Goal-Based Investing Index Series- Highlights

July 2019 Highlights

- The first four months of 2019 were a bull period for equities, with a return of 16.2% for the S&P 500 index from 1 January to 1 May. During the same period, the GHPs of the various indices posted lower returns. For instance, the GHP for an individual targeting 20 years of non-adjusted replacement income and planning to retire in 2038 had a return of 3.73%;
- The outperformance of the equity building block with respect to the GHP caused the allocation to the former building block to increase, as prescribed by the systematic rebalancing rule of the indices. But for the latest retirement dates, in 2038 and beyond, the equity allocation at the beginning of the year was already large, above 75%. As a result, these indices had an even larger equity allocation at the beginning of May, and some of them were even fully invested in equities: this was the case for the GHPs of investors retiring in 2058;
- The market landscape in May was very different, with a downturn in equities and a decline in interest rates. The S&P 500 index had a return of – 6.13%, and the PSP used in Goal-Based Investing Indices a return of – 5.72%. In the same month, GHPs had positive returns, but the indices that had a large equity allocation, sometimes equal to 100%, at the beginning of May, did not benefit from the positive return of their GHP and were impacted by the negative equity returns;
- As a consequence of the underperformance of equities with respect to the GHP in May, the equity allocation decreased in all indices, and the change was sometimes severe. For the individual targeting 20 years of non-adjusted replacement income as of 2038, the equity allocation dropped from 100% to 57.1% in May;
- In June, equities recovered, with a return of 8.01% for the S&P 500 index, and all indices captured a fraction of this good performance, in proportion to their equity allocation;
- As usual, the Goal-Based Investing Indices have by construction close to 100% chances of reaching the essential goal, which is to avoid January-to-January losses relative to the corresponding Goal Price Indices greater than 20%. In contrast, traditional forms of target date funds with a deterministic stock-bond allocation can only reach this objective by chance, so they have lower success probabilities. The risk of failure for deterministic funds is especially large at the longest retirement horizons.

April 2019 Highlights

- Decreasing interest rates combined with shortening horizons imply positive returns for GHPs. This rule was confirmed in March 2019: for investors targeting replacement income, returns ranged from 3.57% for a retirement date in 2023, to 11.65% for the longest horizon, which corresponds to a retirement date in 2058. These differences are explained by the differences in the durations of the portfolios, with the longest horizons implying the greatest exposures to changes in interest rates;
- On the equity side, the PSP posted positive performance in March 2019, thereby continuing a regular rising trend that started after Christmas 2018. After 8.27% in January and 3.89% in

February, it earned 2.39% in March. With the S&P 500 index at about 2,860 at the beginning of April versus 2,920 at the high in October 2018, US equities have almost recovered from the losses recorded in the last three months of 2018;

- With both their building blocks earning positive returns in March, the Goal-Based Investing Indices displayed positive returns too. But longer retirement horizons imply greater allocations to the PSP, as a result of the weighting policy that recommends that the equity allocation be an increasing function of the horizon. So, indices for retirement dates in 2038 and after, which are entirely or almost entirely invested in the PSP, captured just the PSP return, which, while being positive at 2.39%, was less than that of the GHP;
- The probabilities of reaching aspirational goals of 130%, 150% and 200% are the probabilities for portfolios to outperform their reference Goal Price Index by 30%, 50% or 100% by the retirement date. Those of the Goal-Based Investing Indices are very close to those of target date funds with the same horizon, but with a traditional glide path from equities to bonds. The difference, however, is that the Indices have, by construction, a 100% (or close to 100%) probability of attaining at least 80% of the performance of the Goal Price Index every year, while target date funds can only achieve this level by chance. As a consequence, probabilities for target date funds can be much lower than 100%.

