulting in approximately 42 percent of all participants in DB plans have an integrated plan.

On the other hand, DC plans are integrated similar to excess-rate DB plans, where employer contribution rates increase after a certain earnings level (called the integration level) is attained. Although DC plans historically have low rates of integration, the rate of integration has increased such that approximately 25 percent of DC plans were integrated by the late 1990s (Perun, 2002), although because these integrated plans tend to be among smaller employers, Perun (2002, p. 47) estimates that only ten percent of workers in a DC plan have their plan formally integrated with Social Security.

In pension law, nondiscrimination provisions limit the "permitted disparity" in the benefits of integrated plans. While it is beyond the scope of this paper to detail the integration legislation,[3] it is helpful to briefly discuss some of these limits.

- *DC Plans*. McGill *et al*. (1996, Table 15-1, p. 326) shows that the permitted disparity for DC plans can range from 3 to 5.7 percent of pay above the integration level (typically the Social

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[3] See McGill *et al*. (1996, Chapter 15) for a thorough discussion of pension integration rules for all types of plans and more detailed examples of integration provisions and nondiscrimination tests for integrated pensions.

Security taxable maximum earnings level), as the base contribution increases from 3 to 6 percentage points in pay. For example, if the contribution rate into a DC plan was 3 percent for earnings below the integration level, the maximum contribution rate above the integration level would be 6 percent of pay. If the contribution rate was 6 percent for earnings below the integration level, the maximum contribution rate can be no more than 11.7 percent of pay above the integration level.

- *Excess-rate DB Plans*. DB plans using the excess-rate method are generally not allowed to have a permitted disparity above the accrual rate of benefits. That is, if the base accrual rate is one percent of earnings per year of service, the permitted disparity cannot be any more than an additional one percent of earnings above the integration level (for a total of two percent of earnings for those more highly paid individuals). Additionally, there is a cap of a maximum disparity factor of 26.25 percent, that is, the difference in the total accrual rates (the accrual rate times years of tenure) cannot be more than 26.25 percentage points. For example, assume the base and integrated accrual rates above for two employees both of which worked for 30 years in a firm. One employee always had earnings below the integration level while the other had earnings above the integration level. The pension benefit for the retiree with earnings below the integration level would receive 30 percent of their final earnings, while the other (who was above the integration level) could only receive 56.25 percent of final earnings, rather than the full 60 percent because of the cap, because he or she is allowed only to have an replacement rate that does not exceed 26.25 percent above the nonintegrated replacement rate.

- *Offset DB Plans*. Finally, offset plans are not allowed to reduce the benefit by more than half the benefit before the offset. For example, if the retirement benefit for a worker with

earnings below the integration level is $10,000, the reduction due to the offset provisions

cannot exceed $5,000. If the retirement benefit should be $25,000, then the reduction cannot

be more than $12,500.

Previous academic research on pension integration has focused two main theories of why

firms integrate pensions with Social Security. First, in a theoretical treatment of integration,

Merton *et al.* (1987) and Gustman *et al*. (1994) argue that since the benefits from integrated

pensions are negatively correlated with Social Security benefits, employers are insuring their

employees against adverse changes in Social Security benefits.

Other researchers have focused on the cost savings feature of integrating pensions with

Social Security. Indeed, this was one of the initial justifications for integration in the 1940s.

Firms argue that since they pay half of a worker's Social Security contribution (up to the Social

Security taxable maximum earnings level), they should not have to pay 'twice' if they offer their

own pension. Simulations of benefits from typical integrated and nonintegrated plans found in

Bell and Hill (1984), Kollmann *et al.* (1994), Graham (1994), and Slusher (1998) emphasize this

cost savings approach of integration by reducing pension benefits for low paid workers. McGill

et al. (1996, p. 323) also note that integration "reduces the cost of the plan, offsetting to some

extent the Social Security taxes the employer pays for participants."

How is this accomplished? A simple example of each type of plan illustrates how firms

lower pension benefits in integrated plans compared to nonintegrated plans.[4]

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[4] The examples given here are very simplified and generally pass so-called 'safe harbor' tests. Other integration
provisions are possible if they pass nondiscrimination tests under current tax law.

2.1 Example of Pension Benefits calculated from an Integrated Pension using the Offset Method

Under current tax law, the offset method reduces employer pensions by up to 50 percent of a worker's calculated employer pension benefit. For example, assume that when a worker retires, he or she should receive $15,000 per year from the employer pension and $10,000 per year from Social Security. If the pension is integrated using the offset method, the actual benefit from the employer would be half the employer pension benefit or $7,500 per year. Therefore, total retirement income is $7,500 lower under an offset plan.[5]

2.2 Example of Pension Benefits Calculated from an Integrated Pension using the Excess-rate Method

The excess-rate method, now the most common type of integration (U.S. Department of Labor, 2007, Table 45), has accrual rates that differ by the level of income. The earnings level where accrual rates change is called the 'integration level' and is usually the Social Security taxable maximum level of earnings. Therefore a firm with an excess-rate plan might set an accrual rate of one percent of final earnings for each year of tenure for earnings below the integration level and an accrual rate of 1.5 percent for earnings above the integration level. So

