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# Does freezing a defined benefit pension plan affect firm risk? ☆

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ABSTRACT

This paper examines the impact of a defined benefit (DB) pension plan freeze on the sponsoring firm's risk and risk-taking activities. Using a sample of firms declaring a hard freeze on their DB plans between 2002 and 2007, we observe an increase in total risk (proxied by the standard deviation of EBITDA and asset beta), equity risk (standard deviation of returns), and credit risk following a DB-plan freeze. The increase in credit risk is reflected in a decline in credit ratings and an increase in bond yields for freezing firms. When we examine investment strategies, we observe a shift in investment from capital expenditures before the freeze to more-risky R&D projects after the freeze, and an increase in leverage. These strategies (increased focus on R&D and higher leverage) increase the operating and financial risk the firm faces. Overall, we observe an increase in risk-taking following DB plan freezes, consistent with theories that DB plans act as "inside debt" that aligns managers' interests with bondholders'.



## 1. Introduction

This paper examines the effect of a change in the structure of a pension plan on a firm's risk and its risk-taking activities. A pension plan is an arrangement whereby an employer commits to making future payments to employees for service they have provided during their working years (Kieso et al., 2010, p. 1050). Pensions constitute a significant portion of many firms' total compensation costs. For example, (old) General Motors' pension and healthcare costs for retirees were about $1,784 per vehicle or $6.2 billion a year (Kieso et al., 2010, p. 1049), about 4% of (old) GM's total annual costs. With such a significant portion of costs spent on pension benefits, any change in the pension plan might have a significant impact on a firm's investment and strategic plans, and therefore the amount of risk stakeholders in the firm (especially stock and bondholders) are exposed to.

One change in pension plans that has become widespread since the early 2000s is the *freezing* of defined benefit (DB) pension plans. When a firm freezes a DB plan, it stops the future accrual of retirement benefits, and typically switches the participants in the plan to an alternate form of pension (typically defined contribution (DC), such as a 401(k) plan). While a DB-plan freeze does not relieve a firm of its existing commitment to pay out benefits already accrued, it does reduce the risk

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associated with future retirement benefit accruals and, potentially, alters a firm's financial and operating strategies. This paper examines the impact of DB-plan freezes on overall firm risk and on the freezing firms' investment, operational, and financial risk-taking activities.

Sundaram and Yermack (2007) argue that DB pension plans are an important form of "inside debt." Specifically, Sundaram and Yermack (2007) report that more than half the CEOs of S&P500 firms have service-based, defined benefit pensions, and that those pensions are a substantial fraction of their overall incentive compensation. They argue that these typically unsecured debt-like claims on the firm (usually in the form of a Supplemental Executive Retirement Plan, or SERP) alter managerial incentives in a meaningful way by, at the margin, aligning the interests of managers more closely with those of *outside* debt holders (i.e., bondholders). This "debt bias" arises because managers generally bear the same default risk faced by the firm's other unsecured (outside) creditors.[1] As such, Sundaram and Yermack (2007) argue that as the firm's managers have more debt-like (pensions) versus equity-like (stock options) incentive compensation, the firm is likely to take on *less* risk. This is exactly what they find: "As the CEO's pension value increases relative to his equity value, risk taking as measured by distance-to-default declines." (p. 1555).

Other studies report similar findings. Edmans and Liu (2011) argue that debt-like compensation structures (such as pensions) are effective incentive mechanisms when managerial effort is productive in enhancing liquidation values in financial distress. Anantharaman et al. (2011) posit that private lenders recognize the incentive-alignment effects of inside debt and offer the firm more generous lending terms (lower spreads, fewer covenants) when the firm's managers are more exposed to debt-like compensation claims in the form of SERPs. Finally, Wei and Yermack (2011) report that bond prices rise and equity volatility falls for firms that disclose large inside debt positions (SERP and deferred compensation) in 2007 (the first year that SEC mandated such disclosure).

