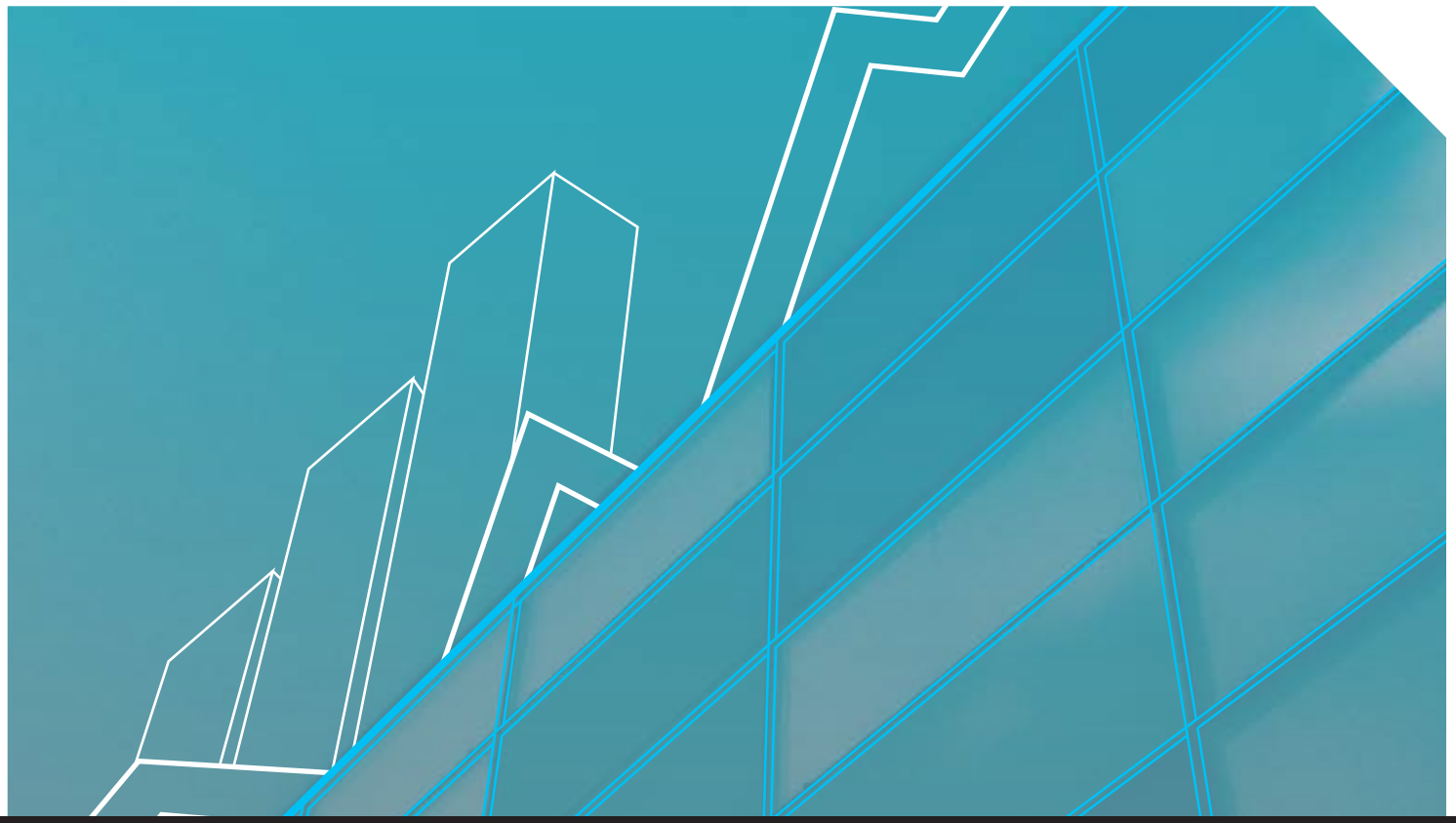

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Allocating Real Estate Assets to Retirement Portfolios

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EXECUTIVE SUMMARY

In this report, we test the investment case for real estate, as an asset class, to be included in defined contribution (DC) plans. We compare assets allocations with exposure to real estate against traditional equity/fixed income asset allocation strategies. We find that allocating to both listed and unlisted real estate assets in retirement portfolios can enhance the risk-return profile of DC investment designs and improve the probability of successfully achieving desired retirement outcomes.

Employing a simulation approach using historical data, we test a range of DC-style asset allocations (including target date and target risk funds) that include an allocation to both listed and unlisted real estate versus comparable designs without real estate. We find that portfolios with a relatively modest allocation (i.e., 10%) to a real estate blend achieve similar expected outcomes (and in some cases better results) with less tail risk and volatility than a conventional portfolio without such a real estate allocation.

Based on this evidence, we recommend that DC plan sponsors give strong consideration to allocating to listed and unlisted real estate investments when DC plan performance is evaluated using outcome-oriented measures of success.

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The principal motivations for adding real estate investments to retirement portfolios during the accumulation phase in defined contribution plans include:

- DIVERSIFICATION AND REDUCTION OF OVERALL PORTFOLIO RISK
- A HEDGE AGAINST INFLATION
- RELATIVELY STABLE CASH FLOWS TO THE PORTFOLIO IN THE FORM OF RENTAL INCOME

Exposure to real estate investments can be achieved in a number of ways, depending on the degree of separation between the investor and these types of assets. Pension funds can gain direct exposure to properties or indirect exposure through listed property vehicles (such as real estate investment trusts, or REITs). Increasingly, defined contribution plans in the U.S. are looking to invest in unlisted real estate assets for at least part of their portfolio, as shown in Andonov et al. (2013). While investment in private, or unlisted real estate has a long heritage in defined benefit type plans, it remains a puzzle as to why there has been very little adoption by DC plans.

Listed real estate securities, represented by REITs, provide an easily implemented exposure to real estate and are generally preferred by DC plans because they are administratively simple due to their liquidity and valuation cycles that mirror stocks and bonds. Even relatively small investors can acquire a well-diversified global property exposure through listed property securities. Unlisted real estate, in contrast, is typically more complex and requires more intensive management, especially when investments are executed internationally. Thus, private, direct real estate is generally a preferred option for larger funds with more assets to invest. In the context of DC plans, there are a number of operational considerations – expectations for daily valuations and liquidity in particular – which appear, at first glance, to limit more significant allocations to unlisted real estate.

Andonov et al. (2013) highlights the integral role that real estate plays in institutional portfolios globally. It is the third-largest asset class for institutional investors and the most prominent alternative class. In a mean–variance framework, Hudson-Wilson et al. (2005) show that real estate investments achieve the majority of investors' expectations[1]. However, in reality, questions concerning the role of real estate within DC plans remain. In addition to the valuation and liquidity considerations mentioned previously, in some jurisdictions, common practices may also act as a constraint to allocations to non-traditional asset classes, including real estate.[2]

While the virtues of investing in real estate are well known, the process for optimizing and allocating a portion of a DC plan's portfolio to real estate assets is less so. In an environment where DC plan asset allocations are subject to more scrutiny (particularly post the Global Financial Crisis, or GFC), this study considers the role of both listed and unlisted real estate for a range of extant DC portfolio designs. In contrast to the usual way in which DC plans are evaluated (typically, time-weighted measures of success), we consider performance from the perspective of the plan participant by reporting outcome-oriented measures of success.[3] In practical terms, we consider the role of real estate in a range of asset allocation approaches common to DC plans (balanced and target date) using a selection of performance and risk measures (e.g. conditional value-at-risk, or CVaR).

[1] Brounen et al. (2010) and Chun et al. (2000) found contrary outcomes when accounting for pension fund liability obligations.
[2] For example, in Australia, default offerings tend to have similar asset allocations. Significantly different allocations to asset classes like real estate would generally be unusual because of the perceived business risk (i.e. potential fund outflows) associated with having worse returns than the peer group.
[3] For further discussion on time- versus wealth-denominated performance measures, see Bianchi, Drew, Evans and Walk (2014).

At present, the US pension system is the largest in the world with around $19 trillion in assets (or 113% of GDP): of this, the proportion of DC plan assets is estimated to be 58% and growing (Towers Watson, 2014).[4] This momentum shift in the US pension system from defined benefit (DB) to DC plans has focused attention on the ability (or otherwise) of current DC plans and their investment designs to meet the retirement income goals of plan participants. One of the many lessons from the GFC has been the critical role of the sequence of returns (or path dependency) experienced by plan participants late in their accumulation phase and early in the retirement phase. This experience has driven innovation in asset allocation strategies (how to structure the portfolio?) and asset selection strategies (which assets to choose?) within DC plans. Furthermore, it has illustrated the dangers of measuring success in retirement portfolios simply as the mean and standard deviation of time-weighted returns.

So what do current plan portfolios look like?[5] In general terms, US pension fund asset allocations remain dominated by investments in stocks and bonds. However, there has been substantial growth in alternative assets in the past decade. In 2009, stocks, bonds, and cash accounted for 47.1%, 36.9%, and 2.5% of retirement fund portfolios respectively, while the remaining 13.5% of the portfolio was invested in alternative assets. Real estate is the most common alternative asset class included, with an average allocation of 5.1% in 2009, followed by private equity (3.6%), hedge funds (2.9%), and other alternative assets (1.8%) (Andonov et al., 2013). In practice, the majority of pension funds invest in some form of real estate. Pension funds in the United States are about as likely as the global average to invest in real estate, while Canada's funds have historically been less likely to invest in real estate assets. Funds in Australia, New Zealand and especially Europe[6] typically have higher allocations to real estate (Andonov et al., 2013) (see Exhibit A).

[4] It is also important to note that there is only one other major pension market that is more DC dominated than the US, namely Australia, where DC assets comprise 84% of the total (Towers Watson, 2014).
[5] The numbers cited in Andonov et al. (2013) are thought to cover all pension funds (i.e. both DC and DB plan types).
[6] Over 95% of the European pension funds invest in real estate.

Exhibit A – European pension fund real estate investment

To illustrate the approach of European pension funds to investing in real estate, we briefly discuss the first European Institutional Real Estate Survey conducted by IPE, which covers 83 pension funds, and accounts for more than €100 billion ($US 136 billion) in property investments and total assets of €1.29 trillion ($US 1.76 trillion) (IPE International Publishers Ltd, 2013).

Figure A outlines the ways that European pension funds gain their real estate exposures by the location of that exposure. Particularly noteworthy is the dominance of private, unlisted real estate as the vehicle of choice among survey respondents with almost 99 percent of domestic (i.e. home country) investment, and around 80% of Europe ex domestic investments. The differences between home country and non-home country allocations are consistent with expectations: investors are typically more comfortable making direct (unlisted) investments in real estate where they understand the legal and business environment they face. When investors venture out of their home country, more prefer to invest in real estate securities where transparency and disclosure standards are (arguably) higher by virtue of being listed. For example, while unlisted real estate exposures to the US and Asia still comprise the majority, the proportions allocated to real estate securities in these two geographies are the highest among all exposures with between 30 and 40 percent allocations.

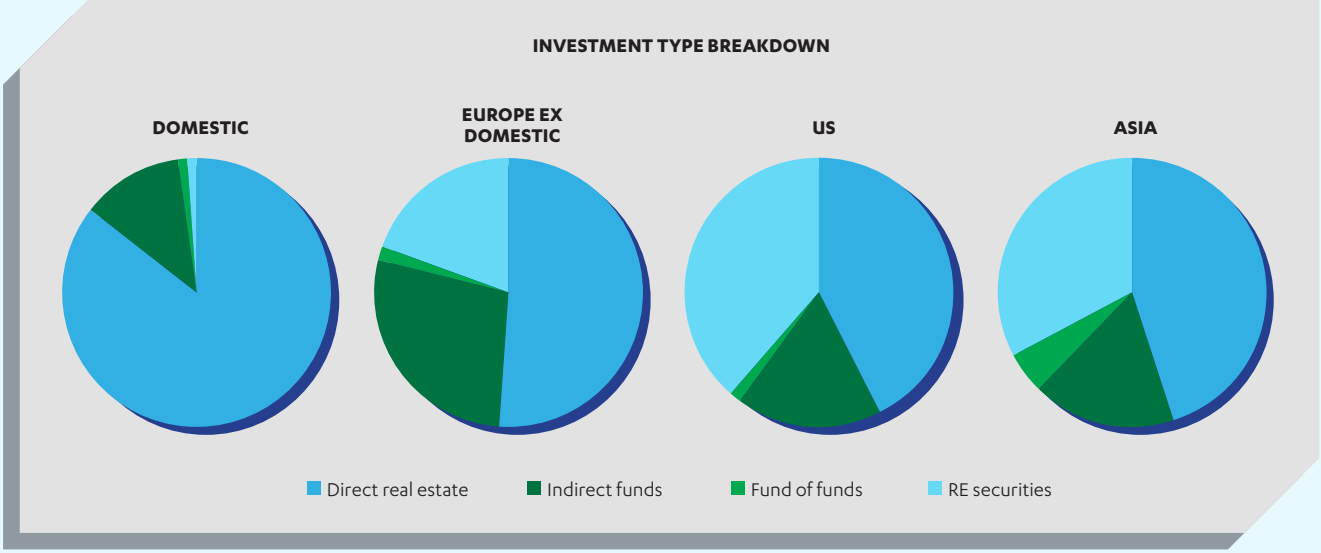


Figure A: Investment type breakdown by domestic and other European but non-domestic investments.

The survey notes that most investors use listed exposures for one or more of the following reasons: diversification, liquidity or to access niche asset sub-classes (IPE International Publishers Ltd, 2013, p. 5). The report hints that the popularity of listed real estate may also be related to the supply of assets, highlighting that the US has a "significant REIT market" that comprises "around half of the [total global] listed market" (IPE International Publishers Ltd, 2013, p. 5).

While European pension funds already appear comfortable with real estate investing, there are signs that further increases in allocations are likely. Despite reporting relatively stable allocations, the biggest grouping of respondents intends to "maintain or increase its real estate allocation by up to 2% over the next two years" (IPE International Publishers Ltd, 2013, p. 2). The next largest grouping plans to increase its allocations further by 3–5%.

Institutional investment in listed real estate is relatively uncontroversial, as it takes the form of listed securities in a company (and/or trust). Existing allocations are implemented explicitly through allocations to REITs and/or implicitly through exposure to broad stock indexes which typically incorporate REITs to some extent. DC plans' investment in private, unlisted real estate is yet to match the exposure of their DB counterparts, despite the increasing attractiveness of "stable, income-producing investments" (IPE International Publishers Ltd, 2013, p. 2). The natural question is: why not?[7]

Notwithstanding some of the practical issues involved in implementing allocations to private, unlisted real estate in DC plans, we are motivated here to test the investment case. The remainder of the study is organized as follows:

Section 3 outlines the data and methodology employed. We take a bootstrap simulation approach using historical data to test for a range of asset allocations both with and without an allocation to a blend of unlisted and listed real estate. The results of the study are presented in both tabular and heat map forms.

Section 4 highlights results by asset allocation and performance and risk measures. We show that by adding a blend of listed and unlisted real estate to a traditional DC plan design, the plan sponsor can improve the risk characteristics of a portfolio without affecting performance and in some instances enhancing portfolio outcomes.

Concluding remarks are provided in **Section 5**.

[7] We noted earlier that there are at least two known barriers to further institutional investment in unlisted real estate, namely valuations and liquidity. We discuss these matters in Exhibit F.

Data covers the period from January 1978 to January 2014. A range of indices were used to serve as a proxy for the traditional asset classes. The S&P 500 return series is used to represent US stocks while the MSCI ACWI (All Country World Index – excluding the U.S.)[8] is used to represent foreign stocks. US bonds are represented by the Barclays US Aggregate[9], the Barclays Global Aggregate[10] is used to represent foreign bond data and the 3-month US Treasury Bill yields are used to represent US cash returns. The FTSE NAREIT U.S. Real Estate Series[11] is used as a proxy for listed US real estate investment returns while an NFI-ODCE Value Weighted Index is used to represent unlisted real estate investment returns.[12]

The summary statistics for the data are reported in Table 1, and Exhibit B provides a technical commentary of these statistics and what they mean for the methodology employed herein. Listed real estate offers higher returns and risk than large-cap stocks (listed real estate is less volatile than mid-cap and small-cap stocks). In contrast, private unlisted real estate (core equity strategy) has returns closer to those of bonds but with significantly lower (reported) risk than stocks. In deciding how to incorporate the blend of real estate into the asset allocation strategies examined herein, we used these estimates to justify taking equivalent allocations from stocks and bonds. In very general terms, unlisted, core real estate could be argued to be a reasonable replacement for bonds because of its regular income, low (reported) volatility and low correlation to listed markets (see Table 2). Furthermore, some would argue that some types of unlisted real estate have inflation hedging characteristics (i.e. retail properties) making the asset class a reasonable defensive asset from the perspective of a liability-driven investor (IPE International Publishers Ltd, 2013, pp. 13-14). Listed real estate is traded on stock exchanges and included in broad stock indices and therefore taking from the stock allocation for this element of the real estate blend is defensible. An equally weighted portfolio of listed and unlisted real estate would have experienced annualized returns of 11.63% and volatility of 9.21%, which takes advantage of the low measured correlation of 0.15 between listed and unlisted real estate observed since 1978. These outcomes, however, ignore the performance of real estate during various economic conditions (such as contractionary and expansionary monetary cycles) and the important correlation benefits provided to long term investors.

	US STOCKS	FOREIGN STOCKS	US BONDS	FOREIGN BONDS	US CASH	REAL ESTATE (LISTED)	REAL ESTATE (UNLISTED)
Mean	12.52%	8.21%	7.87%	6.64%	5.07%	13.90%	8.38%
St Dev	15.82%	18.90%	6.59%	6.11%	1.79%	17.72%	5.53%
Skew	-0.90	-0.63	0.93	0.25	0.55	-1.76	-3.07
Kurt	1.57	0.89	5.06	-0.69	0.10	9.46	13.47
JB-Stat	34	10	174	3	7	611	1,315
P-value	0.00	0.01	0.00	0.23	0.02	0.00	0.00
n	144	104	144	96	144	144	144
Max	21.35%	27.94%	18.78%	8.93%	3.81%	33.28%	6.44%
Min	-22.53%	-22.29%	-8.71%	-3.83%	0.00%	-38.80%	-13.69%

Table 1: Summary statistics for quarterly gross returns of US stocks, foreign stocks, US bonds, foreign bonds, 3-month T-bills and listed and unlisted real estate, January 1978 – January 2014. Refer to Exhibit B for a discussion of these summary statistics.[13]

[8] The MSCI ACWI (All Country World Index – excluding the U.S.) index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets excluding the U.S. As of November 2008 the MSCI ACWI consisted of 46 country indices comprising 23 developed and 23 emerging market country indices. The developed market country indices included are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom. The emerging market country indices included are: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey.

[9] The Barclays US Aggregate index covers the U.S. investment grade fixed rate bond market, with index components including treasuries, government-related & corporate securities, MBS pass-through securities, ABS, CMBS securities; must be at least one year to final maturity (ABS > remaining average life of 1 year), must be rated investment grade or better, and must be publically issued securities although 144A securities with registration rights are included. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis. The lower limit of par outstanding is $250 million.

[10] The Barclays Global Aggregate index provides a broad-based measure of the global investment-grade fixed-rate debt markets. The three major components are the U.S. Aggregate Index, the Pan-European Aggregate Index, and the Asian-Pacific Aggregate Index. The index also includes Global Treasury, Eurodollar, Euro-Yen, Canadian, and Investment-Grade 144A index-eligible securities not already in the three regional aggregate indices.

[11] The FTSE NAREIT US Real Estate Index Series is designed to present investors with a comprehensive family of REIT performance indexes that span the commercial real estate space across the US economy, offering exposure to all investment and property sectors. In addition, the more narrowly focused property sector and sub-sector indexes provide the facility to concentrate commercial real estate exposure in more selected markets.

[12] The NFI-ODCE Value Weighted Index is measured on a quarterly basis.

[13] Consistent with common practice the summary statistics reported in Table 1 are gross returns. In the analysis returns net of actual fees have been used.

Exhibit B – Summary statistics and their implications

Descriptive statistics for each of the seven time series were computed based on quarterly returns and reported in Table 1: annualized arithmetic mean return ("Mean"), annualized standard deviation ("St Dev"), skewness ("Skew"), kurtosis ("Kurt"), the calculated Jarque-Bera test statistic ("JB-Stat") , and the probability value associated with the Jarque-Bera statistic ("P-value"). The Jarque-Bera statistic is a widely-used statistical test for normality that summarises the combined effects of skewness and kurtosis in a single measure (Jarque and Bera, 1980; 1987). Under the null hypothesis the Jarque-Bera test statistic has a chi-square (2) distribution with two degrees of freedom. When the probability value ("P-value") is small, the null hypothesis of a normal distribution is rejected. For each time series – with the exception of foreign bonds – strong non-normality is observed with very large Jarque-Bera statistics and correspondingly small P-values. This finding is generally consistent with our expectations, and with the literature relating to the statistical and distributional properties of financial returns (Mandelbrot, 1963, 1967; Fama, 1965).

The statistical characteristics of financial data have implications for the methodology employed herein. Scholars typically take one of two approaches in dealing with data in general, and the asset return process in particular. The first approach is to model a range of asset return processes, rather than assuming just one. Kritzman and Rich (1998), for example, study five different utility specifications (log, square root, power, quadratic and combination), and consider the implications for the optimal equity allocation over time assuming three different asset return processes (random walk, mean reversion and mean aversion). Many other studies follow similar approaches (Kritzman, 2000; Guo and Darnell, 2005; Fabozzi et al., 2006). So, rather than identifying the asset return process in the data in question and attempting to replicate it directly, advocates of this approach instead directly model a number of processes that have been identified in the finance literature.

The main alternative approach is to employ one or more simulation techniques that are capable of capturing the characteristics of the data being studied. Chief among these techniques are simulation methods. While simulation techniques first appear in the literature some time ago, the majority of studies employed either Monte Carlo (e.g. Fabozzi et al., 2006) or Efron (1979) style bootstrap methods (e.g. Hickman et al., 2001), which implicitly assume that the asset return process follows a random walk. It was not until later that researchers began employing block bootstrap methods; techniques that have the ability to capture the time series characteristics of returns. Bootstrapping involves setting up a data generating process (DGP) allowing researchers to make inferences from actual data. The bootstrap has been applied to a wide range of applications in finance, particularly in the area of portfolio construction.

This research employs the block bootstrap technique which began with the work of Künsch (1989). Whereas the Efron (1979) bootstrap selects a single row vector at random, the block bootstrap resamples "blocks" of successive data from the sample. By doing this, the method seeks to retain some of the serial dependence in the data while still achieving the underlying purpose of non-parametric simulation methods, which is the production of a number of synthetic time series. Each method - both Efron's (1979) and Künsch's (1989) - retain the correlation structure between the assets in the dataset. Ruis and Pascual (2002) point to the block bootstrap as a method that is designed to deal with the "dependent observations (p. 28)" common in financial data. The point here is that we are not making any claims about the time series properties of the data, we are merely selecting a quantitative technique that has been shown to handle the characteristics of financial data.

The central question in considering this last class of quantitative techniques is: What is the optimal block size? Politis and White (2004) point out that "... the optimal block size is never known in practice, and—more often than not—the block size used is

suboptimal (p. 57)." On this basis we select a block size based on our experience. We employ a block size of four (i.e. four quarters, or one year) in this analysis. It is important to note that the correlation between unlisted and listed real estate was found to be around 0.15 for the observation period (see Table 2). This correlation increases to 0.28 when unlisted RE was lagged by two quarters and then to 0.3 when lagged by four quarters. At face value, this suggests that a longer block size may be warranted for the simulation. However, the lagged association between time series will remain in the analysis when only four quarters are used and using longer blocks should theoretically make little difference to the results. To confirm our a priori expectations, we re-ran the simulation for a block size of six quarters and then eight quarters and observed no discernible difference in the results (i.e. the bootstrap results appear insensitive to block size so long as the block length is between two and 12 quarters).

	UNLISTED RE	LISTED RE	US STOCKS	US BONDS
UNLISTED RE	1.00			
LISTED RE	0.15*	1.00		
US STOCKS	0.10	0.61	1.00	
US BONDS	-0.12	0.21	0.14	1.00

Table 2: Correlation co-efficients for unlisted real estate, listed real estate, US stocks and US bonds of quarterly returns 1978 to 2014. [* Correlation between unlisted and listed real estate increases to around 0.3 at lags of between 2 and 4 quarters.]

As detailed in Exhibit B, to simulate the data we employ a block bootstrap simulation approach. The block bootstrap is the most efficient simulation approach when model residuals are correlated. Simple bootstrap methods, or other forms of residual resampling, will fail because they are unable to replicate the correlation in the data. The block bootstrap replicates the correlation by resampling blocks of data. We follow the block bootstrap process articulated in Künsch (1989). Based on experience in using the block bootstrap approach, we employ a block size of 12 months for these simulations (i.e. a block four quarters in length). The portfolio can be rebalanced, or re-main static, after every contribution. If the portfolio is rebalanced it is rebalanced at quarter-end in accordance with the asset allocation settings for each scenario.

We define two hypothetical plan participants; a 25-year old worker with a commencing salary of $40,000 and $0 in retirement savings, and a 40-year old worker with a salary of $53,835 and $100,000 in retirement savings. Each worker experiences salary increases of 2 percent per year which synchronizes the salary level of each worker (the 25-year old worker's salary will be $53,835 when he/she turns 40-years of age). Both workers contribute 8 percent per annum of their salary to a retirement plan portfolio on a continual basis throughout each working year.[14] The income of each worker in their final year of work prior to retirement is thus $88,322. We conduct the simulation for each worker using terminal portfolio values and the retirement wealth ratio (RWR) as a means for comparison (see Exhibit C). The RWR is the ratio of terminal wealth to final salary. We provide the Value at Risk (VaR), Conditional VaR (CVaR) and median results for both the terminal portfolio value (in dollar terms) and terminal RWR. Broadly, success is defined as a RWR equivalent to 12 times final salary. This is a seemingly arbitrary definition. However, it is based on research using various retiree datasets - including the University of Michigan Health and Retirement Study (HRS) - to safely permit adequate retirement income and account for the cost of inflation through retirement (Poterba, et al. 1998). We use RWR to define success because it is a tangible outcome-oriented measure, translatable into dollars, which all audiences can easily identify with.

[14] To confirm, 8 per cent is assumed to be total contributions (i.e. employee plus employer).

Exhibit C – Retirement adequacy measures

The challenge with return- or dollar-based terminal wealth measures of performance is that neither is particularly informative for the investor in terms of what performance means to their spending power in retirement. Baker et al. (2005), for example, argue that defined contribution plans should be measured in terms of their ability to generate sufficient retirement income, and Booth and Yakoubov (2000) and Basu and Drew (2009, 2010) contend that a plan participant's expectations will somehow be related to their salary immediately prior to their retirement. Therefore, we adopt Basu and Drew's (2009, 2010) retirement wealth ratio (RWRT), which is calculated by dividing terminal wealth (WT) by income at retirement (i.e. at time T). The RWRT thus provides a way of relating terminal wealth to some benchmark for the plan participant's post-retirement expectations.

Another advantage of RWR is that it normalizes expectations across income groups. For example, a high income earner and a low income earner can both relate to a RWR of 12 times final salary because it allows for their different dollar expectations based on their respective incomes. Put another way, two individuals could be targeting the identical RWR but with wildly different levels of terminal wealth by virtue of the fact that their incomes are different.

Finally, an existing study relating to the role of real estate in DC investing – Esrig (2013) – uses a version of the RWR which is described therein as "ending value multiple of final year wages" (cf. Exhibits 5-6, p. 149, of that study). In this way, this measure has precedent in the literature relating to the central question of this study.

If we assume income is required for 30 years in retirement (n), and an interest rate (r) of 4 percent per annum, we can compute the replacement rate (RR) consistent with a RWR of 12 via an annuity equivalent value (AEV) calculation as follows,

$$AEV = \frac{r(W_T)}{1-(1+r)^{-n}}$$

Let us assume that if final salary equals $1 and terminal wealth = $12 then the retirement wealth ratio at retirement RWRT = 12 times then,

$$AEV = \frac{0.04(12)}{1-(1+0.04)^{-30}} = 0.69$$

$$RR_T = \frac{0.69}{1} = 69\%$$

The thresholds used in this study in RWR and RR terms are shown in section 3.2 below. The color coding that accompanies these thresholds is used in the heat maps reported later in this study.

To demonstrate the impact of adding real estate to a number of competing portfolio designs, we examine the performance of these designs both with and without the addition of a 50/50 blend of listed and unlisted real estate. To better understand the return dynamics of each investment class, Figure 1 provides a summary of the evolution of listed and unlisted real estate indices from 1978 to 2013. Listed real estate clearly outperforms unlisted real estate over the past 35 years, in part because of greater financial risk due to higher levels of leverage. However the Sharpe Ratio (SR) of each asset class is more similar than Figure 1 suggests (SR(listed) = 0.498 versus SR(unlisted) = 0.599). Based on this recent performance history, unlisted real estate may be viewed as a low-volatility/low-return alternative to listed real estate. Given the higher correlation between listed real estate and unlisted real estate when lagged by two to four quarters, Figure 1 could be plotted such that the lagged time series' align. However the granularity of the data does not materially change the structure of the graph.

