

What Do Unions Do to Pension Performance?*

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Abstract

Unions can have either positive or negative effects on risk adjusted returns in pension plans. On the positive side, a union can improve monitoring of pension advisors and asset managers. On the negative side, the union may sacrifice returns by making investments that promote union goals. This paper discusses how the structure of the pension plan affects the union's ability and willingness to sacrifice returns to promote union goals. Using panel data on over 38,000 pension plans drawn from IRS Form 5500 filings between 1988 and 2008, we find the lowest performing plans are unionized multi-employer plans. Among defined contribution plans, the under-performance of multi-employer union plans disappears when the pension is controlled by individual participants.

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I. Introduction

While private sector unionism has declined over the past 50 years, union pension funds continue to be an important source of retirement savings in the United States. In 2009, collectively bargained private pension plans controlled approximately \$1.5 trillion in assets and covered 31.6 million people.¹ Relative to the universe of private pensions, the collectively bargained plans cover 24 percent of the participants and 28 percent of the assets.

Union leadership has a long history of encouraging its membership to leverage its control over these pension assets to promote union objectives. Unions encourage their members to invest pension assets in unionized companies and in projects or communities that employ union labor. More recently, union leadership has promoted the use of pension assets to initiate and support shareholder proposals for changes in corporate governance, and to pressure mutual funds on their proxy voting behavior.

Some commentators oppose the use of pension funds to promote union goals, arguing that such activities reduce the risk adjusted return on pension assets and violate the fiduciary requirements of the Employee Retirement Income Security Act of 1974 (ERISA). Union leadership argues that pro-union activities do not necessarily reduce risk adjusted returns and could improve performance.²

This study discusses the various ways that unions could either enhance or harm risk adjusted performance and empirically investigates union effects. While prior research has focused on the effect of unions on pension performance, the most recent work is over 20 years old (Dorsey and Turner 1990). Since that study, the design of union and non-union pensions has changed dramatically. In particular, there has been a pronounced shift from defined benefit (DB) to defined contribution (DC)

¹ See U.S. Department of Labor (2011).

² See, for example, Vernuccio (2009) or Entine (2008).

plans. Also, among DC plans, participant direction (PD) has become much more popular. Our study discusses how these changes in plan design could alter the union's ability or incentive to sacrifice returns to promote union goals. Our empirical analysis of IRS Form 5500 filings over the past two decades shows that pension structure significantly alters the union effect on performance. While risk adjusted returns are lower for multi-employer defined benefit (DB) and defined contribution (DC) plans, there is no evidence of a negative effect among participant directed DC plans.

II. Background.

Unions have a long history of encouraging the use of pension assets to advance union goals. In June 1980, the AFL-CIO announced that labor unions should become more actively involved in the administration of pension fund activities.³ This pension activism comprises a wide range of activities, including selecting trustees, investing assets in unionized companies, making loans to support projects that favor union labor, and exercising voting rights on stock owned by the pension fund. Opponents question the legality of such activities since the Employee Retirement Income Security Act of 1974 (ERISA) requires that pension fiduciaries manage a plan for “the exclusive purpose of providing benefits to participants” (Section 404(1)(a)). In 1998, however, the Department of Labor provided an advisory opinion indicating that the fiduciary standards of ERISA do not preclude consideration of collateral benefits so long as “the investment offering the collateral benefits is expected to provide an investment return commensurate to alternative investments having similar risks.”⁴ Hence, union pension activism is acceptable so long as there is no reduction in the risk-adjusted return of the pension

³ See Bennett and Johnson (1981) and Northrup and Northrup (1981) for details on union efforts to gain control over pension funds in the 1980s and the potential conflict between these efforts and federal pension regulations contained in the Employee Retirement Income Security Act of 1974.

⁴ Advisory opinion 98-04A issued by the Pension and Welfare Benefits Administration can be found at <http://www.erisaadvisoryopinions.com>.

portfolio. Disagreement remains, however, about the impact of union pension activism on risk-adjusted returns. As discussed below, the effect on performance will depend on the specifics of the union activism.

Unions can promote their fund goals by investing in companies that employ union labor. This can be accomplished by direct purchases of a company's stock, but more recently, registered investment companies, insurance companies, and banks are designing investments that are diversified across a wide spectrum of union employers to offer greater risk diversification. For example, the Housing Investment Trust (HIT) and the Building Investment Trust (BIT) are bank-managed trusts that serve union pension plans. These trusts managed over \$6 billion in assets in 2012 and are invested entirely in residential or commercial projects employing union labor.⁵ Another example is the I.A.M. fund managed by State Street Group, which invests the majority of its assets in companies that either "(1) have entered into collective bargaining agreements with the International Association of Machinists and Aerospace Workers (I.A.M.) or affiliated labor unions; or (2) are listed in the S&P 500 Index and have not been identified by I.A.M. as having non-union sentiment."⁶ Some banks attract union pension funds by offering "target CDs" that provide a guaranteed rate of return in exchange for a promise that the funds finance projects employing union labor.⁷ One such agreement includes the purchase of a CD by a roofers' union pension fund with the agreement that low interest loans be provided for roofing projects performed by an approved union contractor.

Calabrese (1999) reports that over 80 percent of targeted investments by union pension funds in the 1990s were dedicated to financing union-built construction, and some evidence suggests the rising use of private debt and equity purchases to promote union goals. For example, the Union Labor Life Insurance Company (ULLICO) has a private equity fund that invests in small start-up firms in

⁵ For details on asset holdings and objectives, see www.aflcio-hit.com and www.aflcio.bit.com.

⁶ See http://mypension.iamnpf.org/media/13784/IAM_National_Investment_Option_Summary.pdf

⁷ Calabrese (1999) provides specific examples of such agreements.

exchange for an agreement that the firm confer collateral benefits to the union – such as union neutrality or card check recognition.

Union goals can also be promoted with shareholder activism. Union-sponsored pension funds submitted 43 percent of shareholder corporate governance proposals in 2004 and the proposals vary in their objectives (Prevost et al. 2012). Some restrict executive compensation, other proposals place restrictions on takeover defenses, and still others require that union representatives be included on corporate boards or that managerial pay be tied to employee welfare.

Unions also pressure mutual funds to vote proxies in accordance with union objectives. Partly in response to union pressures, the Securities and Exchange Commission began to mandate disclosure of mutual fund proxy voting in 2003. In the same year, the AFL-CIO issued proxy voting guidelines for its union membership and began rating mutual funds based on their voting behavior (Cremers and Romano, 2011). In 2005, the AFL-CIO went a step further by informing investment firms that organized labor would consider a firm's position on Social Security privatization when choosing mutual funds for pension investments (Furchtgott-Roth, 2008).

The effect any particular type of union pension activism has on risk-adjusted performance will depend upon the specifics. Consider, for example, a policy that tilts investments toward the stock of companies that employ union labor. Hirsch (2007) concludes that unions, on average, lower accounting profits and the value of the firm. Lee and Mas (2012) find that a union election victory reduces a firm's stock value by about 10 percent. However, both studies also note that if financial markets are efficient, the decline in the stock price should reflect the expected effect of the union on the present value of all future profits, so that the expected return on stock in union and non-union companies should be identical after the election result is made public. In this case, tilting the pension fund toward investments in unionized companies would not impact pension performance. On the

other hand, if unions use pension assets to make loans below market rates for projects that employ union labor, the fund is sacrificing risk-adjusted returns to promote collateral benefits for union members.