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[5] Before the revised pension provisions of the Tax Reform Act of 1986 took effect in the early 1990s, the offset applied to the worker's estimated Social Security benefit, not the employer pension benefit. According to McGill *et al*. (1996), one reason for the change was to eliminate the case where the entire employer pension benefit was offset by a relatively large Social Security benefit. Applying these the old rules to the example above shows that the employer pension would be reduced by up to half of the Social Security benefit, giving an employer pension benefit of ($15,000-0.5($10,000)=) $10,000, although when the estimated Social Security benefit is more than twice the pension benefit, the retiree would receive nothing from the employer pension. For example, if the pension was to be $7,500 and the Social Security benefit was $20,000, the retiree would receive no employer pension since the firm's pension is less than half of the Social Security benefit. The data used in the empirical portion of the study is based on pensions using this earlier definition of pension integration.

for a worker with 30 years of tenure and an excess-rate pension in 2008 (when the taxable maximum was $102,000) whose final earnings are $120,000, the pension benefit would be (0.01 * 30 * 120,000 + 0.015 * 30 * (120,000 − 102,000) =) $38,700 (a replacement rate of 32.8 percent). Compared to an accrual rate of 1.5 percent regardless of earnings, the benefit for the same worker would be $54,000 (replacing 45 percent of earnings), a large increase over the integrated pension benefit. This difference is accentuated if all of a worker's final salary is below the integration level.

2.3 How Does Integration Affect Benefits Across Pension Plans?

While the examples above show that it is easy to design an integrated plan to reduce pension benefits and therefore costs to firms, they are applicable only to pension generosity within the firm. There is nothing in pension legislation to require that the integrated accrual rates be set below or above the accrual rates of other firms. Indeed, under pension nondiscrimination rules for an excess-rate pension, the firm has the ability to set the accrual rates how it likes, as long as the accrual rate below the integration level is not less than half of the accrual rate above the integration level at that firm. Therefore, it is easy to come up with a simple example to show that integration might be used to increase benefits to highly paid workers relative to nonintegrated plans. Using the example from above, assume a firm with an integrated excess-rate pension sets the lower accrual rate at the industry average of 1.5 percent and sets the accrual rate above the integration level at 2 percent. In this case the yearly pension benefit would be $56,700 (a replacement rate of 47.25 percent), far above the integrated and nonintegrated examples above. Note that the replacement rate will increase as a larger proportion of income is above the integration level.

Why would a firm pursue such a strategy when it obviously costs more?[6] There are several possibilities. First, following the logic of Merton *et al*. (1987), it could be to give further insurance in the event that there would be a reduction in Social Security replacement rates for the highly paid in the future. Second, it could simply be an extra reward for the highly paid. In general, pension nondiscrimination provisions limit the ability for firms to grant extra benefits to particular groups of workers (unless they have so-called 'Nonqualified' plans, which are not subject to most Employee Retirement Income Security Act regulations and are generally limited to few employees in firms), and so this strategy might be a way around these restrictions. Third, there could be strategic reasons to offer such an integrated pension. If internal labor markets are well developed in the firm, the extra deferred compensation allowed by this type of pension could make workers stay with the firm for a longer time and to be productive during their tenure to increase pay enough to enjoy the extra benefits, thus allowing the firm to receive a greater return to any firm specific human capital it has invested in its workers. Finally, it could be used as a sorting device. Since these plans offer higher benefits for the more highly paid, more able and productive workers would want to be in such a firm since they will likely be among the more highly paid in the firm.[7]

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[6] It is possible that there could be a combination of both cost savings and strategic behavior by firms, since they could save some money by reducing benefits to the low paid and increasing the benefits to the more highly paid. This would imply in the results below that in the multiple pension plans, integration would increase the benefits for "High" earners and decrease them for "Low" earners. As seen in Table 4, although the coefficient in integration for the "Low" earners samples is positive five out of the six regressions, it is never statistically significant.

[7] It would be interesting to examine which of these strategic considerations is being used (if any). Unfortunately, to do this correctly, one would need to have a matched firm-worker panel to investigate these issues. However, in a naïve analysis, we can examine whether integration is correlated with tenure or pay, two of the hypotheses above. In one set of regressions (available from the author), tenure is included as the dependent variable while integrated pension and a set of standard covariates (e.g. gender, race, occupation, industry, etc) were included as independent

Regardless of the reason, however, this discussion shows that there is cause for investigating the effect of integration not only within the firm, but also across firms. The next section details data used to examine this issue and presents results on how integration affects benefits across workers.

3. Data Description and Empirical Results

3.1 Health and Retirement Study Data[8]

To examine whether pension integration decreases or increases pension benefits, data from the Health and Retirement Study (HRS) is analyzed. This survey was first conducted in 1992 and is nationally representative of the 51 to 61 year old population. The basic data contains information on demographic and employment characteristics, health, and retirement plans. Furthermore, if a respondent indicates that he or she has a pension, the HRS obtains pension information directly from the employer and when these descriptions were not available, the pension summary plan descriptions from the U.S. Department of Labor. The resulting dataset, the Pension Provider Survey, identifies the integration provisions in employer pensions. Finally, given that workers can have more than one pension, integration is identified in the analysis as a

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variables. The coefficient on the integrated pension indicator was positive for both the single and multiple pension samples (although only statistically significant for the multiple pension sample) – consistent with the prediction above. Likewise, in a regression using the log of annual pay, the coefficient on the integration indicator was also positive in both samples (although only statistically significant in the single pension sample). This would be a fruitful area of future research.

[8] The data employed here are worker level data, rather than pension plan level data. While one could make the case that analyzing the plans themselves are more instructive (particularly the accrual rates), given the importance of many worker level variables (such as tenure and earnings) on the determination of pension benefits, it is more realistic to allow the pension plan provisions to be applied to worker level data, rather than simulated data on such key variables such as tenure and earnings.

worker who has any one of his or her pensions integrated with Social Security. (Note, however, that if a firm offers more than one pension, U.S. pension law stipulates that only one of them can be integrated. Therefore, nobody in the sample has more than one integrated pension.)

