Selecting Discount Rates for Assessing Funded Status of Target Benefit Plans

Chun-Ming (George) Ma  
Department of Statistics and Actuarial Science, University of Hong Kong, Hong Kong

For the purpose of determining the going concern funded status of a defined benefit pension plan, the current actuarial practice is to determine the liabilities of the plan using a discount rate based on the expected investment return from the pension fund (the "traditional" approach). On the other hand, financial economists have advocated the use of a discount rate based on the market yields of investment grade bonds whose cash flows reasonably match the expected benefit payments, regardless of how the plan assets are invested (the "financial economics" approach). This paper explores the issue of selecting discount rates for assessing the funded status of target benefit plans. A target benefit plan is a pension plan that aims to provide a target retirement income to its members through the pooling of economic and demographic risks, where the employer's funding obligation is predefined while members' benefits may be adjusted upwards or downwards relative to the target. From the viewpoint of managing the risk of intergenerational inequity, it is proposed that the only discount rate for assessing the funded status of a target benefit plan that serves the best interests of members is one based on the traditional approach. To support our proposition, we conduct Monte Carlo simulations on some model plans to demonstrate the impact on pension wealth distributions resulted from the two discount rate approaches.

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1. INTRODUCTION

For the purpose of funding a defined benefit pension plan as a going concern, there are two broad approaches to setting the discount rate assumption for determining the liability for benefits promised to members (i.e., the "funding target"). The first is the traditional approach, which determines the liability by discounting the expected future benefit payments by the rate of investment return that the plan assets are expected to earn over the long term. The other is the financial economics approach, which determines a "market-consistent" value of the liability that is independent of the expected return of the plan assets. Financial economists apply this approach by noting that pension benefit payments have many similarities to bond cash flows, and that market value information of a bond's cash flow is readily available.

When applying to the funding of a defined benefit plan, the traditional approach to determining discount rate assumptions attempts to answer the following question: what amounts of contributions are needed to fund the promised benefits over the long term? On the other hand, the financial economics approach attempts to answer a different question: what is the market-consistent value of the plan's liability at a point in time, as determined by current interest rates? This involves finding a particular bond portfolio with characteristics (e.g., duration) similar to the plan's liability, and then discounting the expected pension cash flows using the yield curve underlying the bond portfolio. The liability value determined on this basis is considered to be a fair proxy based on observed market conditions.

In this paper, we explore the discount rate issue in the context of a target benefit plan (TBP). The CIA Task Force on Target Benefit Plans (Canadian Institute of Actuaries 2015) describes this plan design as follows:

"A TBP is a collective, pre-funded pension plan pooling both economic and demographic risks, with a predefined retirement income goal (the "target benefit"), where the employer's financial liability is limited to predefined contributions while members' benefits may periodically be adjusted upwards or downwards relative to the original target."

For the purpose of determining the funded status of a target benefit plan, which in turn determines how members' benefits will be adjusted, we argue that it is inappropriate to use a discount rate based on the financial economics approach. Doing so could lead to an unfair distribution of plan assets for the payment of benefits to members, either within a single generation or among different generations of members. The only basis for assessing the funded status of a target benefit plan that serves the best interests of plan members is one that reflects the expected return on the plan assets, namely, the traditional approach.

This paper is organized as follows. In Section 2, we outline the current practice in Canada and the United States regarding the setting of discount rate assumptions for funding defined benefit plans. In Section 3, we provide a general reasoning supporting our main proposition that a discount rate based on the traditional approach would provide an unbiased liability measurement for assessing the funded position of a target benefit plan. In Section 4, we describe the numerical analysis conducted on three simple model TBPs using the Monte Carlo simulation technique. We demonstrate in Section 5 that use of the expected investment return as the discount rate would give rise to a fair distribution of plan assets for the payment of benefits to members, while the use of the risk-free rate would not. In Section 6, we show that intergenerational risk sharing can be applied to addressing the risk of benefit volatility, and in Section 7 we conclude.