Cost of house, not just down payment; move explanation of factors up ahead of tables; explain liability concept better

**Glide Path Principles**

Glide paths are ubiquitous in the investment world in that they are a common approach used in retirement savings plans (target date, target retirement or lifecycle funds), 529 plans and corporate defined benefit plans. Yet, they may actually be underutilized. A typical investor of any kind has an objective for the funds they are investing – the funds will eventually be spent for some purpose. As the spending objective gets closer, an investor’s perspective on risk changes and therefore changing asset allocation as a spending objective gets closer makes sense.

There are a number of considerations around how to structure a glide path and the best solution depends on both the investor and the spending objective. This brief paper explains the factors that are important to setting up effective glide path solutions.

**Spending Objectives**

The term “spending objective” is used to define the purpose for the investment funds. It could also be referred to as an obligation or a liability. Some examples of spending objectives include:

* Endowment – operating expenses for a non-profit organization
* Foundation – 5% spending requirement
* Pension plan – benefit payments
* Insurance company - claims
* Individual retirement – income after a person stops earning employment income
* College savings – tuition and other college expenses for a child
* Housing – down payment for a house

The spending objectives can be differentiated by several factors which have relevance for determining appropriate asset allocation. Specific factors that impact solutions are covered in the sections on Institutional Spending Objectives and Individual Spending Objectives.

**Risk Perspective**

As an investor’s spending objective gets closer, their perspective on risk is likely to change. Conventional wisdom is that equities make more sense over longer investment horizons and fixed income makes more sense over shorter periods. While there is debate about the merits of “time diversification” for equities [see call out box], this investment intuition does have merit.

As spending draws near, the sensitivity to a downturn increases. Expectations about the level of spending become established and a downturn close to the time of spending can mean that expectations are not met. There is little time to adjust expectations or to contribute additional funds towards the objective. In addition, the impact of a downturn grows as the size of the investment fund grows. Sequencing risk (risk related to the order in which returns materialize) is created as funds start to be spent because a downturn in the next year will be harder to recover from in future years once funds are being spent rather than added to – i.e. once cash flow is negative rather than positive.[[1]](#footnote-1)

For these reasons, the investment objective evolves as the spending objective gets closer and this is portrayed below. In the accumulation period, not meeting the expected return will require bigger contributions or a longer accumulation period. That risk gradually gives way to the impact of a downturn as described above. The specific timing of the downturn creates the issue. A downturn close to or during the spending horizon can be hard to recover from, even if a robust recovery occurs.



Because of the way risk perspective changes, the nature of the investment objective is different while funds are being accumulated versus while they are being spent. There are several ways to characterize the issues and factors that impact the investment objective as shown below. The investment objective is rarely defined exclusively by accumulating or by spending, but instead evolves over time from when the spending objective is far away until the investor is in the middle of the spending horizon as portrayed below.



These ideas support the typical glide path approach that we see in target date funds and college savings plans which reduce risk as the time period until spending starts decreases. However, the typical glide path may not take careful enough account of how the nature of the spending objective should shape the perspective on risk.

**Liability Perspective**

The last item in the figure above deserves explanation. When a spending objective exists, the risk of not meeting it naturally defines the spending objective. The spending objective creates a kind of “liability” and a full understanding of investment risk must include both the assets and the spending objective liability. When a spending objective is far in the future it may yet to be defined by specific needs or expectations and will often grow substantially with inflation. Assets with higher return expectations that grow in value with inflation and the economy over time, such as equities, make sense. To the extent it is valuable to an investor, volatility in the returns of those growth assets can be mitigated by diversifying into other asset classes. However, as the investor’s spending need or desire becomes better defined, it becomes more important to secure it with reliable cash flow from the investment portfolio, for example, from high quality bonds. Several factors may be important:

* Inflation – will the spending objective increase with inflation or is it fixed? If it increases, is it general inflation (CPI) or specific inflation (house prices or college expenses) that is important?
* Currency – since spending will typically happen in the domestic currency, foreign exchange risk becomes more significant as the spending objective approaches.
* Duration – high quality bonds which match the payment horizon of the spending objective will have the lowest level of risk. Interest rate sensitivity is not a risk when assets are intended to provide cash flow to secure a spending need. The value of the spending objective changes with interest rates in the same way that the value of bonds do.

Meeting a spending objective is easier when yields are higher, or equivalently when asset prices are lower. When interest rates are high or equity prices are low, fulfilling a spending objective will be easier. This leads to the practice of determining a present value for the spending objective by applying interest rates from a yield curve to value the future payments. This is common for pension plans but can be applied to other objectives as well. The potential to fulfill any spending objective decreases when asset prices are high (yields are low). High asset prices also increase the potential for a significant downturn and decrease the potential for a significant recovery from the downturn.