Added to these data were estimated values of replacement rates, annual pension benefits, and pension wealth (the present, discounted value of annual pension benefits).[9] These benefits are simulated using the HRS/University of Michigan Pension Calculator v. 6B detailed in Curtin *et al*. (1998). In order to estimate these benefit amounts, the Calculator uses demographic and job related information (such as age, marital status, hiring date, voluntary contributions to pensions,[10] and earnings level) from HRS respondents and the characteristics of the actual pensions that cover a respondent in the HRS. In addition, to project earnings and benefits into the future, the Calculator uses assumptions regarding parameters such as earnings growth, inflation, etc., which are based on the intermediate assumptions of the 1992 Social Security actuarial projections. Pension benefits are calculated assuming a retirement age of 65, although the results below qualitatively hold for assuming age 62 retirement or the (self reported) age of expected retirement. Three statistics are used for measuring pension generosity: the replacement rate (the proportion of pre-retirement earnings is replaced by pension benefits and annuities), the

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[9] For DC plans, annuities are assumed to be bought at group rates, are joint-and-survivor annuities (if married), and are paid out based on the life tables used by the Social Security Administration's intermediate projections (Curtin *et al.*, 1998).

[10] While the Pension Calculator uses respondent information on voluntary contributions reported in the HRS, one assumption it does make is that employees always have and will always make this same level of voluntary contributions. Unfortunately, the HRS does not have any retrospective information on voluntary contributions.

dollar amount of annual benefits, and the present discounted value of the annual benefit, here termed, pension wealth.[11]

A final data consideration is the employment status of workers in the HRS. Respondents are asked whether they are currently working. If they are working, then they are asked about their current job. If they do not have a job, the HRS asks about their most recent job. Then, the HRS asks everyone if they ever had another job, not covered above, that lasted for five or more years. If the respondent answers yes, then the HRS asks about the most recent previous job. The data employed herein use just those who have a current job and ignores information on previous jobs, primarily because of the relatively low match rate on the pension information on past jobs (Bender, 1999). Individuals out of the labor force or are unemployed are also not included in the sample.

After observations with missing data on the key variables are dropped, the sample contains 1,696 respondents who are currently working, age-eligible (51-61 years old), and have the detailed pension information as well as valid observations for other variables. Of these, 572 have a pension that is integrated while 1,124 have no pension that is integrated. Finally, all results below use sample weights to make the results representative of the general population (of those aged 51 to 61 in 1992), and all monetary values are expressed in 1991 dollars.

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[11] Note that this does not include any income from Social Security. While interesting in its own right in terms of questions about the income adequacy of retirees since income from Social Security is an important component of income, this paper focuses only on pension generosity, rather than income adequacy. Adding in Social Security, as well as other sources of income, would be a fruitful area of future research. It is central to note, however, that Social Security benefits are estimated for workers using HRS data on earnings histories in the calculation of pension benefits from offset integrated plans.

3.2 Results

To get a sense of the effects of integration on pension generosity in the raw data, Table 1 shows averages of pension benefits by integration status as well as two other key variables. The first row shows the correlation between integration and average benefits without controlling for any other variables. For this sample, integrated pension plans have, on average, higher replacement rates (34.0 compared to 38.8 percent), annual benefits ($15,201 compared to $10,757), and pension wealth ($160,244 compared to $128,167).

<center>(Table 1 around here.)</center>

However, the discussions above indicate that several factors may confound these averages. One key variable is the level of earnings of workers, since integration allows for different pension generosity levels for high and low earnings workers. However, given that pensions rely on many years worth of participation and accumulation of benefits, it is not immediately clear how to define "High" and "Low" earnings. A snapshot of 1991 earnings, which is available in the HRS, only gives an indication of earnings in that year. Perhaps a better measure is whether workers have ever had (either in their entire working life or more recently) earnings above the Social Security taxable maximum level of earnings, which is typically the earnings level where the integration provisions are applied. Using these two definitions of "High" earnings, the sample is split to see the correlation of integration and pension generosity for "High" and "Low" earnings workers.[12] Regardless of which method is used to identify

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[12] Unfortunately, the level of analysis is not exactly right here. As explained in the previous section, integration affects pension benefits by earnings level within a particular plan. The sample sizes here are not large enough to encompass workers in the same plan, and so this table is not strictly finding the impact of integration on the generosity of any particular plan, but what integration does on average across plans for high and low earners.

"High" earners, all three generosity measures are higher for "High" earners with an integrated pension, compared to other "High" earners without an integrated pension. Their benefits are also higher than the benefits for "Low" earners. Interestingly, these averages show that even for "Low" earners, pension benefits are higher for integrated pensions as well.

