The Glide Path Assumption

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There are several critical factors for retirement and educational savings plan sponsors to consider when conducting due diligence on their funds. One of the most important of these factors is the fund's glide path.

It is broadly recognized that asset allocation plays a critical role in achieving desirable outcomes. Yet the glide paths currently offered by most providers are neither efficient nor adequately substantiated. There is growing evidence that these glide paths generate sub-optimal outcomes that can be substantially improved by superior portfolio selection and evolution.

The framework most glide path designers utilize is based on the assumption that the future income can be treated as a conventional asset ("human capital"). Therefore, an investor's total portfolio is comprised of financial capital and "human capital." The primary objective is to provide age-appropriate total portfolio risk/return characteristics throughout the investor's lifecycle. The glide path is merely a disclosure of the intended allocation of the financial capital.

There are at least three major problems with this framework. First and foremost, this framework is not designed to produce optimal outcomes. Second, this framework offers no tools to optimize the *collaborations* between portfolios within a glide path. Third, the use of "human capital" requires certain questionable assumptions that may further diminish the usefulness of this framework.

Yet there are a couple of simple and remarkably consequential observations that should be instrumental in the development of a better framework.

First, a glide path contains two distinct components – the current portfolio and the future portfolios. The development of the former is the preeminent challenge of investment management. The latter is just *an assumption*.

Second, the investor is under no obligation to follow this assumption in the future. The investor is at liberty to select any portfolio any time. At any future

point, the investor will follow the original glide path assumption only if the remaining segment of the original glide path (a sub-glide path) still makes sense.

These observations lead to the following essential principle of glide path design:

Any sub-glide path of an optimal glide path should be optimal on its own.

In other words, the investor would not settle for an inferior (sub-)glide path when a superior (sub-)glide path is readily available. Any glide path that contains an inferior (sub-)glide path would represent a clearly unrealistic assumption. Any outcome or contribution estimates based on an unrealistic glide path would be equally unrealistic. Needless to say, clearly unrealistic assumptions are all but unacceptable in the world of prudent fiduciary care.

Furthermore, analysis of the outcomes generated by a glide path should involve similar analysis of all corresponding sub-glide paths. At any point, the starting and ending segments of an optimal glide path must collaborate effectively in order to produce optimal outcomes. Reasonable assumptions should be made regarding the starting asset values for all sub-glide paths (e.g. means and/or percentiles).

The principle of optimality of all sub-glide paths reflects the fact that a glide path represents multiple asset allocation decisions. The problem of optimal glide path design belongs to a well-known framework of multiple decision-makers, their actions and preferences. This framework has been successfully utilized for a variety of problems in economics and other fields for decades.

In the process of optimal glide path design, the portfolio selection at any future point should take into account the subsequent sub-glide path. Accordingly, a portfolio in a glide path should be selected *after* all subsequent glide path portfolios have been selected. Thus, a glide path should be optimized via the process of "backward induction" – from the end to the present. Today's portfolio is the last one to be selected.

It can be shown that a "backward induction" optimized glide path – a *Nash equilibrium* strategy – generates optimal retirement outcomes. All portfolios in a Nash equilibrium glide path are interconnected and collaborative. Every portfolio

selection is the best response to all other portfolio selections. In particular, the selection of today's portfolio takes into account all subsequent portfolios, contribution rates, and the evolution of the investor's risk tolerance. There is no need for "human capital" pricing – the future income is treated as a cash flow, not as a conventional asset. A glide path is an indispensable part of the development of today's portfolio, not a mere disclosure.

Overall, the glide path assumption is a vital component of a long-term strategy that integrates portfolios, contribution rates, and other aspects of funding financial commitments throughout the investor's lifecycle. Plan sponsors conducting due diligence on their funds should be mindful of the fact that most currently offered glide paths contain significant inefficiencies. This state of affairs is untenable and will have to change. While the impending changes should affect various aspects of glide path design, the abovementioned sub-glide path optimality principle should undoubtedly become one of the cornerstones of the mainstream approach to optimal glide path design.

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