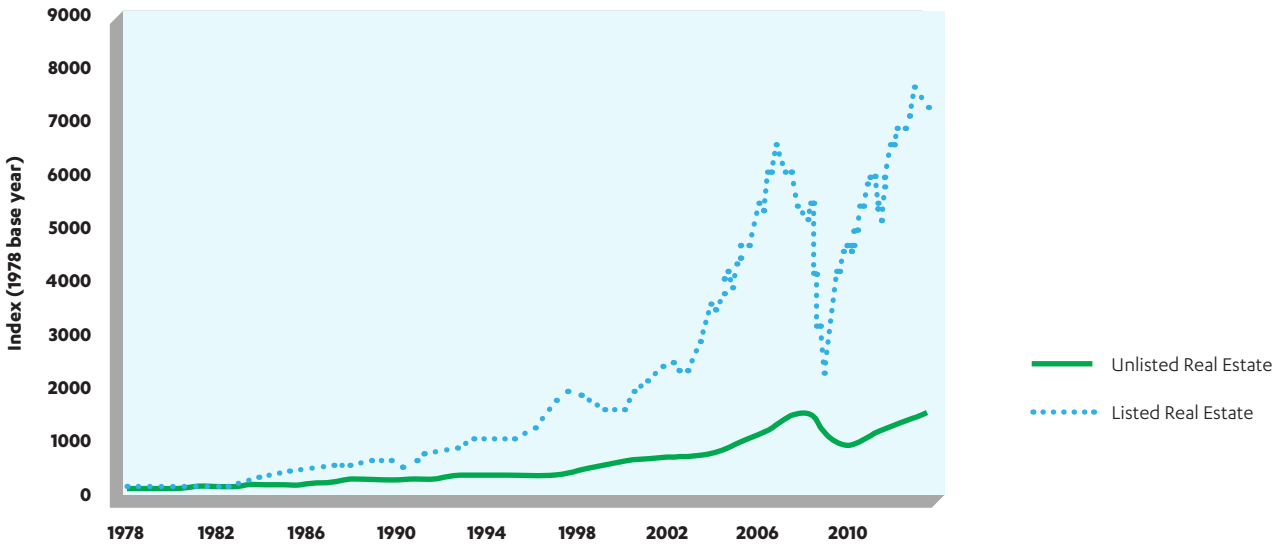


Figure 1: Listed vs unlisted real estate index profiles, 1978-2013 (index base 1978 = 100).

We now consider in detail the portfolio designs to be analyzed.

In selecting asset allocation strategies to analyze, we begin with the current institutional setting in the United States. What we set out to achieve is to select a small number of strategies to fairly represent the spectrum of asset allocation approaches available to DC plan participants (generally through existing DC menu options). To maximize the impact of this research, it would also be ideal if the strategies analyzed are also relevant to other DC-dominated pension systems like the United Kingdom and Australia.

The strategies examined in this research are as follows, along with the rationale for their selection:

100% Stocks;
100% Bonds;
100% Real Estate Blend (50% unlisted/ 50% listed);
Balanced (60% stocks/ 40% bonds);
Balanced with Real Estate Blend (55% stocks/ 35% bonds/ 10% real estate blend);
T Rowe Price Target Date Fund Glidepath[15];
T Rowe Price Target Date Fund Glidepath with Real Estate Blend;
MarketGlide Benchmark Glidepath; and
MarketGlide Benchmark Glidepath with Real Estate Blend.

The principal reason for considering an all-stock portfolio in this study is the desire to have an immediate answer to the common refrain: How does that compare to the performance of 100% stocks? The all-stock portfolio in this context is a benchmark for a wealth maximizing, long horizon, investment approach advocated by scholars such as Siegel (1994). By modeling the all-stock portfolio beside more common DC plan portfolio options we can show approximations for the upper and lower limits of performance for unleveraged portfolios.

In the same way that the all stock-portfolio provides the outer limits of potential performance for an investment portfolio, the all bond portfolio gives an indication of the performance of a low-risk portfolio over the investment horizon in question. In this way, we provide a benchmark for all other risk-oriented portfolios and introduce a basis for performance evaluation. For example, having such a benchmark allows us to balance the upside benefits of growth-oriented portfolios against the opportunity cost of the same portfolio in poor equity market conditions.

The 100% Real Estate Blend has been included to consider the outcomes achieved by an investor devoting their entire retirement portfolio to real estate investments.

Target risk funds – like the 60/40 Balanced Fund – are designed to expose the DC plan participant to a particular static level of investment risk over the planned investment horizon. The level of risk is typically determined based on the investment objective of the fund. A higher objective would imply a greater allocation to risky assets (typically stocks), than a portfolio with a lower objective ceteris paribus. From a practical perspective, while the risk exposure for a target risk fund is constant by design, the underlying investments may change with time (McMurdy, 2009).[16]

[15] We acknowledge that there are a myriad of glidepath designs that could have been used in this study. The rationale in selecting the T Rowe Price glidepath was simply to act as a touchstone that many plan sponsors could relate to, as well as providing a simple way of operationalizing the analysis.
[16] In the vernacular, asset allocation is constant, whereas asset selection may vary.

Target risk funds are widespread in jurisdictions where DC plans are predominant, for example, in the United States and in Australia, where they remain the cornerstone of superannuation fund offerings.[17] Target risk funds are typically labeled in such a way that they clearly indicate to the participant what level of risk the fund targets. For example, funds may be labeled "conservative", "balanced" or "aggressive" in nature. Between jurisdictions, the risk exposure for a given descriptive label varies. In the United States, for example, a typical "balanced" fund is comprised of 60 percent growth assets and 40 percent defensive assets; a so-called "60/40 fund" (The Vanguard Group, 2014).[18]

To examine the marginal effect of adding real estate to a DC plan portfolio, we add a 10 percent allocation to a real estate blend (50/50 listed/unlisted) by taking 5 percent each from the stock and bond allocations. As discussed earlier, in deciding how to incorporate the real estate blend, we argue that private, core, unlisted real estate is a reasonable replacement for bonds because of its regular income, low (reported) volatility, low correlation to listed markets (see Tables 1 and 2) and its (arguable) inflation hedging characteristics. Listed real estate is traded on stock exchanges and included in broad stock indices. Therefore, taking from the stock allocation for this element of the real estate blend is reasonable. For each strategy where we add the real estate blend, the 10 percent allocation is held throughout the investment horizon.

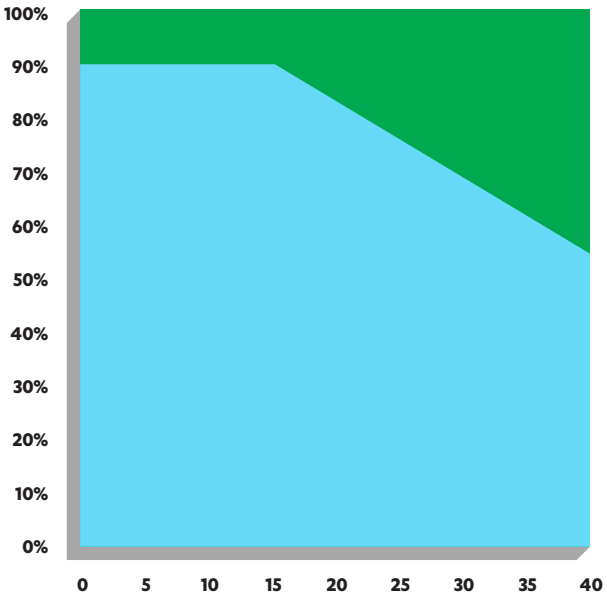
Figure 2 outlines the four lifecycle, or target date, fund designs analyzed in this research. The left panels of Figure 2 show the glidepaths of the T Rowe Price (2014) and NextCapital Group Inc. (2014) MarketGlide Benchmark strategies without the real estate blend, and the right panels those with the real estate blend.

In each case, the glidepaths have the familiar downward sloping allocation to equities when plotted against time. The T Rowe Price (2014) design has a higher overall allocation to stocks because in the early years of the glidepath, the allocation to stocks is maintained at 90 percent then reduced to 55 percent at retirement. The Benchmark strategy, on the other hand, immediately and regularly reduces stock weights from an initial level of 90 percent and the stock weight at retirement is at a lower level of 40 percent. In both cases, stocks dominate the risk budget. Please refer to Figure 2 for the detailed glidepath rules.[19]

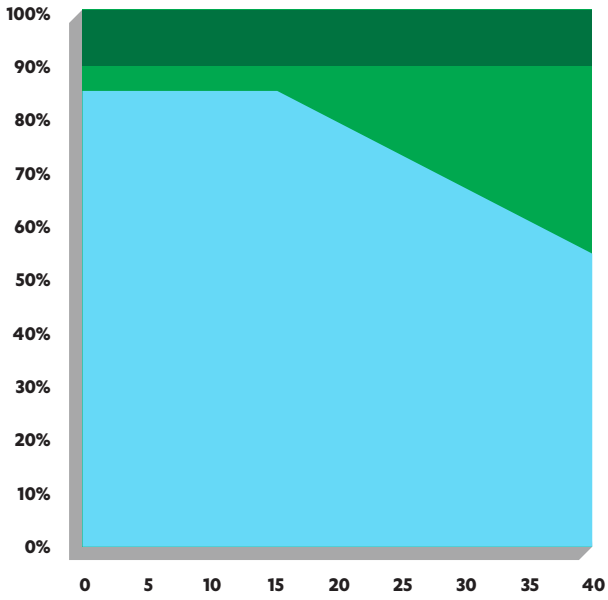
[17] "Superannuation" is the generic name given to retirement savings in Australia. Because the Australian system is overwhelmingly defined contribution in nature most Australians would see "superannuation funds" and "defined contribution pension plans" as equivalent concepts.

[18] According to the P&I/Towers Watson World 500 survey (Pensions & Investments, 2011), The Vanguard Group is the fifth largest investment manager in the world (as at 31 December 2010) when ranked by total assets under management. Even when investment managers eschew the balanced fund label in favor of more sophisticated sounding labels a balanced-style portfolio is often used as a performance benchmark. For example, BlackRock's actively-managed Global Allocation Fund uses a 60/40 portfolio as a "benchmark index" (BlackRock, Inc., 2014). By adopting such a reference benchmark, this investment manager is signaling that it considers balanced funds as its competitive universe. From the perspective of a plan member, for BlackRock's approach to be of value it must outperform a 60/40 benchmark (after fees) or the (rational) plan member would consider switching to a lower cost passive balanced option.

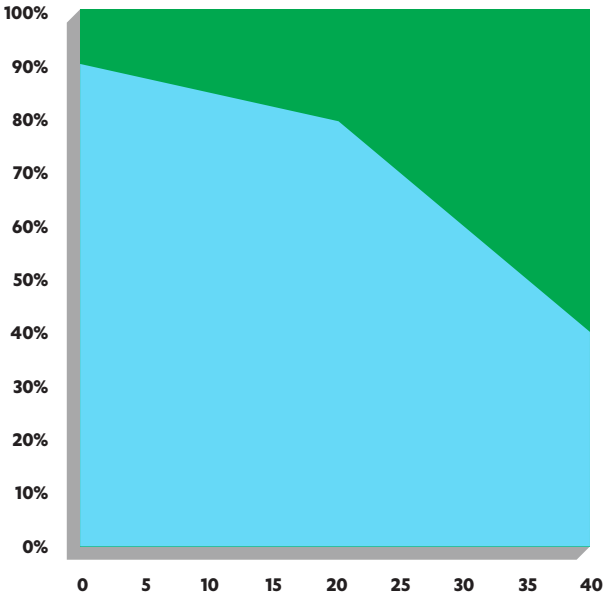
[19] Note that the glidepaths depicted in Figure 2 are approximations of those cited because the authors didn't have access to the exact glidepath definitions. Given this research seeks to investigate the marginal effects of adding real estate to a DC plan design in general terms, this approach is reasonable.



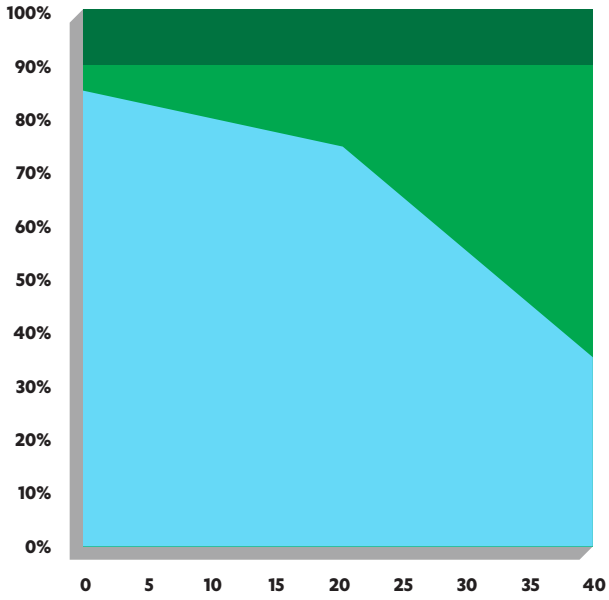
T Rowe Price Glidepath
From year 0 to year 15 portfolio is 90% US stocks/ 10% US bonds. From year 15 to year 40 the US stock weight falls linearly from 90% to 55% and the US bond weight rises to balance to 100%.



T Rowe Price Glidepath with Real Estate Blend
From year 0 to year 15, portfolio is 85% US stocks/ 10% real estate blend/ 5% US bonds. From year 15 to year 40 the US stock weight falls linearly from 85% to 50%, and US bond weights rise from 5% to 40%. The real estate blend weight remains 10% throughout.



MarketGlide Benchmark Glidepath
From year 0 to year 20 the portfolio comprises of US stocks whose weighting falls linearly from 90% to 80% and US bonds whose weighting rises to balance the portfolio to 100%. From year 20 to year 40 the US stock weight falls linearly from 80% to 40% and the bond weight rises to balance to 100%.



MarketGlide Benchmark Glidepath with Real Estate Blend
From year 0 to year 20 the US stock weight falls linearly from 85% to 75%, the US bond weight rises from 5% to 15% and the real estate blend weight remains at 10% throughout. From year 20 to year 40 the US stock weight falls linearly from 75% to 35%, the US bond weight rises from 15% to 55% and the real estate blend weight remains 10% throughout.

US Equities Foreign Stocks US Bonds Real Estate

Figure 2: Target date, or lifecycle, strategies under consideration.

Having resolved the asset allocation strategies to be examined, let us now consider how performance and risk will be judged.

We employ four performance and risk measures which are estimated at our assumed retirement age of 65 (see Exhibit D):

Shortfall measured by comparing the estimated RWR for a given path against the following thresholds, and presented in the form of a so-called "heat map." These thresholds should be interpreted as follows: success is defined as a terminal RWR of 12 times final salary (or 12x) or higher; failure is a terminal RWR of 5x or lower; and, there is a spectrum of varying degrees of success or failure between 5x and 12x, with 7x defined as moderate.

Table 3

DESCRIPTION	COLOR CODE	RWR THRESHOLD	ESTIMATED RR EQUIVALENT*
SUCCESS		12X	69%
MODERATE SUCCESS		7X	40%
FAILURE		5X	29%

* Assuming 30 year horizon and an interest rate of 4 percent.

Value at Risk (VaR) at the 5th percentile;
Conditional VaR (CVaR) at the 5th percentile; and
Median terminal outcomes for each worker.

These measures represent intuitive, wealth-relative outcomes that provide retirees with a more understandable measure of whether their retirement income is sustainable.

Exhibit D – Retirement risk measures

The first measure we consider is shortfall risk. In this study we compare the RWR at any time in the accumulation phase (i.e. at time t, or RWRt) to a number of thresholds: success, moderate success and failure. In this research, we show the RWR through accumulation phase plotted as a heat map. If RWRt exceeds the success threshold of 12x final salary the heat map will display a green cell. See Exhibit E for a full discussion on how to interpret heat maps. Typically, shortfall risk is the probability of falling short of some threshold. Using a simulation approach like that employed herein, shortfall risk expressed as a single measure (instead of a heat map) would be calculated by counting the number of paths where RWRT is below the selected threshold and dividing this number by the total number of paths, in this case 10,000, and expressing it in percentage terms.

The behavioral literature (i.e. Olsen and Khaki, 1998) has argued that, in considering risk, investors weight the magnitude of loss over its probability. We therefore consider two measures of risk that capture the magnitude of loss in different ways: value-at-risk (VaR); and its more robust variant conditional value-at-risk (CVaR).[20] CVaR measures the average loss *conditional* on the loss exceeding the VaR threshold at a given confidence level. In this way, CVaR gives us more information about the nature of tail risk than VaR, which only provides us the threshold at which tail risk begins. In line with Olsen and Khaki's (1998) claims about the importance to investors of the potential magnitude of loss, VaR and CVaR each incorporate the concept of probability via the confidence level, as well as the potential magnitude of the loss.

When using simulation approaches that produce a large number of potential outcomes it is often difficult to summarize expected performance. In this study, we use the median terminal wealth outcome as a measure of what an investor might reasonably expect from a given strategy. We have selected median because it is intuitive to understand (i.e. one has a 50 percent chance of getting the median outcome or better), and it doesn't suffer from the deficiencies of other measures of central tendency like the mean (which can be skewed in the presence of outliers).

It is obvious that a comprehensive picture of potential performance requires the synthesis of all these measures.

We now consider the results of the analysis.

[20] Conditional value-at-risk (CVaR) is known by other names. Rachev et al. (2008) highlight that this measure, for a discrete distribution function, is also variously known as average value-at-risk or expected shortfall. Rachev et al. (2008) define expected tail loss (ETL) as the equivalent measure for a continuous distribution function. We prefer CVaR because it is, to us, the most descriptive term and because of its widespread use amongst practitioners.

Each combination of investment strategy and participant profile was simulated using 10,000 block bootstrap sampling trials. The convergence of results for each set of simulations was checked to ensure the number of simulations was sufficient to achieve stable results. The results are reported in two formats:

Tabular representation of VaR, CVaR and median measures (discussed in detail in Exhibit D) in Table 4 below; and
Shortfall presented as heat maps (see Exhibit E), where the color signals success, or otherwise, against the thresholds outlined above.

The heat maps for the 40 year horizon scenario are presented in the body of the paper, with the results for the 25 year horizon reported in the Appendix.

Exhibit E – Heat maps, and how to read them

Heat maps offer a visual and intuitive method for comparing investment strategies. The heat maps depicted in this study are constructed as follows:

1. Using the simulation method outlined earlier, we produce 10,000 return paths which represent 10,000 potential futures (based on historical returns);

2. Using these return paths, we generate 10,000 "evolutions" of wealth (expressed in RWR terms) for the given horizon (in this study either 25 or 40 years). We thus have 10,000 potential experiences for a plan participant as a way of understanding what a strategy might produce for an individual (assuming the contribution rate, the salary growth rate and the horizon);

3. To summarize this output (a spreadsheet of 10,000 rows and 25 or 40 columns), we sort the 10,000 rows from the best terminal outcomes (at the top) to the worst (at the bottom). To reduce the number of rows we report, we take every 200th row. To reduce the number of columns we report, we focus on the latter half of the accumulation phase where the strategies can be differentiated. [In the first half or so of the accumulation phase all strategies deliver poor outcomes.] Each cell shows the estimated RWR at that given point in the accumulation phase (technically, RWRt).

In summary, the horizontal (or x) axis depicts time and the vertical (or y) axis shows every 200th simulated path of wealth (expressed in RWR terms) from the best (at the top) to the worst path (at the bottom).

In making a comparison, a superior heat map is characterised by the following:

1. **More green overall** – The greener the heat map, the more effective is the strategy at achieving success which in this study is defined as a RWR of 12x final salary (equivalent to a replacement rate of 69%);

2. **Less red** – A strategy that produces fewer red cells means that the strategy produces less in the way of very poor outcomes. Because of the construction of the heat map, red cells are more likely to appear at the bottom of the heat map, which depicts the worst simulated paths from the simulation. Comparing the lower quarter of heat maps therefore allows the reader to compare the downside risk of competing strategies;

3. **Smooth transitions** – The ideal heat map would see a smooth transition from red in the early years to green in the later years for any given path (or row). Some strategies with high allocations to risky assets see transitions from green back to amber or even red following a big market event. Given the deleterious behavior of investors after a large drawdown (i.e. switching out of risk assets), a smoother accumulation phase is expected to equate to a better overall outcome.

As we discussed earlier, we simulate portfolio outcomes for two workers; a 25-year old worker and a 40-year old worker. The simulation assumes retirement at age 65, initial salary of $40,000 for a 25-year old worker and $53,835 for a 40-year old worker, with salary growth rate of 2% and a contribution rate of 8%. The income of each worker in their final year of work prior to retirement is thus $88,322. In Table 4 we provide the simulation results for each worker using both terminal portfolio values and the retirement wealth ratio (RWR) as a means for comparison. As we defined it earlier, the RWR is the ratio of terminal wealth to final salary.[21] We provide the Value at Risk (VaR), Conditional VaR (CVaR) and median results in both terminal portfolio value and RWR terms.

The best performing portfolio against a 12x RWR target is naturally the aggressive approach which maximises its holding of stocks, giving some support to the views of scholars like Siegel (1994). Not surprisingly, the 100% Bond portfolio produces the lowest median outcome of all strategies, but also with poor tail characteristics. These poor outcomes result from a working life of lower overall returns and less in the way of compounding benefits. This finding highlights the risks of taking too little risk during the accumulation phase; the plan participant merely ensures that he or she has a very high probability of a poor outcome.

Looking at the (theoretical) 100% Real Estate Blend portfolio, we start to see some of the benefits of diversification, naïve though it is. Predictably, we forego the positive outcomes available to investors in stocks, but we gain in terms of performance in the worst scenarios. Note, for example, that the 100% Real Estate Blend portfolio provides the highest CVaR terminal portfolio value for our 25 year old plan member (i.e. a 40 year horizon) suggesting that the very worst outcomes for this strategy are superior to those of the others analyzed. The chances of such a portfolio being used as the only investment in a DC plan, however, are very remote.

	VAR (5%) TERMINAL PORTFOLIO VALUE	CVAR (5%) TERMINAL PORTFOLIO VALUE	MEDIAN TERMINAL PORTFOLIO VALUE	VAR (5%) RETIREMENT WEALTH RATIO	CVAR (5%) RETIREMENT WEALTH RATIO	MEDIAN RETIREMENT WEALTH RATIO
25-year old						
100% Stocks	$1,513,837	$1,071,392	$6,136,084	17.14	12.13	69.47
100% Bonds	$581,781	$533,032	$847,152	6.59	6.04	9.59
100% Real Estate Blend	$1,474,632	$1,209,982	$3,907,249	16.70	13.70	44.24
60/40 Stocks/Bonds	$1,130,436	$978,427	$2,730,984	12.80	11.08	30.92
55/35/10 Stocks/Bonds/RE	$1,185,042	$989,484	$2,703,299	13.42	11.20	30.61
T Rowe Price Glidepath	$1,450,102	$1,157,071	$4,174,756	16.42	13.10	47.27
T Rowe Price Glidepath with Real Estate Blend	$1,335,309	$1,084,201	$4,143,593	15.12	12.28	46.91
Benchmark Glidepath	$1,185,109	$980,055	$3,377,719	13.42	11.10	38.24
Benchmark Glidepath with Real Estate Blend	$1,399,373	$1,070,883	$3,448,584	15.84	12.12	39.05
40-year old						
100% Stocks	$940,013	$779,909	$3,742,004	10.64	8.83	42.37
100% Bonds	$636,340	$597,708	$843,426	7.20	6.77	9.55
100% Real Estate Blend	$892,934	$667,653	$1,926,904	10.11	7.56	21.82
60/40 Stocks/Bonds	$1,011,149	$832,114	$2,171,420	11.45	9.42	24.59
55/35/10 Stocks/Bonds/RE	$942,105	$783,747	$2,098,405	10.67	8.87	23.76
T Rowe Price Glidepath	$1,052,848	$908,521	$2,460,000	11.92	10.29	27.85
T Rowe Price Glidepath with Real Estate Blend	$1,109,354	$932,188	$2,500,428	12.56	10.55	28.31
Benchmark Glidepath	$934,378	$784,907	$2,177,632	10.58	8.89	24.66
Benchmark Glidepath with Real Estate Blend	$1,003,385	$895,753	$2,295,365	11.36	10.14	25.99

Table 4: The 5th-percentile Value at Risk (VaR), conditional VaR (CVaR) and median terminal portfolio values and retirement wealth ratios for two workers (a 25-year old with a retirement portfolio balance of zero and a 40-year old with a retirement portfolio balance of $100,000). Simulation assumes retirement at age 65, initial salary of $40,000 for a 25-year old worker and $53,835 for a 40-year old worker, salary growth rate of 2% and contribution rate of 8%. All real estate allocations are evenly split between listed and unlisted real estate.

[21] This does not include any entitlements as a supplementary means of income.

Next, we turn to the diversified strategies. We begin with the traditional Balanced portfolio of 60 percent stocks and 40 percent bonds, and its alternative design which includes a 10 percent allocation to the real estate blend (the 55/35/10 Stocks/Bonds/RE portfolio). Consistent with expectations, we see that by adding the real estate blend to the Balanced portfolio (by taking equally from stocks and bonds) we improve performance in tail scenarios without giving up much in the way of expected performance for our hypothetical investor with a 40 year horizon (the 25 year old). This is possible because when we replace stocks and bonds with real estate, we are increasing diversification by adding imperfectly correlated asset classes (cf. Table 2) with nearly the same expected returns as stocks (listed real estate) and bonds (unlisted real estate) (cf. Table 1). Over the shorter horizon the results are more mixed with each measure suggesting marginally better performance for the 60/40 portfolio. It is however likely that the 60/40 portfolio will be perceived by the plan participant as more volatile due to more modest diversification (see later discussion regarding the comparisons gleaned from heat maps). Thus, we have initial evidence that adding real estate to a traditional DC investment portfolio may result in benefits for the plan participant.

We now consider the performance of our target date, or lifecycle, funds. From an inspection of the entire lifecycle in Figure 2, we see that the T Rowe Price glidepath has a higher overall allocation to stocks. It maintains its initial allocation of 90% stocks for the first 15 years of the glidepath, with a "landing point" at retirement of 55%, a higher level than the MarketGlide Benchmark of 40%. Based on this fact alone, we would expect the T Rowe Price target date strategy to deliver better overall outcomes compared to the MarketGlide Benchmark over time. This expectation is born out in the results reported in Table 4 with the absolute value of all measures being higher than the comparable statistics for the MarketGlide Benchmark glidepath.

So, what happens when we add the real estate blend investment to each glidepath? First, we should recall from Figure 2 that the allocation to the real estate blend remains constant at 10% throughout the time horizon, whereas stock weightings fall and bond weightings rise. As we observed with the longer horizon Balanced strategy comparison, we see an improvement in downside performance, with downside performance improving to a greater degree for the MarketGlide Benchmark glidepath. In contrast to the target risk strategies, we see that median outcomes improve slightly too. What drives this? As the portfolio size effect (Basu and Drew, 2009) becomes manifest – that is, in the last half of the accumulation phase before retirement – the superior performance of the real estate blend strategy over bonds compounds, thus, benefitting performance.

We see that over a 40 year horizon, adding a real estate blend strategy to both target risk and target date portfolio designs results in better downside performance and, on occasion, marginally better retirement wealth outcomes.

Finally, we also see that the benefits of adding the real estate blend appear to occur regardless of the age of the participant. The results for the 40-year old investor appear to mirror the results of the 25-year old, indicating that similar expected performance is possible, but with better downside performance. The most noticeable impact is the difference between the absolute value of each measure for the same strategy. For the 100% Stocks strategy, median wealth is 64% higher over the 40 year time horizon ($6,136,084) compared to the 25 year time horizon ($3,742,004). In contrast, for the 100% Bond strategy median wealth is 0.4% higher over the 40 year horizon ($847,152) compared to the 25 year horizon ($843,426). What accounts for this enormous difference in the effect of time horizon? The main contributor is the effect of compounding on a rapidly growing portfolio size.

Exhibit F – Valuations and liquidity

Listed real estate investments are valued daily along with all other exchange-listed securities. While at face value this may appear desirable, the property exposures embedded in the listed security are valued far less frequently. Listed real estate returns are, therefore, at least partly about overall equity market conditions and other factors, including the direction and level of interest rates. Whatever the realities of the valuation process, daily valuations are considered desirable when most of the other assets in a DC plan are also valued daily.

What does this mean for private, unlisted real estate where full appraisals may be conducted annually and desktop appraisals performed on a quarterly basis? To address this question, we consider the experience of another developed economy with a preponderance of DC plans and significant allocations to unlisted real estate: namely, Australia.

Around 84% of assets in the Australian pensions (or superannuation) system are DC in nature, with average allocations to real estate of around 9%. Of this allocation around 7% is unlisted in nature and 2% listed as of June 30, 2013 (Association of Superannuation Funds of Australia, 2014). The reasons for this bias to unlisted real estate have not been the subject of specific investigation (to the authors' knowledge) but are thought to include:

- A long history of unlisted real estate investment within Australian pension funds;
- A relatively limited listed real estate (or A-REIT) opportunity set;
- Relatively clear guidance from regulators about unlisted assets; and
- Established practice among funds in relation to incorporating unlisted asset valuations into unit prices.