The discussion above also indicated other reasons for thinking that integration might impact benefits, particularly across firms. Unfortunately, there is no good indicator of whether firms are using integration as insurance. On the other hand, the other reasons point to the use of pensions as strategic devices to attract particular types of workers. In this case, integration seems well suited to attracting highly paid workers, since integration allows for relatively higher benefits. The use of pensions as a strategic tool is well documented in the literature.[13] As Ippolito (1997 and 2002) show, pensions can be effective in sorting particular kinds of workers and offering multiple pensions can attract long tenure workers (Ippolito, 1997, pp. 129-31). Therefore the offering of multiple pensions might be an indicator of important strategic motives of firms.[14] As Table 2 details, nearly 30 percent of the sample has more than one pension.[15] The

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[13] For example, pensions can attract workers with long expected tenure (Salop and Salop, 1976) reducing turnover which saves the firm money if hiring and training costs are high (Lazear, 1985 and 1990; Even and MacPherson, 1996). Pensions also can increase productivity (Dorsey and MacPherson, 1997; Dorsey *et al.*, 1998). This is partially due to reduced turnover which offers an incentive to firms to invest in firm specific human capital for their workers. More recent empirical research on the important influence of pensions on turnover, training, productivity, and hiring can be found in many articles, including Even and MacPherson (1996), Garen *et al.* (1996), Dorsey and MacPherson (1997), Dorsey *et al.* (1998), Heywood *et al.* (1999), and Hirsch *et al.* (2000). Ippolito (2002) specifically examines the role of pensions as a tool to attract "stayers."

[14] This is particularly true since it is likely that multiple pensions might cost more than offering a single pension. On the other hand, this is not the only interpretation of the offering of multiple plans, since firms may offer multiple plans because it is something that workers desire. Unfortunately without more information on the employer side, we cannot be sure which reason is the correct one. Interestingly, using the HRS data employed here, a regression of type of pension and integration status on tenure at firms (including other standard variables) finds that integration is

most common multiple plan is a mixture of DB and DC plans, offering some support that firms may be using the different types of plans to offer incentives to keep certain kinds of workers or discourage other kinds (Ippolito, 1997). Another key point to notice is that the rate of integration is quite different depending on the mix of pensions. Multiple pensions are much more likely to be integrated, particularly compared to single defined contribution pensions.

(Table 2 around here.)

Therefore, the bottom two rows Table 1 show the average pension benefit for integrated and nonintegrated plans by the number of pensions. Only when single pensions are considered is the pattern, that other researchers (e.g. Graham, 1994, Slusher, 1998, and Bender, 2001) have found, apparent, namely that average pension benefits are lower for integrated plans (over three percentage points for replacement rates, approximately $1,000 for annual benefits and around $19,000 for pension wealth). On the other hand, average retirement benefits are much larger when one is an integrated plan for the multiple plan subsample. Replacement rates are almost ten percentage points higher, annual benefits are almost $9,000 higher, and pension wealth is over $82,000 higher.

While these averages are suggestive, they may be biased by differences between individuals. Therefore, a series of OLS regressions are estimated to control for a variety of individual characteristics. These characteristics are listed and described in Appendix Table A1

positively correlated with tenure (by nearly 3 years for those with multiple pension plans). This holds even controlling for whether the pensions are DB or DC pensions. Full results are available from the author.

[15] This is slightly higher than the percentage of multiple pension holders in the April 1993 CPS Pension Supplement, where the percentage of workers with multiple pensions is just over 21 per cent for the 51 to 61 year old working population with pensions. Part of the difference may be due to the selection of larger firms in the HRS Pension Supplement as discussed in Bender (1999).

and include gender, marital status, education, race/ethnicity, years of tenure, union membership, industry and occupational affiliation, and type of pension plan. Table 3 contains the results of the basic regressions of the pension benefits to investigate the correlation between integration and pension benefits, controlling these personal and job characteristics. Only when the dependent variable is replacement rate is there a significant correlation with integration – a reduction of replacement rates by 2.27 percentage points when the worker's pension plan is integrated. For both annual benefits and pension wealth, there is no statistically significant effect of integration on benefits. Other variables do seem to make a difference, however. For example, males receive higher annual benefits and pension wealth (although no significant increase in replacement rates), marital status is negatively correlated with benefits, whereas race/ethnicity is only significant for the annual benefit regressions (and then only for black workers). Tenure takes an unsurprisingly positive and significant coefficient. Interestingly, union membership is correlated with lower benefits. Various industry and occupational variables are also important partial correlates with pension benefits.

(Table 3 around here.)

Since the averages reported in Table 1 indicate the importance of splitting the sample by earnings level and number of pension plans, the regression analysis should replicate this to see if there are differential effects of integration on benefits in these different samples. Table 4 reports the coefficient on the integration indicator for a number of regressions based on different samples. Columns (1)-(3) show the differences in benefits between integrated and nonintegrated

plans based on the two definitions of "High" and "Low" earners.[16] For replacement rates and

pension wealth, the results indicate that integration affects only the relatively low paid,

significantly lowering replacement rates by 3.62 or 3.48 percentage points and pension wealth by

just over $20,000. Only for annual benefits does integration have a positive effect, raising

annual benefits by $3,250, although it is statistically significant only at the ten percent level. In

general then, it seems that pension integration lowers pension benefits for low paid workers,

lending evidence to the 'cost savings' role of pension integration.

(Table 4 around here.)

On the other hand when the sample is further broken down by the number of pensions as

shown in columns (4) through (9), a different picture emerges. When the sample is restricted to

those with only a single pension plan, integration has a negative effect on pension benefits for

not only "Low" earners, but also for "High" earners when the "Any Tax Max" definition is used

to identify "High" and "Low" earners (it is statistically insignificant using the other earnings

definition). Among those with single plans, *ceteris paribus*, integration reduces replacement

rates by nearly 6 percentage points for *both* earnings groups and reduces pension wealth by over

$30,000 for both groups. On the other hand, pension benefits are higher (and statistically

significant) for only the "High" earners group when the sample is restricted to those with

multiple pension plans. There is no statistically significant effect for "Low" earners. If, as

discussed above, firms are using multiple pensions to strategically attract high income workers,

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[16] Alternative definitions of "High" and "Low" earnings were also employed (for example, whether the worker was

above the taxable maximum in 1991 or by splitting the 1991 earnings distribution into thirds), but the results were

qualitatively similar to the ones reported in Table 4.

this would seem to confirm this, as the positive effects of pension integration are seen only with this group of "High" earners with multiple pensions.