Shareholder activism by a union pension fund could have positive or negative effects on risk-adjusted performance depending on the specific governance changes that the union proposes. For example, if the union promotes changes in corporate governance that increase union bargaining power and thus lowers corporate profits, there will be a reduction in risk-adjusted returns as the stock price falls to reflect a lower expected stream of future profits. If the change in corporate governance improves corporate performance (e.g., by improving corporate board structure or executive compensation rules), risk-adjusted performance would be enhanced.

Renneboog and Szilagyi (2009) and Prevost et al. (2012) show that union sponsored proposals for changes in corporate governance can create either positive or negative stock price reactions depending on the nature of the proposal and the governance structure of the targeted firm. Agrawal (2012) finds that union voting behavior on corporate governance proposals varies depending on whether the targeted company employs union labor. For example, corporate governance proposals eliminating “poison pills” would make hostile takeovers easier and could improve stock performance. However, a hostile takeover could also result in layoffs for existing workers. Consequently, the union might favor elimination of poison pills when the firm has a nonunion workforce, but oppose elimination if it increases the risk of layoffs for union labor.

Unions could enhance pension performance by improving monitoring of pension fund sponsors, service providers, or money managers. GAO (2009) and Turner and Muir (2012) underscore the prevalence of conflicts of interest for parties involved in pension plan administration. For example, pension advisors who are compensated by the mutual fund industry with commissions

could steer the pension plan toward high expense funds that pay higher commissions. The expense fees in pension funds can be quite substantial. Purcell and Topoleski (2009) explain that the median fee for both money management and administration in a sample of 401(k) plans is 0.72 percent of assets, with significant variation from a rate of 0.35 percent at the 10th percentile and 1.72 percent at the 90th percentile, across plan types.

While plans are required by law to disclose most of the fees that plan participants pay, the information is provided piecemeal, making comparisons across plan options difficult (GAO 2006). In a DB plan, the employer has an incentive to keep fees low because any shortfall in return comes at its expense. In a DC plan, the fees are passed through to the participants, and the employer has little incentive to keep fees low without pressure from the participants. Without a union, it may not be cost effective for any single worker to spend the time and effort necessary to assure that money managers keep expenses to a minimum. With a union, pension participants are able to act collectively, reduce the free rider problem with monitoring, and potentially improve monitoring of the pension fund manager.⁸ There is, however, the question of whether agency problems for a pension trustee are greater when a trustee is appointed by union leadership rather than management.

The Importance of Plan Design

While the union has a variety of ways to leverage pension assets to promote union goals, several pension design features could affect the union's ability or incentive to pursue activist policies.

⁸ This argument is similar to the belief that institutional ownership of a corporation improves monitoring because large equity positions make research and monitoring expenditures more cost effective. Thus, for example, corporations with many small owners may be monitored less closely than those with a few large institutional owners. See, for example, Agrawal and Mandelker (1990), or Shleifer and Vishny (1986).

These design features include (1) whether the pension is a single or multi-employer plan, (2) whether the pension is a DB or DC plan, and (3) whether the plan is trustee- or participant-directed.

In collectively bargained single-employer plans, the firm chooses the pension manager and the union is not guaranteed any control over the pension assets, though a small number of unions have used the collective bargaining process to negotiate for joint-trusteeship between union and management (Cook 2002). Our research was unable to find information on how many unions have negotiated joint-trusteeship for single-employer plans.

Unions have the greatest control over investments in multi-employer (also called Taft-Hartley) pension plans where the plan covers workers from multiple employers. Such plans are most common where workers are not attached to a particular firm, such as those employed in the building trades and trucking industries. The Taft-Hartley Act requires that such plans be jointly trusted by union and management. Moreover, many observers believe that unions have had effective control over multi-employer plan management.⁹

Consistent with the premise that unions have little influence in single employer plans, Dorsey and Turner (1990) found that unions had no impact on the performance of single-employer plans, but that unionized multi-employer plans underperformed. However, they also found that the inferior performance of the multi-employer plan existing in the late 1970s disappeared during the 1980s. They suggest that the shortfall in performance was eliminated when the Department of Labor issued advisories in 1980-81 warning that an explicit sacrifice of earnings for nontraditional objectives was a violation of ERISA fiduciary requirements.¹⁰

⁹ See Dorsey and Turner (1990) and the cites contained therein.

¹⁰ An alternative explanation for the underperformance of union pension funds is that union plans tilt equity investments toward unionized companies and the stock returns were lower for unionized companies in the late 1970s and early 1980s, but were similar for union and nonunion firms both before and after these time periods (Hirsch and Morgan, 1994).

Several pension design features can influence a union's incentive or ability to use pension activism to pursue union goals. For example, whether the pension is a DB or DC plan could be important. With a DB plan, the employer is liable for any shortfall in returns. With a DC plan, the employer is liable only for contributions to the pension, and any shortfall in returns reduces the employee's account balance at retirement. Consequently, management should be less willing to sacrifice returns in a DB plan. The reverse is true for the union membership. Therefore, if the employer controls the assets, union activities that reduce performance should face less resistance in DC than DB plan, though unions may be willing to offer wage concessions in exchange for greater control over assets in DB plans. If the union has control over assets (as in a multi-employer plan), the union should be more willing to sacrifice returns in a DB plan.

Another factor that potentially affects how much union pension funds sacrifice returns to promote union goals is whether a DC plan is trustee- or participant-directed. In a trustee-directed DC plan, each participant receives shares of a common portfolio in proportion to his or her contributions and investment earnings. In participant-directed plans, the pension sponsor chooses the list of investment vehicles offered by the plan, but each individual decides how much to invest in the various investment options. Among DC plans, there has been a dramatic move from trustee- to participant-directed plans over the past 20 years with the percentage of DC participants who manage some or all of their pension assets rising from 15 to 86 percent.¹¹

A switch from trustee- to participant-direction plans should reduce union pension activism if workers believe it reduces risk adjusted returns. As a group, the membership may believe that the benefits of the pension activism (e.g., increased employment of union labor) exceed the cost (reduced pension returns). Hence, with collective decision making, the union may decide that the collateral

¹¹ See Even and Macpherson (2010) for evidence on the causes and consequences of the shift toward participant directed plans.

benefits to the group outweigh any loss in returns. With participant direction, each worker makes an individual decision based on a comparison of individual benefits and costs of activism. Since the vast majority of collateral benefits associated with any individual worker's investments spillover to other workers, each worker will ignore many of the benefits that accrue to the group at large. That is, many of the collateral benefits from activism are like a public good to the union membership. Switching from trustee- to participant direction introduces a free rider problem and may limit pension investments in activities that generate a public good.¹²

In review, union influence could have positive, negative, or zero effects on risk-adjusted returns. Targeting investments that generate collateral benefits for union members could reduce risk-adjusted returns, but it could have zero effect if the investments are made in a competitive and efficient asset market. Shareholder activism by unions could have either positive or negative effects on performance depending on the nature of the governance proposals. Finally, unions could improve performance with additional monitoring of pension fund managers.