The issue of valuations (for all unlisted assets including private equity, infrastructure, timberland, etc.) in the Australian system is even more problematic, because plan participants have complete portability (i.e. they can typically switch plans at will). While this adds an additional challenge, strong positive cash inflows into all Australian DC plans – due to compulsory superannuation contributions – allows funds access to significant liquidity to deal with fund redemptions (which tend to be small in any case).

On the subject of liquidity, including unlisted assets such as unlisted real estate poses challenges to pension fund management. As already mentioned, this is especially so in pension systems which allow portability across plans and/or switching within plans. Global best practice seeks to minimize the impact of stale prices on the unit price and, in turn, on plan participants.

So, how do Australian DC plans deal with valuation and liquidity issues? In their unit pricing process, funds generally provide for returns on a daily basis and adjust when updated valuations are conducted. The regulator of superannuation funds, the Australian Prudential Regulation Authority (APRA), provides prudent standards and guidance to pension funds on liquidity risk management, which includes stress testing (see Superannuation Prudential Standard (SPS) 220 Risk Management, section 12(c); SPS 530 Investment Governance). Guidance on unit pricing is provided in a joint publication by APRA and Australian Securities and Investments Commission (ASIC), the Australian equivalent of the US Securities and Exchange Commission (see Unit pricing - Guide to good practice).

Even with the challenges of valuation and liquidity, plan sponsors of Australian DC plans have implicitly (at the very least) accepted the rationale for investing in unlisted assets, especially unlisted real estate. Real estate is considered a cornerstone investment for Australian DC plans.

Let's now turn to the heat maps and consider what insights they reveal. Consider Figure 3 which shows the heat map for the 100% Stock portfolio. Measured against the threshold RWR of 12x final salary, a large proportion of the paths achieve success (i.e. the right column is almost entirely green). However, it is arguable that the threshold RWR should be higher to take account of the amount of risk being taken by the plan participant. It is also noteworthy, but not surprising, that many paths are volatile; colors change quite suddenly, and color changes occur in both directions (green to red, and vice versa) through time.

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
5.076002	6.007228	7.074542	9.148037	10.16471	12.97288	16.91004	23.75655	27.93901	37.69121	43.23366	51.43958	59.64665	69.06032	89.11417	106.3811	123.9667	151.3293	244.922	217.0694	244.0168	286.3183	251.9251	291.486	416.0645	556.5547
5.336809	7.123365	8.127507	10.70521	12.53126	14.85546	24.10059	30.08014	32.63792	42.00194	46.74853	61.04678	79.66563	88.5726	123.2007	175.0719	193.302	236.3912	199.5367	259.8629	286.8942	193.3955	192.0403	238.5381	285.8992	342.8925
5.823944	7.481212	6.676305	5.754886	8.320909	10.96091	16.28663	17.9452	21.78563	25.78874	28.29207	35.56639	46.61721	55.66846	80.65698	114.6425	131.013	155.3917	181.1367	253.8703	326.255	282.8869	318.6692	214.8112	291.727	281.3883
3.341832	3.731577	4.202186	4.811195	5.674316	5.096134	6.846468	7.552901	12.28827	10.86151	14.62907	17.52804	26.0128	31.83723	42.43966	64.60746	53.42255	59.02058	63.92348	79.77682	95.22958	103.7806	121.3473	157.7015	219.3119	254.5732
1.169675	1.537989	2.013983	2.722013	3.506376	4.501972	5.465114	7.72116	8.686563	12.18407	7.94044	10.61221	11.83067	16.06444	19.11394	22.1937	31.31677	42.64528	45.44379	53.09619	70.60233	78.40433	99.61334	135.7254	189.2441	225.6573
3.40334	4.514288	5.641455	6.672661	8.056681	11.77818	13.98189	16.3985	24.10294	28.29606	35.05111	45.34146	43.78039	51.78089	64.61768	72.38307	80.94573	92.63053	113.2038	126.7618	140.3402	183.0629	228.314	305.4576	190.7677	213.5733
3.185984	3.701763	4.90634	5.616598	7.087891	8.634194	10.06168	11.0173	12.94768	16.19887	16.13937	18.71289	21.66749	31.5782	37.92715	51.35765	71.47241	76.41579	96.91287	119.9646	141.8878	180.9795	186.5634	120.1777	176.2313	203.572
3.14564	3.856015	4.950859	4.82212	5.846926	7.943582	11.40206	14.16781	19.82935	23.62552	25.53012	30.67595	33.69394	29.6522	24.54961	29.17464	31.84226	39.3573	49.95087	47.05865	53.07324	75.97298	105.5644	125.9925	147.9333	187.3387
2.226554	2.327152	3.548979	4.285799	5.807491	7.561752	6.514702	7.844974	9.23438	12.51451	15.53757	12.50156	13.39422	15.85106	21.09641	25.08081	26.90167	34.6731	41.57138	35.17277	41.27862	56.35334	67.19856	93.38382	134.1029	177.6627
3.829498	5.395005	7.096441	8.903841	6.629712	7.095998	7.99898	10.34591	12.53045	13.99013	13.62252	22.11261	28.27577	23.94738	28.17068	41.76587	56.53454	67.02493	93.25434	60.09486	70.57033	77.6178	86.18898	96.59205	131.0884	165.2719
1.925227	2.577577	3.331669	4.842255	6.844784	9.314091	14.0273	16.22758	19.13402	22.86955	14.321	19.28338	16.82196	18.50758	21.54455	25.62014	34.05631	42.51516	57.38498	49.191	41.79356	60.85277	69.18075	87.11493	110.3562	158.4609
2.90971	3.456745	4.154577	4.757285	3.72831	3.211428	3.556005	4.181347	3.772105	5.190075	6.519255	7.847212	8.767064	9.742329	10.83293	15.32448	18.76907	20.03823	25.14782	32.98128	38.61677	49.87383	58.99162	72.0597	100.517	143.8163
3.378658	4.587984	6.441129	4.553756	5.381569	4.381367	3.744334	3.14393	3.811089	4.520207	6.522112	8.861556	11.08486	14.90304	15.39217	15.05233	15.00795	20.30805	29.11951	38.70223	44.17667	56.16141	68.67068	78.99019	101.933	136.4254
5.067711	6.063944	8.516866	10.92178	12.81931	13.67	15.92103	10.83349	13.72443	16.80759	21.4778	24.53621	24.23016	32.20838	37.74145	41.93917	48.55833	53.22495	65.73639	44.28021	50.79435	64.7516	80.55911	93.30066	110.0719	129.4557
2.902185	3.29395	4.044827	4.954828	5.834143	6.444259	6.900118	8.846738	6.699477	7.420235	10.02158	13.11759	14.81626	18.41775	21.5354	26.80838	35.14867	29.04993	34.7883	40.76624	47.58308	61.01301	57.28342	78.31647	92.59142	121.1816
1.633718	1.992077	2.587927	3.435053	4.074479	4.542753	6.266463	7.444355	9.335022	10.73246	12.93153	17.37048	14.12646	18.22954	16.75211	21.30031	25.06719	36.52731	44.33539	60.2092	69.49751	85.04621	65.86497	63.9443	85.6147	114.6234
2.233375	2.640435	3.191732	3.464276	4.148356	5.349592	6.47241	7.786369	7.637602	8.995868	11.54136	13.69329	20.897	22.25871	16.77816	13.49987	13.44989	18.39249	22.53771	27.08572	32.81641	47.59036	52.4972	56.06027	85.63707	109.187
5.065909	6.904769	7.879824	7.437159	9.758526	11.88926	13.18024	15.02376	16.68032	19.85073	30.36209	27.04933	33.04756	41.78305	44.62212	52.03867	62.05027	69.3864	79.80489	101.454	108.0188	137.2058	119.3922	102.1276	85.0429	106.117
1.740434	1.521431	2.079608	2.489833	3.093975	3.426896	4.32276	5.412014	8.000731	10.26608	10.55954	12.38479	14.57241	19.56472	23.73814	20.34418	23.55606	33.2359	40.76969	33.05234	33.88338	42.14955	58.82937	74.552	92.945	101.2994
1.379508	1.883328	1.518604	2.046658	2.303319	1.601401	2.296161	2.714766	2.468361	2.789201	3.774572	4.492196	6.117805	7.155334	10.00665	10.85548	14.48849	16.29589	19.22776	22.06206	27.88232	34.60328	46.37872	51.27303	66.02452	91.87632
1.538259	1.178484	1.859631	2.095587	2.622735	3.398475	4.695494	6.18546	7.436992	6.040828	7.147246	8.937282	12.02251	14.2645	18.68429	20.53059	22.84641	19.62901	23.60973	30.07112	36.42479	41.35364	47.03727	51.8895	69.71777	87.01107
2.958011	4.181042	6.249011	6.93515	5.759644	8.089723	9.653018	11.4202	12.66424	13.96944	19.05847	23.03347	25.07035	30.28134	35.93016	48.50476	56.80522	62.63473	55.08686	74.54623	84.54611	54.09006	60.86578	65.69315	70.25347	82.90578
3.846108	4.211957	4.980979	5.82039	6.81012	6.654482	9.668454	8.454908	12.13442	13.44946	11.74613	12.39026	17.30288	19.16432	25.90557	22.58451	23.3372	29.27292	38.09814	50.52836	32.80939	38.3123	43.4596	53.15972	60.27504	78.97469
0.973637	1.469159	1.662722	2.156082	2.519457	2.980862	3.591402	4.305488	5.528488	7.037874	8.835397	10.53699	10.83899	13.48814	16.83754	20.90253	25.9172	31.20393	29.12886	33.359	28.98261	38.65269	57.28854	72.68194	86.00139	75.62334
1.891792	2.633244	3.138032	4.237221	3.653544	4.282938	4.81741	5.865875	8.031288	8.924972	11.71039	15.39501	23.15078	23.86958	26.4125	30.32179	36.04153	36.59151	23.7717	30.38726	39.54861	50.94259	57.45043	80.2328	113.0226	70.62253
2.392987	2.821135	2.701966	2.922202	3.865682	5.291569	7.289078	9.815325	14.33904	12.26265	7.880389	9.146729	10.13795	10.33657	12.60121	18.5477	20.37657	26.39593	25.77164	24.31194	30.52199	40.02932	47.0543	56.39708	61.16316	67.93862
1.610202	1.936782	2.420123	3.047838	3.505138	2.501865	3.585636	2.936644	2.596676	3.594277	3.893188	4.870885	6.279796	7.045407	8.197417	9.176665	10.14849	11.83052	13.28841	18.69949	25.47271	30.05479	33.25281	41.50268	54.12406	65.50514
0.802983	1.176476	1.374575	1.255515	1.705118	2.462924	2.906512	4.116716	5.631691	6.225	8.303071	6.902534	7.971431	10.13159	13.10354	15.33104	19.17845	13.0506	16.2336	21.0116	26.05798	31.30689	44.55653	50.99309	65.13426	63.2386
1.256125	1.572207	1.885316	2.626024	3.830843	5.278243	5.773184	6.325497	7.707449	6.294127	5.584002	6.721002	7.986232	11.21251	13.46761	11.26024	13.85367	19.57939	24.88753	29.5903	35.73797	42.21216	29.59875	39.89753	53.75095	59.71535
2.201618	2.937152	3.175645	4.079363	4.186709	5.955867	7.832948	5.316206	7.480982	7.069218	9.289839	9.987409	13.29522	11.73742	13.81664	17.62514	20.60698	22.97572	27.02536	37.7466	30.30546	25.27748	36.36348	47.43146	51.92773	57.01063
2.653698	3.299947	4.032582	5.064462	6.956762	9.04619	12.64486	14.50288	16.14898	17.33714	19.22104	25.14713	26.87928	39.47112	48.22862	40.75369	27.67391	37.34516	42.74555	46.66149	66.67622	53.77091	60.964	59.44094	60.31378	53.12621
1.310334	1.388884	1.558088	1.906651	1.453486	1.854852	2.259999	2.244054	2.492997	2.909173	4.201542	5.703943	6.759758	6.576958	5.843035	7.660711	8.237183	9.206454	12.10892	15.87685	17.00435	22.60041	24.25683	32.52929	42.52067	49.96325
1.596604	2.17829	3.017339	3.790819	3.567373	4.835197	3.790518	4.430953	5.417563	5.308209	6.88562	8.586021	7.008994	8.380551	10.89703	12.15736	13.95784	13.19546	15.80323	21.60006	23.86386	32.2201	46.72897	34.63081	38.1146	48.70818
2.293473	2.80519	3.258549	4.302378	4.939695	6.414925	7.267333	8.437117	9.018989	11.56429	9.578386	9.767073	6.622177	9.703592	9.159047	10.22228	12.01738	17.3262	21.60635	25.25867	30.51837	40.99304	36.07445	31.75597	43.33035	46.36834
4.53683	5.84024	7.688255	9.946906	10.85308	12.062	11.78841	15.15864	16.78549	15.79428	17.35409	13.66119	15.83427	21.54674	13.91985	16.28816	10.21729	13.89323	15.28711	17.9819	21.54063	25.81957	32.30914	42.66369	51.89561	44.43449
0.781516	0.97898	1.244249	1.533713	1.894721	1.669533	1.618779	2.091464	2.253375	2.276933	2.274762	2.249778	2.769991	3.311304	4.452168	6.28203	8.232345	9.403516	10.9859	13.12324	16.32652	21.81238	25.54857	33.40055	36.69825	42.00172
1.383468	1.941094	2.934452	3.284893	3.663161	4.384406	6.334063	6.825289	9.369276	10.87494	14.24371	19.12581	14.42308	14.89737	15.70151	17.72629	23.18245	25.46	29.84342	39.13798	49.48086	33.59462	27.81591	32.22269	40.7589	39.37822
4.025543	4.484682	3.850234	4.303423	5.49036	6.036991	4.779947	4.433401	5.02159	5.603073	7.387207	9.267674	6.328005	7.467201	9.829488	8.801307	10.24692	12.45927	8.125913	9.727192	12.57962	16.24396	16.78296	21.10095	24.9633	37.51521
2.103839	2.455611	2.981459	3.636698	5.155688	6.020628	5.696686	7.51863	9.263846	10.49353	13.15171	11.70975	13.56215	17.76646	22.98027	23.35306	20.36563	17.95336	20.26306	20.798	26.71392	31.4274	24.38234	28.1927	30.80753	34.08847
1.175061	1.396887	1.877468	1.246334	1.480372	1.520052	2.203693	2.309673	2.680111	3.803904	4.954176	6.815638	7.602107	10.66824	14.542	16.6861	21.62769	13.87233	18.63622	22.185	19.0309	25.32473	32.37217	31.96377	37.93777	33.06094
1.532487	1.823717	2.366263	2.864513	3.945304	5.301943	6.60228	7.345379	8.473677	10.02193	8.858591	13.18272	11.19201	13.67807	18.09837	19.88324	25.08617	31.94346	37.51385	42.6541	34.6211	31.06662	23.40322	34.11834	29.64619	31.1975
2.108901	1.875075	2.275205	3.076205	3.967381	3.534685	4.245112	4.046571	4.488167	5.666337	6.301874	7.054219	7.585257	8.686688	11.40528	12.22901	16.35188	19.57463	25.99897	28.20011	39.28852	29.12424	23.66121	22.03088	24.27724	29.02407
1.819016	2.15836	2.805551	3.841853	4.687872	5.687002	6.254187	5.11626	4.603214	3.163644	4.056986	4.171888	5.269673	5.703108	6.311326	7.595928	8.940933	9.951674	11.87286	16.59074	17.79844	23.77093	20.38098	24.06666	27.40898	27.85534
1.241349	1.403513	1.675475	2.054899	1.745614	2.106169	1.679183	1.999822	2.396572	2.726463	3.2451	4.42001	5.088295	5.668862	5.044236	5.977168	7.071787	9.133172	10.05192	13.61554	17.66785	14.37761	17.94926	16.95854	21.13858	24.61422
1.969557	2.181791	2.992356	3.611005	4.467044	5.606104	6.87786	8.070111	10.44423	9.790855	13.78584	10.41188	8.39599	10.66747	13.41965	17.07729	19.58436	25.6242	32.38684	39.2222	32.37028	39.23867	27.51869	32.78267	35.10019	22.49159
1.769914	1.970861	2.332009	2.846114	3.38953	4.026521	4.509035	5.495429	3.744708	2.817682	2.552614	3.481611	3.647688	4.954161	5.858872	7.019603	9.01647	10.98328	9.38002	11.07368	11.06109	8.926687	11.45534	14.3526	18.52953	21.27884
1.180167	1.313488	1.501017	2.069972	1.765911	2.117797	2.498398	3.159993	3.702393	4.593397	3.000605	3.597436	3.10766	3.939924	5.404176	6.584731	8.979994	12.15584	11.34639	12.93499	14.41875	9.337309	11.08375	14.3426	16.56443	19.27743
1.936836	2.52604	3.055795	3.640317	2.491545	3.027629	3.41578	4.117685	5.411641	6.452574	5.588884	6.840549	5.563485	4.561078	4.321535	5.34867	6.367322	7.748303	6.453131	7.105591	10.17736	9.182307	12.50192	14.75317	15.02882	17.46235
0.950534	1.243062	1.596824	1.55115	1.921292	2.335686	2.859618	3.058471	3.624963	2.970279	1.896944	2.186709	2.97609	1.973099	3.088598	2.698372	3.214158	2.54849	3.416552	3.237062	4.491191	5.681219	6.572126	7.746333	10.94299	12.92159
1.894277	2.28982	2.928984	3.987675	4.410545	4.861854	5.949654	7.268944	9.084793	7.728181	9.216163	11.13567	7.161822	8.616952	8.929986	10.74817	11.94788	8.101365	10.68213	8.665792	9.774214	8.140595	5.296081	6.465175	7.26579	8.479059
1.102933	1.458984	1.760979	1.594501	1.449898	1.775031	2.110116	2.5514	2.323133	2.974536	3.469836	3.062005	4.340313	5.73428	6.345926	8.054337	7.274927	8.688912	6.142747	4.362906	4.897887	5.48279	4.117389	3.54045	4.899421	4.211337

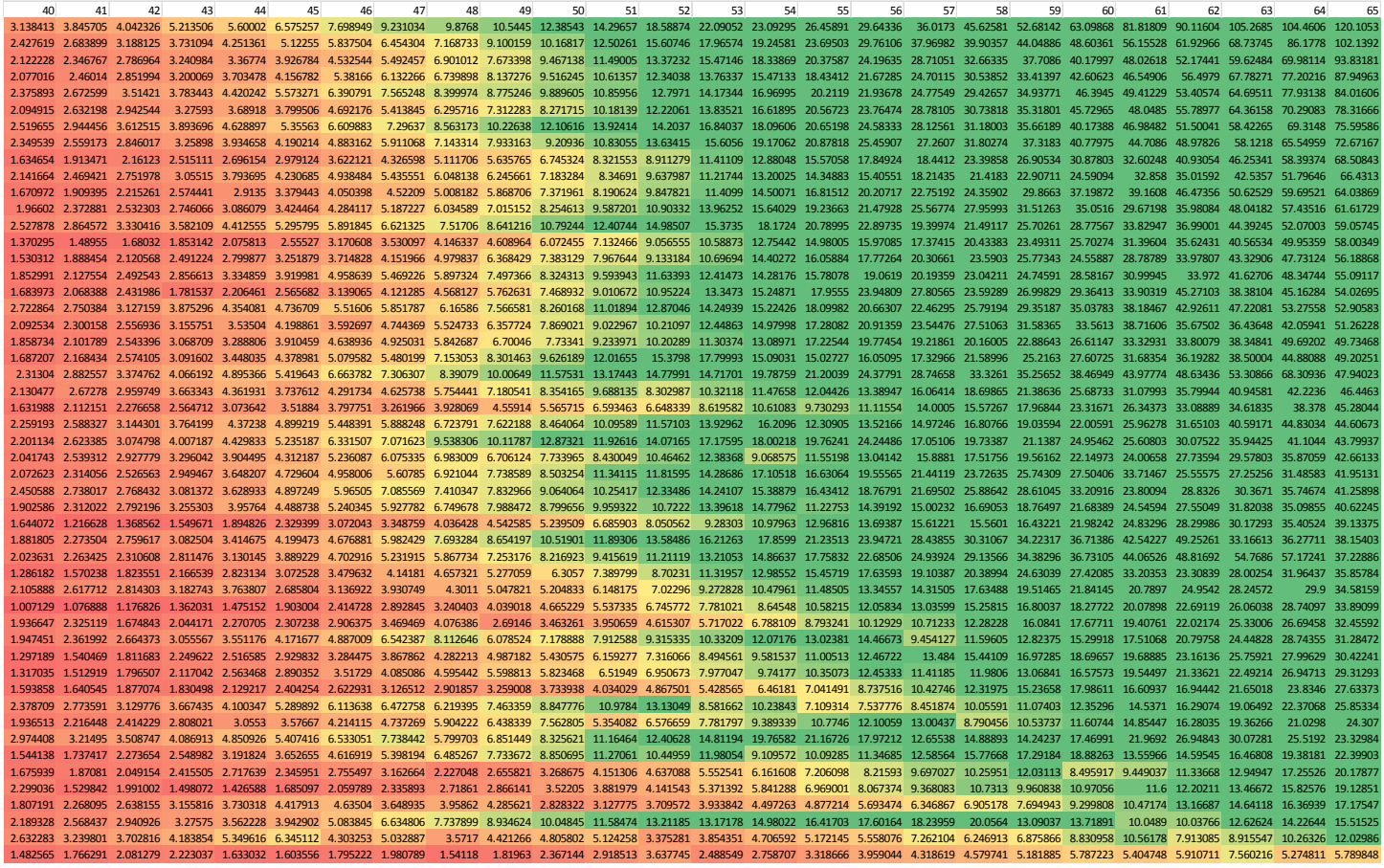
Figure 3: Heat map for a 100% Stock asset allocation strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

Figure 4 shows the heat map for the 100% Bond portfolio. Consistent with the conclusions drawn from Table 3, very few paths achieve success when defined as a RWR of 12x final salary. The main conclusion we can take from this heat map is that such a measure of success is too optimistic for a 100% Bond portfolio.