3.3 Alternative Specifications

The results presented above indicate that in addition to the cost reducing role for integration, there may also be a strategic role for pension integration. However, other issues may bias the results. This section examines the robustness of the results from Table 4.

3.3.1 Sample Selection.

One concern is that the results may be biased from sample selection. The pension sample may vary in non-random ways from the working population, which can lead to biases in the regression coefficients. Therefore, a series of regressions control for the sample selectivity of having a pension.[17] Table 5 shows the coefficients on the integration variable from these regressions. Correcting for sample selection does not change the pattern of results found in Table 4. When the single plan sample is used, the integration coefficient remains negative and significant for "Low" earners in each pension benefit measure. For "High" earners, the coefficient is rarely significant, except when it is negative for replacement rates and pension wealth based on the "Any Tax Max" definition of the earners sample. On the other hand in the

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[17] The methodology used here was to estimate the retirement benefit and sample selection regressions simultaneously in a maximum likelihood framework. In order to identify the sample selection equations, variables need to be included in the selection equation but not in the benefits equation. Following the discussion in Gustman *et al*. (1994) and Parsons (1994), firm size was used as a determinant of pension availability, but not as a determinant of pension benefits. A (weak) test of this exclusion was performed by including the firm size variables in the benefit regressions. In each case, they were insignificant. The results from the selection equations (which include data from 2,962 current workers who do not have any pensions) and the full results from the sample selection corrected benefit regressions are available in a data appendix from the author.

multiple pension sample, the integration coefficient is positive and significant for "High" earners, while it is not significantly different from zero for "Low" earners.

(Table 5 around here.)

3.3.2 Tenure and Integration.

An implication of the discussion above about the potential directions of the correlation of integration and retirement benefits is that tenure at the firm will be an important factor. Certainly there are positive correlations between tenure and earnings, as well as tenure and pension benefits. Furthermore, if the strategic use of integration by firms is true, it will also likely affect the years of tenure. Appendix Table A1, for example, shows that average years of tenure are highest for those with multiple plans where one plan is integrated (26.9 years). This is 2.5 years of tenure greater than workers with no integrated pensions. While tenure is included as a control variable in the regressions, to test whether this higher average is significant, integration is interacted with the tenure variable. If the tenure-integration relationship is strategic the interaction variable should be significantly positive in the multiple plan regressions.

Table 6 includes the coefficients from a new set of regressions that include integration, tenure, and variable that is the interaction of the two variables. In each of the benefit regressions, the interaction variable is negative (or insignificantly different from zero) when the single pension sample is used, although it is usually statistically significant for the "Low" earners sample. On the other hand when the multiple pension plan sample is used, the coefficient of the interaction term is positive and significant, particularly for the "High" earner samples. Again,

both of these are consistent with integration being used as a cost savings measure for firms offering only single pensions, while it being an extra benefit for those with multiple pensions.[18]

(Table 6 around here.)

4. Conclusions

Integrating pensions with the Social Security retirement system can result in several outcomes desirable to firms. First, it is a way for some firms to reduce their costs of supplying pension benefits, since they can offer lower pension benefits to relatively low paid workers, because they pay part of the contribution to Social Security. Previous research in this field has offered examples that suggest that integrated pensions reduce benefits compared to the same pension with the integration provision taken out. Second, because integration allows for some relaxation of nondiscrimination provisions, it can be a method whereby firms can use integrated pensions to increase pension benefits to highly paid workers.

That integration is sometimes found to increase pension benefits is something not previously found in the literature. While the HRS data are not detailed enough to determine why firms may wish to do this, it could be done for strategic reasons to attract certain kinds of workers or give further incentives to be productive and stay with the firm. While there is

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[18] Note that while the coefficient on the integration variable is negative and significant in many of the regressions of those with multiple pensions, the total effect of integration is found from this coefficient and the coefficient on the interaction term multiplied by years of tenure. Interestingly, at low levels of tenure, integration will result in lower pension benefits, but when tenure reaches about 18 years for "High" earners and 22.5 years for "Low" earners (using the top panel of Table 6), the effect of integration is positive. Given that the average years of tenure are around 27 for those with multiple pensions where one is integrated, the average effect of integration is to raise replacement rates by 6.91 percentage points, annual benefits by $12,570, and pension wealth by $128,600, *ceteris paribus*, for "High" earners and nearly three percentage points, $1,100, and $9,900 for replacement rates, annual benefits, and pension wealth, respectively, for "Low" earners.

circumstantial evidence of this since the positive effects of integration are found when firms offer multiple plans, without information from the employer side, one cannot distinguish between these explanations and other potential ones. While that does not diminish the empirical findings in the paper, it does lead to an important avenue for further research.

There are potentially important policy implications from these results. Integrated pensions, by themselves, can reduce pension benefits significantly for workers. So if a public policy goal is a specified level of retirement income, reducing the incidence of pension integration should help achieve this goal. While this is undoubtedly true for workers with single pensions, the policy implication is not so straightforward for those with multiple pensions. If being able to integrate pensions with the Social Security retirement system allows firms to attract certain kinds of worker, reducing the incidence of pension integration may lead to a reduction in the incidence of firms offering multiple pensions, thereby decreasing pension benefits for workers covered by these firms.

