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A Lifecycle Analysis of Defined Benefit Pension Plans

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Abstract


This paper employs a lifecycle model from the consumption-savings literature to examine the tradeoffs between defined benefit and defined contribution pension plans. We examine the effects of varying risk aversion, varying initial income and financial wealth, and varying wage processes (that may be correlated with returns on the risky asset).

Results indicate that wage-indexed claims are not an optimal vehicle for retirement policy if the decision to participate is made early in life, because individuals hold most of their wealth in their human capital and would not wish to increase their exposure to income shocks. Later in life, after most of a worker's human capital has been converted to financial assets, defined benefit pension plans help increase diversification by reducing exposure to financial market risk. The access that defined benefit plans provide to annuities markets and possible guaranteed rates of return over the risk-free rate increase the value of defined benefit plans to workers. The model also predicts that wage-indexed claims will be more valuable when equity markets provide low expected returns or are highly variable and when annuity markets are inefficient.

The model illustrates two economic functions performed by defined benefit plans. Firstly, DB plans pool individual wage risks. This allows older workers to buy a wage-linked security that increases their exposure to wage risks. Secondly, they create a group annuities market that reduces the cost of adverse selection.

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