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.321117	1.413829	1.547313	1.717557	1.920678	2.262123	2.749405	2.933135	3.268988	3.178247	3.827161	4.351111	4.939337	5.368759	5.847377	6.251469	6.626752	7.1921	8.42193	9.42761	10.0527	10.71582	11.9537	12.88618	14.78347	16.8421
1.396625	1.602237	1.786949	2.072303	2.141428	2.46611	2.889175	3.413937	3.549256	3.724375	4.207781	4.61538	5.382366	6.258323	6.393845	6.475284	7.066667	7.283471	8.267363	9.091791	10.51115	10.37914	11.32556	10.94872	12.86541	15.34887
1.245475	1.387776	1.483643	1.495662	1.663479	1.856435	2.140242	2.633537	3.044532	3.610835	4.095101	4.40503	5.140114	5.527056	6.152473	6.605788	7.296495	8.265015	8.229921	8.704689	9.743147	10.02813	12.0071	11.67584	13.90965	14.43039
1.381324	1.652225	1.844202	2.032905	2.205593	2.294883	2.618159	2.982558	3.425413	3.791332	4.30123	4.791473	5.619716	6.302823	6.590967	6.779583	7.137689	7.800334	8.428539	8.212474	9.033382	10.5378	10.95061	11.7558	13.33255	14.06857
1.223668	1.480576	1.670842	1.749575	1.872663	2.0035	2.435445	2.934914	3.572998	3.534556	3.652136	3.615078	4.058039	4.622024	5.253764	5.509628	6.595825	6.938173	8.077192	8.67559	8.761862	9.407096	9.127529	10.16142	11.90473	13.60804
1.158698	1.431589	1.61689	1.76406	2.090173	2.176189	2.56745	3.012596	2.983228	3.170266	3.48767	4.102623	4.480986	5.289888	5.616281	6.273207	6.861616	7.298746	7.895888	8.364313	9.248813	10.39984	10.64767	11.49386	12.18992	13.03825
1.365754	1.48544	1.717663	1.881927	1.834801	1.95412	2.271119	2.552886	2.482915	2.592587	2.79347	3.039157	2.962145	3.415551	3.903718	4.224809	4.984488	5.388722	5.990118	6.318389	6.993104	7.923257	8.961001	10.25485	11.90337	12.78621
1.352013	1.32938	1.46334	1.696541	1.906339	2.24567	2.495894	2.758621	2.903129	3.336907	3.841431	4.353487	5.084234	5.624066	6.018503	6.530105	7.037323	7.573941	8.078522	8.733356	9.399106	9.770819	10.3713	10.89367	11.52023	12.53151
1.113592	1.310852	1.404671	1.552955	1.758153	1.958313	2.266824	2.618489	2.807639	2.791634	3.015472	3.415137	4.030644	4.118148	4.674122	5.050121	5.453442	5.7559	6.531779	7.207277	7.109998	7.905577	9.462882	10.15864	11.23923	12.24341
1.233673	1.435973	1.664839	1.921941	2.104086	2.227148	2.437983	2.886019	3.268843	3.38717	3.683095	4.131031	4.57018	5.562162	5.436427	6.512358	7.176951	7.781459	8.826007	9.329998	9.920795	10.40701	10.26204	10.53857	10.64034	11.98492
1.29855	1.502306	1.730753	1.843812	2.262928	2.335824	2.426764	2.548256	2.697766	2.972863	3.067719	3.408734	3.830095	4.20039	4.686166	4.786427	4.778835	5.731919	6.740573	7.931527	9.05074	9.878115	10.33131	11.67418	10.99914	11.77239
1.10133	1.196731	1.411667	1.572037	1.776196	1.960521	2.25813	2.254193	2.415925	2.636867	2.803688	3.24795	3.57809	3.657947	4.332199	4.29957	4.935543	5.375322	5.452962	5.610926	6.104163	6.76008	7.926911	8.772292	9.678398	11.56775
1.24958	1.330845	1.532462	1.723423	1.947559	1.953129	2.192366	2.532179	2.747418	3.258674	3.534219	3.938959	4.230793	4.989384	5.617964	5.863365	6.649506	7.087445	7.570349	8.201936	8.502487	8.995663	9.747055	10.97436	11.12679	11.33309
1.326149	1.511567	1.877837	2.127994	2.123443	2.376304	2.632678	2.626136	2.645375	2.793236	3.029044	3.260447	3.427108	3.907333	4.562771	5.07955	5.738847	6.144012	6.860825	7.269886	7.838031	8.276909	9.613878	10.1037	10.54776	11.20681
1.4872	1.72127	1.978175	2.032269	2.237289	2.41995	2.882745	3.173801	3.468844	3.85216	4.200425	4.680643	4.912647	5.218035	5.507646	5.896145	6.25678	6.446182	7.107532	7.708738	8.163359	7.909226	9.00672	9.530228	10.50739	10.99139
1.071898	1.243627	1.455178	1.627398	1.927756	2.159757	2.253663	2.543133	2.527944	2.777021	3.114468	3.4597	3.833744	4.242572	4.765804	4.695267	4.654791	5.226524	5.651956	6.092748	6.966333	7.728156	8.223752	9.002947	9.101163	10.90823
1.140339	1.156658	1.344649	1.507939	1.582083	1.660111	1.868393	2.034757	2.234666	2.395815	2.762119	3.163243	3.483005	3.721599	4.188561	4.536443	5.462507	5.846999	6.609129	7.936408	8.077413	8.971075	9.612965	10.43181	10.88773	10.65856
1.156769	1.180464	1.384404	1.362673	1.50907	1.771063	1.947407	2.14013	2.447705	2.540777	2.654348	2.912815	3.331857	3.667829	3.97221	4.579767	4.406665	5.113104	5.530857	5.829322	6.782381	6.96744	7.986822	8.584531	9.399583	10.4999
1.160359	1.333056	1.405324	1.605817	1.718781	2.011723	2.465601	2.588152	2.729072	3.024676	3.141933	3.5087	4.012872	3.98102	4.173116	4.058781	4.263521	5.105605	5.49691	5.601249	5.853089	6.730136	7.417207	7.6378	8.652891	10.33942
1.163488	1.251194	1.362189	1.561591	1.807355	2.042599	2.372317	2.733552	3.114987	3.758998	4.007801	4.301448	4.593037	4.521316	5.308991	5.595673	6.143763	6.746148	7.270634	8.232791	8.806922	8.708029	8.971853	9.29692	10.3188	10.24092
1.220592	1.241591	1.382041	1.572255	1.812935	1.980872	2.142496	2.358452	2.637342	2.779148	3.131891	3.365291	3.711577	3.817056	4.468714	5.112267	5.452232	5.782038	6.057094	6.904702	6.783019	8.129009	8.582928	9.710049	9.516091	10.14263
1.10463	1.129474	1.140291	1.306842	1.465421	1.575703	1.786543	2.004074	2.040651	2.149817	2.552335	2.659058	2.984987	3.146301	3.581278	3.677355	3.617775	3.965107	4.253324	4.870478	5.953527	6.416913	6.76933	7.6953	8.974967	9.999225
1.134756	1.258603	1.363197	1.627067	1.706261	1.860466	1.992128	2.162931	2.423969	2.700654	2.66462	2.985185	3.054994	3.216391	3.865573	4.337772	4.348986	4.583151	4.818808	5.86967	6.630925	6.944893	7.94314	9.09573	9.370995	9.851756
1.027754	1.094116	1.12995	1.255998	1.381171	1.550014	1.786721	2.176914	2.644436	3.112136	3.310035	3.618781	3.624363	3.743796	4.292488	4.672425	5.223184	5.333075	5.798385	6.371888	7.073726	7.609644	8.2146	8.514537	9.531902	9.78451
0.991775	1.166896	1.361481	1.550231	1.793696	2.137127	2.18788	2.402166	2.37418	2.560304	2.848361	3.115111	3.408796	3.639221	4.316184	4.820134	5.253892	5.491763	5.88047	5.809117	6.236186	7.317372	8.075598	9.412733	9.436981	9.693589
1.174922	1.298269	1.496546	1.846349	1.974582	2.102776	2.163319	2.258384	2.280047	2.587545	2.880019	2.938569	3.241422	3.465093	3.731105	4.496506	4.779204	5.145467	6.080399	6.460598	6.584605	7.096886	7.219725	7.59214	9.167806	9.579606
0.956402	0.954214	1.073021	1.339654	1.526032	1.589457	1.73591	1.997307	2.126913	2.238168	2.344077	2.500601	2.796774	3.231128	3.795329	3.995911	4.506177	4.986053	5.396022	6.007691	6.376673	6.942645	7.471521	8.286136	8.519337	9.426634
1.225185	1.357075	1.496964	1.682468	1.796072	1.927408	2.094834	2.180455	2.276975	2.647522	3.20543	3.371566	3.74384	4.082031	4.173324	4.494232	4.910787	5.464547	5.831547	6.089924	6.259382	6.624601	7.575121	8.330189	8.464485	9.326062
1.150138	1.314722	1.430902	1.637726	1.646096	1.710456	1.724382	1.826259	2.2314	2.411511	2.594035	2.973911	3.238814	3.39568	3.596215	3.936893	4.53856	4.681111	4.586806	5.51748	5.863107	6.73196	7.364281	8.253519	8.387289	9.231865
0.981936	1.021137	1.108574	1.208131	1.408909	1.593517	1.631883	1.779178	1.988012	2.145274	2.32832	2.526087	2.777184	3.270349	3.442328	3.805487	4.27277	4.695228	4.849799	4.952945	5.393089	5.658968	6.685943	6.620055	7.719523	9.096648
1.458421	1.567877	1.836824	2.042066	2.062762	2.383645	2.434026	2.494933	3.006333	3.293801	3.458673	3.775979	3.73684	4.145267	4.259502	4.500102	4.983361	5.24332	5.08742	5.198959	5.662757	6.429743	6.611344	7.305445	8.018965	9.04049
1.241776	1.463227	1.649121	1.82101	1.980797	2.221008	2.230596	2.653188	2.849207	3.0087	3.437886	3.638566	4.054466	4.128335	4.412203	5.080185	5.439041	5.51546	5.961431	6.637657	6.425291	6.703715	7.216277	7.795525	8.519179	8.923175
1.234486	1.377016	1.560127	1.663174	1.668245	1.680455	1.695082	1.880891	1.977796	2.151558	2.358316	2.614251	3.01083	3.315831	3.711911	3.986833	4.181487	4.800142	4.75634	5.294941	6.069528	6.606277	7.300997	8.053553	8.594588	8.815516
1.044545	1.069508	1.108838	1.273572	1.471216	1.799833	1.911913	2.09895	2.413844	2.728572	2.948723	3.463964	4.170791	4.320377	4.329273	4.621791	5.236699	5.924314	6.208455	6.191808	6.339447	7.029443	8.423048	9.123552	8.982227	8.722949
1.381843	1.476484	1.584079	1.556565	1.676504	1.814986	2.093724	2.33938	2.551358	3.074162	3.108627	3.406256	3.367727	3.592493	4.15349	4.688694	4.903333	5.149831	5.472199	5.996032	6.261125	6.116633	6.453624	7.699578	8.414932	8.626448
1.214739	1.350125	1.538293	1.705297	1.723766	1.797603	2.087722	2.245712	2.243192	2.462601	2.665761	2.930579	3.084469	3.309043	3.891958	4.222906	4.256235	4.522415	4.462648	5.02664	5.490032	5.604586	6.033072	6.889452	8.008247	8.518739
1.173782	1.303178	1.284672	1.577411	1.733548	1.964734	2.29254	2.503564	2.74195	2.888968	3.039913	3.25154	3.429109	4.022376	4.213215	4.721751	4.904686	5.759418	5.628087	5.899097	6.018583	6.641672	6.705743	7.443748	7.375772	8.315388
1.09139	1.223163	1.439117	1.439062	1.596974	1.920719	2.019276	2.113431	2.293994	2.706856	2.707279	2.696297	3.013263	3.210387	3.671415	3.554646	4.113222	4.249171	4.623505	4.701166	5.644432	6.042701	6.520506	7.087901	7.692122	8.222446
1.30034	1.426979	1.656561	1.819767	2.146793	2.286824	2.551275	2.79736	2.874726	2.90402	2.886837	2.869949	3.284856	3.296683	3.916238	4.10732	4.543025	4.907648	5.37801	5.594816	5.943241	6.557752	6.68955	7.099763	7.294541	8.069681
1.34516	1.413964	1.572011	1.586063	1.743009	1.898981	1.958313	2.195557	2.299334	2.647866	2.863079	2.944364	3.219545	3.217148	3.595017	3.638324	3.84213	3.75422	4.068772	4.387399	4.959435	5.485189	6.005667	6.906705	8.088933	7.941626
1.200208	1.217629	1.460976	1.565782	1.621495	1.808326	2.01368	2.182143	2.381676	2.723508	2.954912	2.996891	3.559187	4.188032	4.880223	5.325205	5.491003	5.567515	6.012685	5.946537	6.727556	6.833889	7.097562	7.337641	7.505371	7.852773
1.018591	1.189391	1.217966	1.380391	1.551329	1.769302	1.776994	1.901431	2.218178	2.406809	2.542973	2.764164	2.986121	3.501679	4.030023	4.12254	4.708881	4.615761	4.830693	4.826933	5.261313	5.855381	6.241945	6.541117	7.152157	7.698029
1.090345	1.261434	1.283806	1.380891	1.57692	1.825433	2.067094	2.178779	2.406405	2.562664	2.58185	2.581027	2.506377	2.822549	3.096429	3.117429	3.440121	3.458955	3.717175	4.004591	4.33857	5.234831	5.615779	6.022079	6.640366	7.522953
1.151604	1.287859	1.466226	1.588538	1.854957	2.127972	2.403345	2.594836	2.749489	2.751788	3.146432	3.187382	3.176167	3.744555	3.656791	3.75353	3.845415	4.125686	4.465322	4.894449	5.037153	4.988612	5.518565	6.458276	7.003621	7.428887
1.217197	1.20218	1.228424	1.282335	1.275435	1.397489	1.377423	1.530898	1.635028	1.926095	2.055445	2.073993	2.167821	2.312224	2.37922	2.801034	3.221416	3.523131	3.728339	4.185913	4.634368	5.586338	6.313233	6.912471	7.342335	7.265726
1.107904	1.293352	1.41038	1.629299	1.950319	2.145224	2.358145	2.480728	2.744962	3.062864	3.21932	3.439142	3.361138	3.342008	3.69189	3.990633	4.540876	4.621237	4.817375	4.636602	5.086843	5.258712	5.524559	6.29679	6.627492	7.139331
0.97573	1.045769	1.255279	1.432285	1.676242	1.807746	1.998029	2.261086	2.231171	2.358926	2.52783	2.769973	2.967838	3.248517	3.701568	3.730079	3.687127	4.114466	4.352964	4.661085	4.696512	4.556732	5.336162	5.524626	6.357205	6.92252
0.966187	1.092521	1.198874	1.223394	1.378698	1.547336	1.80297	1.917518	2.158975	2.379665	2.667349	2.927491	3.368293	3.707212	3.630134	3.962605	3.915991	4.209391	4.755003	5.213422	5.82532	6.443221	6.258775	6.286912	6.407699	6.663829
1.04686	1.207627	1.247249	1.392306	1.712631	1.845832	1.908961	2.016334	2.274352	2.6989	2.761797	3.157645	3.476952	3.733714	4.003845	3.978383	4.156856	4.320356	4.625297	4.93873	4.79844	4.879217	5.394451	5.785399	6.185725	6.115749
1.018589	1.08463	1.143765	1.289205	1.339143	1.436993	1.576255	1.786699	1.831621	2.0155	2.156976	2.421166	2.362278	2.693018	2.581334	3.045967	3.28462	3.499017	3.577996	4.200452	4.504427	4.761848	4.762981	5.051816	5.597045	5.383775
0.954229	0.990837	1.239542	1.550723	1.792967	1.963828	1.942903	1.950679	1.979228	2.039704	2.026366	2.158779	2.216309	2.342249	2.623048	2.961044	3.073867	3.368349	3.543854	3.788612	3.982259	3.949463	4.358819	4.349295	4.333629	4.768462

Figure 4: Heat map for a 100% Bond asset allocation strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

In Figure 5, we see the heat map for the 100% Real Estate Blend portfolio. Once again we see a large proportion of paths resulting in success, but this time, with an overall smoother transition to success (i.e. the transition to green is smooth and, in most cases, permanent) than the 100% Equity portfolio. This is due to the ability of unlisted real estate to mute volatility.



40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
3.138413	3.845705	4.042326	5.213506	5.60002	6.575257	7.698949	9.231034	9.8768	10.5445	12.38543	14.29657	18.58874	22.09052	23.09295	26.45891	29.64336	36.0173	45.62581	52.68142	63.09868	81.81809	90.11604	105.2685	104.4606	120.1053
2.427619	2.683899	3.188125	3.731094	4.251361	5.12255	5.837504	6.454304	7.168733	9.100159	10.16817	12.50261	15.60746	17.96574	19.24581	23.69503	29.76106	37.96982	39.90357	44.04886	48.60361	56.15528	61.92966	68.73745	86.1778	102.1392
2.122228	2.346767	2.786964	3.240984	3.36774	3.926784	4.532544	5.492457	6.901012	7.673398	9.467138	11.49005	13.37232	15.47146	18.33869	20.37587	24.19635	28.71051	32.66335	37.7086	40.17997	48.02618	52.17441	59.62484	69.98114	93.83181
2.077016	2.46014	2.851994	3.200069	3.703478	4.156782	5.38166	6.132266	6.739898	8.137276	9.516245	10.61357	12.34038	13.76337	15.47133	18.43412	21.67285	24.70115	30.53852	33.41397	42.60623	46.54906	56.4979	67.78271	77.20216	87.94963
2.375893	2.672599	3.51421	3.783443	4.420242	5.573271	6.390791	7.565248	8.399974	8.775246	9.889605	10.85956	12.7971	14.17344	16.96995	20.2119	21.93678	24.77549	29.42657	34.93771	46.3945	49.41229	53.40574	64.69511	77.93138	84.01606
2.094915	2.632198	2.942544	3.27593	3.68918	3.799506	4.692176	5.413845	6.295716	7.312283	8.271715	10.18139	12.22061	13.83521	16.61895	20.56723	23.76474	28.78105	30.73818	35.31801	45.72965	48.0485	55.78977	64.36158	70.29083	78.31666
2.519655	2.944456	3.612515	3.893696	4.628897	5.35563	6.609883	7.29637	8.563173	10.22638	12.10616	13.92414	14.2037	16.84037	18.09606	20.65198	24.58333	28.12561	31.18003	35.66189	40.17388	46.98482	51.50041	58.42265	69.3148	75.59586
2.349539	2.559173	2.846017	3.25898	3.934658	4.190214	4.883162	5.911068	7.143314	7.933163	9.20936	10.83055	13.63415	15.6056	19.17062	20.87818	25.45907	27.2607	31.80274	37.3183	40.77975	44.7086	48.97826	58.1218	65.54959	72.67167
1.634654	1.913471	2.16123	2.515111	2.696154	2.979124	3.622121	4.326598	5.111706	5.635765	6.745324	8.321553	8.911279	11.41109	12.88048	15.57058	17.84924	18.4412	23.39858	26.90534	30.87803	32.60248	40.93054	46.25341	58.39374	68.50843
2.141664	2.469421	2.751978	3.05515	3.793695	4.230685	4.938484	5.435551	6.048138	6.245661	7.183284	8.34691	9.637987	11.21744	13.20025	14.34883	15.40551	18.21435	21.4183	22.90711	24.59094	32.858	35.01592	42.5357	51.79646	66.4313
1.670972	1.909395	2.215261	2.574441	2.9135	3.379443	4.050398	4.52209	5.008182	5.868706	7.371961	8.190624	9.847821	11.4099	14.50071	16.81512	20.20717	22.75192	24.35902	29.8663	37.19872	39.1608	46.47356	50.62529	59.69521	64.03869
1.96602	2.372881	2.532303	2.746066	3.086079	3.424464	4.284117	5.187227	6.034589	7.015152	8.254613	9.587201	10.90332	13.96252	15.64029	19.23663	21.47928	25.56774	27.95993	31.51263	35.0516	29.67198	35.98084	48.04182	57.43516	61.61729
2.527878	2.864572	3.330416	3.582109	4.412555	5.295795	5.891845	6.621325	7.51706	8.641216	10.79244	12.40744	14.98507	15.3735	18.1724	20.78995	22.89735	19.39974	21.49117	25.70261	28.77567	33.82947	36.99001	44.39245	52.07003	59.05745
1.370295	1.48955	1.68032	1.853142	2.075813	2.55527	3.170608	3.530097	4.146337	4.608964	6.072455	7.132466	9.056555	10.58873	12.75442	14.98005	15.97085	17.37415	20.43383	23.49311	25.70274	31.39604	35.62431	40.56534	49.95359	58.00349
1.530312	1.888454	2.120568	2.491224	2.799877	3.251879	3.714828	4.151966	4.979837	6.368429	7.383129	7.967644	9.133184	10.69694	14.40272	16.05884	17.77264	20.30661	23.5903	25.77343	24.55887	28.78789	33.97807	43.32906	47.73124	56.18868
1.852991	2.127554	2.492543	2.856613	3.334859	3.919981	4.958639	5.469226	5.897324	7.497366	8.324313	9.593943	11.63393	12.41473	14.28176	15.78078	19.0619	20.19359	23.04211	24.74591	28.58167	30.99945	33.972	41.62706	48.34744	55.09117
1.683973	2.068388	2.431986	1.781537	2.206461	2.565682	3.139065	4.121285	4.568127	5.762631	7.468932	9.010672	10.95224	13.3473	15.24871	17.9555	23.94809	27.80565	23.59289	26.99829	29.36413	33.90319	45.27103	38.38104	45.16284	54.02695
2.722864	2.750384	3.127159	3.875296	4.354081	4.736709	5.51606	5.851787	6.16586	7.566581	8.260168	11.01894	12.87046	14.24939	15.22426	18.09982	20.66307	22.46295	25.79194	29.35187	35.03783	38.18467	42.92611	47.22081	53.27558	52.90583
2.092534	2.300158	2.556936	3.155751	3.53504	4.198861	3.592697	4.744369	5.524733	6.357724	7.869021	9.022967	10.21097	12.44863	14.97998	17.28082	20.91359	23.54476	27.51063	31.58365	33.5613	38.71606	35.67502	36.43648	42.05941	51.26228
1.858734	2.101789	2.543396	3.068709	3.288806	3.910459	4.638936	4.925031	5.842687	6.70046	7.73341	9.233971	10.20289	11.30374	13.08971	17.22544	19.77454	19.21861	20.16005	22.88643	26.61147	33.32931	33.80079	38.34841	49.69202	49.73468
1.687207	2.168434	2.574105	3.091602	3.448035	4.378981	5.079582	5.480199	7.153053	8.301463	9.626189	12.01655	15.3798	17.79993	15.09031	15.02727	16.05095	17.32966	21.58996	25.2163	27.60725	31.68354	36.19282	38.50004	44.88088	49.20251
2.31304	2.882557	3.374762	4.066192	4.895366	5.419643	6.663782	7.306307	8.39079	10.00649	11.57531	13.17443	14.77991	14.71701	19.78759	21.20039	24.37791	28.74658	33.3261	35.25652	38.46949	43.97774	48.63436	53.30866	68.30936	47.94023
2.130477	2.67278	2.959749	3.663343	4.361931	3.737612	4.291734	4.625738	5.754441	7.180541	8.354165	9.688135	8.302987	10.32118	11.47658	12.04426	13.38947	16.06414	18.69865	21.38636	25.68733	31.07993	35.79944	40.94581	42.2236	46.4463
1.631988	2.112151	2.276658	2.564712	3.073642	3.51884	3.797751	3.261966	3.928069	4.55914	5.565715	6.593463	6.648339	8.619582	10.61083	9.730293	11.11554	14.0005	15.57267	17.96844	23.31671	26.34373	33.08889	34.61835	38.378	45.28044
2.259193	2.588327	3.144301	3.764199	4.37238	4.899219	5.448391	5.888248	6.723791	7.622188	8.464064	10.09589	11.57103	13.92962	16.2096	12.30905	13.52166	14.97246	16.80766	19.03594	22.00591	25.96278	31.65103	40.59171	44.83034	44.60673
2.201134	2.623385	3.074798	4.007187	4.429833	5.235187	6.331507	7.071623	9.538306	10.11787	12.87321	11.92616	14.07165	17.17595	18.00218	19.76241	24.24486	17.05106	19.73387	21.1387	24.95462	25.60803	30.07522	35.94425	41.1044	43.79937
2.041743	2.539312	2.927779	3.296042	3.904495	4.312187	5.236087	6.075335	6.983009	6.706124	7.733965	8.430049	10.46462	12.38368	9.068575	11.55198	13.04142	15.8881	17.51756	19.56162	22.14973	24.00658	27.73594	29.57803	35.87059	42.66133
2.072623	2.314056	2.526563	2.949467	3.648207	4.729604	4.958006	5.60785	6.921044	7.738589	8.503254	11.34115	11.81595	14.28686	17.10518	16.63064	19.55565	21.44119	23.72635	25.74309	27.50406	33.71467	25.55575	27.25256	31.48583	41.95131
2.450588	2.738017	2.768432	3.081372	3.628933	4.897249	5.96505	7.085569	7.410347	7.832966	9.064064	10.25417	12.33486	14.24107	15.38879	16.43412	18.76791	21.69502	25.88642	28.61045	33.20916	23.80094	28.8326	30.3671	35.74674	41.25898
1.902586	2.312022	2.792196	3.255303	3.95764	4.488738	5.240345	5.927782	6.749678	7.988472	8.799656	9.959322	10.7222	13.39618	14.77962	11.22753	14.39192	15.00232	16.69053	18.76497	21.68389	24.54594	27.55049	31.82038	35.09855	40.62245
1.644072	1.216628	1.368562	1.549671	1.894826	2.329399	3.072043	3.348759	4.036428	4.542585	5.239509	6.685903	8.050562	9.28303	10.97963	12.96816	13.69387	15.61221	15.5601	16.43221	21.98242	24.83296	28.29986	30.17293	35.40524	39.13375
1.881805	2.273504	2.759617	3.082504	3.414675	4.199473	4.676881	5.982429	7.693284	8.654197	10.51901	11.89306	13.58486	16.21263	17.8599	21.23513	23.94721	28.43855	30.31067	34.22317	36.71386	42.54227	49.25261	33.16613	36.27711	38.15403
2.023631	2.263425	2.310608	2.811476	3.130145	3.889229	4.702916	5.231915	5.867734	7.253176	8.216923	9.415619	11.21119	13.21053	14.86637	17.75832	22.68506	24.93924	29.13566	34.38296	36.73105	44.06526	48.81692	54.7686	57.17241	37.22886
1.286182	1.570238	1.823551	2.166539	2.823134	3.072528	3.479632	4.14181	4.657321	5.277059	6.3057	7.389799	8.70231	11.31957	12.98552	15.45719	17.63593	19.10387	20.38994	24.63039	27.42085	33.20353	23.30839	28.00254	31.96437	35.85784
2.105888	2.617712	2.814303	3.182743	3.763807	2.685804	3.136922	3.930749	4.3011	5.047821	5.204833	6.148175	7.02296	9.272828	10.47961	11.48505	13.34557	14.31505	17.63488	19.51465	21.84145	20.7897	24.9542	28.24572	29.9	34.58159
1.007129	1.076888	1.176826	1.362031	1.475152	1.903004	2.414728	2.892845	3.240403	4.039018	4.665229	5.537335	6.745772	7.781021	8.64548	10.58215	12.05834	13.03599	15.25815	16.80037	18.27722	20.07898	22.69119	26.06038	28.74097	33.89099
1.936647	2.325119	1.674843	2.044171	2.270705	2.307238	2.906375	3.469469	4.076386	2.69146	3.463261	3.950659	4.615307	5.717022	6.788109	8.793241	10.12929	10.71233	12.28228	16.0841	17.67711	19.40761	22.02174	25.33006	26.69458	32.45592
1.947451	2.361992	2.664373	3.055567	3.551176	4.171677	4.887009	6.542387	8.112646	6.078524	7.178888	7.912588	9.315335	10.33209	12.07176	13.02381	14.46673	9.454127	11.59605	12.82375	15.29918	17.51068	20.79758	24.44828	28.74355	31.28472
1.297189	1.540469	1.811683	2.249622	2.516585	2.929832	3.284475	3.867862	4.282213	4.987182	5.430575	6.159277	7.316066	8.494561	9.581537	11.00513	12.46722	13.484	15.44109	16.97285	18.69657	19.68885	23.16136	25.75921	27.99629	30.42241
1.317035	1.512919	1.796507	2.117042	2.563468	2.890352	3.51729	4.085086	4.595442	5.598813	5.823468	6.51949	6.950673	7.977047	9.74177	10.35073	12.45333	11.41185	11.9806	13.06841	16.57573	19.54497	21.33621	22.49214	26.94713	29.31293
1.593858	1.640545	1.877074	1.830498	2.129217	2.404254	2.622931	3.126512	2.901857	3.259008	3.733938	4.034029	4.867501	5.428565	6.46181	7.041491	8.737516	10.42746	12.31975	15.23658	17.98611	16.60937	16.94442	21.65018	23.8346	27.63373
2.378709	2.773591	3.129776	3.667435	4.100347	5.289892	6.113638	6.472758	6.219395	7.463359	8.847776	10.9784	13.13049	8.581662	10.23843	7.109314	7.537776	8.451874	10.05591	11.07403	12.35296	14.5371	16.29074	19.06492	22.37068	25.85334
1.936513	2.216448	2.414229	2.808021	3.0553	3.57667	4.214115	4.737269	5.904222	6.438339	7.562805	5.354082	6.576659	7.781797	9.389339	10.7746	12.10059	13.00437	8.790456	10.53737	11.60744	14.85447	16.28035	19.36266	21.0298	24.307
2.974408	3.21495	3.508747	4.086913	4.850926	5.407416	6.533051	7.738442	5.799703	6.851449	8.325621	11.16464	12.40628	14.81194	19.76582	21.16726	17.97212	12.65538	14.88893	14.24237	17.46991	21.9692	26.94843	30.07281	25.5192	23.32984
1.544138	1.737417	2.273654	2.548982	3.191824	3.652655	4.616919	5.398194	6.485267	7.733672	8.850695	11.27061	10.44959	11.98054	9.109572	10.09285	11.34685	12.58564	15.77668	17.29184	18.88263	13.55966	14.59545	16.46808	19.38181	22.39903
1.675939	1.87081	2.049154	2.415505	2.717639	2.345951	2.755497	3.162664	2.227048	2.655821	3.268675	4.151306	4.637088	5.552541	6.161608	7.206098	8.21593	9.697027	10.25951	12.03113	8.495917	9.449037	11.33668	12.94947	17.25526	20.17877
2.299036	1.529842	1.991002	1.498072	1.426588	1.685097	2.059789	2.335893	2.71861	2.866141	3.52205	3.881979	4.141543	5.371392	5.841288	6.969001	8.067374	9.368083	10.7313	9.960838	10.97056	11.6	12.20211	13.46672	15.82576	19.12851
1.807191	2.268095	2.638155	3.155816	3.730318	4.417913	4.63504	3.648935	3.95862	4.285621	2.828322	3.127775	3.709572	3.933842	4.497263	4.877214	5.693474	6.346867	6.905178	7.694943	9.299808	10.47174	13.16687	14.64118	16.36939	17.17547
2.189328	2.568437	2.940926	3.27575	3.562228	3.942902	5.083845	6.634806	7.737899	8.934624	10.04845	11.58474	13.21185	13.17178	14.98022	16.41703	17.60164	18.23959	20.0564	13.09037	13.71891	10.0489	10.03766	12.62624	14.22644	15.51525
2.632283	3.239801	3.702816	4.183854	5.349616	6.345112	4.303253	5.032887	3.5717	4.421266	4.805802	5.124258	3.375281	3.854351	4.706592	5.172145	5.558076	7.262104	6.246913	6.875866	8.830958	10.56178	7.913085	8.915547	10.26326	12.02986
1.482565	1.766291	2.081279	2.223037	1.633032	1.603556	1.795222	1.980789	1.54118	1.81963	2.367144	2.918513	3.637745	2.488549	2.758707	3.318666	3.959044	4.318619	4.579741	5.181885	5.787223	5.404748	5.910711	7.560216	5.274811	5.789848

Figure 5: Heat map for a 100% Real Estate Blend asset allocation strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

Figure 6 shows the heat map for the target risk Balanced portfolio while Figure 7 shows the alternative Balanced portfolio which includes an allocation to the real estate blend strategy. Using the guidance from Exhibit E, what do these heat maps tell us? First, in Figure 7, there are marginally better outcomes in the center of the heat map. This means that the plan design with the real estate blend strategy gets closer to success earlier than the basic 60/40 Balanced design. Second, Figure 7 displays less dismal outcomes than Figure 6. Where cells aren't green, they are more likely to be amber in Figure 7 and shades of red in Figure 6. Finally, and perhaps most importantly, given the behavioral consequences of volatility, the Balanced portfolio with real estate in Figure 7 produces a smoother transition to portfolio success. Figure 6, on the other hand, depicts a number of paths where green cells transition back to amber before returning to green again. However, Figure 7 cells tend to remain green once they have turned green. For an extreme example of the effect of portfolio volatility on success, refer to the row second from the foot of Figure 3. It shows a path that on three occasions suggests "success" (green) and yet finishes as "moderate success" (amber).