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Table 1. Average Pension Generosity by Integration, Earnings Level, and Number of Pensions

	Replacement Rates			Annual Benefits			Pension Wealth		
	All Pensions	Integrated	Not Integrated	All Pensions	Integrated	Not Integrated	All Pensions	Integrated	Not Integrated
All workers	30.7	34.0	28.8	$12,327	15,201	$10,757	$139,496	$160,244	$128,167
"High" Earnings									
Any tax max	33.0	37.3	30.5	17,398	22,515	14,442	195,152	237,424	170,738
Recent tax max	34.3	44.1	25.2	23,242	32,834	14,323	241,907	344,196	146,797
"Low" Earnings									
Never tax max	28.7	31.2	27.5	8,122	8,719	7,812	93,353	91,839	94,141
No recent tax max	30.0	31.4	29.3	10,357	10,555	10,259	121,016	111,774	125,567
Single Plan sample	26.8	24.3	27.6	10,901	9,355	10,335	120,833	104,214	126,356
Multiple Plan sample	40.0	43.8	34.3	17,706	21,022	12,675	184,403	216,030	136,403

Notes: The table uses two ways to calculate the relative "High" and "Low" earnings levels. "Any tax max" refers to individuals who had earnings above the Social Security taxable maximum at any time between 1951 and 1991. "Recent tax max" refers to individuals who had earnings above the taxable maximum any time in the last ten years. Observations are weighted by HRS sample weights.

Table 2. Incidence of Multiple Pensions

	% in Sample	% Integrated
Single Defined Benefit (DB) Pension	47.4	32.4
Single Defined Contribution (DC) Pension	24.1	10.5
All DB Pensions	0.5	93.0
All DC Pensions	3.9	60.3
Mixture of DB and DC Pensions	24.1	59.7

Table 3. OLS Results of Pension Benefits Regressions

	Replacement Rates	Annual Benefits/1000	Pension Wealth/10,000
Integrated Plan	-2.27**	0.99	-0.29
	(-1.98)	(1.21)	(-0.34)
Male	1.68	5.38***	5.26***
	(1.42)	(7.08)	(6.48)
Married	-6.20***	-1.39**	1.16
	(-4.89)	(-2.01)	(1.56)
Postgrad degree	3.19	6.23***	7.66***
	(1.60)	(2.79)	(3.43)
Bachelor degree	2.84	2.97	3.59*
	(1.36)	(1.25)	(1.66)
Associate degree	6.94**	2.10	3.47
	(2.04)	(0.98)	(1.56)
HS diploma	-0.17	-2.11*	-2.21**
	(-0.15)	(-1.69)	(-2.00)
Black	-1.81	-1.55**	-1.25
	(-1.35)	(-2.23)	(-1.60)
Hispanic	-0.48	-1.16	-1.78*
	(-0.26)	(-1.28)	(-1.77)
Other race/ethnicity	1.81	1.67	2.24
	(0.63)	(0.78)	(0.84)
Years of Tenure	1.29***	0.62***	0.68***
	(21.44)	(9.35)	(11.35)
Union member	-3.78***	-2.27***	-2.15***
	(-3.33)	(-3.34)	(-2.70)
Pension Type and Number			
One DC pension	-8.93***	-2.64***	-6.32***
	(-7.19)	(-3.84)	(-8.11)
All DB pensions	18.68**	5.11	5.34
	(2.51)	(1.57)	(1.39)
All DC pensions	-11.79***	-3.70**	-6.80***
	(-4.79)	(-2.15)	(-4.40)
DB and DC pensions	14.41***	7.49***	5.79***
	(10.46)	(5.21)	(4.29)
Industries			
Natural resources	5.58**	-0.94	0.53
	(2.29)	(-0.62)	(0.33)
Transportation	6.92***	1.83	4.22**
	(2.90)	(0.98)	(2.28)
Sales	4.45*	-2.18	-1.50
	(1.77)	(-1.03)	(-0.79)
Service	3.23	1.51	2.68
	(1.43)	(0.56)	(1.00)
Professional	4.40***	-1.05	-0.51
	(2.61)	(-0.78)	(-0.39)
Public administration	7.58***	0.16	2.84
	(3.51)	(0.09)	(1.46)
Missing	8.59	-0.84	0.35
	(1.39)	(-0.26)	(0.09)

Table 3 continued

	Occupations		
Professional	1.72	-1.80	-2.59
	(0.95)	(-0.91)	(-1.26)
Sales	-4.68	-4.58	-6.05**
	(-1.54)	(-1.51)	(-2.28)
Clerical	0.83	-4.99**	-5.73***
	(0.42)	(-2.48)	(-3.14)
Service	-0.60	-5.58***	-6.88***
	(-0.35)	(-2.75)	(-3.66)
Mechanical, etc	-9.24***	-9.53***	-10.98***
	(-3.38)	(-3.10)	(-4.01)
Construction	-2.55	-7.86**	-10.57***
	(-0.59)	(-2.25)	(-3.48)
Precision	-1.02	-7.72**	-7.65**
	(-0.26)	(-2.15)	(-2.35)
Operatives, etc	-5.84***	-9.83***	-10.69***
	(-2.71)	(-3.15)	(-3.99)
Missing	-6.23	-1.76	9.94
	(-0.57)	(-0.18)	(0.47)
R-squared	0.481	0.287	0.340

Note: *, **, and *** indicate 10%, 5%, and 1% levels of significance, respectively. Results also include a constant and eight dummy variables capturing region. Numbers in parentheses are t-statistics. All regressions are weighted using sample weights.