The union influence over pension investment practices may differ depending on the specifics of the plan type. A union's ability to exercise control over pension assets is greatest in multi-employer plans where they are directly involved in management of the pension. Employers may allow unions to exert greater influence in DC plans, which shift the cost of any underperformance to the workers. On the other hand, unions may be more willing to sacrifice returns in a DB plan, as it comes at the expense of the employer unless the employer is able to extract wage concessions in exchange for giving the union greater control. If a DC plan is participant-directed, the union membership is more likely to act in their individual interest (instead of the union's interest) when deciding whether to invest in a pro-

¹² While participant direction could reduce investments in union projects when risk-adjusted returns are reduced, this same logic does not apply equally to shareholder activism since proxy voting rights are held by the pension trustees or their investment managers regardless of whether the plan is participant directed.

union project that reduces risk-adjusted returns. Participant direction of DC plans should therefore reduce any negative effect of unions on pension performance.

III. Data and Empirical Methodology

To investigate the effect of unions on pension fund performance, we draw data from pension plan filings of IRS Form 5500 for private sector plans between 1988 and 2008. This data contains information on asset values, investment income, and administrative and asset management expenses that can be used to estimate an annual rate of return. Because plans with less than 100 participants fill out an abbreviated form and are excluded from the public release database annually, our analysis focuses only on plans with 100 or more participants. We also exclude Employee Stock Ownership Plans (ESOP) because they are not designed to be well-diversified portfolios, and present special issues when calculating the rate of return.¹³ To estimate risk-adjusted returns, we need panel data on pension returns and restrict the sample to plans that have at least 10 years of data. The resulting sample includes 38,895 pension plans, of which 6,773 are collectively bargained plans. Because our sample excludes small plans, ESOPs, and plans with fewer than 10 observations, our 2008 data cover only 3.5 percent of all private sector pension plans. Nevertheless, the 2008 plans in our sample are relatively large and cover 46 percent of the active participants and 56 percent of the assets for private plans in that year.

To estimate the rate of return on pension plans in the IRS Form 5500 data, we use the approach described in McCarthy and Turner (1989). The rate of return is calculated as investment income (dividends, interest, and both realized and unrealized capital gains) divided by assets at the beginning

¹³ See Conte (1994) for a discussion of the issues with calculating the rate of return on ESOP plans.

of the year.¹⁴ This is the same methodology used by the Employee Benefits Security Administration in its annual summary of pension returns from the IRS Form 5500.

The rate of return estimates are net of any expenses charged by external money managers (e.g., master trusts, registered investment companies, or insurance companies) and also subtract any administrative, advisory, or asset management expenses explicitly charged to the pension plan. The IRS Form 5500 data may understate administrative expenses because an employer could absorb some of these expenses and fail to report them.¹⁵

Figure 1 compares the annual net of expense rate of return on nonunion with single- and multi-employer union plans over our sample period (1988-2008). The value weighted return on all NYSE, AMEX, and NASDAQ stocks is presented as a benchmark.¹⁶ The average annual returns on union and nonunion plans track each other closely. Average pension returns are highly correlated with stock market returns, but there is less volatility in pension returns. This is to be expected since most pension funds have a significant share of assets in bonds. For example, in 2009, 39% of assets in pensions sponsored by the S&P 1500 firms were in bonds (Hartsohn, 2010).

One concern with our panel data set is that it could create a survivor bias in estimated rates of return. *Ex ante*, we have no strong priors on the direction of any survivorship bias since plans could

¹⁴ To be precise, the annual rate of return is calculated as net income from assets divided by invested assets. The net income from invested assets is defined as the sum of interest, dividends, rents, royalties, net realized gain or loss on sale or exchange of assets, other income, unrealized appreciation or depreciation of assets, and net investment gain from trusts minus unrealized appreciation or depreciation of buildings and depreciable property used in plan operations. Investible assets are defined to reflect assets at the beginning of the year plus additional purchases of assets through the year with the assumption that all purchases are made midyear.

¹⁵ Both Mitchell and Andrews (1981) and Dorsey and Turner (1990) note that administrative expenses are rarely reported in single employer plans because the firm frequently absorbs the costs as part of their everyday operations. However, when pension funds are externally managed (e.g., registered investment companies, insurance companies, or master trusts), there are typically explicit charges for administration of the plan and investment management fees are subtracted from the returns on the funds that they manage.

¹⁶ The returns on the overall market are drawn from Kenneth French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html. The sample used to generate the plot of annual returns is restricted to the 81% of pension plans whose filing year matches the calendar year. There are relatively few observations in most of the other months, which reduces the precision of the estimated mean for those months.

have fewer than 10 years of data for a number of reasons that are unlikely correlated with pension performance. For example, plans that started after 1999 would be unable to generate 10 years of data by the end of our sampling period, thus necessarily excluded from our data. Also, plans that existed prior to 2000 could have been terminated if there was a merger of firms, a bankruptcy of the sponsoring firm, or if one plan was replaced by another (e.g. a DB is replaced by a DC.)¹⁷

To determine whether survivor bias is a problem, we estimate a regression of net pension returns as a function of whether it survives the requirement for 10 years of data, controlling for plan characteristics and fixed year effects. The results indicate that the difference between the average net return in the survivor sample and full sample (the “survivor bias”) is +13 basis points for nonunion plans, +12 basis points for single employer union plans, and +16 basis points for multi-employer union plans.¹⁸ Consequently, controlling for plan characteristics and year effects, restricting the sample to plans with 10 or more years of data results in slightly higher returns for all three plan types, but the effect on differential performance across plan types is negligible.¹⁹

Table 1 provides the sample characteristics for nonunion (NonU), single-employer union (SingleU), and multi-employer union (MultiU) plans. Over the sample period, NonU plans had lower average returns and higher within-plan volatility than either SingleU or MultiU plans. The average annual rate of return (net of expenses) was 6.8, 8.0, and 6.8 percent for NonU, SingleU, and MultiU

¹⁷ If pensions hold some share of assets as company stock, bankruptcy or mergers could be related to pension performance. However, our elimination of ESOP plans reduces this potential source of survivor bias.

¹⁸ In an OLS regression of returns on a survivor dummy and other controls using all plans (survivors and non-survivors), the regression line passes through the mean so that $\bar{r} = \hat{\alpha}_0 + \hat{\alpha}_1 \bar{S} + \bar{X} \hat{\beta}$ where \bar{r} is the mean return for all plans, \bar{S} is the mean of a dummy variable indicating whether a plan is a survivor, and \bar{X} is a vector containing the means of the plan characteristics and year effects. Controlling for plan characteristics and year effects, the difference between the mean return of a sample with only survivors ($\bar{S} = 1$) and the entire sample is $\alpha_1(1 - \bar{S})$. This logic is applied separately for each type of plan by introducing interaction terms between dummies for plan type (non-union, union single employer, union multi-employer) and the survivor dummy..