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
2.69741	3.116164	4.072646	4.677855	5.899898	7.778045	9.393178	10.6477	12.28573	12.65256	15.50126	20.11657	20.85467	24.39976	22.85336	28.27352	32.27725	34.68013	41.53473	51.90396	56.08432	61.78653	70.20885	79.13588	95.80623	106.1381
1.789622	2.041659	2.58981	3.252368	3.918699	5.021552	5.776242	6.803863	8.145675	9.023133	10.3037	11.27465	12.8328	16.081	19.36691	15.71149	18.64571	22.46633	28.01023	33.11572	36.08704	39.00838	47.37514	54.4801	71.41642	83.41412
2.822539	3.381395	4.07111	4.480557	5.490366	6.390277	7.9413	10.0026	11.89682	14.0586	13.47859	13.81014	14.89083	14.85328	17.70546	19.29693	23.42159	24.04168	26.15336	31.46096	35.35987	43.95135	46.52604	54.23069	66.27984	76.71544
1.603826	1.860886	2.137248	2.460781	2.930073	3.468497	3.778831	4.463315	5.064163	6.033692	6.935311	7.929644	9.15867	10.70771	12.19533	14.83277	19.33126	22.72065	24.43901	28.53411	33.41686	39.40561	51.67677	51.07178	60.33843	71.7289
3.010853	3.231553	3.924603	4.64414	5.796111	6.590782	5.985473	6.90605	7.803999	8.942895	10.58408	11.76655	12.68338	14.51292	15.27067	18.21384	20.44836	21.20406	23.96093	27.70157	31.22621	35.98625	43.17634	50.87343	57.70977	64.80999
1.794313	2.189907	3.005112	3.439251	3.244967	3.752578	4.235203	5.75069	5.200636	6.060729	6.481623	7.20401	9.027895	9.547661	11.19508	12.94299	14.83311	18.17922	20.77704	23.60319	27.21337	32.17881	39.48959	46.76779	53.20097	61.59387
2.068205	2.393545	2.64743	3.156485	3.798657	4.65648	5.536438	6.017427	7.107774	9.051927	10.68194	13.52869	15.69157	19.50147	21.86364	23.53279	25.96265	26.68311	25.89484	33.24046	38.11323	43.36984	50.08393	41.76672	48.17812	57.94393
2.425748	2.935389	3.321231	3.276462	3.820659	3.976368	4.221575	4.082728	4.866553	6.318121	6.878145	7.816348	9.282357	8.724163	10.04769	13.32708	14.18986	17.55578	20.91999	24.9168	28.45598	32.14214	30.7447	41.36083	46.30985	55.54426
2.35999	2.805768	3.271842	3.585177	3.612539	4.318471	5.010764	5.659169	6.150695	7.061537	7.940016	8.607151	10.14076	11.90037	14.10639	15.6719	18.55735	21.37986	25.41803	25.31847	26.90373	30.55208	38.99918	44.41177	53.37898	53.83404
2.111981	2.480097	2.689891	3.118382	3.485877	3.914845	5.22546	5.785259	7.432354	9.246053	10.90963	12.93366	13.94989	13.09067	17.69282	19.28319	22.58298	21.4069	21.64278	25.32769	29.87302	32.88366	37.53762	46.88647	43.62103	51.4016
2.124995	2.453322	2.837614	3.376581	3.382751	4.452332	5.015809	6.032109	6.873116	7.574645	8.72028	10.17255	9.861212	10.71075	11.62332	11.19299	13.14564	15.98592	19.10554	21.34759	25.59937	28.77422	32.16652	35.58556	39.44641	49.30784
2.010767	2.053162	2.482552	2.744974	3.072879	3.619183	4.016973	4.50074	4.956806	5.715679	6.451965	7.57759	7.146752	7.401974	9.995781	11.41627	11.85161	13.03891	12.49379	15.08294	17.74777	22.22561	28.0306	30.76234	40.54051	46.70331
1.743884	2.106221	2.401379	2.738276	3.067644	3.93942	4.134187	4.556792	4.847929	6.272734	6.632139	7.669985	9.004208	9.57936	12.41833	14.76695	17.44431	22.80849	24.6837	27.72497	36.34655	42.40903	50.08673	56.26795	46.91612	44.9991
1.992978	2.186454	2.988901	3.019211	3.509466	4.206046	5.00927	6.555411	7.691355	8.304209	8.058768	10.56992	11.57559	10.67171	12.17092	15.18788	17.84967	21.26842	22.08434	25.50527	28.28937	30.39218	37.97607	40.95401	44.79317	43.5836
2.497304	2.674963	2.539575	2.779342	3.067795	2.975449	3.43742	4.349769	4.72193	5.464679	5.929163	6.863695	8.047976	9.926252	11.39695	11.38501	10.25468	12.38849	13.21835	16.58689	20.53615	23.20121	26.27967	30.3425	36.52536	41.97803
1.374946	1.602894	1.911958	2.168812	2.453106	3.118437	2.7955	3.150222	3.907215	4.437023	5.369309	6.576523	7.581969	9.459858	13.12464	13.86598	16.28677	17.52359	16.38999	19.02423	22.02088	27.55762	31.68712	31.61787	35.9402	40.09304
1.568015	1.878779	1.874492	2.20491	2.428057	2.920245	3.289828	3.598854	2.879399	3.410638	3.933303	4.525175	5.227234	5.473038	6.0887	7.613728	8.73566	11.8355	13.95574	16.53218	17.05221	17.01083	22.35652	22.99496	30.05284	38.37952
1.571141	1.871922	2.099805	2.17337	2.985178	2.952122	3.573263	4.34865	5.084081	5.974575	7.465394	8.675925	10.27701	12.31682	11.9296	13.95523	15.38089	18.72296	18.10694	19.4926	23.2832	23.93318	31.03898	30.70499	35.04376	37.16856
1.794825	1.936256	2.32439	2.693151	2.995053	3.683785	4.167071	4.625264	5.777762	7.250539	6.81026	8.207707	8.676421	9.404041	10.9109	13.00427	13.31748	14.57092	16.49857	18.70656	19.13359	24.66599	27.67308	29.92745	34.216	36.34074
2.047558	2.364605	2.699192	3.233175	4.288746	3.345268	2.678011	3.148141	3.726754	3.915103	4.333765	4.78916	5.227507	6.020685	6.955847	8.093322	9.335617	11.05688	13.35583	14.24649	16.87654	19.54697	22.28225	24.34014	29.0605	35.55816
1.587337	1.778016	1.528994	1.729502	1.967129	2.26108	2.796542	3.089791	3.370347	3.839563	4.624774	5.112059	5.679703	7.130457	9.087516	9.381319	11.73726	14.66812	19.28285	15.60579	18.67852	22.4943	24.21964	27.6003	32.22747	34.77082
2.038071	2.702063	3.096781	3.450746	3.953614	4.296213	5.093479	6.065381	7.168388	7.745519	8.968643	10.09631	9.697134	11.7156	13.2998	17.04754	16.99945	20.68478	27.80724	30.64847	24.77	29.57026	34.7643	32.92715	37.58562	33.72772
0.906885	1.277055	1.50751	1.66871	2.075208	1.947036	2.421212	2.692598	3.208919	3.655172	4.365188	4.140914	5.621525	6.630955	8.42849	9.895448	11.27784	12.96228	14.61482	18.73192	20.45772	22.40363	23.63309	26.58554	28.33181	33.21862
2.283116	2.606976	3.127439	3.004591	2.476095	3.187695	3.531492	3.869855	4.58125	5.234068	6.154727	6.659402	7.91775	8.258092	9.297334	10.26858	10.94857	14.3981	16.58941	19.12293	21.9013	27.98714	28.27794	34.71447	40.21843	32.57637
1.940142	2.31211	2.707398	3.137202	3.572344	4.716147	5.488203	6.823025	8.106515	8.888434	9.431631	11.50148	9.027089	10.31395	12.55007	13.603	14.15285	16.05657	14.52073	17.64732	20.06485	20.54218	25.62394	30.25384	26.42344	31.47944
1.212739	1.374417	1.606871	1.947085	2.251054	2.783048	3.2173	3.38886	3.150666	3.649716	4.361025	4.810374	6.706498	7.387334	7.804893	8.053409	9.622824	11.03319	11.97072	14.11807	16.27117	20.58647	26.81013	25.67099	30.92377	30.79642
2.291869	2.418699	2.796978	2.615987	3.034949	3.38503	3.426343	3.87467	4.393776	4.292913	5.501596	6.053541	6.960416	8.499498	9.188731	10.78176	12.07571	13.82219	16.01887	20.36165	19.8472	20.29734	24.01003	29.37537	33.68912	30.2386
1.335363	1.092138	1.204701	1.59192	1.953539	2.483967	2.563918	3.507195	4.07346	3.927905	4.490927	5.041336	6.524354	7.548891	6.817293	7.789541	9.322821	10.49402	12.043	12.54161	16.57353	16.96145	21.41187	20.87157	24.46314	29.47443
1.158485	1.363006	1.552302	1.890739	2.085402	2.295492	2.656291	3.07596	3.650567	4.03693	4.670552	4.840129	5.517069	6.050344	7.047345	8.379607	9.050816	10.67194	12.69059	13.51934	15.91586	18.50357	21.32545	26.69308	27.72981	28.02389
1.474473	1.742099	2.140918	2.084515	2.385311	2.646586	3.093912	3.527068	4.034722	5.294574	4.192683	5.047319	5.364243	6.208218	7.774221	8.262843	8.851554	8.800663	10.99643	13.07568	14.10791	15.38122	17.7206	20.78758	23.76188	27.14602
1.601411	1.869061	2.181219	2.544518	3.471223	3.557238	3.838867	4.746152	5.593498	4.425774	4.893565	6.303392	6.927752	6.628555	7.725165	9.116703	11.78846	13.62883	14.87379	17.44017	18.79219	22.31437	25.60793	30.08778	28.18002	26.38201
1.7878	1.785155	1.900019	2.401138	2.374937	2.851251	3.431907	3.599412	4.393858	5.087755	6.623528	5.320481	6.728307	5.303016	7.045659	7.460535	8.84618	10.18293	12.05509	14.29093	15.45435	18.8178	20.57986	22.8947	26.0683	25.80255
1.788022	2.344663	2.990956	3.326278	4.185844	4.447148	5.071386	5.76022	6.892602	8.248265	9.470797	10.22009	12.00378	13.58239	15.33993	17.14293	16.98189	15.6939	18.21795	14.74726	16.49049	15.86126	18.14547	19.94088	23.08456	25.38376
1.654796	2.042802	2.513032	2.937366	3.207334	2.512913	2.61804	2.907074	3.378644	4.370638	5.315049	5.84246	7.098774	7.82628	9.249709	8.975757	8.447855	7.955996	9.506016	10.54725	12.6015	16.27356	18.30824	18.81593	24.05373	24.90866
1.553704	1.551737	1.719312	2.045595	2.365637	2.260767	2.638681	3.1657	3.522512	4.175459	5.114504	6.529641	7.840728	8.183354	10.51598	11.51807	11.53357	13.49718	16.40093	15.72582	18.79891	17.58206	16.51725	19.04613	20.58235	24.19882
1.626076	1.566042	2.026859	2.393034	2.154826	2.57067	2.230511	3.401372	4.253979	4.940456	5.888703	6.824608	7.49885	7.460745	8.686686	10.05849	11.39604	13.07027	16.60256	19.02341	21.67134	24.1984	23.57649	24.48065	19.80251	22.9791
1.319471	1.550455	1.972816	2.379013	2.705143	3.105098	3.425302	4.048211	3.582222	3.769147	4.923931	6.036568	7.25266	7.870279	8.64373	9.38921	9.329978	11.67852	11.96919	13.67384	14.18739	15.73648	15.3579	17.17472	18.82508	22.06243
1.185003	1.258257	1.501923	1.926879	2.213039	2.829614	3.24811	3.084262	3.490356	3.879483	4.199631	5.078123	5.273029	6.272759	7.96021	9.251704	10.4195	13.17847	14.95758	18.50902	17.29424	20.85029	23.87576	18.85147	22.94129	21.49133
1.826244	2.098849	2.479776	2.995398	3.588104	4.684379	4.433999	5.145378	6.095251	7.018361	7.594053	8.260586	9.594566	11.27842	8.928348	8.666133	10.12215	13.03818	13.43526	14.93603	17.20944	14.39729	15.21385	19.32069	20.08493	20.88601
1.252714	1.219285	1.228993	1.453811	1.732464	1.884533	2.327277	2.582627	3.0384	3.712878	4.887236	5.307372	6.075338	7.331822	9.105068	10.4546	13.05782	14.41215	13.8167	12.4358	13.10257	15.52843	14.26207	15.62167	17.47019	20.48081
1.498348	1.54316	1.755519	2.053629	1.935894	1.73952	2.337441	2.60717	3.27535	3.901014	3.742948	4.165219	5.331182	6.122756	6.964682	6.19196	6.753304	6.481163	6.010261	6.513349	7.58999	8.540776	10.26035	12.10433	15.01426	19.72933
1.52591	1.712187	2.070315	2.438103	2.330934	2.863022	3.454093	3.969884	4.332367	4.917175	5.785912	6.640592	8.250578	8.257012	9.857087	7.810986	8.26512	10.25942	9.622849	7.817856	9.843126	11.83148	14.31406	13.60043	14.95104	18.88942
1.619989	1.978961	2.369969	2.228325	3.133662	3.524952	3.964534	3.850503	4.203867	4.762923	5.606387	5.355755	5.22375	5.456072	6.564266	7.412915	8.595969	11.32088	12.03435	15.0098	17.90137	20.34975	22.58938	17.69278	23.42578	18.34809
1.60464	1.296096	1.50171	1.671292	1.359008	1.706051	2.065511	2.106067	2.503288	2.848387	2.749614	3.694849	4.005156	4.618947	4.281598	5.214841	6.795628	7.823562	8.889211	10.42777	14.46923	15.23454	12.34569	16.05289	15.3404	17.59254
1.165103	1.329123	1.843465	1.941404	2.038832	2.230397	2.555235	3.052165	3.7876	4.331533	5.006767	5.93007	6.699453	7.16212	7.483627	8.925839	10.62793	9.844916	11.07916	8.730668	8.36164	9.076995	11.368	12.82362	14.27708	16.25469
1.10689	1.260963	1.628648	1.902638	2.249773	2.295318	2.521979	2.358845	2.853278	3.273875	3.169206	3.67335	4.337761	5.154158	6.070271	5.834494	6.780041	7.821364	7.531832	8.307904	9.391893	9.999548	12.55113	11.81308	13.98061	15.2392
1.508958	1.69263	2.141407	2.790611	3.225227	3.73009	4.399526	5.266441	4.95975	6.493712	7.396842	7.24359	8.26795	8.985941	10.49031	12.23647	9.604904	10.69602	11.61874	12.57714	11.77388	12.07057	12.72286	12.74305	12.17469	14.12826
1.35977	1.821511	2.219103	2.402708	2.667287	3.124439	3.778403	3.579324	3.482764	3.754289	4.259075	4.121991	4.744547	4.467161	5.211329	6.724197	6.213585	6.836068	6.58204	8.904328	9.844308	11.16217	12.1871	9.653808	11.32497	13.04828
1.261879	1.034314	1.009422	1.13445	1.145596	1.333012	1.587425	1.792787	2.068828	1.946324	2.201642	2.503381	3.047161	3.883949	4.159339	4.360044	4.771029	6.024444	6.658257	7.766808	8.210668	9.122808	10.81249	12.71182	11.45306	11.45467
1.648191	1.708257	2.018002	1.729749	1.937157	2.326039	2.513208	2.97276	3.317461	3.191496	3.863824	4.573631	5.472624	5.179083	5.417582	5.910697	6.33069	5.178238	6.104308	7.460087	6.279996	7.1233	8.099861	8.578256	8.064964	9.483805
1.59871	2.162166	2.875078	3.189113	2.705644	2.659218	2.16095	2.759743	2.57572	2.868223	3.191171	3.574101	4.026173	4.288788	4.392617	4.142759	4.584877	5.564179	6.131167	5.409947	5.197818	5.946804	4.793939	5.662726	4.647601	5.973518

Figure 6: Heat map for a 60/40 US Stock and US Bond static asset allocation strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.695884	2.273294	2.689256	3.679251	4.52993	5.057905	5.926948	6.813952	7.065132	8.229913	9.791566	12.43674	15.25401	15.81637	18.00798	19.37072	23.05956	27.57515	30.76455	36.61517	43.41468	56.43203	73.76767	93.47727	112.5037	116.5472
2.32746	2.697197	3.0738	3.540395	3.505344	3.891042	4.226996	4.662671	5.188537	6.619981	7.628971	8.783284	10.70821	12.69734	15.41617	17.85432	20.85213	25.21791	28.59688	36.03026	40.17776	47.30781	52.29751	63.4461	72.84151	80.74194
3.029586	3.709488	4.586084	5.800485	4.782937	5.218717	5.960163	6.912512	8.035309	10.26536	11.29697	12.42747	14.72391	15.24839	16.22285	17.69473	19.90904	21.63295	24.99066	26.40255	31.34936	39.24232	44.49757	56.42037	65.82311	75.84363
1.537246	1.783072	2.055295	2.196891	2.602874	2.894409	3.553274	4.230781	5.288024	5.970081	7.346023	8.414073	9.674062	11.08992	13.44839	15.47852	19.76473	22.58813	27.01436	29.98027	33.06055	34.5153	38.0721	47.43418	60.65514	71.7828
2.267123	2.998445	3.657991	4.155291	4.36537	5.587754	6.697886	8.229397	9.651407	9.877646	11.75305	13.96798	16.32335	16.86321	19.70379	21.98422	24.7743	23.85415	24.59076	23.12781	26.4526	30.94797	42.64024	52.73921	51.04647	66.34437
2.038324	2.457401	3.144773	3.326919	4.007347	3.238152	3.562383	3.833502	4.698734	5.885347	6.116033	7.188765	7.696131	8.798443	10.10173	11.24285	14.0023	18.92175	22.09741	24.66953	31.98617	39.13621	42.29963	50.27982	55.9955	61.21642
1.377205	1.631954	1.840404	2.179316	2.290939	2.634103	2.891927	3.589472	4.241968	5.065569	6.6904	7.39665	9.726903	11.35435	13.76737	17.50499	20.27408	22.13311	24.08287	27.5171	30.07633	38.07351	37.84073	42.3575	49.43821	57.92568
1.713771	2.042062	2.276687	2.813989	3.129074	3.862445	4.484532	5.741079	6.965796	8.419324	9.51215	10.99395	12.37908	14.45328	18.37198	17.89542	21.33105	24.5133	27.57282	26.28646	23.67154	30.14864	30.75082	39.79671	47.12539	55.43091
1.445632	1.53624	1.803898	2.060342	2.60131	2.963766	3.54323	3.969748	4.851741	5.05102	4.82278	5.173449	6.877123	8.23326	8.928345	9.884984	13.41386	17.20381	20.43528	24.51249	28.60753	32.81532	34.26127	40.58057	47.94705	52.83668
1.22279	1.607004	1.655908	1.879556	2.221544	2.614237	3.141434	3.103784	3.392232	4.250367	4.460735	5.857828	7.354848	7.890163	9.535726	12.18482	14.53214	17.26368	23.37305	27.31092	28.49648	29.331	31.74326	37.78388	39.29198	50.41687
2.204315	2.546457	3.245758	3.385915	3.963665	3.93379	4.455066	5.146847	6.131685	7.347701	8.106123	8.932598	9.952449	10.52817	10.07294	11.36206	13.29572	17.2191	20.38423	21.95052	21.08538	25.03414	32.14879	38.9377	46.52322	48.36354
2.105063	2.535386	2.901497	3.339365	3.58321	4.587242	5.567968	7.112825	8.626313	9.886668	10.58117	10.32904	12.58104	9.538962	11.99402	14.05702	15.19946	18.84408	21.77485	26.62717	31.32139	32.6719	37.8216	41.37175	48.8271	45.98521
2.21139	2.511487	3.036787	3.858582	4.132192	4.743149	5.172332	5.494573	5.946546	7.9791	8.495541	10.16436	10.73196	12.60816	14.80204	14.41329	15.80527	17.55487	22.05198	24.24598	27.86959	30.93003	29.34105	28.16556	38.81759	44.6897
1.29991	1.476572	1.668154	1.932013	2.351181	2.82744	3.140633	3.850384	4.691971	5.439785	6.143507	7.557174	7.839165	9.163808	11.20832	11.08079	12.83857	16.65502	17.41961	19.30449	23.57751	29.86487	34.85377	39.24752	45.07132	43.55999
2.102876	2.540582	2.78402	3.263909	3.130078	4.022281	5.098212	6.429056	8.059913	9.308552	10.74646	11.72087	14.37997	16.45534	20.00634	25.22407	26.64447	30.85119	31.88856	37.94527	40.79974	34.7163	35.7511	33.99029	38.97971	42.12941
1.987219	2.148715	2.395541	2.877336	3.188851	2.895943	3.663554	4.592175	4.451283	5.054161	6.592367	8.198303	9.511858	12.16994	12.22967	13.93883	16.02233	16.61496	19.4323	22.16226	26.50944	31.41433	38.05876	40.92608	37.21901	40.82419
2.329789	2.753811	3.024865	3.369462	3.694238	4.310021	4.61003	4.943137	5.138396	6.160833	7.865509	8.887546	10.42344	11.65626	11.01189	12.0958	13.45006	15.47091	16.02531	18.60301	21.51183	29.03338	25.94698	33.64327	37.7636	40.27081
1.680744	2.034876	2.632287	2.757545	3.512365	4.092371	4.048743	5.059678	5.824151	6.037736	7.094243	8.817368	10.18534	11.90403	15.31822	17.70104	16.4182	19.77029	24.83116	23.03725	24.80762	26.35506	34.38327	37.28195	40.20277	39.3812
2.421972	2.873845	2.819937	3.327419	3.886789	4.260199	4.974596	4.729808	5.243923	6.532409	7.000303	8.958891	10.08046	11.03514	13.17904	16.14317	17.739	20.56516	23.17968	25.15329	22.89682	23.58183	28.52893	30.97826	33.2784	38.26431
1.630512	1.639526	2.082564	2.358427	3.173695	3.866373	4.612237	5.594372	7.055846	8.278379	10.17421	11.63001	11.25006	11.78222	12.95891	11.6971	12.24044	14.73379	16.82344	18.60981	21.13056	23.23896	23.3069	27.57421	32.807	37.01441
1.257729	1.251709	1.509304	1.449491	1.723297	2.0476	2.334703	2.86224	3.145231	3.84249	4.455668	4.754544	5.47737	6.132078	7.438636	8.038593	9.258169	10.99413	12.16054	14.70102	18.23409	21.10021	24.60103	27.79552	31.21423	36.51113
1.429005	1.591802	1.913445	2.312988	2.672624	3.221523	3.756733	4.443489	5.847394	6.815522	7.49255	7.971364	9.488508	12.69771	12.54338	13.38585	10.48419	11.81503	13.02336	16.53066	17.90536	20.83919	23.18064	26.86068	30.9102	34.95388
1.406777	1.598605	2.120225	2.355663	2.287219	2.586163	3.109085	3.752989	4.627715	5.821021	6.345173	7.455681	6.954515	8.227543	9.801388	11.63038	14.25516	15.50891	13.99068	16.1512	18.5599	22.45998	24.37895	27.19006	29.57793	33.71167
2.834543	3.060267	2.820421	3.729069	4.15492	5.187117	6.770369	6.357277	7.483349	8.631881	10.72507	12.71609	14.52135	17.19652	16.60033	15.84795	17.5705	16.54209	19.01831	23.00963	24.01983	23.13493	23.82776	25.3267	30.88684	32.50269
2.891031	3.651591	4.509574	5.416177	6.350873	5.813251	6.653595	7.426996	7.786646	8.591744	10.66323	12.58617	13.16073	16.07491	12.87541	13.93381	13.44303	14.53997	13.89272	16.51021	21.51043	25.21542	28.53731	32.62668	40.84286	31.37838
2.273138	2.957792	3.420898	3.818582	4.27124	4.446571	5.195063	6.05439	6.957345	8.810459	10.23141	12.20721	9.561675	10.11725	8.316082	8.981383	10.14601	9.579974	11.86843	14.73473	16.86225	18.49389	19.66936	22.11144	25.40584	30.38598
2.085459	2.58014	2.763488	3.258804	3.765627	4.422475	5.708	7.11844	6.999499	8.317836	8.791229	9.49742	12.06659	11.39615	13.71835	10.99663	12.5953	13.41544	14.32466	16.57444	15.61209	18.60679	20.66132	21.41481	25.34411	29.73799
1.464705	1.455625	1.783379	1.976107	2.22918	2.626391	2.573509	2.467244	2.966521	3.543686	4.573478	5.712548	6.482606	7.561453	7.49519	7.42485	8.751896	10.53881	13.70818	15.62773	17.58016	19.81217	22.93601	24.76669	26.86805	29.49277
1.774831	2.112893	2.533634	3.020956	4.079886	3.380058	3.849585	4.435148	5.790425	6.814191	8.694545	10.4344	12.94965	12.22572	11.91451	13.55572	14.59544	16.18865	17.60455	16.77057	17.47086	21.91835	23.60953	26.52609	30.23284	28.82441
2.28325	2.520758	2.733043	2.221932	1.815467	2.04495	2.467042	3.038536	4.031242	4.389093	4.986316	5.303546	6.322608	7.429867	8.721679	9.455386	10.87002	12.27254	14.08919	15.88971	19.45641	22.52402	20.29553	22.40918	25.72737	28.16615
1.367358	1.374014	1.766123	2.000977	2.129549	2.146079	2.417325	2.514584	2.44231	2.874835	3.285052	4.501365	4.731932	5.703075	7.425452	8.646162	9.58149	11.11832	12.25966	14.64098	16.77353	12.91979	16.23186	18.77384	23.68848	27.57462
1.923532	2.486236	2.874564	3.469056	3.869028	4.27673	5.113873	5.693656	6.931197	6.823288	7.717091	8.907326	10.46029	11.29595	13.2738	15.28539	14.88313	17.36875	13.59003	17.24643	18.56133	17.47664	19.71533	21.2461	24.59346	26.94379
2.432906	2.726597	2.930229	3.550042	2.8749	3.716516	4.37066	4.958623	5.782806	7.043787	8.095455	9.290272	10.11191	11.58362	13.37064	10.60477	11.98578	11.68575	13.67534	15.16832	16.67245	15.92452	18.69603	19.83621	22.93048	26.26817
1.314166	1.431252	1.734125	1.861732	2.225227	2.551245	2.501348	2.628316	3.306095	3.851148	4.639991	4.865294	4.761932	5.61798	6.003929	6.454908	7.427178	5.749506	7.375848	8.201662	9.46953	10.91897	13.87757	16.07167	22.1875	25.93589
2.546257	3.222823	3.673324	4.043404	3.790734	4.303063	3.70769	3.38068	3.68685	4.36083	5.4516	5.960267	6.270023	6.938401	6.944684	8.075447	9.596121	10.06421	11.79338	12.94497	12.03212	13.21878	15.46576	17.49507	23.69524	25.12285
1.563241	1.879021	2.214902	2.567804	3.047424	3.544887	3.406483	4.172636	4.747238	5.471814	6.035585	7.183659	9.55397	10.68934	12.67654	14.48025	16.79911	18.41139	15.70178	19.60738	21.28167	26.72821	28.39089	21.82909	23.65982	24.37126
2.932773	2.855452	3.580697	4.416374	4.696433	5.316483	5.688924	6.631442	7.633375	6.136652	7.005505	7.584545	5.959437	7.14036	8.245498	8.307364	9.710996	11.12374	13.40648	15.42386	17.57115	15.98651	18.93559	19.95431	22.98818	23.8212
1.315053	1.699104	1.913559	2.18506	2.651331	2.553034	2.0331	2.36101	2.600272	2.920494	3.504014	4.110835	4.073553	4.847814	5.355604	5.992686	6.949102	8.324377	10.5938	11.50979	12.30238	13.31583	16.64508	16.71598	20.2641	22.85443
1.99918	1.938853	2.316464	2.272926	2.937305	3.646787	4.20348	3.995705	4.998166	4.902096	5.092224	5.661881	7.057593	9.256063	10.62364	9.702245	9.55697	9.396357	10.24743	10.31409	10.30112	10.99005	13.96735	16.11174	18.49517	22.1439
2.419057	2.684203	3.463466	3.878003	3.693695	3.878738	4.643426	4.902047	3.865344	4.417779	4.305052	4.485955	4.920883	5.673679	6.622658	7.366115	8.552819	8.977281	9.308511	10.11405	11.67087	10.8571	12.30413	14.59623	18.43626	21.71928
1.884707	2.005831	2.283887	2.627937	3.022117	3.580925	4.139022	4.899269	5.26022	4.347342	5.56957	5.861802	6.78177	8.089748	10.13333	8.050312	9.790465	12.69977	14.73103	13.91748	10.72892	12.5181	13.89538	16.44224	19.47635	20.64144
1.906192	2.441092	2.83301	3.088739	2.906234	3.410093	3.393954	3.080904	3.384535	4.127977	4.965767	5.586432	6.076836	6.714638	8.065534	6.236783	6.762261	7.192525	8.30541	10.59343	10.09326	10.57809	12.8511	15.23956	18.66982	19.51059
2.383897	2.85601	3.137512	3.429968	3.272799	3.811676	5.022653	5.816465	6.968462	7.811505	9.160763	11.05445	12.11661	12.6077	12.18678	15.83492	19.217	18.93952	18.58803	18.32449	16.66749	12.62951	13.91548	14.78376	17.30034	18.41015
1.670698	1.623782	1.937637	1.922691	2.287326	2.272688	2.3881	2.6746	2.833016	2.750081	3.282631	3.141908	3.518709	3.715018	3.930227	4.857411	5.338712	5.880648	6.611026	6.626379	8.378427	10.54606	12.24649	14.27804	17.38346	17.76648
2.306476	2.496526	2.288227	2.122076	2.376598	2.336552	3.136647	3.433446	2.784284	3.179158	3.9868	4.554195	5.321613	6.383462	6.218736	5.344834	5.851135	6.482628	7.425382	9.459866	10.98246	11.9697	14.02313	13.76464	15.10904	16.42962
1.325271	1.734038	2.010283	2.220874	2.094501	2.476319	2.485364	2.808723	3.33216	4.179655	4.890517	5.748494	5.705727	6.191771	7.22652	6.981608	6.491325	7.35397	6.91326	7.397189	7.700842	8.68238	10.19072	13.49562	16.00328	14.87878
1.084347	1.26003	1.55062	1.864484	2.180635	2.46826	3.152609	3.743407	2.869225	3.470551	4.035349	5.066082	4.922778	4.818684	5.708074	6.59353	7.84969	8.673094	6.985593	7.940245	8.243877	9.679951	11.57607	11.20638	13.70633	14.17693
0.866869	1.04081	1.291224	1.606328	1.899128	2.33774	2.432529	2.399061	2.809173	3.042635	3.574516	4.293493	3.706362	3.977136	4.109891	4.663067	5.408024	5.754583	6.519422	7.168355	7.019734	8.176891	9.450002	10.93306	12.71152	13.54982
1.814438	1.932904	1.56725	1.993655	2.407177	2.683934	2.898335	3.222416	3.212997	3.804693	3.507172	3.037493	3.773582	4.655965	4.680551	5.406694	6.137071	7.332629	8.926985	9.731315	9.211321	10.41577	11.62499	9.322467	10.77834	12.00628
1.598677	1.315814	1.632411	1.957093	2.089161	2.603338	2.072299	2.289939	2.527994	2.839996	3.343885	3.959613	4.268673	4.963986	5.275634	5.135971	4.151538	4.367449	4.795499	5.479587	6.242838	7.280653	6.899919	6.635111	7.55642	9.220495
1.557674	1.7548	1.7715	1.896224	2.062466	1.997363	2.296922	2.714576	2.991383	2.825153	3.370458	4.071354	4.785404	3.779174	4.373575	5.397021	5.784848	6.33423	5.897783	6.947233	6.642778	7.345664	7.043289	6.846726	6.648231	7.553156

Figure 7: Heat map for a 55/35/10 US Stock, US Bond and Real Estate Blend static asset allocation strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

Finally, consider the heat maps for target date or lifecycle portfolio designs. As with the Balanced portfolio comparison, the T Rowe Price glidepath with the real estate blend (Figure 9) is marginally more "successful" (or green) than the equivalent design without real estate (Figure 8), suggesting that real estate assists in achieving success during the accumulation phase. Also, where paths have yet to achieve success (green), in Figure 8, these cells are more likely to be red than amber. Once again, this suggests that the addition of real estate can assist in bridging the gap to success much earlier in the accumulation phase. With these findings, we have further confirmation that a real estate blend strategy adds value in both the target risk and target date paradigms.