Table 4. Coefficient on Integration Indicator for OLS Regressions by Level of Earnings and Number of Pension Plans

	Any Number of Plans			Single Plan Sample			Multiple Plan Sample		
	Replacement Rate	Annual Benefits/1000	Pension Wealth/10,000	Replacement Rate	Annual Benefits/1000	Pension Wealth/10,000	Replacement Rate	Annual Benefits/1000	Pension Wealth/10,000
Earners Sample	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Any Tax Max									
"High" Earner	-0.77	3.25*	1.89	-5.95***	-1.50	-3.43**	7.12*	12.84**	12.92***
	(-0.43)	(1.93)	(1.13)	(-3.05)	(-1.32)	(-2.37)	(1.79)	(2.37)	(2.70)
"Low" Earner	-3.62**	-0.87	-2.08***	-5.87***	-1.40**	-3.03***	0.09	0.13	0.17
	(-2.40)	(-1.38)	(-3.02)	(-3.55)	(-2.22)	(-4.12)	(0.03)	(0.10)	(0.13)
Recent Tax Max									
"High" Earner	3.94	3.92	5.20	-2.51	0.66	1.08	13.08**	8.57	12.16
	(1.33)	(1.20)	(1.61)	(-0.93)	(0.33)	(0.51)	(2.18)	(1.10)	(1.45)
"Low" Earner	-3.48***	-0.59	-2.07***	-6.09***	-1.76**	-3.60***	-0.67	0.93	0.20
	(-2.74)	(-0.87)	(-2.82)	(-4.30)	(-2.67)	(-4.31)	(-0.24)	(0.54)	(0.13)

Notes: Other covariates include those in Table 3. Numbers in parentheses are t-statistics. *, **, and *** indicate statistical significance at the 10, 5, and 1% level, respectively. Regressions are weighted by HRS sample weights.

Table 5. Selected Results from Sample Selection Regressions

	Replacement Rates			Annual Benefits/1000			Pension Wealth/10,000		
Earners Sample	Any # of Pensions (1)	Single Plan Sample (2)	Multiple Plan Sample (3)	Any # of Pensions (4)	Single Plan Sample (5)	Multiple Plan Sample (6)	Any # of Pensions (7)	Single Plan Sample (8)	Multiple Plan Sample (9)
Any Tax Max									
"High" Earner	0.36	-6.32***	12.84***	3.99*	-1.85	16.30***	2.70	-3.82**	15.63***
	(0.18)	(-3.02)	(3.13)	(1.79)	(-1.47)	(2.72)	(1.27)	(-2.32)	(3.01)
"Low" Earner	-2.03	-5.01***	2.25	-0.34	-1.13*	0.65	-1.42*	-2.70***	0.76
	(-1.32)	(-3.04)	(0.65)	(-0.43)	(-1.92)	(0.52)	(-1.69)	(-3.45)	(0.59)
Recent Tax Max									
"High" Earner	7.97**	-1.96	24.56***	8.48	0.70	21.84	9.53*	1.03	23.34*
	(2.18)	(-0.66)	(3.37)	(1.33)	(0.33)	(1.45)	(1.72)	(0.46)	(1.85)
"Low" Earner	-2.13	-5.59***	1.66	-0.23	-1.51**	1.03	-1.55**	-3.25***	0.37
	(-1.62)	(-3.89)	(0.60)	(-0.36)	(-2.23)	(0.76)	(-2.04)	(-3.52)	(0.27)

Note: *, **, and *** indicate 10%, 5%, and 1% levels of significance, respectively. Other variables controlled for in all regressions are the same as the previous table. Numbers in parentheses are t-statistics. Sample selection correction is via the two step Heckman (1976) procedure. Complete results are available from the author.