¹⁹ The comparison of survivor and non-survivors is conditioned on the plan characteristics and controls for year effects. Without controlling for these differences in plan characteristics, the survivor bias appears larger since, for example, the survivors tend to be larger and older plans that have performance advantages for reasons we discuss below. Also, since any plan started after 2000 is excluded from the survivor group, the survivor group includes fewer observations from this time period, which had below average returns.

plans. The within plan standard deviation of net returns was 12.3, 11.0, and 9.0 percent. Based on these simple comparisons, one might conclude that NonU plans underperform relative to unionized plans. However, this would ignore several important factors. First, union and nonunion plans are not in the sample for the same years. The returns need to be adjusted for which years of data are used to calculate the rate of return. To make this adjustment, we estimated a regression of net returns with dummies for plan type (SingleU and MultiU) and added year fixed effects. The results imply that, compared to NonU plans, SingleU plans have a slightly higher return (0.3 percent) and a slightly higher variance of returns (.03 percent); MultiU plans have a lower return (1.0 percent) and a higher variance of returns (.05 percent).²⁰ Second, union plans have many more participants than non-union plans. Since there are scale economies in pension administration with respect to both the number of participants and assets per participant, this should *ceteris paribus*, result in superior performance among the unionized plans.²¹ Third, economies of scope in the administration of pension plans could give SingleU plans an advantage relative to the NonU or MultiU, since SingleU employers are the most likely to offer more than one pension plan.²² Fourth, both SingleU and MultiU plans are approximately three times more likely than nonunion plans to be DB plans, which are more expensive to administer than DC plans.²³ Union plans are also less likely to be participant directed or have a 401(k), profit sharing, or money purchase feature. To the extent that such features impact the

²⁰ All of the differences between NonU and either SingleU or MultiU plans are statistically significant at the .01 level. To compare variance of returns across plan types, we regressed the squared-residual from the net return regression with year fixed effects and plan type dummies for SingleU and MultiU.

²¹ Investment Company Institute (2009) provides a good review of the factors affecting administrative costs and shows economics of scale in administration with respect to balance per participant and number of participants. See also Mitchell and Andrews (1981), Ghilarducci and Terry (1999), and Bikker and De Dreu (2009) for evidence on scale economies in the administration of pension plans.

²² The fact that an employer offers more than one pension plan does not necessarily mean that the same workers are covered by multiple plans. For example, a given employer may offer two pension plans and these two plans may cover the same workers or two entirely different groups of workers. Regardless of whether the plans cover the same workers or different workers, there is the potential to take advantage of economies of scope in administration.

²³ Husted (1998) shows that administrative expenses are higher in DB than in DC plans. He also provides evidence that regulatory reforms have driven up the cost of DB relative to DC plans over time and may partially account for the shift from DB to DC plans, particularly at small firms.

administrative costs of the plan, this could result in differential performance by union status. Finally, union plans could take on a very different risk profile than nonunion plans. Any comparison of returns across plans requires an adjustment for differential risk exposure in the plans.

To determine how unions affect risk-adjusted return performance, we use a version of the Fama-French (FF) model (Fama and French, 1993). We include four risk factors for stocks and two risk factors for bonds. This methodology is a common way to examine the risk and return features of a stock or mutual fund.²⁴ The essence of the approach is described by the regression below where excess pension returns are regressed on a constant and six FF factors:

$$(1) r_{it} = \alpha_i + \beta_{1i} VWRF_t + \beta_{2i} SMB_t + \beta_{3i} HML_t + \beta_{4i} MOM_t + \beta_{5i} DEF_t + \beta_{6i} Term_t + e_{it}$$

where i indexes the pension plan and t indexes time. The dependent variable is the annual return on the pension portfolio (net of expenses, measured in percentage points) in excess of the “risk free rate” measured as the average of the corresponding annualized one-month U.S. Treasury bill rates. The control variables include six FF factors. The first four represent stock market risk factors: VWRF is the value-weighted returns on all stocks traded on the NYSE, AMEX, and NASDAQ in excess of the risk free rate (the annualized yield on one-month U.S. Treasury bills); SMB (small minus big) is the difference in returns on small- versus large-cap portfolios; HML (high minus low) is the difference in returns on value and growth portfolios; MOM (momentum) represents the difference in returns on portfolios formed on size categorized as “winners” and “losers” based on returns in the prior 2-12 months.²⁵ The remaining two factors represent bond risk. TERM is the difference in annual returns

²⁴ For recent examples employing this methodology to mutual and pension funds, see Tonks (2005) and Cohen et al. (2008).

²⁵ The construction of these variables and the data are available from Kenneth French’s website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html.

on 20-year government bonds and one month treasury bills. DEF is the difference between the annual returns on 20-year government bonds and a portfolio of 20-year AAA and AA corporate bonds.²⁶

Because the pension plan reporting year does not necessarily coincide with the calendar year, all risk factors are calculated to match the 12-month period corresponding to the plan's IRS Form 5500 filing.

In the FF model, the coefficients on the FF factors reflect the exposure to risk factors in the market. For example, if a pension is entirely invested in the overall market portfolio (as measured by VWRF), β_1 would equal one; and β_2 through β_6 would equal zero. If instead the portfolio was invested entirely in one-month U.S. Treasury bills, β_1 through β_6 would equal zero. If there were no administrative, record keeping, or investment fees for managing the pension, α would equal zero in both cases. To the extent that there are such fees, α will be negative. Idiosyncratic risk is captured in the residual. In theory, idiosyncratic risk is not rewarded with higher expected returns.²⁷ A plan's risk adjusted net returns is measured by α .

The FF regression is estimated separately for each pension plan and by union status using OLS. Because there are relatively few observations per plan (minimum of 10, maximum of 21), the coefficient estimates may be estimated imprecisely making it difficult to accurately test for differences in plan behavior by union status. The large number of plans, however, potentially mitigates this problem and, as seen below, the vast majority of FF regressions have statistically significant explanatory power, which reveals statistically significant differences in the parameters by union status.

The estimated FF coefficients are used to examine the impact of unions on pension performance. First, using a procedure similar to Carhart (1997) and Busse et al. (2010) to analyze the performance of mutual fund and institutional investment managers, the union's effect on risk-adjusted

²⁶ The data source for all bond returns is Morningstar (2010).

²⁷ This approach to measuring risk-adjusted performance is very similar to that used by Dorsey and Turner (1990) for examining pension performance, except that we use multiple risk factors reflecting different types of stock and bond market risk, whereas they use a single factor based on a mixed stock and bond market index.

performance is estimated by regressing each plan's measure of risk adjusted performance including the year-specific residual from the FF equation ($a_i + e_{it}$), on a dummy variable indicating whether the plan is collectively bargained. Our measure of performance varies across time for a given plan because the residual from the first stage equation is added to α_i . This allows us to estimate whether control variables that vary over time for a given plan (or across plans) systematically explain its variation in performance over time. The standard errors for the coefficients in the risk adjusted return regression are corrected for clustering of residuals by plan and heteroskedastic errors. Because union status might correlate with other variables impacting performance, we add controls for other pension characteristics that might affect performance and year dummies that might account for changes in performance due to regulatory or technological changes potentially affecting administrative or asset management expenses.