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
5.202874	6.906871	7.691921	9.34005	11.51254	12.60761	16.8222	18.62189	21.27596	26.23243	29.7903	37.22866	37.87374	46.50713	51.54643	64.80854	69.10502	60.8553	69.60534	79.63579	97.90805	113.1831	127.4982	164.3672	214.3877	195.1336
2.363086	2.829303	3.170496	3.676249	5.151315	6.737747	7.764149	9.89774	12.16597	13.84403	14.55775	16.82265	21.78447	25.55109	23.88061	31.75214	36.85546	48.63953	60.59858	73.41829	86.71865	82.69051	102.3173	102.3668	128.7114	143.7295
3.559397	5.285791	6.14424	8.495709	10.13164	10.15489	12.14709	17.43843	23.48951	25.27358	29.27307	30.55592	37.16866	43.57003	40.87982	38.14113	42.16333	53.65456	61.76543	59.16944	71.22397	66.56405	87.54012	113.129	132.3105	133.0982
3.537262	4.606704	5.027651	5.961214	6.924391	6.066554	9.190946	11.74774	12.81428	16.63544	20.43848	21.74018	26.26384	28.9116	30.77217	34.92374	37.02469	41.41813	49.95995	64.86154	70.70886	79.61366	75.43488	86.93497	100.9431	117.3638
1.980382	2.398557	2.95373	3.446942	4.568641	5.446288	6.517969	7.72739	11.10331	13.14761	17.30578	22.09079	25.18248	27.34462	21.15501	25.85585	33.79094	41.22119	48.41683	49.55904	55.6231	62.90912	73.39858	82.92457	95.59441	109.1307
1.274894	1.789321	2.152216	2.681694	3.546078	3.218098	3.936424	4.927729	6.117217	7.901213	9.146074	10.03233	11.668	15.33564	20.27983	19.01858	20.66229	24.72503	25.35158	32.80903	38.16531	45.12555	49.20137	64.03619	74.52996	98.82583
2.90552	2.105073	1.965417	2.340392	3.2868	3.761819	5.20575	7.336762	9.361568	11.54941	14.60619	16.53654	18.68787	23.61115	17.59864	19.4978	21.9456	20.94525	24.69778	29.11472	34.34738	40.62461	48.79933	57.67669	66.95473	90.62263
1.60589	1.789277	1.694274	2.071849	2.626957	3.425584	4.263751	5.06337	6.663384	9.303303	11.28996	14.54325	17.04605	21.54511	23.86853	27.48013	36.81404	41.98874	50.114	51.29381	60.35902	57.49853	62.73015	67.28155	68.32209	86.5465
3.796504	5.063287	5.6353	7.212541	8.839985	10.35298	11.85168	16.21031	18.76675	18.26965	16.12398	14.46082	18.31065	21.43545	24.86097	26.68577	35.29828	46.55726	52.51127	56.7879	61.91678	67.72135	73.94538	83.80804	88.33613	82.08335
1.813319	2.241324	2.478022	2.229831	2.661001	3.732611	5.301814	6.424967	7.787441	7.12703	8.363569	9.990269	11.07621	12.99549	15.65267	19.72127	24.72985	24.70894	28.24733	29.31779	33.40028	40.31586	49.76336	60.24531	65.62897	78.85261
2.57058	2.846906	3.088502	3.871877	4.938782	6.159729	7.130421	9.228038	10.19909	12.42161	12.9762	14.69826	17.19046	20.23139	22.76223	27.2335	31.0518	29.68011	30.43211	34.06226	39.23742	52.99748	62.47714	65.34884	67.32503	75.62309
1.358638	1.245934	1.785203	2.13628	2.524783	2.835047	3.040202	3.715801	4.748252	6.690931	7.239503	8.271197	10.16781	11.1502	13.05196	14.38743	15.39582	17.87929	20.22016	24.97488	28.30725	36.1833	44.15652	45.17606	58.56931	73.08571
1.956399	1.805477	2.012938	2.318157	2.560374	3.670757	4.26173	4.73331	5.51014	6.90273	8.05784	9.023925	10.50188	11.51244	13.63816	15.26928	19.28994	22.04185	24.26985	28.69119	33.51752	40.45709	52.33638	61.03256	66.09519	69.57087
1.777114	2.061778	1.925989	2.312258	2.660968	3.358778	4.087206	4.454157	5.067719	6.020531	7.706378	8.845097	12.48409	14.81936	18.40155	21.79177	25.89712	27.17464	31.98351	37.19515	43.86753	52.03984	53.52857	56.53773	64.68062	68.43502
3.60366	4.368676	4.854427	4.463994	3.910858	5.115148	5.583751	7.239849	7.813662	9.531088	12.16173	14.75638	17.35219	22.46567	25.28395	29.20401	32.29596	40.50907	38.46792	44.04541	41.87653	48.02582	54.73251	53.33027	57.39826	65.1125
1.566951	2.204478	1.606804	2.027168	2.225472	2.364625	3.027184	3.684702	4.228809	4.967531	6.682023	9.183745	10.91309	12.26534	15.77289	17.85279	19.06393	21.4542	22.31141	25.71107	27.88021	35.02698	39.98679	44.76198	53.42503	62.94627
1.569787	1.999812	2.47556	3.041999	3.670589	4.073149	4.820351	5.764246	6.901177	10.27791	9.53345	11.94832	10.94592	15.90895	19.11095	17.71859	21.68608	17.11136	20.05245	26.32575	30.76053	33.85476	42.27246	39.5814	47.70306	61.27526
1.959399	2.433407	3.205221	3.711595	4.392847	5.688077	6.285681	7.394724	6.647267	7.654789	8.748104	8.612658	10.12176	11.62743	15.57894	20.20598	25.41002	27.31209	30.58236	25.16673	28.28221	30.39906	34.93607	44.01438	55.10939	59.29147
1.193378	1.330646	1.784561	1.666709	1.97428	2.500807	3.667731	4.503009	5.476232	6.395404	6.074881	6.94383	8.351722	9.001591	9.788886	12.60846	14.20715	17.88238	20.50498	24.22672	27.49525	31.67521	35.09243	43.11499	51.07425	58.23692
2.164369	3.065102	3.819188	5.229798	7.429401	10.61374	9.324105	8.38937	9.585852	9.758041	10.91392	12.73127	14.69165	13.7836	16.06461	12.53147	15.48952	15.88794	18.27912	24.88485	25.46844	27.38211	31.82611	39.9701	45.58212	56.28149
1.126233	1.034103	0.923625	1.136314	1.38121	1.848351	2.534705	3.369903	4.451402	5.402647	5.324992	6.993259	8.751775	10.50949	12.77598	14.93608	16.29993	19.56718	24.75972	28.4163	31.52984	34.0243	42.33163	46.39257	58.02278	53.94115
1.83396	2.31187	2.890129	3.778065	3.630611	4.330204	4.798887	5.93665	6.290934	6.657605	7.590932	8.782306	10.49061	12.14393	13.79335	13.54769	14.86356	21.10461	28.35164	26.63928	30.7041	31.84768	39.77118	42.01369	48.84694	52.58972
1.817742	2.870137	3.463457	2.956405	2.606524	3.381001	3.915747	4.951142	6.81704	8.700993	9.753289	8.947848	9.126432	11.12919	12.69451	15.38751	13.17437	18.16224	22.17337	22.58323	27.34762	36.1633	36.95617	43.24316	40.12633	51.52313
2.113336	2.655933	3.099309	3.580883	4.572174	4.471206	5.15898	6.048213	7.155638	8.607862	9.32361	10.19856	11.91538	14.52364	18.32381	23.44991	28.28664	24.94796	28.95395	31.29448	31.94296	25.74987	29.44378	35.89877	44.47439	49.54468
1.95864	1.434903	1.566062	1.863477	2.245757	2.672996	3.208443	2.863414	3.455538	3.182198	4.156076	5.151106	7.300263	8.730975	10.74034	12.14688	14.20972	17.01895	20.22434	24.31361	28.80707	27.25453	28.93993	33.89151	41.35485	48.10425
2.384927	1.986033	2.041688	2.393397	2.264612	3.278766	4.54553	5.69504	5.295219	7.005749	7.94418	10.12442	11.90189	12.14827	14.07283	16.0079	17.95949	21.19243	24.39667	22.50706	29.41708	31.22974	34.65587	37.8198	42.32957	47.06747
2.097446	3.090743	4.086874	5.054016	6.108479	6.398103	7.356351	9.619139	11.56769	14.04611	15.89991	18.15821	18.502	17.13536	15.43071	17.87908	19.34922	21.16087	22.87532	27.1726	32.75099	37.0829	41.40124	39.81385	41.15927	46.23183
2.948588	3.441767	2.502658	2.240149	2.399959	2.774634	3.802566	3.711481	4.234389	3.803625	4.413557	5.751128	7.016262	8.145271	9.573994	10.26095	13.13097	15.12627	17.42432	22.88601	25.01526	24.90145	29.36027	35.41514	38.00551	43.99759
2.263004	2.787151	3.501427	3.910668	4.90717	5.91164	6.504109	8.332345	9.468915	9.768599	10.53262	12.20692	14.25708	15.84326	12.1377	14.13156	16.05119	19.17997	19.56224	22.81595	28.54106	27.0035	36.22479	36.29414	41.73401	43.03785
1.651349	2.0595	2.307973	2.756242	3.207152	3.790146	4.190783	5.278558	7.133115	8.575528	9.506565	10.37706	12.19833	13.27257	15.94392	21.06315	22.35721	28.94327	33.85118	39.97045	34.63334	44.92576	52.69362	54.59199	50.54248	41.6775
1.511367	1.88946	2.244897	2.564198	1.972601	2.393818	2.840483	3.386857	3.948226	5.495843	7.521919	9.477777	9.963113	11.12958	13.3129	10.01226	11.08958	13.02254	14.28636	16.38095	15.2241	18.7459	21.1891	23.95075	30.72162	39.80535
2.421138	3.169843	3.898652	4.687405	5.799299	6.860944	7.475509	8.838765	10.65945	12.38209	14.34544	16.38919	18.19283	21.5631	23.51963	28.91122	22.62686	24.62933	29.85053	34.29615	26.66322	31.16327	29.88037	39.92313	36.49642	38.35365
1.67064	2.134113	2.545411	3.093404	3.640206	4.241115	5.241019	6.045605	7.482964	8.256392	9.642399	11.27341	13.04179	15.3958	18.01525	21.61012	24.65438	23.1151	24.27891	20.95984	26.09746	24.77566	28.68121	32.59474	35.60422	36.66423
2.025838	2.223496	2.931902	3.272195	3.826033	4.419872	5.062503	6.004132	7.442305	8.909727	11.9957	14.34967	14.61688	13.41345	14.11838	13.11261	14.83947	15.29095	17.956	20.60007	21.34342	25.93231	28.92009	32.90171	33.74274	35.02924
2.436105	3.190279	3.229082	4.39785	3.235127	3.596592	3.277195	2.87229	3.497341	4.15949	5.957888	6.272589	7.31	8.528537	9.367155	9.85755	9.301884	11.98133	13.96833	18.93623	22.20626	23.65579	30.16028	28.72922	33.82024	33.89533
1.336835	1.629016	1.852357	2.208787	1.582216	1.939555	2.358325	2.736558	2.996447	3.379515	4.307335	5.556264	6.638858	7.253638	8.265917	7.060795	7.933669	9.380201	10.18596	11.07216	11.50712	14.78243	16.84989	19.69247	25.74867	32.92465
1.941018	2.495903	3.352685	3.884368	4.569997	6.070397	6.119959	6.323416	6.696953	8.767656	10.44109	12.10006	13.74873	15.04008	12.72184	14.99244	17.4922	21.11616	22.83797	25.08251	22.88041	24.37933	29.89076	23.69921	27.87113	31.52936
2.185533	2.205736	2.594339	2.883621	3.24181	3.773612	4.155884	5.212084	5.870802	6.706536	6.303336	5.736758	6.923449	7.487144	9.041234	10.3451	10.20839	12.30111	14.43642	17.25139	19.8167	18.7705	20.44531	24.40993	26.35135	30.13306
2.15832	2.597631	3.141166	2.628669	2.322974	1.666649	1.533413	2.023188	2.618546	3.359549	3.415287	4.786867	4.705455	5.996203	6.483538	8.28583	9.402543	10.95577	12.77903	14.93137	17.16193	18.26985	17.43654	22.26396	25.34425	29.16997
1.557214	1.526741	1.80673	1.655439	2.189276	2.02891	2.378447	3.12692	3.897989	4.401361	5.19997	6.327646	6.99767	7.167831	8.138523	10.7882	13.05276	15.94679	18.37651	20.32717	23.91265	25.30537	25.61296	29.04476	27.78091	27.66179
1.489838	1.354102	1.926057	2.536678	2.574223	3.194542	4.027893	4.120713	4.970937	5.906712	7.119814	6.715944	7.247876	9.029453	10.16406	12.04697	13.08529	16.54981	12.68541	14.18065	16.26813	20.61339	16.20972	19.11697	22.07456	25.96698
1.85487	1.866459	2.143041	2.607318	3.007866	3.447315	3.058847	3.372844	3.975995	4.824036	6.109786	7.126037	8.590905	9.896439	11.01749	12.87709	15.62959	17.60205	16.50633	19.60079	25.7098	22.41456	26.14889	28.54465	22.71881	24.86904
2.559893	3.303048	3.064808	2.689269	3.222702	3.265218	2.42048	2.870216	2.695885	3.346043	3.176882	3.750761	4.369829	4.090279	5.363224	5.984682	7.083899	7.422579	8.552577	9.986036	12.43964	14.71617	15.29943	18.17983	20.38188	23.32558
1.385211	1.762121	1.439688	1.377648	1.507917	2.042234	2.431503	2.876872	3.555407	3.998471	4.854265	5.84783	7.906397	8.756672	11.75032	14.2588	16.20992	15.02656	13.35387	12.60619	14.04873	15.75225	17.02661	16.10931	18.73506	22.05167
1.942845	2.188286	1.825043	2.037233	2.533061	2.829636	3.747802	2.814482	3.112704	4.108792	3.252301	3.463605	4.114325	4.714842	6.000227	6.84057	7.845329	9.099088	12.14641	13.55745	12.91236	13.98303	14.88466	16.00281	17.86711	20.07605
1.232192	1.041726	1.333846	1.381847	1.24201	1.461026	1.949612	2.350642	2.430922	2.677649	2.84459	3.172317	4.087018	5.153746	5.906454	4.393904	5.301517	6.966246	9.575655	10.1494	12.02766	13.17939	13.3672	15.85864	16.58888	18.66495
0.89445	1.105303	1.218257	1.589592	1.908412	2.512568	2.846972	2.691151	2.365824	2.620115	3.101028	4.441333	5.229204	4.980488	6.091614	6.337281	7.022091	8.13702	9.212903	8.793909	11.03728	11.39442	11.86855	14.01904	15.14617	17.94536
1.521912	2.005212	2.855789	2.916915	2.661639	3.094483	4.05312	4.504495	5.849356	7.942752	9.229761	8.434427	9.823048	11.31715	12.18527	11.51281	13.13805	14.85733	17.44889	16.11679	12.33851	11.15301	10.84224	12.05728	14.0712	16.43326
1.866566	2.213799	2.595682	1.913866	2.333552	2.633224	3.649038	4.287068	5.089143	5.729172	6.575826	5.828619	5.183234	6.076012	7.073322	8.271824	10.60508	12.79219	11.78514	11.09909	10.76178	10.10811	11.91697	14.05322	12.8957	14.56676
2.133487	1.452667	1.817848	2.018151	2.442949	2.205125	2.028624	2.277657	2.620211	3.270105	4.160292	4.082118	3.842254	4.521389	4.959931	5.91394	6.517873	6.04371	6.915243	8.192034	8.782077	10.44918	12.35878	14.27539	13.83283	11.45632
0.972172	0.866739	1.101364	0.827428	1.150897	1.283028	1.49374	1.497501	1.750122	2.144039	2.550493	3.498733	4.886234	5.40085	4.929432	5.794661	6.454307	7.182197	7.692809	5.877129	5.506351	6.241781	6.935702	6.556176	7.204901	6.68378

Figure 8: Heat map for the T Rowe Price Glidepath strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
5.090306	5.64945	6.45397	7.922069	11.5699	10.74917	12.3592	14.39996	16.98902	19.58161	20.60276	24.52339	28.79889	38.62449	42.74164	49.14272	61.72882	75.38437	90.09018	112.1434	145.7005	167.3904	193.2081	238.0056	230.5533	224.4808
3.806739	4.064013	4.802918	5.739902	5.023749	5.74762	6.615161	7.705142	8.533577	9.647464	13.76121	15.86246	20.11075	23.36809	29.00136	32.76866	38.73099	44.83705	52.47057	63.51406	75.18838	81.68741	93.31135	114.9326	125.3401	145.603
3.36785	4.187303	6.196736	7.235544	10.60536	13.12286	17.6635	20.63426	19.8655	22.39579	25.38772	22.88449	24.83408	27.19107	33.00551	42.06537	45.78174	52.73268	53.96221	62.09305	59.56331	75.09083	90.48009	87.90653	100.604	128.0525
4.361019	5.178493	6.316119	7.314809	8.365722	7.906957	9.398593	13.16736	17.89441	21.41126	23.60496	28.74231	34.02131	40.05075	47.20315	55.37015	45.81757	49.08023	51.04254	57.51446	66.40462	76.20926	91.39484	107.4566	117.6333	110.0293
3.95103	4.846856	5.927862	8.041314	8.971839	9.13625	11.01767	14.26576	16.57305	20.20913	22.6831	23.19365	27.22295	32.60464	38.55309	50.26144	58.18118	54.33235	55.62883	62.79136	75.89323	83.27565	80.28759	85.36256	89.9579	102.9726
3.106367	3.030593	4.082543	4.806295	6.639024	8.605149	7.231777	7.99104	9.289275	10.02422	11.79209	13.48385	19.04055	17.76955	23.68036	26.23149	28.34281	35.50878	42.30996	50.41821	54.28232	62.31516	71.76731	74.33798	80.52026	98.47993
2.366334	2.886203	2.415601	2.81283	3.826457	5.286204	6.127674	7.555938	9.069778	10.71578	12.32966	15.5757	19.36248	20.26644	23.21821	21.93119	24.65342	29.93888	29.59012	36.40208	47.68333	55.14216	63.23011	73.24745	77.43023	91.28211
2.652532	2.78522	3.323805	4.245427	5.219568	6.145426	7.939847	8.805846	8.322459	8.652032	9.47765	10.43655	13.07712	16.62166	18.43179	23.23121	29.83421	35.40137	44.21021	55.26429	67.7691	78.19126	91.29911	100.8757	83.63092	88.00757
3.542865	4.740502	5.112521	6.943756	7.924279	9.492321	12.21655	17.1772	20.13494	25.39698	32.64405	35.10225	26.58242	29.37779	32.52155	41.38487	49.51403	53.0497	59.70588	55.94346	64.31286	81.58857	89.18243	99.81633	80.8503	82.82008
1.382446	1.665311	2.089129	3.110769	3.624878	3.403247	4.610172	4.130716	4.999094	6.135306	7.284862	8.761175	10.17829	12.10906	13.06845	15.12281	17.67251	18.97806	24.28367	32.61951	39.67233	47.03425	49.13524	57.67119	67.78324	79.83609
2.622728	2.865602	3.61051	5.189585	6.191839	7.175444	8.335214	9.760867	11.70643	12.61761	14.7831	18.03868	20.03244	24.9927	29.48266	33.86153	34.87891	40.46801	37.54939	36.14232	41.73815	49.09691	56.82916	64.93667	73.00746	77.14637
2.407519	3.213955	3.761811	4.146047	2.868546	3.508751	4.125214	4.068238	5.136464	6.753293	8.30739	9.257911	10.01442	11.78813	13.55002	16.10418	17.4184	19.07188	20.75321	24.00526	30.87219	35.10871	42.2536	52.67918	64.79585	74.59423
2.920816	3.378628	3.885141	4.541145	4.823637	5.385213	6.363089	4.704943	5.479272	5.044739	6.719679	8.296893	10.90046	12.61182	16.62471	17.41773	20.05829	22.03246	26.24745	29.54839	34.2161	36.91657	45.03316	52.58199	61.70621	71.30613
4.795286	4.171155	4.751311	5.219385	6.81093	8.356777	8.169662	10.17096	12.09902	11.45395	12.9368	16.45283	18.69898	21.51918	23.84349	19.66623	24.94388	33.61418	39.51748	45.116	49.13651	55.21815	67.31236	77.5714	85.00764	69.40882
2.933316	3.243466	4.066891	4.14141	4.661387	5.50295	5.725905	6.288132	7.985706	9.275192	9.643237	10.63002	12.92964	14.67388	18.04496	22.42089	26.89258	28.9464	33.24553	37.75813	42.72338	43.91584	46.62319	52.94231	57.97347	66.13954
2.299382	2.581225	3.20828	4.393356	5.531788	7.234617	6.088798	7.458894	8.989284	11.40631	14.35914	18.44001	13.97287	18.08613	12.97956	14.86833	14.03023	16.3382	20.17815	26.38077	28.01176	31.1004	37.62195	43.17851	51.54336	63.8735
1.960938	1.371887	1.838747	2.351578	3.044209	3.845383	4.599843	5.468412	7.022485	8.686169	7.817524	8.201814	9.479407	11.10127	13.2382	16.4807	15.545	18.57279	21.32109	26.2168	31.6319	37.01234	41.05845	45.34887	54.46712	62.03159
4.422973	5.891346	4.576375	5.33358	4.781234	5.602785	7.001748	8.900084	12.48243	14.94952	16.14274	18.7155	22.86664	21.28101	22.87152	26.59089	31.17695	37.92056	45.96914	56.90248	57.74017	67.38041	75.62402	70.29047	74.08825	60.02223
2.479693	2.813634	3.245081	4.197096	4.748795	6.192406	6.937001	7.629366	8.781212	9.479419	10.56789	13.18274	12.6376	14.00132	17.44372	20.13363	19.10373	22.10534	28.03675	32.75834	29.23341	33.85434	41.24599	47.36518	52.5543	58.06178
2.224697	1.943753	2.535447	2.7614	3.240258	3.578974	4.316583	5.506739	6.780147	8.033337	9.324579	10.39093	11.24673	13.83118	15.15178	16.78227	21.7714	23.10884	26.24754	24.47997	26.12795	33.90826	42.39699	50.2063	49.47699	56.75565
1.974943	2.57964	2.973505	3.701549	4.137509	5.303423	6.175613	7.253666	10.1858	11.5874	13.74115	16.72736	15.97813	19.30512	24.909	27.59781	26.28146	32.50795	31.01302	35.57913	28.85543	29.71232	34.90335	40.9691	49.48605	54.89757
2.284279	3.069843	4.21492	4.683018	5.054782	5.766033	5.861415	5.757834	6.271623	5.968352	7.669321	8.915311	10.53917	12.0733	12.74596	15.76343	17.61247	19.82415	22.0964	25.37269	27.70607	31.95719	37.55438	39.30306	50.10246	52.92574
2.776267	3.0725	3.716838	5.353261	5.419785	7.517137	9.070194	11.25165	13.09801	9.975436	10.1748	12.25564	13.63041	16.40827	19.2465	21.21759	24.06798	25.68894	29.0945	32.15919	39.98278	44.93099	48.69237	37.19805	43.5885	50.85335
1.816925	1.722539	1.831974	2.343899	2.973104	3.563455	5.05856	6.478543	8.507146	10.08051	11.82008	14.13846	16.74331	12.18918	14.07769	17.1446	20.23088	25.74174	27.91337	31.0224	29.83113	33.04632	37.66672	41.02833	44.23708	49.8705
1.207741	1.440764	1.595565	2.164904	2.760593	3.382465	3.779424	3.589846	4.565323	5.752655	7.814896	9.719101	13.12544	18.45638	21.39752	24.58471	26.69537	31.1477	36.21025	34.13546	39.13247	36.20661	38.04234	44.14304	51.08402	48.02608
1.755686	2.372489	2.652599	1.941918	1.759103	2.320517	3.011422	2.89806	3.90235	4.334804	5.498613	6.532553	7.323672	8.668113	11.22377	15.29024	16.07399	18.80563	19.2997	25.81607	28.28615	32.18836	35.56031	38.91476	38.62206	46.57891
2.646472	3.214007	4.037612	4.936512	4.133709	5.742703	6.311948	7.686985	9.096993	10.62271	14.70133	17.6175	20.94766	18.07497	19.6956	18.61334	21.78128	25.68843	24.89158	26.95275	25.50082	29.43024	35.54739	35.16867	39.89104	45.80378
2.710892	3.838904	2.832125	2.674954	3.960054	4.404862	5.395584	5.304507	6.721504	7.075866	7.810892	8.92196	10.39643	7.953824	9.397856	11.03189	13.25825	15.33379	18.30272	21.08458	27.41367	30.60697	29.58062	36.49113	37.77301	43.19686
1.421823	1.656574	2.07861	2.783742	3.141357	4.106919	5.326878	6.725374	8.310363	9.947256	11.53033	13.46026	15.3022	20.4392	26.36807	25.52702	24.05406	23.25472	26.84926	33.88012	30.08311	30.6461	32.43743	36.5866	43.32596	41.73957
2.605717	3.291197	4.424508	5.480765	6.633399	7.847762	5.469737	6.457603	7.646132	10.9675	12.75501	15.01012	17.7044	16.52675	18.21409	16.87514	18.76951	23.06454	25.01782	28.80157	30.02153	23.98052	29.19116	33.17824	38.00622	39.97994
1.853332	1.960537	2.438917	3.078295	2.238113	2.920186	2.624113	3.311195	4.187739	4.732587	5.582447	7.261772	6.960544	7.858789	8.983999	8.096684	10.59333	12.93291	12.57091	14.5577	18.04388	19.78985	25.89485	29.99773	37.42824	38.71232
2.299183	2.656795	3.339647	3.950881	4.148812	4.529762	4.905249	6.065019	7.242021	8.418879	7.415247	6.031841	8.300977	8.552476	9.6715	11.4576	13.02173	13.48511	14.85235	16.57461	17.60714	19.44149	22.26825	28.99737	33.26446	37.30465
1.81946	2.37793	2.987938	2.667407	2.281098	1.967232	2.46938	3.244317	3.761912	2.747253	2.476933	3.465647	4.55205	5.551305	6.452647	6.646963	7.703742	9.819709	12.43786	14.07152	15.20022	19.347	23.33389	28.0766	30.98273	35.24966
2.414698	2.817728	3.740016	2.778279	1.970048	1.818155	2.274599	3.086257	4.151062	4.134795	4.736939	6.598212	6.497677	7.111435	8.192209	11.44867	11.10751	13.0888	14.98523	17.57073	19.54708	21.12866	20.86333	23.90822	26.70996	33.64125
1.675793	1.70023	2.194562	1.954826	2.414784	2.858076	2.949392	3.550787	4.027055	4.958926	5.801917	5.276504	6.505246	6.137892	7.660853	10.04507	12.3097	14.72181	16.11145	19.32498	22.09683	25.1103	23.7171	24.86813	29.83052	32.47521
1.16931	1.583944	1.918375	2.153777	2.464114	3.021469	3.245816	3.837977	4.411584	4.841511	5.649644	6.967084	8.253037	10.00712	9.290055	11.39305	11.79581	14.62064	10.81376	11.43992	12.97626	16.59533	20.57077	23.0251	27.25064	30.98827
1.560699	1.996521	2.191007	2.959704	3.58555	3.618204	4.331805	3.886162	5.105182	6.275289	8.161695	8.336953	10.2244	11.24202	13.40515	15.42455	17.35949	20.46788	22.8349	24.02957	22.63379	26.21839	28.50034	31.40409	25.48129	29.85183
2.041021	2.309777	2.999371	3.679277	4.645867	5.107165	6.165392	4.570387	4.679271	5.280889	5.845259	6.427897	7.201846	5.270919	7.249069	8.469219	9.568259	10.47884	9.759104	13.68454	12.92666	13.5607	16.80271	19.83037	22.89318	28.21406
2.635157	2.494098	2.945259	3.481001	3.867368	3.645494	4.03883	3.836597	5.058873	6.416795	6.566768	6.746678	8.013104	9.033108	11.01802	12.63462	14.6813	17.02703	15.61531	16.73887	17.43712	20.43183	22.20163	24.11735	28.01177	27.33883
2.883132	3.090164	3.416994	4.498234	4.970402	5.695876	7.308625	8.557387	10.2829	7.302957	8.26447	7.838516	8.950416	9.216841	9.455364	12.00979	14.51991	16.64858	14.87999	20.01924	15.00213	16.23996	17.01375	19.54875	23.42943	26.88027
2.059854	2.471309	2.955649	3.315917	3.88894	4.713928	5.183315	6.589287	8.143493	9.298532	10.18121	10.96213	12.6457	13.83872	13.85353	16.2326	21.58467	17.99255	13.54205	14.73413	15.00356	16.86173	20.87216	21.00255	23.63348	25.48638
2.183793	2.555305	2.629214	3.191153	4.170228	5.074309	6.47522	6.255523	7.53808	6.452457	7.495882	8.772895	7.163016	8.073265	10.84537	13.06573	12.66653	14.02761	17.96939	17.26724	20.24283	22.26749	21.04021	23.78361	21.75926	23.95263
2.283759	2.628824	2.934753	3.440196	4.007861	3.815304	3.541557	4.62501	5.83098	4.986179	6.782635	7.593496	9.579588	9.261117	11.21345	11.06293	11.99286	10.88832	11.77411	13.53975	14.74964	12.57	14.47513	17.18612	19.26779	22.30659
1.419918	1.834097	2.366155	3.181485	3.853807	3.523589	4.237535	4.524903	5.520865	5.480723	7.186792	8.322079	10.02497	7.497854	7.91146	9.922698	9.816919	9.002479	10.29671	12.05541	14.57509	16.00016	19.83745	22.38145	26.69942	20.71973
0.685442	0.935868	1.240467	1.665727	1.772024	1.963024	2.50797	2.995673	3.497982	4.604316	5.93221	6.54789	6.745877	6.519785	7.690411	9.781379	9.002199	10.6963	9.763121	12.36435	14.71638	11.49491	12.84962	14.62901	17.79835	19.96782
1.76747	1.483497	1.776725	1.643536	1.86348	2.14835	2.403761	2.209845	2.841916	3.639615	4.276755	4.084622	4.832668	5.682146	7.042933	9.151415	9.379513	10.3687	9.729875	11.39141	8.710203	9.433532	10.07882	12.0489	13.96713	18.14973
1.222462	1.509405	1.353993	1.235052	1.579736	1.777657	2.166265	2.56874	2.865117	3.59921	4.299445	5.332306	5.504874	5.959115	6.162307	7.097592	8.393966	6.559464	7.044732	7.554642	8.730236	10.99619	11.9754	13.51084	14.02109	17.03924
2.23682	1.94259	2.370031	2.796571	2.646922	3.108651	3.615581	4.38456	4.758541	5.015111	5.829983	6.40793	8.425818	9.708407	11.73375	13.85412	17.18058	12.6054	13.31066	14.10534	10.94837	9.813075	11.37637	12.1061	13.92478	15.32039
1.149308	1.485547	1.786574	1.648233	2.039971	2.642388	3.207466	3.590905	4.32389	4.77488	6.507453	7.450549	8.732562	10.00968	10.51783	11.08401	10.59405	8.15527	8.731972	10.21539	8.124102	9.091485	10.48012	12.76404	12.62773	13.09489
0.609922	0.583268	0.760833	0.895471	1.256578	1.369319	1.661765	1.727064	2.11925	2.512683	2.349479	2.969615	2.637164	3.036379	3.428138	3.853047	4.767432	4.634442	4.567206	6.02117	4.552791	6.224472	6.921663	8.048124	9.417327	10.60215
1.198969	0.879771	1.117099	1.275645	1.554731	1.161016	1.381818	1.753282	1.70202	1.959777	2.553994	2.899006	3.502756	4.4287	5.394945	5.99909	6.648243	7.765311	8.534537	6.931802	5.474117	5.158525	6.156274	6.919359	6.70646	6.145875

Figure 9: Heat map for the T Rowe Price Glidepath with Real Estate Blend strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

Figure 10 and 11 show the pair of heat maps relating to the MarketGlide Benchmark glidepath, the former without real estate blend strategy and latter with real estate blend strategy. Before comparing the two to each other, it is worth briefly highlighting the main difference between these glidepaths and those of the T Rowe Price glidepaths shown in Figures 8 and 9. Due to the overall higher allocation to stocks in the T Rowe Price glidepath (cf. Figure 2) both heat maps transition to success (green) marginally earlier than the MarketGlide Benchmark equivalent. In effect, the additional return earned from equities and the associated compounding, allows the plan participant to achieve success earlier.