In this paper we argue that freezing a DB pension plan will have two potentially offsetting effects. On the one hand, the *direct* effect of freezing a DB plan is that firm risk is lowered because firms sponsoring DB plans guarantee the payout of a specific amount of benefits for the life of their employees upon their retirement. Therefore, firms with DB plans bear various risks associated with the provision of those future payouts, including the risk associated with the rate of return on the funds invested to provide future payouts and longevity/mortality risk of their employees. Thus the direct effect of freezing a DB plan is a reduction in this DB-plan induced risk.

On the other hand, DB-plan freezes might result in firms taking on more risk because, at the margin, the "debt bias" induced by inside debt positions becomes less important as executive retirement benefit begin to accrue in the form of DC plans. Over time, therefore, the "debt bias" should reduce and managers' incentives should be aligned with stockholders' to a greater extent.[2] We call this the *incentive* effect. It is an empirical question whether the incentive or direct effect dominates.

We find that the incentive effect outweighs the direct effect. Using a sample of firms that freeze their DB plans during the period 2002–2007, we observe a higher standard deviation of earnings (EBITDA) following DB-plan freezes. This change in freezing firms' risk is observed after controlling for the endogenous nature of a firm's pension freeze decision. Our analysis of the firm's equity and credit risk suggest that both increase after the freeze. The standard deviation of stock returns is higher in the five years after the freeze compared to the five years before the freeze. Our analysis of credit ratings and bond yields provides independent confirmation of this increase in risk: credit ratings of freezing firms decline and the required yields on publicly traded debt increase after the freeze event.

When we evaluate investment, financing, and operating strategies of these firms in the pre- and post-freeze periods, we observe that freezing firms tend to invest more in high risk R&D projects and less in capital expenditure after the DB plan freeze (compared to pre-freeze investment). Notably, the increase in R&D intensity of DB-plan freeze firms during our sample period is in stark contrast to a reduction in R&D expenses in the post-SOX period (which coincides with our sample period) documented by Bargeron et al. (2010). DB-plan freeze firms also increase leverage in the post-freeze period. However, we do not observe any significant change in diversification or focus (as an operating strategy) in these firms. These results continue to hold after controlling for CEOs' equity-based compensation, change in CEOs, tenure of CEOs, and the number of years a CEO has credited in the firm's retirement plan. The results are also robust to controlling for the endogenous nature of the DB-plan freeze decision. Collectively, our results suggest that firms become more aggressive and tend to take on more investment and financing risk following DB-plan freezes.

This is an important research topic because of both the number of employees in the U.S. that are covered by defined benefit pension plans and the speed (and breadth) at which such pension plans are being converted into alternate forms

[1] Certain DB-plan benefits are guaranteed by the U.S. federal government via the Pension Benefit Guaranty Corporation (PBGC), and also are not available to other creditors of the firm in the event of default. However, such guaranteed/protected benefits are capped at a maximum level—the PBGC cap is now $54,000 a year for a 65-year-old and younger workers get less (Wall Street Journal, 12/16/2011)—that would be far below the benefits expected to be received by senior managers, and none of the pension benefits in a SERP plan are protected either by the PBGC or from other unsecured creditors. For example, while the PBGC has paid full benefits to 78% of employees at airlines it has bailed out in the past, pilots and other high earners get only a portion of their notional benefits because of the caps on the agency's payment (Wall Street Journal, 12/16/2011). As such, DB-plan benefits for senior executives are debt-like unsecured claims on the firm. As discussed later in the paper, when firms freeze their DB plans they almost always freeze *both* the "rank-and-file" (a.k.a. "qualified") and SERP (a.k.a. "non-qualified") plans.

[2] While the value of *existing* pension obligations is typically not changed by a DB-plan freeze (see Section 2.2. for more details), the relative importance of the inside debt position declines over time as executives accrue more equity-like incentive compensation and retirement benefits in the form of DC pensions.