IV. Results

Fama-French Regressions

A separate FF regression is estimated for each of the 38,895 pension plans in the panel data set. The means of the estimated coefficients are presented in Table 2 along with the percentage of times that each coefficient is statistically different from zero at the .05 level.²⁸ The number of regressions corresponds to the number of pension plans in the panel data set (38,895). The average of the regression R-squared values is .88. The excess return on the market equity index is the FF factor that has the greatest explanatory power. The average coefficient is .52, which is statistically different from

²⁸ The t-statistics used to determine statistical significance for a given plan's regression coefficients are compared to critical values from the t-distribution with (n-7) degrees of freedom where n represents the number of observations for that plan and are calculated using robust standard errors.

zero at the .05 level for 93 percent of pension plans. The fact that the coefficient is substantially below one is consistent with Figure 1, which shows that the return on the average pension plan tracks the market index but is less volatile. The other FF factors have smaller coefficients (in absolute value) and are less frequently statistically significant. A test of the joint hypothesis that all the coefficients on the six factors equal zero is rejected for 95 percent of pension plans. Overall, despite the relatively small sample sizes for each pension plan, the regressions generally have statistically significant explanatory power.

The results of the FF regressions suggest that SingleU plans have the highest average risk adjusted performance (α). The average estimate of α is -.13 for SingleU, -.44 for NonU, and -.71 for MultiU. The coefficients on the market index suggest that MultiU plans have the least exposure to equities while NonU plans have the highest. MultiU plans have the greatest exposure to the term and default factor. The greater exposure to the term and default factors is consistent with the fact that, among the plans that report asset holdings, MultiU plans hold a larger share of assets in government and corporate bonds.²⁹ The fact that risk exposure differs across plan type could reflect differences in the preferences of the members. For example, if the workers in MultiU plans are older or more risk averse, on average, they would likely prefer a larger share of assets to be invested in bonds. Alternatively, it might be that union control over assets affects the taste for risk – though we don't have a theory for why union trustees would be more or less conservative than their members. Unfortunately, we don't have data on the characteristics of plan members and are unable to investigate the underlying reasons for differential risk exposure across plan types. Nevertheless, the systematic differences in risk exposure highlight the importance of risk-adjusting returns to compare performance across plans.

²⁹ Among pension plans that hold less than 25 percent of their assets in master trusts (where there is no breakdown provided on asset types held), the share of assets in government and corporate bonds is 41.3 percent for MultiU plans, 21.8 percent for SingleU plans, and 22.3 percent for NonU plans.

Figure 2 plots estimated kernel density distributions for risk-adjusted net returns (a) by union status and shows that the lower mean of risk adjusted returns for union plans is not the result of outliers in the data. The observed performance differentials could be due to factors correlated with unionism. Regression analysis is required to isolate the effect of unionism.

Regression analysis of excess returns

Table 3 presents several specifications analyzing the determinants of risk adjusted net pension returns (α).³⁰ With the exception of the single-employer and multi-employer union plan dummies, all variables are measured as deviations from means so that the intercept represents the mean value of α for the non-union sample holding other plan characteristics equal to the mean for all plans.

Besides year and industry controls, specification (1) contains only two dummy variables: one for single-employer union plans and another for multi-employer union plans. Compared to NonU plans, SingleU plans outperform non-union plans by 19 basis points points, and the difference is statistically significant at the .01 level of significance. MultiU plans underperform by 22 basis points. This simple specification, however, does not adjust for several factors that might affect administrative and money management costs.

To control for plan differences that might influence performance, we first estimate separate regressions for DB and DC plans (specifications 2 and 3) without any controls for plan characteristics. Among DC plans, SingleU plans outperform the NonU plans by 48 basis points; the performance MultiU plans is not significantly different from the performance of NonU plans. For DB plans, the performance of neither SingleU plans nor MultiU plans are significantly different from the performance of NonU plans.

³⁰ The reported t-statistics are based upon robust standard errors corrected for clustering of residuals by pension.

These simple comparisons do not control for the fact that union and non-union plans' differences could account for the performance differentials. In specifications (4) and (5), we add controls for number of participants, assets per participant, the age of the plan, year and industry dummies, and whether the employer offers other plans.³¹ The estimated effects of these controls are generally consistent with expectations. For example, the positive effects of per capita assets and the positive but diminishing effects of the number of participants suggest scale economies in both dimensions. Also, the better performance of older plans could reflect start-up costs and/or improved efficiencies from experience.

As discussed previously, unions can exercise the greatest influence on investments in multi-employer plans, which is where we expect to find the largest union effect. In single employer plans, unions have limited ability to implement activist policies since the employer makes the investment decisions. The union could, however, improve performance by strengthened monitoring of pension fund managers. We also predict that a MultiU DB plan will be more willing to sacrifice returns since underperformance comes at the expense of the employer unless the the employer is able to extract wage concessions to compensate for the loss of performance.

The pattern of results in specifications (4) and (5) are consistent with our hypotheses. First, MultiU plans underperform relative to NonU plans, and the difference is statistically significant at the .01 level. Moreover, the underperformance is worse among DB plans (76 basis points) than DC plans (36 basis points).

In contrast to the findings for MutliU plans, we find no significant performance differential between SingleU and NonU plans. Among DC plans, SingleU plans have a slight performance edge (14 basis points) over NonU plans, but the effect is statistically insignificant at the .10 level. Among

³¹ The regressions include year and industry dummies to allow for the fact that risk-adjusted performance might differ systematically across years and the cost of administration could differ across industries because of different work force characteristics or seasonal variability in the timing of contributions.

DB plans, the SingleU plans slightly underperform (4 basis points), but this effect is not statistically significant at the .10 level either.

Overall, the empirical results imply that SingleU plans do not underperform, whereas MultiU plans do, particularly among DB plans. There are three competing explanations for the underperformance of MultiU plans: (1) they are more expensive to administer; (2) MultiU plans sacrifice returns to promote union goals; or (3) there are greater agency problems in MultiU plans causing a sacrifice of returns for the trustees' own personal gains. An inability to accurately measure administrative expenses with IRS Form 5500 data precludes determining whether higher administrative expenses are the source of underperformance. Administrative expenses are inaccurately measured, as asset management practices vary. For example, if a plan invests its funds with a mutual fund or insurance company, the administrative expenses for managing the underlying funds would simply be subtracted from the funds' returns and will not appear as expenses on the IRS Form 5500. On the other hand, a pension fund that hires an investment advisor to manage its funds will show the explicit charges for the investment management services on the IRS Form 5500. To further complicate matters, some employers may absorb part of the administrative costs associated with the pension plan by providing office space, bookkeeping staff, and other expenses that do not reduce net returns. A MultiU plan is not affiliated with any single employer, thus less likely to have an employer absorb administrative costs.

The Role of Participant Direction

While we are unable to provide a direct test of the relative importance of competing explanations for the underperformance of MultiU plans, the rapid growth of participant direction in

pension plans could shed some light. In a trustee directed (TD) pension, all participants hold shares in a common pool of assets controlled by the pension manager. The pension manager frequently employs investment advisors to assist with asset allocation decisions. In a participant directed (PD) plan, the plan sponsor chooses a list of investment options and each participant decides how to allocate his or her own assets. In most cases, PD plans consist of offerings from a registered investment company (mutual funds) or an insurance company.