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
3.966069	4.5253	3.987198	4.688968	6.629468	7.198239	8.456167	10.7009	13.01964	14.0464	14.70087	19.42541	25.42401	31.23114	36.94508	41.24381	48.07347	61.34731	75.00034	80.56658	87.73143	104.1479	113.8777	142.9983	162.5754	195.7862
3.808061	4.2565	4.677287	5.795495	6.546105	9.435105	11.75102	15.76915	16.01696	19.6681	18.19822	21.59935	24.94813	27.08075	30.75012	37.16029	46.59071	49.01196	58.08718	62.45925	72.96049	78.16772	84.81252	96.60181	109.66	136.0787
3.192828	4.37885	5.671717	7.192564	9.47094	12.17377	14.72798	16.07666	18.45228	19.83895	23.22166	23.03475	27.18156	31.89872	37.29227	38.57429	44.7843	50.80824	47.0966	55.32625	58.12578	60.86343	70.56751	87.99845	102.8319	110.421
2.782725	3.115214	3.853325	4.801	6.966356	8.172859	10.81769	11.29906	14.87967	13.70197	14.75511	17.47953	19.16222	17.57956	21.366	22.73901	28.47392	30.586	36.80824	49.6481	58.40298	68.08457	75.43141	82.00477	85.91478	100.7155
3.557409	3.928316	4.903353	6.938552	6.272843	7.762241	9.503357	11.80493	13.37019	15.35661	17.42972	19.06452	24.29273	31.36372	30.86043	35.27498	37.88161	36.04276	42.15519	44.53302	55.35724	57.9716	62.67989	72.46994	92.46785	93.46855
2.392835	2.457206	3.511571	4.365055	6.220904	7.718335	8.869205	11.12309	14.23097	19.44376	23.18027	24.69321	29.55292	32.32898	41.52602	46.95045	36.69652	38.70432	45.53644	50.0399	55.95498	52.33533	58.51718	65.37125	74.89047	85.02154
3.396095	4.627772	5.423711	5.482617	6.404384	7.327052	8.992238	8.342433	10.49172	12.8461	15.04056	18.23322	21.84993	28.86367	27.18981	33.87283	31.01897	39.54298	33.53698	36.84934	41.79445	46.94528	53.0666	61.80243	76.83361	81.7646
1.948021	2.740602	3.168877	3.890557	5.071729	5.787139	6.589789	6.896923	8.874455	11.17597	14.07741	17.1084	21.51013	21.88541	25.32726	27.59297	32.69253	35.68101	45.67701	57.83606	60.72371	64.69606	54.07751	57.88143	70.76868	75.31675
3.080067	3.378717	3.770451	4.396034	5.388511	6.249737	8.228057	11.06056	13.94635	15.29917	17.02691	20.21336	15.24338	16.51715	18.26108	18.66266	21.26891	27.69854	32.41222	40.10844	45.99004	48.03975	49.50257	56.47018	64.53705	71.18158
1.747646	2.177193	2.90561	3.221796	3.94581	4.795057	6.321702	7.375422	8.587658	9.916789	13.45134	14.72687	16.20284	14.75291	15.2361	14.39088	18.17022	21.64193	26.50772	32.73608	36.01076	45.49082	49.62546	54.00835	53.5071	66.07105
1.853589	2.359182	2.570837	3.037889	2.280821	2.617923	2.911705	3.551851	4.667964	6.506123	7.168189	8.408149	8.8486	11.73067	12.92082	16.45405	18.93789	25.36035	26.15194	29.74202	34.71688	40.23061	46.0277	54.99324	57.68957	62.40464
1.636001	2.00502	3.080248	3.506065	4.353723	4.111135	4.574595	6.172431	7.599891	8.267024	8.906737	12.44343	11.58924	11.90486	12.67252	14.5268	18.57772	17.55092	20.73744	24.43177	26.55794	29.85502	37.23468	41.35722	47.89231	59.37075
2.68586	3.344367	3.957774	4.864766	6.286292	7.266008	9.245039	10.35721	11.48349	12.48994	11.26265	11.17495	12.99232	14.26975	15.85029	18.01324	19.63255	23.01272	25.23216	31.13268	39.24143	42.89373	41.28724	44.34389	49.26553	56.97489
1.661879	2.301565	2.668086	3.245517	3.685118	4.318286	5.699203	5.588188	7.44501	9.159872	10.21166	11.77629	13.0658	12.08681	15.59378	18.29292	18.79053	14.85861	17.34499	21.11916	27.72647	32.21847	40.35101	42.34979	50.88246	54.67949
1.736035	2.021945	2.085376	3.007494	3.4963	4.163827	5.013924	6.970222	8.410282	10.47491	12.16767	14.6429	16.53215	14.24404	13.49917	14.92438	16.47915	19.40185	24.68676	27.60444	30.32189	33.57551	36.76424	45.50248	45.30356	53.47013
1.710818	2.329738	2.894459	3.41154	3.934817	4.860491	5.164446	6.248937	6.147997	6.47027	7.723363	8.692206	11.79119	12.95816	15.21905	17.4275	21.41631	22.19182	22.87938	28.96152	28.07909	30.80018	34.64682	42.99301	46.83946	52.18256
2.292236	2.660538	3.588579	3.284031	3.810119	4.174972	5.690227	6.541482	7.704576	7.064695	8.484543	10.59995	12.9766	14.07087	16.70187	18.85078	21.35817	23.01841	23.58181	27.35649	33.4552	32.89783	34.62995	37.23567	41.66044	50.30189
2.538111	3.164371	3.886749	4.398199	3.846563	4.595468	6.652485	7.783349	6.65312	8.303848	8.974481	10.81388	11.48694	11.51692	12.99745	14.79608	17.35429	20.50744	23.33204	25.65681	28.51837	32.62932	34.93871	43.24716	48.64983	48.99039
2.03402	2.58313	2.990984	3.949008	3.667091	4.08383	4.536677	6.23916	6.743652	6.880611	8.103312	9.212445	7.474212	9.03017	10.0002	11.68918	14.60689	15.98722	17.83403	20.68929	21.33069	25.01108	30.76365	36.43576	39.77168	47.52751
1.698937	2.036883	2.304533	2.57258	2.98397	3.266394	4.039537	4.61799	5.86458	6.502557	7.274044	9.267881	8.481791	9.761641	12.01887	14.6014	15.52071	17.523	20.46658	20.917	18.80357	23.71034	29.71756	33.65659	37.41208	46.54006
3.853818	3.467913	3.231359	2.947345	3.708032	3.764486	5.320216	7.452145	8.18304	7.525369	9.161491	8.60512	9.354883	10.91914	11.50594	12.25132	13.49695	15.9281	17.55326	22.53761	23.88892	27.94621	34.16591	39.1963	39.95227	44.81182
2.635953	2.45377	2.83286	3.03437	3.50584	2.888058	3.450252	4.304505	5.683855	6.784139	8.289474	9.6501	11.42577	14.02069	16.27447	18.52583	17.36882	20.6728	23.40912	25.22742	28.18036	32.89005	33.91787	39.29522	40.69414	43.12444
2.217944	2.549318	2.214834	2.44863	2.901626	3.457359	2.855115	3.292641	3.772356	4.612095	5.312645	6.423929	7.023058	8.117117	9.185808	9.94781	11.80169	15.15753	18.59289	20.85911	21.67586	24.53387	26.42888	28.88402	35.65197	41.25436
2.577081	3.441384	3.760241	3.842191	3.877568	4.661702	4.538227	5.036026	6.202618	7.241215	6.747187	6.241047	7.936739	9.612628	9.958337	10.63356	11.33527	13.12525	15.66679	20.28897	23.91863	24.54708	29.12933	30.39635	34.64005	39.62699
1.611068	1.788291	2.318479	2.724719	3.566722	4.236237	4.547837	5.322931	5.447364	4.185268	3.81466	4.705437	6.119399	7.650879	8.719139	11.11626	12.73299	14.48021	14.2422	18.59099	21.12393	21.00909	25.31729	26.11941	30.14458	38.74531
3.016254	2.226841	2.026325	2.524276	2.844322	3.758604	4.564052	5.699234	7.695309	6.924576	5.174991	6.387966	7.285444	9.284389	10.90658	14.33468	18.49251	21.58727	24.44544	28.1538	27.29816	26.41297	25.71905	29.70076	33.66548	38.0352
2.65239	2.855249	3.338967	3.761003	4.11552	4.825868	6.569648	7.552501	8.637475	11.69776	10.49353	12.28479	15.47643	16.57555	15.71099	18.25862	14.58506	17.11167	18.39353	21.20247	23.80924	24.78332	28.43057	29.43073	31.96199	37.06997
2.907839	3.68734	4.286053	4.886381	4.981213	5.611872	7.154743	6.090601	7.322977	8.514703	10.6379	12.6267	14.38765	16.25323	19.14636	20.94326	20.05963	22.51848	21.78573	27.61793	33.05176	26.81918	32.98173	33.662	34.09351	36.0932
2.259071	2.92328	3.456887	3.724781	3.809002	4.252904	4.989349	6.522182	8.340492	10.05366	8.893424	10.70782	11.73511	9.586322	11.38716	13.35948	16.43481	16.93959	20.42005	19.98272	26.43416	30.51121	32.90321	35.35484	40.31704	34.77484
2.48167	3.334904	3.656948	4.226589	4.754672	5.861243	7.799653	7.138569	8.227394	8.944827	9.734208	11.7251	9.199835	11.59681	12.78617	14.39147	18.50419	17.81186	18.89079	21.33242	23.03961	21.79795	27.38907	29.43494	29.43662	33.41907
2.742391	3.33933	3.600988	4.651089	6.429979	7.09069	6.431598	6.328056	7.934221	7.484477	5.463945	6.081625	7.385826	8.872253	10.84057	12.64375	14.57417	16.49395	17.25931	18.79466	20.09147	21.64066	20.12176	20.58439	26.32664	32.24305
1.475776	1.73879	2.04257	2.44221	2.513138	2.81339	3.253386	3.851421	4.272987	5.258762	6.809288	8.769986	11.51601	10.40877	11.51184	12.98201	16.28727	17.25056	21.4049	21.08486	23.9095	25.78295	26.09037	26.69161	30.28469	31.06827
1.790835	2.31453	2.578074	2.98493	2.811263	3.076977	3.522052	3.275904	3.644594	4.11454	5.682298	6.452011	7.302535	7.591562	8.890582	11.07606	10.37166	13.27224	14.82225	15.00501	16.34758	18.17814	19.37747	22.26833	25.98411	30.09876
1.753514	2.287104	2.743642	2.769469	1.953067	2.191873	2.701151	3.577317	3.090494	3.309522	3.310539	3.943139	5.052837	5.436822	6.04586	7.920293	9.924315	11.95925	12.66705	13.87293	16.33966	18.73947	23.80069	26.50413	27.53539	29.37928
1.089536	1.358929	1.680932	1.847551	2.131681	2.464899	3.198346	3.53305	4.281547	4.734185	5.471812	6.262566	7.455721	8.282004	10.2787	8.272278	8.282307	9.873074	11.27549	13.34591	14.6083	15.18685	19.27161	21.42015	26.68694	28.91239
1.042919	1.092681	1.434286	1.765633	2.227327	2.531738	3.051948	4.095528	5.055932	6.23057	6.853579	7.037496	6.017623	6.154867	6.773577	7.623475	8.370323	8.017123	8.867867	9.531847	10.97634	12.91275	15.52153	19.65804	25.23115	28.33079
1.829902	1.379323	1.609515	1.930882	2.337016	2.609299	2.843325	2.564976	3.130949	3.543042	4.078585	4.391172	5.10996	4.936084	5.937919	7.288077	8.587803	8.843156	11.83689	14.22611	15.37022	17.75574	20.42082	22.75759	25.64811	27.50745
2.822865	3.260044	4.001865	5.26602	6.998641	5.38946	4.923794	5.167094	5.738739	6.324767	7.194769	7.385731	7.785915	9.031541	10.55089	11.93928	14.24969	14.62866	17.96927	17.08762	19.33106	21.26826	22.39264	22.2918	23.22569	26.26237
1.419427	1.700435	2.128277	2.61718	2.426896	2.949575	3.614676	4.084723	3.810133	5.427894	6.028564	7.082033	8.221278	7.51326	8.038089	8.845247	9.079404	10.79086	11.82996	12.24525	13.2025	12.5201	15.92887	20.54431	24.81327	25.3109
1.579453	1.902275	2.293397	2.102546	1.591423	1.776968	1.836248	1.967043	2.40804	3.064029	3.453772	4.200051	4.603143	5.771818	7.473987	8.510064	9.659893	12.01921	9.949792	10.91236	12.37181	14.72924	16.92925	19.46498	22.20691	24.06505
2.102346	2.487429	2.91585	3.578033	4.46712	4.186926	5.046482	4.618627	4.356247	5.03222	5.928982	6.193141	7.070764	7.732427	9.905712	8.240484	9.576715	11.06321	11.7018	12.90337	14.2129	15.24805	16.75555	19.60467	23.06981	23.34737
2.335498	2.702245	2.437165	2.674507	2.935993	4.022598	4.829933	5.238187	6.204972	5.497971	6.450222	8.005791	9.707327	11.62273	10.65204	11.51738	12.66166	15.80041	17.28778	18.82554	15.75524	19.57606	16.24426	18.85548	20.18875	22.05296
3.294876	3.953818	4.032014	4.794588	5.507833	7.072128	6.575909	6.092493	7.79553	6.982657	7.804975	8.787195	10.54074	8.097143	9.657043	11.52674	11.06086	13.57871	14.59937	15.75233	16.00668	18.35923	17.98707	15.04168	18.28096	21.2405
2.144646	2.498513	2.802034	2.434741	2.794659	3.339789	3.830574	4.183382	5.302752	6.516243	5.806843	6.518071	8.223091	9.316672	11.96722	13.00946	15.72163	15.78182	15.27019	19.51023	18.90658	16.03162	15.88896	15.81859	18.1381	19.9709
1.940852	1.711946	1.691138	1.898499	2.097859	2.521434	2.757885	1.978088	2.748044	3.438889	4.537519	5.94351	7.514499	7.213353	7.622563	8.529062	9.213325	10.90272	10.52462	12.2471	12.62319	13.86742	13.95998	15.97347	17.61678	19.2022
1.674151	2.039282	2.433987	2.995927	3.525616	4.043533	4.809965	5.967896	5.485019	5.555408	4.304919	5.11792	5.859209	5.909451	7.586801	9.50539	10.59192	11.62313	12.04799	14.90547	14.57969	12.12613	13.08449	15.2788	15.43582	17.22434
1.088837	1.315249	1.614285	1.79792	2.286568	2.570659	2.632186	2.332089	2.309898	2.704155	2.839718	3.556062	3.941123	4.601006	5.534441	7.293771	7.775499	8.145916	7.839783	9.92875	11.61029	13.51463	11.21384	11.26515	14.23597	15.22902
1.280883	1.558794	1.961645	2.473185	3.033406	3.829123	3.408311	3.936398	4.477505	3.448496	3.563026	3.360316	3.523072	3.749268	4.057146	4.35271	5.441485	5.628142	7.216004	8.703089	9.061537	10.49014	11.49216	12.56219	12.07026	13.42343
1.826991	1.877252	2.074286	2.421929	3.136023	2.212788	2.71838	3.279446	3.815591	3.547598	4.491649	5.587212	6.6187	6.822785	8.29006	9.003816	7.219898	7.087622	7.006067	8.061692	6.590814	7.644814	9.512619	10.54911	11.78357	11.76204
1.546785	1.998365	1.850701	1.81622	1.867703	2.300478	2.796914	3.249106	3.437165	3.642751	4.743863	3.438167	4.122965	4.273891	4.98047	6.023424	5.812734	5.943845	6.568708	5.515583	5.736127	5.90122	6.426145	6.282395	7.932504	8.480477
1.321259	1.506488	1.753189	2.124963	2.372201	2.121545	2.378103	2.339511	2.609902	3.019194	2.274033	2.140372	2.401163	2.68357	2.756363	3.169331	3.619816	3.596492	3.633598	3.495322	2.932521	2.489859	2.142171	2.151515	2.183378	2.523023

Figure 10: Heat map for the MarketGlide Benchmark Glidepath strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

By visually comparing Figures 10 and 11, the addition of real estate to the MarketGlide Benchmark glidepath has two main effects. First, the change in asset class exposure appears to have caused a slight delay in the transition to success (green). However, as with the Balanced and T Rowe Price glidepath designs, the addition of the real estate blend exposure has assisted in delivering a smoother transition to success through diversification. Second, as we also saw from Table 4, exposure to the real estate blend strategy improves downside characteristics.

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
3.478161	4.158845	5.029467	5.264939	6.098419	7.526784	8.184915	9.845983	13.62139	18.14635	22.18698	27.66177	25.69243	33.79877	43.54616	49.13289	55.80327	59.87355	70.33601	84.95762	103.4904	121.8214	149.68	171.433	164.4821	141.7177
2.954356	3.485666	3.889369	4.503507	4.176379	4.644573	6.275831	6.660605	8.388158	10.29819	13.25268	15.12357	18.15199	22.45989	26.57896	24.37815	28.82374	33.61711	37.34544	42.98868	54.35109	61.83058	74.89143	87.00142	98.59752	109.6492
4.189511	5.002513	5.51852	6.035563	7.78538	9.062412	11.50036	14.16292	16.37382	19.83591	24.85052	28.66549	32.73182	38.59064	44.20972	51.16798	59.80338	55.71207	50.95129	57.94686	68.89871	88.15593	97.39459	100.4501	85.94285	95.07163
3.245525	4.197117	4.857083	5.424814	5.734751	6.948312	8.345776	10.63855	9.580683	10.48409	12.16251	14.57879	16.13865	19.32495	25.30263	32.41469	36.40983	40.8693	46.84468	54.92668	57.18055	45.98976	52.46642	62.15467	72.06576	85.7617
2.988454	3.510481	4.382399	3.909676	4.147883	5.570452	6.495868	7.79568	9.309778	11.49218	13.3796	17.05201	20.63378	21.16503	25.76468	24.82213	31.86801	35.28801	37.35683	40.57219	45.22441	48.41334	52.95092	66.99245	74.60707	80.75765
2.775007	3.001895	2.691162	3.373033	2.813186	3.907555	5.049572	7.527626	8.615067	12.21775	13.56775	15.20623	18.48627	22.36496	21.43111	24.48315	28.32788	33.10492	35.94389	38.85806	41.01467	48.5186	51.76079	65.85496	74.25744	77.05836
3.21433	4.087524	4.467686	4.578918	5.103162	5.57202	6.583098	7.390347	9.300297	11.433	14.3692	17.06047	18.02712	18.82773	20.15284	23.95173	29.5539	35.69648	38.4509	42.56284	47.00852	53.36309	59.3399	65.69542	74.40819	72.16784
2.348051	2.660817	3.299564	3.657533	3.868256	4.435739	4.937439	6.242427	7.466025	9.170296	10.13238	11.89899	15.16103	20.28408	24.77152	30.34026	34.84911	43.8764	53.86309	60.12786	47.28454	50.52742	51.45979	60.32524	60.23846	69.98649
3.788058	4.53353	5.239736	4.73507	4.973498	4.376317	5.272797	6.559937	7.665381	9.64065	10.36317	11.38506	15.16731	18.4812	22.70503	23.68142	27.39063	24.62133	30.29862	35.98372	35.69766	41.519	48.02547	52.69965	56.06721	66.3565
2.226637	2.600952	3.548319	4.101905	4.682825	5.564023	6.534548	6.66005	7.343751	8.61092	10.15774	11.03061	10.89349	14.45418	16.60285	17.33116	19.06366	21.90702	25.89868	29.54287	31.69896	38.07346	46.54502	54.21719	56.66157	63.2899
2.838134	3.704663	4.249061	4.771388	6.026971	7.665086	8.742224	10.33089	12.85795	11.79487	13.59262	15.40037	18.45838	16.21332	17.19042	18.30802	21.66454	23.9264	29.04512	33.48786	39.90841	33.30248	39.26181	49.479	55.37488	61.04076
1.343905	1.527621	1.817146	2.407324	2.78147	3.540176	4.276637	5.214093	6.256943	7.388845	8.963849	10.22541	12.01603	13.25764	15.493	17.65455	22.1267	25.73525	28.96564	31.06202	34.67739	39.53717	45.04569	50.54498	58.8106	59.92195
3.752023	3.289643	3.789968	4.622197	5.773291	6.591927	8.555704	8.966327	10.39726	11.0263	12.62056	15.19749	19.34094	20.83116	26.8664	31.36841	35.89247	45.18772	44.56214	34.70573	37.20091	42.85289	45.16533	43.1953	52.44967	57.61296
2.193276	2.610245	3.114751	4.55835	5.044058	5.889997	7.94168	7.531223	8.622159	9.28657	10.78079	12.56826	9.327856	12.6061	13.89867	17.34221	19.88845	24.0004	22.79507	25.48876	27.34048	31.85759	39.57986	44.03745	50.32478	55.48726
1.874514	2.306137	2.683418	3.362572	3.946636	4.172279	5.352249	5.130999	5.742175	6.50618	6.104538	7.235059	9.856829	12.22029	11.78358	12.60719	15.10759	17.91313	20.2216	24.01234	26.47405	32.69804	36.74649	39.90339	46.3763	53.59431
1.539974	2.031784	2.463864	3.435649	4.235161	4.556671	4.32231	3.246439	3.550061	4.767646	5.536183	6.069856	6.963207	9.452058	11.58029	13.26094	15.92917	18.79728	21.76964	24.89025	26.42814	28.23548	32.84545	35.92257	44.41684	51.3334
1.82726	2.324865	3.238898	3.678705	3.762252	4.477277	5.272825	6.428399	7.127898	8.141702	9.393769	8.136473	9.082146	10.40367	12.43323	15.93258	16.42469	16.84615	19.52391	20.98251	24.57315	32.53012	36.85331	44.87766	44.83212	49.63371
1.280093	1.502835	1.836845	2.103378	2.657307	3.388056	3.742347	4.933968	5.381573	6.95813	7.608386	8.475515	10.75641	12.27757	13.44808	13.23072	15.50073	15.02972	17.24825	20.28648	23.59839	26.6342	33.83671	33.97087	42.25532	48.35165
1.59073	1.956307	2.293909	2.516441	2.775529	3.939111	4.788388	4.925144	5.710827	6.485387	6.151639	7.358117	10.22669	12.27054	10.33446	9.714285	11.53068	12.96317	15.71093	18.50059	21.56826	25.24481	31.02758	35.65306	43.24671	47.35707
0.817934	1.016859	1.370958	1.78457	2.221283	2.626282	3.21675	3.884283	4.313453	5.708666	6.321338	7.290597	8.67926	9.754981	13.16051	16.99009	17.93251	18.5508	21.03933	24.28304	27.09857	30.15358	34.78347	40.59081	43.20273	45.97787
1.178292	1.388283	1.236045	1.381156	1.617043	2.155116	2.427124	2.827303	3.570377	4.623265	5.531006	8.063599	9.709166	10.65611	12.95687	13.96381	10.75998	14.1533	15.57501	18.61199	20.26029	25.53233	28.72328	32.81869	36.35097	44.80302
1.196162	1.53173	1.394771	1.664392	2.128265	2.550259	2.788331	3.49776	4.513556	4.122586	4.703697	5.711329	5.668867	6.973987	7.735743	8.671149	10.55326	12.34924	14.1547	15.69098	20.07238	23.69284	30.84702	38.89269	40.91814	42.72075
2.05704	2.66606	3.329034	3.744256	4.242853	3.15306	4.367991	5.101878	5.62108	7.212773	6.83539	7.646561	9.219224	11.0322	11.56433	12.95478	14.16586	16.22015	18.75568	21.65551	24.93368	29.32236	33.38391	40.64961	39.4284	41.89789
2.361302	2.774548	3.493041	3.173552	2.357804	3.072066	4.479469	5.322597	7.111681	8.193028	8.435929	11.24311	13.49351	16.16864	17.58251	23.21402	21.09116	16.37798	20.3854	23.82512	27.24774	26.35633	29.34867	32.13974	36.10096	40.73156
2.71142	3.486892	3.141267	4.029526	5.037548	6.168612	6.717843	7.344219	5.262942	4.9068	6.175837	7.02647	8.865611	9.119464	11.14112	12.26892	13.43591	15.30953	16.97303	19.98042	22.83987	30.24131	35.79563	35.93312	41.03776	39.61886
2.650029	3.139288	3.539036	2.599862	2.225528	2.903083	3.190479	3.035755	3.829509	4.879408	5.661444	6.870123	8.107458	6.799715	8.154617	7.289442	8.418983	9.851794	12.77641	16.12405	17.61194	20.3307	24.22758	27.24361	30.2765	38.57531
1.372422	1.92843	2.625434	3.152725	3.59893	4.599853	5.384384	6.201147	7.236471	7.795815	5.832891	6.980315	7.894823	9.100049	10.57026	11.76816	12.79721	14.74145	16.04143	18.0573	20.4054	23.22185	29.0925	31.17359	34.86954	37.4333
1.799531	2.074218	2.48694	2.788444	2.604647	3.34172	3.731839	4.427684	5.113094	6.033016	6.761932	6.940879	8.018263	9.263623	10.62213	12.13128	15.43501	18.6435	14.85217	17.01827	20.10898	22.92566	24.51053	27.27055	31.89358	36.16458
1.022784	1.177071	1.483331	2.047403	2.430115	3.19526	3.65523	4.353966	4.88161	5.623763	6.495956	7.173118	7.771888	8.979046	10.94651	12.36834	13.20928	13.66305	18.11168	20.32487	21.95491	24.95829	24.71059	28.10195	32.05473	35.36912
2.620896	2.988462	3.859651	4.486303	5.373054	4.065239	3.263031	3.10356	3.719125	4.724902	5.344911	6.837239	7.907477	8.294295	9.567728	10.61666	10.15959	12.98946	15.80406	16.37755	20.75504	23.94308	23.00404	26.11202	28.71109	34.81257
2.895455	3.503808	4.226507	3.504957	4.649606	6.417038	7.616898	8.697874	8.338622	8.565418	9.785226	12.10198	13.78618	13.1576	11.80364	14.05764	11.53363	13.34811	15.09991	17.34843	19.91692	21.02917	23.6613	27.02776	29.52808	34.01053
1.940273	1.856337	2.550003	2.979267	3.493241	4.241156	5.204769	6.039146	6.443329	7.900784	6.010867	7.514994	8.943677	10.85681	10.51309	11.87441	14.84295	17.49503	19.69695	22.73852	23.4653	25.28928	28.75493	31.46469	35.94498	32.57171
0.729354	0.85266	1.057356	1.204651	1.453634	1.798843	2.112537	3.186752	4.134997	5.899381	6.08811	6.603508	7.352385	7.994753	9.236904	10.99331	14.03763	13.12579	14.56214	16.33768	19.01158	21.99514	23.93916	25.55825	29.07051	31.27356
1.698748	2.047941	2.377557	3.175068	3.804516	5.012038	6.459914	7.039327	7.725855	8.632254	10.32219	7.909305	8.105533	9.058025	8.706455	8.24264	9.92841	11.57861	15.74355	18.20476	20.78583	21.59084	24.78021	26.12971	26.67221	30.65401
1.290008	1.513642	1.830877	2.031608	2.575458	3.142409	3.493885	3.82354	4.699084	5.747099	6.297811	7.788434	6.201496	7.22776	7.996851	9.323952	10.90722	12.9489	15.60225	18.2525	20.90014	21.97187	24.04159	26.36109	26.90771	29.39239
1.510303	1.829108	2.024185	2.595708	3.269745	3.613706	3.461799	4.454293	5.463959	6.441869	4.910559	5.189785	5.626235	6.683066	8.126587	8.832564	10.56246	12.78114	13.27639	12.93103	15.35319	17.5148	21.06638	21.52383	25.00953	28.54259
1.31121	1.453826	1.893719	2.723838	2.473896	2.721568	2.795319	2.164088	2.172964	2.530397	2.811428	3.536346	4.330727	5.192033	6.158851	7.282512	8.472605	9.005909	10.203	11.80389	13.51208	16.37879	16.45228	20.92328	24.1751	27.69179
2.123056	2.543353	3.21321	4.033774	4.1417	4.962319	5.090175	4.882429	5.492701	5.002568	5.820544	6.45035	7.787373	9.328755	9.60993	11.01688	13.11903	14.81921	16.06592	15.94328	18.28773	19.59038	19.61519	21.02169	22.46137	26.93609
1.758391	2.1956	2.595164	3.031066	3.607058	3.187069	3.911574	4.460352	5.93338	7.127612	5.427744	6.255597	5.48414	6.369249	7.362969	8.047518	9.268368	10.13235	11.41857	12.52997	16.23639	19.32413	19.14585	19.96737	22.16459	25.84741
2.52045	2.830968	3.349367	3.88413	4.056371	4.911709	6.413761	7.058405	7.779435	8.926994	10.09416	12.28246	14.27588	18.72219	21.84184	21.28601	24.86631	28.38007	27.81041	21.98599	25.46862	25.05348	22.26067	22.00473	23.37451	24.56521
2.433776	2.83804	3.49499	3.127728	4.14914	4.79178	5.403882	6.015336	7.374137	6.765724	6.514264	7.076808	8.353281	9.625913	11.50882	10.72715	12.26374	12.87281	11.89781	13.62474	13.58659	16.1778	18.45401	20.54991	21.83039	23.89294
1.025844	1.201685	1.502432	1.882271	2.305919	2.137876	2.534427	3.262182	3.956504	4.674746	5.167249	3.826331	4.598635	6.396291	7.439165	6.683365	7.790248	9.229047	10.51667	12.2619	12.6723	15.8599	17.58563	20.02396	20.31998	22.51383
1.513473	1.784674	2.196045	1.970842	2.280877	2.787898	3.299777	4.296505	4.114509	4.679033	5.237559	5.967352	4.657553	5.811965	6.968035	7.679122	8.865259	10.04239	9.431347	7.773566	9.999343	11.22638	14.00078	15.07424	18.95896	21.74653
1.869175	2.00639	2.412921	2.927282	3.441544	2.433946	2.848056	3.264145	4.185449	4.871304	5.010062	6.18042	6.723115	7.654137	9.31637	8.461419	10.98472	12.25999	13.8744	16.03917	16.73329	19.10925	21.74753	21.54793	21.87007	21.08416
1.531903	1.843457	2.188067	2.318964	2.383717	2.975599	3.604012	4.490975	4.610187	3.410837	3.729248	4.631338	5.713954	6.633313	8.215453	10.50914	12.63864	13.89574	11.32162	13.74247	15.40069	13.61699	13.3207	15.40737	16.9466	18.98671
1.73219	1.61562	2.102664	2.355167	2.650681	4.019038	4.788376	5.306453	4.800962	5.118095	6.518753	7.177173	5.982372	7.204068	8.701803	9.881448	10.32236	12.26226	12.02903	13.02576	13.58105	13.20786	13.91076	15.58215	17.05396	17.39502
1.250806	1.469202	1.916714	1.737638	1.471393	1.737381	1.969388	2.456047	2.321054	2.795809	3.187503	3.583789	4.127961	4.595181	4.788342	4.547324	5.450592	6.868819	8.902999	11.29229	12.98357	10.84226	10.77591	11.34871	14.17336	16.42632
1.80119	2.263852	2.146424	2.560761	3.412794	3.628599	4.503803	4.473794	5.427931	6.626419	7.15079	7.063948	7.408552	8.548856	9.522269	7.160831	8.579717	8.173063	8.039415	9.441381	9.007689	10.28567	11.63797	12.99998	14.36052	15.89072
0.587857	0.776002	0.886343	1.080726	1.442683	1.804373	2.170189	3.071689	3.552112	4.255661	4.530655	5.843931	6.261703	7.618405	7.341084	6.001848	6.962453	6.422155	7.051298	7.686236	8.997798	10.20389	11.4223	9.738908	11.62939	13.14146
1.540341	1.545491	1.4581	1.712607	1.979979	1.815613	2.11664	2.389037	2.661524	1.954607	1.64749	1.794369	2.144461	2.092848	2.354125	2.665322	3.544445	3.721052	4.464541	5.128022	5.07534	5.507136	6.200201	7.084712	8.586274	9.154729
0.875445	1.203264	1.15609	1.441804	1.892599	2.298112	2.869371	2.062263	1.855329	1.816623	1.906065	1.795747	2.620087	3.140886	2.513213	2.711372	2.519866	2.553636	2.455763	2.90899	3.198705	3.70256	4.05243	4.151035	4.623862	5.142262