January 2019 Highlights

- Over the first three quarters of 2018, the general move was a rise in long-term interest rates that caused negative returns for GHPs in many months. On the other hand, the PSP followed a roughly rising trend. According to the weighting rule described in the Ground Rules of the Index Series, the percentage allocation to the PSP in an index is increasing in the relative return of the PSP with respect to the GHP, so this allocation tended to increase until the autumn of 2018. Indices with the longest retirement horizons (2038, 2043, 2048, 2053 and 2058) even became fully invested in the PSP;
- Any change in the value of a Goal-Based Investing Index is the result of changes in the values of its constituents (the GHP and the PSP) and the relative weighting of these constituents in the index. With high PSP allocations, indices with long horizons were severely exposed to the US equity market downturn in December: the three major US stock indices (NASDAQ, Dow Jones and S&P 500) experienced substantial losses. In particular, the PSP lost 10.04%, so all indices that were entirely invested in this constituent at the beginning of December displayed the same negative return. Indices with retirement dates in 2023, 2028 or 2033 posted less negative returns in December, but still less than –4%;
- The rebalancing rules of the index series stipulate that in every January, each Goal-Based Investing index is rebalanced back to the weights of a deterministic target date fund with the same target date as the index. This rebalancing operation takes place irrespective of market conditions, so January is the only month in the year where the relative weighting of the two constituents does not reflect their respective past performances and is driven solely by the retirement date. For all indices, rebalancing has led to a lower PSP allocation than at the beginning of December 2019. Just as in a standard target date fund, indices with longer horizons are more exposed to the risk of equities falling once more as well as to the chance of equities going back to higher prices.

October 2018 Highlights

- In each index series, the GHP replicates a Goal Price Index, so the negative returns posted by Goal Price Indices translate into equally negative returns for the various GHPs. This happened in September, with all GHPs displaying negative returns. The most negative returns are those of the GHPs with the longest duration, that is the highest exposure to interest rate risk: the GHP for retirement income starting in 2058 had a return of – 9.32%, versus – 2.54% for the 2023 GHP;
- Equities in the PSP have displayed positive performance over the summer, with a return of 7.76% from the beginning of July to the beginning of October (7.77% for the S&P 500 with dividends reinvested), although the rise is slowing down, with a return of 0.96% in September (0.94% for the S&P 500). Since the beginning of the year, the PSP has grown by 11.10% (10.97% for the S&P 500);
- The dynamic investment policy implemented in the Goal-Based Investing Indices commands a higher allocation to equities when the PSP outperforms the GHP, and conversely, a lower allocation when it underperforms. In view of the outperformance of the PSP with respect to the GHP over the past months, the dynamic portfolios are now mainly invested in the PSP. This is especially true for the most distant retirement dates for two reasons: first, these strategies have by design a higher allocation to equities, like standard target date funds, and second, the return spread between the PSP and the GHP is higher for these indices than for the short-maturity ones. For retirement in 2038 or after, all strategies are now fully invested in the PSP, so the September performance of these indices coincides with that of the PSP;
- If good PSP performance were to persist in the next few months and interest rates were to rise again, the dynamic strategies would remain largely invested in the PSP until January 2019, where the allocation will be revised for all indices and will be set back to the allocation of a target date fund;
- Recent outperformance of the PSP with respect to the GHPs has resulted in outperformance of each Goal-Based Investing Index with respect to its GHP between January 2018 and October 2018. The natural benchmark for each index is its GHP, and outperformance of the index means that an investor who would have entered the dynamic strategy would have seen an increase in the purchasing power of his/her savings in terms of replacement income or retirement wealth;
- This recent outperformance also implies good probabilities of reaching aspirational goals, which are levels of replacement income or retirement wealth greater than 100% of the initial purchasing power. For all investors retiring in 2028 or later, the probability of increasing the initial purchasing power by 30% at least is greater than 70%. Investors who have more time to retirement and plan to retire in 2038 have more than 80% chances of seeing an increase by 50% or more.

July 2018 Highlights

- Since January 2018, the PSP (the equity portfolio) has outperformed all GHPs (replicating the Goal Price Indices). As a result, and in line with the rule-based allocation policy, all indices have a substantial allocation to the PSP, but the effect is more pronounced for long horizons, because equity allocation tends to increase with the horizon, like in standard target date funds: the 2023 indices for an income goal have 53.3% in PSP, the 2038 ones have 86.0% and the 2058 ones are 100% invested in PSP. These numbers will not decrease significantly until market conditions change and feature rising bond prices and falling equity prices;

- In June, however, the PSP posted a slightly negative return of – 0.15%, while GHPs had positive returns (e.g., 2.53% for the 2038 index for an income goal). As a result, indices had either small positive or negative returns (e.g., – 0.15% for the 2058 index for an income goal, and 0.19% for the 2023 index). Negative returns were posted by those with the heaviest PSP allocation, i.e. by those with the longest horizons;
- Probabilities of reaching aspirational goals are very close for the index and for the deterministic target date fund, meaning that these strategies are close in terms of upside potential. But the indices have much greater probabilities of respecting the annual loss objective, especially over long horizons: the 2058 target date fund has only a 19% chance of respecting this goal when the goal is expressed in terms of replacement income.