A pension switching from TD to PD could affect performance in several ways. First, the asset manager must now manage a separate account for each participant rather than one common account, which increases expenses. Conditional on plan size, the effect of PD on expenses is unlikely to differ for union and nonunion plans and thus should not affect the relative performance of union and non-union plans. Second, PD could make it easier for workers to monitor pension performance. Since most PD plans offer a list of mutual funds, it is easy to track performance and compare it to benchmarks. Tracking performance could be much more difficult in a TD plan that might hold individual stocks or bonds. Once again, any improvement in the ability to monitor from PD should have similar effects on union and non-union plans and should not affect their relative performance. Finally, PD could reduce the union's ability to control assets since individual plan members decide how to invest their assets. This shift in control over asset allocation decisions could alter plan performance, depending on who selects better investments. If the union is willing to sacrifice returns to improve performance, PD should improve performance of union relative to nonunion plans.

To examine the effect of PD on risk adjusted returns, we restrict our sample to DC plans and estimate risk adjusted return regressions separately for PD and TD plans. Because data on asset allocations used in subsequent regressions are not available for 1988-89, the sample is restricted to plan year observations from 1990 forward. In the first two specifications, the models control for all the

plan characteristics used in Table 3. With the exception of the dummies for SingleU and MultiU, all variables are measured as deviations from means. As a result, the intercept represents the estimate of risk-adjusted performance for a NonU plan with plan characteristics matching that for the average pension plan.

Among PD plans, there is no significant difference in the risk adjusted performance of NonU, SingleU, and MultiU plans. That is, PD completely eliminates the underperformance of multi-employer pension plans. Among TD plans, there is no significant difference in risk adjusted net returns for NonU and SingleU plans, but MultiU plans underperform by 50 basis points. Another interpretation of the estimates is that a switch from TD to PD has little effect on risk-adjusted performance for NonU and SingleU plans, but substantially improves performance for MultiU plans. Since a switch from TD to PD is likely to have similar effects on administrative expenses for both union and nonunion plans, we take this as evidence that the forfeiture of union control over investment decisions with a movement to PD eliminates negative effects on performance.

One possible explanation for the impact of PD on performance is the significant asset-management differences between PD and TD. Lakonishok et al. (1992) argue that the mutual fund industry outperforms institutional pension fund managers because of agency problems in pension administration. Moreover, TD plans are much more likely to rely on institutional pension fund managers than PD plans. One explanation is that TD plans have a common pool of money to manage for all participants, whereas PD plans must have separate accounts that allows for differing participant asset allocations. The requirements of PD give the mutual fund and insurance industry a cost advantage relative to internal money management, as these industries use technology designed for managing individual accounts that bring significant scale economies in fund administration.

Our data confirm the greater reliance of PD plans on external money managers. We estimate that the average share of assets managed “externally” (i.e. by trusts, registered investment or insurance companies) is 56 percent for TD and 86 percent for PD plans. For multi-employer union pensions, the difference is more pronounced: 35 percent for TD and 84 percent for PD plans.

To determine whether the type of asset management explains the positive PD effect on MultiU plan performance, we add controls for the share of the fund’s assets managed by registered investment or insurance companies and the share of assets held in common/collective trusts, pooled separate accounts, master trusts, or 103-12 investment entities (“trusts”). The omitted asset category reflects assets managed directly by the pension fund. The results of this specification are in the last two columns of Table 4.

Consistent with Lakonishok et al. (1992), the share of assets managed externally has a positive effect on risk-adjusted returns for both PD and TD plans. A 10 percentage-point increase in the share of assets managed by registered investment or insurance companies increases performance by around 4 basis points. An increase in the share of assets in trusts by 10 percentage points improves performance by 2-3 basis points. Nevertheless, controlling for the share of assets managed externally does not eliminate the underperformance of multi-employer plans when they are trustee directed.

We provide several tests for robustness of our empirical results. Following Busse et al. (2010), we consider three other variations of the model presented in Table 4. First, we exclude the momentum factor and re-estimate the Fama-French regressions to yield an alternative estimate of risk adjusted performance. Second, we estimate value weighted regressions of risk adjusted performance where value is measured by plan assets with and without controls for the momentum factor. All of the models control for the same list of variables as in the last two specifications of Table 4. A summary of the coefficients of interest under these alternative specifications is given in Table 5.

Most of the earlier results are robust to the alternative specifications; others are not. For example, among DB plans, MultiU plans underperform relative to NonU plans; SingleU plans do not underperform. Among DC plans, the underperformance of MultiU plans remains in three of the four specifications. The exception is the value-weighted specification that does not adjust performance for momentum where the performance of MultiU relative to NonU plans is actually worse with participant direction. Hence, when returns are not adjusted for the momentum factor, a comparison of weighted and unweighted results imply that only small MultiU plans benefit from a switch to PD – large MultiU plans actually experience a decline in risk adjusted performance. In fact, if we restrict our analysis to plans with assets below the median for DC plans (approximately \$5 million), the result that participant direction eliminates underperformance of MultiU plans is robust to all four specifications considered.

An obvious question is how one should interpret the inconsistency in the results regarding the effect of participant direction. The answer is that there is a systematic relationship between the loading on the momentum factor, plan size, and participant direction. In separate analyses, we find that the importance of the momentum factor (measured by the coefficient on momentum in the Fama-French regressions) rises with plan assets among trustee directed plans, but falls with size among participant directed plans. As a result, a failure to control for the momentum factor causes the estimate of risk-adjusted performance of large MultiU plans to rise among trustee directed plans, but fall among the participant directed.

In order to benefit from the momentum factor, a plan can invest in assets that recently outperformed the market and sell assets that recently underperformed. Apparently the likelihood of following such a strategy rises with size among trustee directed plans, but falls with size among participant directed plans. One possible explanation for the pattern in trustee directed plans could be

scale economies in trading costs which make large plans more likely to adjust their portfolio on the basis of recent performance. These scale economies would be less applicable in participant directed plans where individual participants are making the decisions on individual portfolios. We admit that this is speculative and that we do not have a good explanation for why, among participant directed plans, the smaller MultiU plans are more likely to take advantage of momentum. Better data on trading behavior and the details of the assets held could shed light on this.

Are the Effects Large Enough to Matter?

While our empirical results suggest that unions have statistically significant effects on pension performance, the question of whether the effects are large enough to cause concern among union members or policy makers remains. To address this, we examine the effects of union status on retirement wealth among workers in DC plans.

To provide some sense of the magnitude of the effects, we estimate that in 2008, the average union member with a DC plan had annual contributions of \$3,700. The average real rate of return (net of expenses) on union DC plans over our entire sample period was 4.1%. If real contributions for the typical worker hold constant over a 30-year career and earn a 4.1% real rate of return, the worker would accumulate real wealth of \$211,015 by retirement.

Using the above as a benchmark, we estimate the effects of MultiU pensions on retirement wealth. For example, we estimate that MultiU DC plans underperform by 36 basis points relative to nonunion plans (Table 3, specification 4). If the underperformance of MultiU plans was eliminated, workers could increase pension wealth at retirement by 6.2% (approximately \$13,000) without any increase in annual contributions.

As an alternative illustration, consider a MultiU DC plan with and without participant direction. Our unweighted estimates correcting for momentum (Table 4) suggest that participant direction is associated with a 33 basis-point improvement in performance. This would result in 5.7% more wealth (approximately \$12,000) for workers at retirement in the benchmark situation detailed above. In addition to improved returns, PD allows workers to adjust their individual portfolios to their personal and potentially age-specific risk tolerances.

