

# Pension Risk Management in the Enterprise Risk Management Framework

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## **PENSION RISK MANAGEMENT IN THE ENTERPRISE RISK MANAGEMENT FRAMEWORK**

Enterprise risk management (ERM), a new development in the field of risk management, has received unprecedented international attention from both industry and academia in recent years (Lin et al., 2012). ERM represents an integrated risk management method that assesses all enterprise risks and coordinates various risk management strategies in a holistic fashion, as opposed to a silo-based traditional risk management (TRM) approach. In the TRM framework where risk classes are treated in isolation, individual decisions handling idiosyncratic risks can be incompatible with the firm's overall risk appetite and global corporate agenda (Ai et al., 2012). A separate management of individual risk categories can also create inefficiencies due to lack of coordination between various risk management units (Hoyt and Liebenberg, 2011).

Departing from TRM, ERM considers all risk factors, at a holistic level, that ostensibly overcome the limitations of TRM; hence, ERM is likely to create value in multiple dimensions. For example, managing risks in the aggregate facilitates risk control on key drivers of earnings volatility arising from business, operational, credit and market risks (Lam, 2001). Liebenberg and Hoyt (2003) find that firms with greater financial leverage are more likely to establish ERM programs as ERM can mitigate information asymmetry regarding the firm's current and expected risk profile. As noted by Lin et al. (2012), ERM can generate synergies between different risk management activities by coordinating a set of complementary risk management strategies. Furthermore, ERM optimizes the trade-off between risk and return at the enterprise level and thus allows the firm to select investments based on a more accurate risk-adjusted rate (Nocco and Stulz, 2006).

To achieve its proposed benefits and facilitate better operational and strategic decision making, ERM requires firms to encompass all risks that affect firm value. Despite this widely accepted view, surprisingly, the current ERM practice and literature mainly target risks that affect the basic balance sheet and disregard the off-balance-sheet items that could impose a significant impact on a firm. Among different off-balance-sheet items, perhaps no other items are more important than corporate pension plans (Shivdasani and Stefanescu, 2010). According to Towers Watson (2013a), at the end of 2012, the total value of defined benefit (DB) pension assets for U.S. firms was about \$7.1 trillion, an amount far greater than that of any other off-balance-sheet item.

DB pensions introduce significant risks that arise from market downturns, low interest rate environments, new pension accounting standards, and prolonged life expectancy of retirees. If firms do not control expenses arising from pension risk, they will have to cut costs elsewhere, which will diminish their ability to maintain current operations and invest in new positive net present value projects. Unanticipated improvements in mortality rates increase pension liabilities and shortfalls

(Lin and Cox, 2005). In addition to longevity risk, investment risk constitutes another significant concern for DB plans. The 2007–2009 mortgage and credit crisis and the subsequent drop in discount rates caused double-digit rises in pension funding deficits and notable value decreases in many DB firms. For example, the DB plans of General Motors (GM) were underfunded by \$8.7 billion in year 2012. As GM is obligated to infuse cash to cover gaps created by the market downturns, “the pension shortfall is one factor hindering GM’s share value even as it operates profitably” (Bunkley, 2012).

After the 2007–2009 credit crisis, the profession began moving from an integration of various major business risks to aggregating them with pension risk. As suggested by Kemp and Patel (2011), “For many firms who already have some form of ERM in place, an initial step might be to extend the governance and risk management function in what may already be an effective framework for decision making in the core business to incorporate the pension subsidiary.” Despite this positive direction, with only a few exceptions, the implications of pension risk on firm overall risk have been largely unexplored. Little attention has been paid to how pension obligations impact business decisions despite the central role that pension plays in corporate operations. There is also a void in our understanding of how significant it is to incorporate pension risk in an ERM program as no ERM model currently exists to integrate pension scheme into a firm’s decision making processes (Kemp and Patel, 2011). In this article, we seek to extend this literature by consolidating pension risk with various business risks such as operational, hazard, and strategic risks. Specifically, we propose an optimization model for DB firms considering pension investment and longevity risks. In our model, we maximize the expected total return on capital net of total pension cost subject to separate operational, hazard, and pension risk constraints as well as an enterprise-wide overall risk constraint. With this setup, we illustrate the importance of integrating pension risk with other risks in an ERM program.

Over the last decade, DB firms have sought to de-risk their DB plans, driven by pension deficits due to the latest market downturns and low interest rate environments. Many firms sponsoring DB plans are confronting an important decision on whether and how to lessen pension obligations. According to a survey from 180 participant responses conducted by Towers Watson in mid-2013, “half of all responding plan sponsors are looking to transfer some or all of their DB plan obligations off their balance sheet” (Towers Watson, 2013b). There are generally two major de-risking strategies for companies to off-load their pension risks: the ground-up hedging strategy and the excess-risk hedging strategy (Cox et al., 2013). The ground-up hedging strategy, including pension buy-ins and buy-outs, transfers a proportion of the entire pension liabilities to another party. The excess-risk strategy cedes part of longevity risk that exceeds a given level. A prominent example of the excess-risk strategy is longevity hedging such as a longevity swap. Pension firms are clamoring to de-risk pensions. In 2013, buy-in and buy-out deals were worth more than £5.5

billion (Hawthorne, 2013). According to Pfeuti (2014), longevity-hedging transactions completed by UK pension funds reached some £8.9 billion in 2013, breaking all previous annual records.

While there exists a rich literature that explores the rationale and trend of pension de-risking activities, little is known about whether and the extent to which pension risk should be ceded in the ERM framework. To fill the gap, instead of simply comparing different pension hedging tools, as another objective of this paper, we study how much pension risk a plan should transfer given that pension risk and other business risks are managed holistically. In particular, we add a pension hedging decision to our ERM optimization problem. Given this setup, we solve for the plan's optimal pension hedge ratio. Our optimal pension hedge decision ensures that pension de-risking is compatible with global corporate strategic goals. The existing literature suggests that the excess-risk hedging strategy is more attractive than the ground-up strategy as the later is more capital intensive and expensive. Our optimization results, however, indicate that subject to enterprise-wide risk constraints, the excess-risk strategy is less effective in improving overall firm performance, which provides an important insight for pension de-risking.

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