**Institutional Spending Objectives**

The table below summarizes the key characteristics of some common institutional spending objectives. These institutional solutions are characterized by overlapping accumulation and spending horizons such that the perspective is never exclusively based on accumulating or spending. For a pension plan, the perspective evolves as the plan population ages and the population of retirees grows. For an endowment or foundation, the two perspectives are likely to be balanced much of the time and the idea of a glide path is not usually relevant.

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristic of Spending Objective** | **Public Pension, Open** | **Corporate Pension, Closed** | **Endowment/ Foundation** |
| Floor (minimum spending requirement) | Yes, promised |  | Yes |
| Other sources if below floor | Yes (lower profit) |  | No |
| Ceiling (no value in spending above a certain level) | Very high relative to floor | Yes, excise taxes | No |
| Inflation | Yes, often partial | No | Yes |
| Accumulation time horizon | Decreases over decades | Decreases each year | 0 years |
| Accumulation time horizon flexibility | Some | Some | None |
| Funding requirement | Yes | Yes | No |
| Spending time horizon | Perpetual | 20-30 years | Perpetual |
| Percent of total capital for investor | Small to Significant | Small to Significant | All |

**Individual Spending Objectives**

The table below summarizes the key characteristics of some common individual spending objectives. Glide paths are highly relevant for these objectives. Spending objectives for college and housing are characterized by short spending horizons which means that a badly time downturn can be very harmful. Retirement is characterized by an uncertain spending horizon and insurance or another mechanism that pools longevity risk and provides income to an investor while they are still living can be a useful way to increase spending capacity.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Retirement** | **College** | **Housing** |
| Floor | Yes, desired | No | Yes |
| Other sources if below floor | No (except house, kids) | Yes (other discretionary, loans) | No |
| Ceiling | No | Yes, 10% penalty but not likely to hit | No |
| Inflation | Yes | Yes, tuition | Yes |
| Accumulation horizon | 20-40 years | 5-15 years | 2-10 years |
| Accumulation horizon flexibility | Some, retire later | None | Yes |
| Funding requirement | No | No | No |
| Spending horizon | 20 – 30 years | 4 – 6 years | 1 year |
| Percent of total capital | Most or all | Some | Significant |

Each of these characteristics which distinguish the spending objectives may influence the investment approach during accumulation and during the spending horizon. The characteristics can be translated into an aspect of an objective function and have relationships to the relevant utility function. The characteristics are described below

* Floor – a minimum amount of funds or spending is needed to fulfill the objective so there is risk related to falling below the floor. The marginal utility of additional funds increases significantly at the floor. If the minimum spending need will not come entirely from invested funds, then there is effectively no floor – e.g. for college savings.
* Ceiling – some amount of funds will be more than can be used effectively to satisfy the objective. In terms of a utility function, the marginal utility of additional funds decreases significantly at some point. This is the case for corporate pension plans.
* Inflation – different types of cost increases impact spending objectives and different asset classes can align with inflation increases in the spending objective. Most spending objectives have some relationship to inflation, but corporate pensions do not.
* Accumulation horizon – the period over which the invested funds are increased with contributions
* Funding requirement – any legal requirement for the investor to contribute a minimum amount of funds
* Spending horizon – the typical period over which funds are spent. The ranges given are intended to capture the typical range of years over which most of the funds will be spent. Shorter spending horizons significantly increase the impact of a near-term downturn.
* Percent of total capital – How much of the investors total capital will be dedicated towards the spending objective at the time the spending objective begins. Because a retirement investor is likely to dedicate a substantial portion of their invested savings to their retirement objective, the comparison of financial to human capital as described in the footnote is of relevance for the retirement spending objective – the only other source of funds is from working.

**Time Diversification.** [Call Out Box]

Time diversification is the idea that equity risk decreases as the time horizon increases, such that equity investments make more sense for investors with longer time horizons. For many investors this is intuitive, but there is a theoretical argument against this idea. When investors are assumed to be typically risk averse and when equity returns are assumed to be independent of each other, it can be shown that equity risk increases over time (see Kritzman, 1994 FAJ).

It is certainly worth being aware of the theoretical argument against time diversification. It is also worth understanding the evidence for mean reversion in equity markets and the behavioral preferences of investors which may support the concept of time diversification. Reasons to question the classic argument against time diversification include:

* Evidence of mean reversion in markets (see Blanchett, Finke, Pfau, 2014 Advisor Perspectives)
* Risk aversion may be lower over longer time horizons (Jaggia, Thosar, 2000 Journal of Psychology and Financial Markets; Olsen and Khaki, 1998 Financial Analysts Journal)

1. For a retirement saver these ideas are often captured as a comparison of financial capital and human capital. Human capital is high when a retirement saver is young which provides flexibility to add more funds. As human capital decreases with age, financial capital increases which creates more sensitivity to downturns. [↑](#footnote-ref-1)