V. Summary and Conclusions

This paper describes the numerous ways that unions can affect pension performance and how pension plan design might alter the effect. We investigate several hypotheses. First, if there is a union effect on performance, we expect it to be largest in multi-employer union plans where unions have the greatest control over assets. Second, multi-employer union plans should be more willing to sacrifice returns in a DB than a DC plan, since their employers are responsible for any shortfall in a DB plan's performance while union membership absorbs the shortfall in performance of a DC plan. This premise, however, assumes that employers are unable to extract wage concessions in exchange for giving the union greater control over pension assets. Finally, among DC plans, a change from trustee to participant direction should lessen the union membership's sacrifice of returns to promote union goals. With trustee direction, leadership controls the asset allocation decisions. With participant direction, membership controls the decisions individually and should be less willing to sacrifice returns for union goals due to a free rider problem.

Our empirical results support most of our predictions. Multi-employer plans afford unions the greatest control over pension assets, which also manifest the greatest underperformance relative to

nonunion plans. Also, among multi-employer union plans, performance relative to non-union plans is worse in DB than DC plans. While the underperformance of multi-employer plans could be due to higher administrative expenses or greater agency problems, evidence that a switch to participant direction improves the relative performance of multi-employer union DC plans suggests that union control over investment decisions is part of the reason that multi-employer plans underperform. If higher administrative expenses are the reason that multi-employer plans underperform, a switch to participant shouldn't eliminate that disadvantage. The fact that a switch to participant direction improves the relative performance of multi-employer union plans suggests the participants do a better job of choosing investments than the union trustees. We should emphasize, however, that this result is most robust for small plans. For large plans, the result is sensitive to how risk-adjusted returns are calculated.

Our overall conclusion is that union control over investment decisions have no significant influence on the performance of single-employer plans, and negative or neutral effects on performance in multi-employer union plans, depending on pension design. Based on these results, we expect that if DB plans continue to decline in popularity and participant direction continues to grow among DC plans, any negative effect of unions on pension performance will diminish over time.³²

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³² For research regarding the shift from DB to DC plans, see Gustman and Steinmeier (1992), Kruse (1993), and Ippolito (1995).

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Table 1. Sample Means for IRS Form 5500 Pension Plan Data, 1988-2008

	All	Nonunion	Single employer Union	Multi- employer union
Union	17.3%	0%	100%	100%
Return Net of Expenses	6.9%	6.8%	8.0%	6.8%
Std. Deviation of Net Returns	11.9%	12.3%	11.0%	9.0%
Within plans	11.6%	12.0%	10.6%	8.7%
Between plans	3.1%	3.2%	3.7%	3.0%
Participants	1,841	1,411	2,973	5,123
Per Capita Assets (\$1000s)	27.1	27.0	25.1	30.5
Percent Assets Managed Externally	69.8%	72.2%	77.9%	31.9%
Defined Benefit	30.0%	22.0%	71.7%	63.4%
Defined Contribution Plan	70.0%	78.0%	28.3%	36.3%
Participant Directed Defined Contribution Plan	49.5%	56.7%	19.9%	9.2%
401k Plan	54.9%	63.3%	22.3%	4.6%
Profit Sharing Plan	60.0%	69.2%	22.4%	8.2%
Money Purchase Plan	5.4%	4.1%	3.7%	21.5%
Offer other DB plan	22.0%	18.9%	60.4%	5.3%
Offer other DC plan	31.9%	30.0%	67.3%	6.4%
Number of Plans	38,895	32,461	4,119	2,654
Number of Plan Year Observations	538,565	445,266	53,107	40,192
Number of Observations Per Plan	13.8	13.7	12.9	15.1

Note: The sample is based on IRS Form 5500 data for private sector plans, with 100 or more participants between 1988 and 2008. The sample excludes plans with less than 10 years of data, ESOP plans, and plans with missing data on union status or other key variables.

Table 2. Summary Statistics from Fama-French Regressions, 1988-2008

Explanation. The numbers presented below represent the average of the estimated Fama-French coefficients across the pension plans. The dependent variable is excess pension return net of expenses measured in percentage points. In parentheses are the percentages of plans for which the corresponding coefficients are statistically different from zero at the .05 level. The statistical significance is based upon robust standard errors corrected for clustering of residuals by plan and the t-distribution.

	All Plans	Non-Union Plans	Single Employer Union Plans	Multi- employer Union plans
Alpha (in percentage points)	-0.43 (18.1%)	-.44 (17.9%)	-.13 (17.6%)	-.71 (20.2%)
Coefficients on Fama-French Factors				
Market – Risk Free	.52 (93.0%)	.54 (93.8%)	.48 (89.4%)	.38 (89.5%)
Small – Large Cap	-.0006 (23.1%)	.0008 (23.0%)	.004 (25.7%)	-.021 (21.3%)
High – Low Book-to-Market	-.066 (27.7%)	-.067 (27.9%)	-.064 (25.6%)	-.065 (28.3%)
Momentum	.026 (20.5%)	.029 (21.2%)	.009 (18.4%)	.009 (15.5%)
Term	-.087 (27.1%)	-.111 (27.6%)	-.002 (22.4%)	.062 (27.1%)
Default	-.155 (27.0%)	-.185 (27.6%)	-.106 (22.4%)	.122 (27.1%)
% of regressions with coefficients on Fama-French factors jointly significant at .05 level	95.1%	95.5%	92.2%	94.6%
Average of Regression R-squared	.88	.88	.88	.85
Number of Pension Plans	38,895	32,461	4,119	2,654
Number of Observations	538,565	445,266	53,107	40,192
Observations per Pension Plan	13.8	13.7	12.9	15.1

Table 3. Determinants of Risk-Adjusted Returns Regressions, 1988-2008

Explanation. The coefficients are from a regression of the estimated alpha plus the residual from the Fama-French equations as the dependent variable. The t-statistics in parentheses are based upon robust standard errors corrected for clustering of residuals by plan.

	(1)	(2)	(3)	(4) ^a	(5)
	All	DC	DB	DC	DB
Constant	-0.435	-0.532	-0.122	-0.508	-0.108
	(-25.53)	(-28.16)	(-3.19)	(-27.02)	(-2.719)
Union Single Employer	0.192	0.476	-0.0437	0.142	-0.0360
	(3.68)	(5.27)	(-0.60)	(1.519)	(-0.476)
Union Multiemployer	-0.219	-0.080	-0.566	-0.357	-0.757
	(-3.86)	(-0.95)	(-1.37)	(-3.859)	(-7.600)
Plan Assets Per Capita in \$10,000				0.00649	0.000841
				(2.648)	(0.195)
Participants in 10,000s				0.0405	0.00285
				(6.609)	(1.062)
(Participants in 10,000s) ²				-0.000191	-1.08e-06
				(-5.859)	(-0.114)
Plan Age				0.0354	0.0148
				(21.47)	(6.973)
Employer Offers Other Defined Benefit				0.562	-0.112
				(12.33)	(-1.649)
Employer Offers Other Defined Contribution				0.338	0.00160
				(8.239)	(0.0268)
Year Dummies Included	Yes	Yes	Yes	Yes	Yes
Industry Dummies Included	Yes	Yes	Yes	Yes	Yes
Observations	538,565	377,139	161,426	377,139	161,426
<u>p-values for hypothesis tests:</u>					
equal coefficients on union single & union multiemployer	0.000	0.000	0.000	0.000	0.000
equal coefficients on union single-employer in DB and DC	--	0.000		0.138	
equal coefficients on union multi-employer in DB and DC	--	0.000		0.003	
R-squared	0.061	.071	.054	0.086	.056

^a Column (4) also includes controls for 401(k) plan, profit sharing plan, and other money purchase plan.