Table 6. Selected Results from Tenure Interaction Regressions

Earner Sample and Variable	Replacement Rates			Annual Benefits/1000			Pension Wealth/10,000		
	Any # of Pensions	Single Plan Sample	Multiple Plan Sample	Any # of Pensions	Single Plan Sample	Multiple Plan Sample	Any # of Pensions	Single Plan Sample	Multiple Plan Sample
Any Tax Max									
"High" Earner									
Integration	-8.68**	2.23	-13.88	-11.87*	0.96	-22.80*	-9.58*	1.14	-19.54*
	(-2.10)	(0.51)	(-1.49)	(-1.93)	(0.40)	(-1.78)	(-1.81)	(0.37)	(-1.76)
Tenure	1.18***	1.20***	0.97***	0.59***	0.59***	0.22	0.71***	0.73***	0.21
	(11.18)	(10.61)	(3.53)	(9.16)	(9.43)	(0.93)	(9.04)	(8.26)	(0.94)
Interaction	0.29*	-0.31*	0.77**	0.56**	-0.09	1.31**	0.42*	-0.17	1.20**
	(1.70)	(-1.80)	(2.09)	(2.11)	(-1.05)	(2.25)	(1.87)	(-1.53)	(2.48)
"Low" Earner									
Integration	-5.53	8.42**	-15.10**	-2.52	1.21	-4.30	-1.46	1.92	-3.33
	(-1.41)	(2.05)	(-2.08)	(-1.56)	(0.60)	(-1.39)	(-0.90)	(1.02)	(-1.04)
Tenure	1.26***	1.23***	1.37***	0.37***	0.36***	0.43***	0.45***	0.43***	0.48***
	(12.60)	(11.29)	(5.73)	(9.73)	(9.30)	(3.77)	(8.74)	(7.96)	(3.81)
Interaction	0.08	-0.58***	0.67*	0.07	-0.11	0.20	-0.03	-0.20**	0.16
	(0.45)	(-3.46)	(1.96)	(0.90)	(-1.17)	(1.32)	(-0.34)	(-2.50)	(1.00)
Recent Tax Max									
"High" Earner									
Integration	-21.48***	-5.79	-23.53	-26.57*	-1.40	-48.10	-23.77**	-2.04	-40.73
	(-3.12)	(-1.02)	(-1.43)	(-1.86)	(-0.30)	(-1.34)	(-1.99)	(-0.42)	(-1.32)
Tenure	0.78**	0.88***	0.96**	0.62***	0.62***	0.64	0.65***	0.68***	0.50
	(9.56)	(5.54)	(2.25)	(3.27)	(4.42)	(1.20)	(3.41)	(4.55)	(0.97)
Interaction	0.94***	0.13	1.30**	1.12**	0.08	2.01	1.07**	0.12	1.88
	(3.63)	(0.65)	(2.30)	(2.06)	(0.50)	(1.61)	(2.31)	(0.69)	(1.80)
"Low" Earner									
Integration	-4.19	6.07*	-10.10*	-2.50*	1.48	-4.60	-1.18	2.21	-3.65
	(-1.41)	(1.85)	(-1.69)	(-1.66)	(0.94)	(-1.50)	(-0.72)	(1.23)	(-1.18)
Tenure	1.26***	1.23***	1.35***	0.45***	0.45***	0.45***	0.55***	0.54***	0.50***
	(16.47)	(14.74)	(6.44)	(13.43)	(12.95)	(4.63)	(12.08)	(10.94)	(4.93)
Interaction	0.03	-0.49***	0.40	0.08	-0.13*	0.23	-0.04	-0.23***	0.16
	(0.21)	(3.49)	(1.33)	(1.06)	(-1.85)	(1.49)	(-0.47)	(-3.04)	(1.06)

Note: *, **, and *** indicate 10%, 5%, and 1% levels of significance, respectively. Other variables controlled for in all regressions are the same as the previous table. Numbers in parentheses are t-statistics. Complete results are available from the author.

Appendix Table A1. Definitions and Means of Variables

Variable	Integrated Plans			Nonintegrated Plans		
	Any # of Pensions	Single Plan Sample	Multiple Plan Sample	Any # of Pensions	Single Plan Sample	Multiple Plan Sample
Annual earnings	$35,897	$34,353	$37,435	$33,101	$32,866	$34,161
Male	0.55	0.55	0.55	0.53	0.53	0.55
Married	0.74	0.74	0.74	0.76	0.76	0.74
Postgraduate Degree	0.08	0.07	0.10	0.17	0.17	0.19
Bachelor Degree	0.16	0.14	0.17	0.13	0.14	0.12
Associate Degree	0.04	0.04	0.05	0.03	0.03	0.01
High School diploma	0.40	0.41	0.39	0.38	0.38	0.38
No High School diploma (excluded)	0.32	0.34	0.30	0.28	0.28	0.29
White	0.88	0.86	0.89	0.85	0.85	0.85
Black	0.08	0.07	0.08	0.10	0.09	0.11
Hispanic	0.03	0.03	0.03	0.04	0.04	0.02
Other race/ethnicity	0.02	0.03	0.00	0.02	0.02	0.02
Years of Tenure	26.4	25.9	26.9	24.4	24.6	23.7
Union member	0.34	0.38	0.29	0.42	0.41	0.44
Pension type and number						
One DB pension (excluded)	0.43	0.86	0.00	0.49	0.59	0
One DC pension	0.07	0.14	0.00	0.33	0.41	0
Multiple pensions where all are DB pensions	0.01	0.00	0.02	0.00	0.00	0
Multiple pensions where all are DC pensions	0.08	0.00	0.17	0.03	0	0.17
Multiple pensions with mix of DB and DC pensions	0.41	0.00	0.81	0.15	0	0.83
Industries						
Manufacturing (excluded)	0.34	0.35	0.32	0.17	0.16	0.23
Natural resources	0.02	0.03	0.01	0.04	0.04	0.03
Transport	0.08	0.06	0.10	0.10	0.10	0.09
Sales	0.11	0.08	0.14	0.06	0.06	0.04
Service	0.14	0.11	0.17	0.06	0.06	0.07
Professional	0.24	0.29	0.20	0.42	0.43	0.39
Public administration	0.06	0.07	0.04	0.13	0.13	0.14
Missing industry	0.01	0.01	0.01	0.01	0.01	0.01
Occupation						
Managerial (excluded)	0.20	0.19	0.20	0.19	0.19	0.18
Professional	0.16	0.15	0.17	0.25	0.25	0.24
Sales	0.07	0.06	0.08	0.03	0.03	0.03
Clerical	0.23	0.23	0.23	0.18	0.18	0.18
Service	0.08	0.08	0.07	0.12	0.12	0.11
Mechanical, etc.	0.05	0.05	0.04	0.05	0.05	0.08
Construction	0.01	0.01	0.02	0.02	0.02	0.03
Precision, etc.	0.06	0.06	0.07	0.03	0.03	0.05
Operatives, etc	0.14	0.17	0.12	0.12	0.12	0.11
Missing occupation	0	0	0	0.003	0.003	0

Note: All means are evaluated using sample weights. Percentages may not sum due to rounding. Excluded variables in the regressions are: no high school education, white, manufacturing industry, managerial occupation, and single DB pension.

Source: 1992 Health and Retirement Study