A Few Keys to Understand Index Values

- These indices represent the value of a dynamic portfolio strategy invested in a PSP and a GHP. The GHP replicates the performance of a Goal Price Index;
- Each Goal-Based Investing Index has the same characteristics (wealth or income objective and retirement year) as the Goal Price Index that its GHP replicates;
- By construction, and because the annual COLA is constant (2% per year), an index for a wealth goal with COLA has exactly the same performance as the index with the same characteristics (wealth objective and retirement year) but with no COLA;
- The PSP is taken to be the a broad equity index, namely the US cap-weighted index calculated by Scientific Beta;
- Together with index values, the website reports the index composition (past and current) and the estimated probabilities for the index to reach "aspirational goals", defined as levels of retirement wealth or replacement income that an individual was unable to secure with his/her resources in January 2018 but that he/she expects to reach by retirement if markets perform sufficiently well;
- Probabilities are also reported for a deterministic target date fund invested in equities and a standard bond portfolio.

About the EDHEC-Princeton Goal-Based Investing Index Series

The EDHEC-Princeton Goal-Based Investing Index Series is a joint initiative of EDHEC-Risk Institute and the Operations Research and Financial Engineering (ORFE) Department of Princeton University that aims to promote the use of state-of-the-art goal-based investing principles in retirement investing. At the root of this initiative is the recognition that none of the existing "retirement products" provides a completely satisfying answer to the threefold need for security, flexibility and upside potential. Annuities offer security, but at the cost of fees and surrender charges. Target date funds have more moderate costs and they have growth potential, but they offer no guarantee in terms of wealth at the horizon or in terms of replacement income. This is a concern because the evolution of accounting and prudential regulations have led to a massive shift from defined-benefit pension to defined-contribution pension schemes across the world, implying a transfer of retirement risks from corporations to individuals.

To foster interest in the investment industry for the launch of new forms of retirement investment *solutions*, EDHEC-Risk Institute has partnered with Princeton University's ORFE department to launch the EDHEC-Princeton Retirement Goal-Based Investing Index series. The first family of indices, called the Retirement Goal Price Index series, represents the price of $1 of retirement wealth or $1 of replacement income per year. This number, which is available for a range of retirement dates, can be used to evaluate the purchasing power of savings in terms of retirement wealth or retirement income and answer the question: are my savings sufficient to secure my wealth or income objective? The second family, the actual Retirement Goal-Based Investing Index series, represents the performance of improved forms of target date funds invested in a goal-hedging portfolio (GHP) and a performance-seeking portfolio (PSP). The role of the GHP is to replicate changes in the price of retirement wealth or replacement income (i.e. to replicate the performance of a Goal Price Index).

The PSP is introduced to have a chance to increase the purchasing power of savings, which will happen, in effect, if the PSP outperforms the GHP. If it underperforms, the allocation policy implemented in the improved target date fund ensures that short-term losses in purchasing power are limited in size: in the index series, the cap is set to 20% per year. In a nutshell, the investment rule is to increase the percentage allocation to the PSP as long as it performs well with respect to the GHP and to reduce it when the situation reverses.

To design the EDHEC-Princeton Goal-Based Investing Index Series, EDHEC-Risk Institute has built on its expertise in the fields of asset-liability management and goal-based investing. This expertise has been developed since the Institute's foundation in 2001 through a number of partnerships with prestigious industry players, notably including the leading provider of comprehensive wealth management and investment services, Merrill Lynch, who supported a research chair on goals-based wealth management. The values of the indices are published on EDHEC-Risk Institute website at

https://risk.edhec.edu/indices-investment-solutions

Also available on the website are research papers on goal-based investing and its application to the retirement problem, the detailed construction rules of the indices and a number of articles published in the general or financial press.