Table 4. Determinants of Risk-Adjusted Returns, by Participant Direction Status, for DC Plans, 1990-2008

Explanation. Coefficients are from a regression of the estimated alpha plus the residual from the Fama-French equations as the dependent variable. T-statistics are in parentheses and are based upon robust standard errors corrected for clustering of residuals by plan.^a

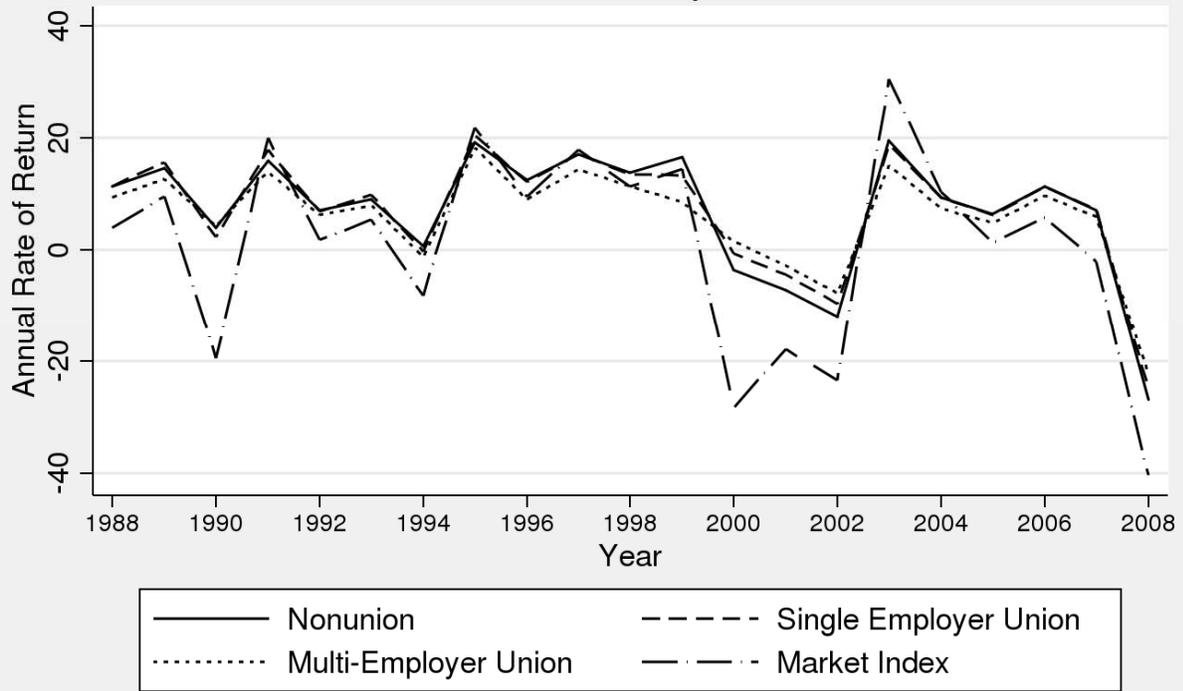
	Participant Directed	Trustee Directed	Participant Directed	Trustee Directed
Constant	-0.328 (-13.31)	-0.333 (-8.063)	-0.354 (-13.68)	-0.291 (-7.144)
Union Single Employer	0.108 (1.060)	0.128 (0.821)	0.115 (1.122)	0.116 (0.746)
Union Multiemployer	-0.118 (-0.891)	-0.504 (-4.030)	-0.107 (-0.809)	-0.443 (-3.506)
Share of Assets Invested with Registered Investment or Insurance Companies			0.453 (5.920)	0.424 (5.704)
Share of Assets Invested in Trusts			0.282 (3.579)	0.220 (2.739)
Sample Size	262,731	95,210	262,731	95,210
R-Squared	0.101	0.076	0.101	0.077

^a The sample period is 1990-2008. Share of Assets Invested in Trusts is defined as the sum of assets in common/collective trusts, pooled separate accounts, master trusts, and 103-12 investment entities divided by total assets. All models also include controls for industry, year, plan assets per capita in 10,000s, participants (in 10,000s) and its square, plan age, whether employer offers other defined contribution plan, whether the employer offers other defined benefit plan, 401(k) plan, profit sharing plan, and other money purchase plan.

Table 5. Union Effect on Risk Adjusted Performance with Alternative Specifications.			
<u>Explanation.</u> Coefficients are from a regression of the estimated alpha plus the residual from the Fama-French equations as the dependent variable. T-statistics (in parentheses) are based upon robust standard errors corrected for clustering of residuals by plan. ^a Weighted regressions use value of plan assets as weights. ^a			
	Intercept	Single Employer Union	Multi-Employer Union
Fama French estimates excluding momentum factor, unweighted regressions.			
DB plans only	0.047 (1.82)	-0.093 (1.77)	-0.689 (8.80)
DC plans only	-0.003 (0.24)	0.025 (0.44)	-0.809 (11.53)
Participant-directed DC plans only	0.184 (11.02)	0.066 (1.09)	-0.557 (6.11)
Trustee-directed DC plans only	0.012 (0.43)	-0.118 (1.19)	-0.866 ^b (8.93)
Fama French estimates including momentum factor, value weighted regressions.			
DB plans only	0.042 (0.24)	0.026 (0.43)	-1.082 (-2.69)
DC plans only	-0.017 (-0.19)	0.427 (1.04)	0.261 (0.72)
Participant-directed DC plans only	-0.070 (-0.58)	0.708 (1.58)	0.578 (1.21)
Trustee-directed DC plans only	0.253 (1.83)	-0.411 (-0.92)	-0.563 ^c (1.35)
Fama French estimates excluding momentum factor, value weighted regressions.			
DB plans only	0.079 (4.52)	-0.099 (-0.22)	-1.256 (-2.95)
DC plans only	0.591 (9.80)	0.383 (1.27)	-0.805 (-3.14)
Participant-directed DC plans only	0.701 (6.26)	0.597 (1.80)	-0.929 (2.26)
Trustee-directed DC plans only	0.487 (5.08)	-0.513 (1.78)	-0.329 ^d (-1.39)
^a The sample period is 1990-2008. All models include controls for industry, year, per capita assets, number of plan participants and its square, plan age, whether employer offers other defined contribution plan or defined benefit plan, and dummies indicating whether the plan is a 401(k), profit sharing, or money purchase plan. ^b Coefficient is significantly different from that for participant directed plans at .05 level. ^c Coefficient is significantly different from that for participant directed plans at .10 level. ^d Coefficient is not significantly different from that for participant directed plans at .10 level.			

Figure 1

Mean Rate of Return by Union Status



Source: IRS Form 5500 filings with 100 or more participants excluding ESOP plans.