Figure 11: Heat map for the MarketGlide Benchmark Glidepath with Real Estate Blend strategy for a 25-year old worker with zero initial retirement portfolio balance, 2% salary growth and 8% contribution rate. Block bootstrap simulations for 10,000 paths (every 200th path depicted).

In this analysis, we have taken some typical DC plan designs, comprised of stocks and bonds, and constructed a hypothetical alternative real estate blend strategy comprising a 50/50 blend of listed and unlisted real estate investments. We have subjected all asset allocation designs to the same analysis and looked at outcomes which plan participants themselves would have a reasonable chance of experiencing. We find that the addition of a relatively modest allocation of 5% listed real estate (to replace equities) and 5% private, unlisted real estate (to replace bonds) improves the downside performance of a number of DC plan designs without materially impacting expected outcomes.

In this study, we set out to understand how an investment allocation to both listed and unlisted real estate performs in a defined contribution portfolio context. We took several extant portfolio designs – both target risk and target date – and considered their performance both with and without a blend of listed and unlisted real estate.

This research is of particular importance to the risk-return profile of DC plans as the future cornerstone of retirement savings for the global workforce. As plan sponsors are acutely aware, many plan participants face a classic asset-liability mismatch in retirement that is, the need to fund relatively short- and medium-term retirement spending needs with a longer term investment strategy. Recent financial history provided a living case study of the perils facing retirees and near-retirees ignoring the mismatch between the duration of retirement assets and liabilities.

As Milevsky (2006), Bianchi et al. (2014) and Drew et al. (2014) have illustrated, the odds of portfolio ruin in retirement are highly sensitive to the returns the investor earns decade by decade. Path dependency matters greatly. Our results illustrate that adding real estate assets to DC plans assists plan participants through the critical conversion phase; that is, converting from savings (accumulation) to retirement income (spend down). As the title of this study suggests, allocating real estate assets to DC plan investment portfolios can provide a path to better retirement outcomes.

In measuring performance and risk, we had the choice between traditional measures of performance, or ones that might be more informative to plan participants. We chose the latter as more meaningful indicators of the "success" of DC plan investment portfolios in general, and the marginal impact of real estate allocations in particular.

Consistent with similar studies (e.g. Esrig et al., 2013), we found that DC investment portfolios, such as target date, target risk or balanced strategies, with a relatively modest 10% allocation to an equally-weighted blend of listed and unlisted real estate:

Achieved similar expected outcomes and in some cases better results
when compared to portfolios without real estate;
Did so with better tail risk characteristics; and
Achieved success to a similar extent as their non-real estate alternative portfolios,
but with a smoother path to success.

This last point is particularly important for DC plan sponsors. A portfolio strategy that delivers a smoother transition to success contributes to improved long term participant behavior, where it is possible to help DC investors avoid adverse responses to temporary market setbacks (e.g. switching out of risky assets and moving out of the market altogether after a significant market down turn). This gradual transition increases the likelihood that participants will "stay the course" and achieve success.

This study, therefore, finds strong support for allocations to real estate in DC plan designs. Given the myriad of retirement risks faced by plan participants (e.g. market, inflation, growth, tax, interest rate, to name but a few), the diversifying characteristics of real estate can improve portfolio efficiency and retirement outcomes.

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Heat Maps for 40-year old worker with starting portfolio value = $100,000

100% US Stocks

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.370555	1.62149	2.213678	3.205889	4.809833	5.873098	8.217057	10.30674	11.7605	12.62518	19.27153	16.46702	20.67285	30.6694	41.66913	53.1259	77.32229	109.9105	147.9088	171.0963	169.9043	149.2949	176.0068	209.8584	271.1503
1.132237	1.72643	2.119994	2.732321	3.744359	4.641132	6.93495	8.891086	11.14693	13.54905	14.89463	17.45577	20.76736	29.71227	38.24953	48.7707	52.07629	44.04058	50.42684	70.35988	89.6604	131.4985	114.4285	159.5621	182.0776	197.2869
1.132237	1.599445	1.939225	1.646035	2.235933	2.906008	3.239983	3.741125	4.335813	4.885053	6.460976	7.874993	9.949245	13.24609	15.92164	20.16928	22.60064	26.39452	24.89661	30.79229	41.05893	57.61181	65.46985	88.14351	106.8898	136.1778
1.132237	1.449333	1.319797	1.641529	1.994889	2.758928	3.751198	3.255938	2.969587	3.311253	4.214382	4.571585	5.857937	6.907561	9.682881	12.93631	18.12244	23.77955	31.41557	42.23473	53.60032	62.10098	69.92269	84.99674	101.8087	125.6806
1.132237	1.498781	2.020909	2.491085	2.719805	3.035009	3.92698	5.566094	6.370117	5.499212	6.718815	8.595934	9.505354	12.41691	16.73216	21.5815	24.05754	31.52413	42.33599	54.47734	59.79777	68.44818	78.29035	86.49149	100.4476	117.8048
1.132237	1.686819	2.203469	3.240439	2.060861	2.417404	1.833059	2.560262	2.849813	3.590935	4.756496	6.935645	8.502087	9.994758	13.13407	15.4668	14.61375	18.28603	23.02115	32.19587	36.28477	50.65424	58.4834	74.32637	84.48462	110.5797
1.132237	1.686819	1.976307	1.862861	2.465543	2.781626	3.239458	4.091095	5.419493	7.242576	5.885236	7.629827	10.68141	12.28508	14.943	17.72078	24.13746	28.88659	32.10966	41.37336	46.67039	54.06185	65.52113	82.29772	106.9933	106.3089
1.132237	1.410174	1.970576	2.371691	2.582685	3.088451	3.7034	4.196218	5.291632	6.738603	9.179473	11.47854	10.0056	11.72696	12.52045	14.65757	17.80532	22.20739	24.27509	32.80189	36.44196	42.79046	55.06078	68.96624	81.38661	99.38804
1.132237	1.440869	1.564002	1.573071	2.176488	2.369394	2.639568	3.231371	4.478117	5.491223	6.660279	7.680624	9.639007	11.10704	9.901663	13.87605	16.30194	22.27593	31.05005	38.78395	41.43217	52.71362	61.71455	82.9009	70.9125	92.61341
1.132237	1.391185	1.726993	2.20279	2.796648	3.103663	4.125289	5.298501	6.319594	8.110119	7.187275	7.605388	9.145051	9.471474	12.25469	14.73649	17.11614	20.49255	30.80125	24.7397	29.77314	35.43497	43.28636	56.54983	74.60831	85.33392
1.132237	1.623575	2.039511	2.233533	2.822389	3.175728	4.205565	5.055501	7.41866	8.825153	11.24823	12.54182	16.47387	21.86158	21.26041	26.81728	38.16959	48.39198	55.06766	60.09162	69.36194	58.67173	69.95935	56.11773	62.45848	80.62026
1.132237	1.557857	2.16445	2.548958	3.799296	4.706744	5.347701	4.188015	4.524001	6.056816	7.789057	9.746385	11.20641	13.00092	15.48689	17.75932	25.47208	32.52581	35.67738	44.71256	52.48099	68.83318	78.70024	49.19121	58.17361	77.07514
1.132237	1.383854	1.72767	2.319677	2.536429	2.510085	2.983553	4.097056	4.916805	4.102207	5.02898	6.738649	8.231194	9.479511	8.548394	10.65951	14.44547	12.58329	17.5487	23.5506	29.24362	36.50572	40.56693	45.40682	61.29274	72.53992
1.132237	1.086713	1.523948	2.053256	2.504069	2.767424	3.526351	4.59371	5.383114	4.592536	6.212955	8.43393	9.963333	11.7106	14.18217	14.67775	17.89747	21.32721	23.72411	28.82282	40.46624	55.02563	38.56222	48.47083	45.52514	68.33711
1.132237	1.498612	1.95549	1.7176	1.82448	2.536015	2.753002	2.781426	2.361485	3.663739	4.716701	5.985021	6.882114	7.857368	8.625916	10.78155	13.51955	15.1175	15.38923	17.51579	22.25431	29.55211	34.69274	39.06892	50.11607	63.93439
1.132237	1.512661	2.123666	1.404852	1.92716	1.641079	1.863167	2.271071	2.72482	3.731328	5.128507	6.932192	9.071311	10.09018	11.75933	12.94586	16.38897	22.41872	28.90998	32.88875	41.34712	52.55793	43.79451	43.21536	57.88821	61.67253
1.132237	1.501583	1.680465	2.112969	2.91738	3.740062	4.15293	5.285078	6.449922	7.179569	9.817529	11.96795	9.744258	11.3565	14.88764	17.25411	23.15202	27.73907	29.6512	40.38509	29.93425	33.19602	28.44582	37.19263	47.46861	60.33374
1.132237	1.306419	1.751942	2.288905	3.138762	3.511629	5.26357	6.190053	5.149875	7.231602	8.592494	10.90302	10.22212	7.965552	7.0645	7.766438	9.05378	10.75057	13.46682	16.03776	19.07085	23.37079	26.7345	37.38277	43.86758	57.89826
1.132237	1.356409	1.878693	2.509084	2.980115	3.807284	4.784122	6.165034	6.795035	7.984781	10.74986	11.92845	14.27985	16.99692	20.35858	17.26025	15.24283	17.73078	21.60797	29.29811	32.64241	36.28	35.05492	43.4878	49.32314	54.58235
1.132237	1.389548	1.662319	2.036977	2.578251	3.202978	2.864167	2.16445	2.270545	2.630594	2.33343	2.645954	3.665399	4.74586	5.972901	5.166491	7.066377	9.978699	12.10066	15.68294	19.49604	21.59523	29.28587	34.01405	43.78812	52.68179
1.132237	1.284163	1.130491	1.411342	1.652069	1.87448	2.279005	2.990984	4.235759	5.15105	6.108375	4.159969	3.422855	4.430076	6.410545	8.003964	9.227477	9.942684	11.81518	13.08659	15.47853	20.68404	24.42162	31.08665	36.9382	50.53571
1.132237	1.420633	1.695286	2.526745	3.068521	2.747454	3.18024	3.854255	5.034809	3.947993	5.077207	5.664303	5.575696	6.270011	8.549121	12.45372	18.51033	15.88593	20.71267	18.0186	25.21871	21.61684	27.06368	31.02832	45.00755	49.136
1.132237	1.384633	1.65663	2.046713	2.429663	2.056111	2.093326	2.362387	2.892937	3.550431	4.530819	3.461911	3.891052	5.168189	7.082796	9.928099	8.448736	11.5364	14.58848	15.10168	19.12335	23.12592	33.98485	38.35397	46.44253	47.83268
1.132237	1.471355	1.913355	2.310216	3.07388	3.453832	3.123231	2.577924	2.553409	2.913647	3.432619	4.397475	3.458144	5.103357	6.197523	5.740901	7.589851	9.220265	10.29774	14.04719	16.58784	18.08501	24.53297	28.81571	34.05741	46.14168
1.132237	1.473416	2.066573	2.451506	3.268749	3.047976	2.728703	3.037387	3.854345	4.692926	5.388879	4.73669	5.692595	6.298941	7.327618	6.094476	7.617409	7.627017	9.580715	11.6689	14.89284	17.88579	21.20078	29.63502	33.38676	44.25211
1.132237	1.639571	2.333361	3.328412	4.177351	5.501008	4.882923	4.109173	4.439925	6.417432	8.252307	9.85211	10.85057	13.60109	15.74492	17.30624	21.78878	20.01389	25.11737	28.13841	19.12703	23.7293	31.01659	24.91736	35.65307	41.39481
1.132237	1.365941	1.587671	2.205924	2.489622	2.854644	3.911721	5.544714	7.400253	8.934904	9.2061	10.70833	11.96871	13.82027	19.43702	21.16972	28.08933	30.77327	27.13187	32.9521	38.98836	43.33109	29.42724	38.55352	44.66014	39.64468
1.132237	1.055366	1.368013	1.078108	1.440761	1.695569	1.406541	1.620914	1.96337	2.186364	2.840907	4.278069	5.504331	7.261882	8.001098	9.340432	10.75584	11.06904	12.35236	14.75414	11.94698	14.36408	16.38754	21.52858	28.29061	38.05081
1.132237	1.50137	1.730169	2.070114	2.322727	2.035393	3.049159	3.617316	3.445101	3.296097	2.264401	2.355349	2.762152	3.491846	4.299592	6.247674	6.931846	8.983184	10.79812	12.0717	13.4153	16.46373	20.86433	26.66518	31.24305	36.49835
1.132237	1.402034	1.802562	2.059205	2.464945	2.910366	3.585322	4.191656	4.675172	7.181447	9.531878	10.57998	14.06402	10.62319	14.07285	19.88479	23.68555	28.05034	20.80723	24.59485	27.77422	36.4204	41.93038	34.60484	30.16094	34.93574
1.132237	1.394773	1.953612	2.340362	3.057036	4.009169	5.869292	6.99061	6.862694	7.618471	8.31249	6.90115	8.073871	7.213064	9.723572	10.75055	11.93572	7.785539	8.608135	12.98834	15.5549	18.29704	21.00785	24.59244	29.62378	33.0102
1.132237	1.328163	1.639892	1.808099	2.1087	1.469484	1.968284	1.673849	2.249726	2.574025	2.902583	2.465182	2.76128	2.749936	4.022324	4.992993	7.47034	10.49068	8.465951	10.10236	13.23648	15.77677	18.9956	19.32642	22.59211	31.50219
1.132237	1.439773	1.613347	1.8345	2.558238	3.40964	2.965483	2.492981	2.915831	3.385899	4.488427	5.386382	6.779943	8.876517	11.33911	13.18497	15.49362	16.9457	14.79527	15.81286	17.18162	25.84331	32.83166	27.14679	26.99507	30.64937
1.132237	1.513542	2.012045	2.408681	2.695963	3.023928	3.961715	5.11597	6.245525	7.196204	8.259962	11.8822	15.34364	18.64355	15.45726	21.73206	27.74247	19.47011	22.84006	26.46673	31.72055	29.50768	28.68553	19.36117	23.17452	29.08319
1.132237	1.438105	1.398425	1.100946	0.747107	0.879819	1.150197	1.221633	1.533621	1.973766	2.213644	2.957291	4.451773	4.648592	5.524008	6.436917	8.78013	10.48644	12.61332	12.85298	15.13188	22.48187	26.72815	32.29381	20.21858	27.65244
1.132237	1.371944	1.691328	2.012174	2.091896	3.00733	3.542676	4.348307	6.126672	6.949808	4.755101	5.212451	6.24893	6.750748	9.206398	11.91533	15.59042	14.59307	11.87575	14.44501	11.99701	16.37495	17.79272	21.0989	26.988	26.87113
1.132237	1.218348	1.30896	1.643405	2.203619	2.789752	3.99085	4.100247	5.169733	5.9698	8.097097	8.349256	7.806352	9.813108	12.41478	8.094297	7.478332	8.798032	7.187372	9.457968	8.116996	9.663959	12.6343	15.44718	22.13847	25.86881
1.132237	1.498511	2.064533	2.822757	3.074639	4.3694	3.653142	2.517972	2.608807	2.885424	3.442641	3.082634	3.995282	4.658151	5.75185	6.892483	6.746617	8.162141	9.147048	10.2215	8.804518	12.08646	13.81498	17.85475	22.48966	25.03337
1.132237	1.384633	1.230632	1.462581	1.794836	2.366438	3.102099	3.07499	3.476819	3.91207	4.533608	5.490479	3.767717	5.652514	6.420556	7.734757	6.43952	8.350589	9.596517	14.72925	10.03793	8.547519	10.03538	13.1698	19.39644	24.27503
1.132237	1.673878	2.191718	2.491747	3.221795	2.773055	3.115885	3.739095	4.520425	6.160853	7.080093	8.903944	10.61115	12.65182	11.92368	10.62642	15.03534	14.01747	11.35117	12.12811	18.53067	22.5328	20.70229	23.97916	28.66641	23.03715
1.132237	1.405504	1.85764	2.306919	2.817188	2.42349	3.218872	3.594063	4.362294	5.107183	5.286271	3.447586	4.449395	4.878312	6.281789	8.075073	11.30935	16.25136	17.40087	12.93034	15.78147	15.71909	20.50223	16.67665	21.9006	21.38572
1.132237	1.473416	1.230706	1.707513	1.192941	1.372458	1.924213	1.694711	2.116457	2.528429	3.077432	4.099593	5.032641	3.578973	4.237022	5.773601	6.795743	8.044266	8.989476	10.62511	12.19374	12.08406	16.24642	21.93889	17.84197	19.8678
1.132237	1.311005	1.222189	1.428438	1.836654	2.058273	1.941187	2.118498	2.8663	3.479223	3.642868	4.82072	5.621059	8.212309	8.152745	11.18852	12.4748	13.66593	15.87451	10.19723	13.52092	12.17577	13.96545	11.96009	13.7449	18.47295
1.132237	1.623407	1.932538	1.272458	1.518426	1.781053	2.607711	3.118518	3.600678	2.374722	3.026789	4.090408	4.521168	5.4782	6.099623	7.421465	6.330565	7.935625	10.698	13.37248	17.13065	12.05199	16.07012	13.0856	15.21411	17.51056
1.132237	1.579058	1.900326	1.716913	1.743095	1.552123	1.850555	2.279209	2.788661	3.195474	3.169234	3.302813	4.252717	4.005652	4.684108	5.535113	3.585958	3.426046	4.162177	4.656262	6.376962	7.739896	7.162773	10.98701	14.81999	15.88498
1.132237	1.319814	1.671986	1.496737	2.020061	1.951289	2.314696	2.858482	2.351899	2.482665	2.778019	3.94406	4.62535	5.084649	4.525822	5.051297	6.910553	9.710535	10.44636	11.24955	12.39439	9.380025	6.631525	10.1793	12.30532	14.36416
1.132237	0.965923	1.300475	1.244292	1.643314	1.868135	2.563858	2.940341	3.588756	4.509927	5.390591	6.364791	8.277075	9.158559	10.43637	6.81162	8.165666	8.741974	11.51849	9.780786	11.55027	14.48604	16.98167	10.98965	13.64509	13.36492
1.132237	1.402034	1.768223	2.302387	1.59311	1.222403	1.398592	2.023591	1.771687	1.236235	1.571478	1.678216	1.845102	2.11752	2.210219	2.967677	3.514919	4.087722	5.409209	7.236082	6.02524	6.694915	8.46334	9.375609	12.32142	11.36092
1.132237	1.325341	1.080947	1.252808	0.925303	0.69718	0.698266	0.725273	0.615508	0.655744	0.782825	0.93534	1.324328	1.090232	1.623617	2.119562	2.690057	3.115849	4.838733	5.513152	6.687047	7.507483	10.53052	11.75819	14.00918	9.555471
1.132237	1.551259	1.986907	2.302747	2.07138	2.862354	3.602663	4.024777	3.203477	3.230259	2.673591	2.341609	2.80527	3.400527	4.008249	3.484249	4.257299	2.790607	3.129518	3.977494	2.736463	3.403809	3.947744	4.415394	5.489152	6.514068
1.132237	1.574038	2.310776	2.812418	2.521229	1.612578	2.520876	3.241085	3.80455	3.321338	4.001498	3.379566	3.157758	3.542384	4.196557	4.724346	4.854483	5.393482	4.806755	4.023069	2.76376	1.833044	2.12644	2.623609	3.236593	3.655149

Key takeaway: Positive outcomes with some volatility and tail risk.

100% US Bonds

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.370555	1.62149	2.213678	3.205889	4.809833	5.873098	8.217057	10.30674	11.7605	12.62518	19.27153	16.46702	20.67285	30.6694	41.66913	53.1259	77.32229	109.9105	147.9088	171.0963	169.9043	149.2949	176.0068	209.8584	271.1503
1.132237	1.72643	2.119994	2.732321	3.744359	4.641132	6.93495	8.891086	11.14693	13.54905	14.89463	17.45577	20.76736	29.71227	38.24953	48.7707	52.07629	44.04058	50.42684	70.35988	89.6604	131.4985	114.4285	159.5621	182.0776	197.2869
1.132237	1.599445	1.939225	1.646035	2.235933	2.906008	3.239983	3.741125	4.335813	4.885053	6.460976	7.874993	9.949245	13.24609	15.92164	20.16928	22.60064	26.39452	24.89661	30.79229	41.05893	57.61181	65.46985	88.14351	106.8898	136.1778
1.132237	1.449333	1.319797	1.641529	1.994889	2.758928	3.751198	3.255938	2.969587	3.311253	4.214382	4.571585	5.857937	6.907561	9.682881	12.93631	18.12244	23.77955	31.41557	42.23473	53.60032	62.10098	69.92269	84.99674	101.8087	125.6806
1.132237	1.498781	2.020909	2.491085	2.719805	3.035009	3.92698	5.566094	6.370117	5.499212	6.718815	8.595934	9.505354	12.41691	16.73216	21.5815	24.05754	31.52413	42.33599	54.47734	59.79777	68.44818	78.29035	86.49149	100.4476	117.8048
1.132237	1.686819	2.203469	3.240439	2.060861	2.417404	1.833059	2.560262	2.849813	3.590935	4.756496	6.935645	8.502087	9.994758	13.13407	15.4668	14.61375	18.28603	23.02115	32.19587	36.28477	50.65424	58.4834	74.32637	84.48462	110.5797
1.132237	1.686819	1.976307	1.862861	2.465543	2.781626	3.239458	4.091095	5.419493	7.242576	5.885236	7.629827	10.68141	12.28508	14.943	17.72078	24.13746	28.88659	32.10966	41.37336	46.67039	54.06185	65.52113	82.29772	106.9933	106.3089
1.132237	1.410174	1.970576	2.371691	2.582685	3.088451	3.7034	4.196218	5.291632	6.738603	9.179473	11.47854	10.0056	11.72696	12.52045	14.65757	17.80532	22.20739	24.27509	32.80189	36.44196	42.79046	55.06078	68.96624	81.38661	99.38804
1.132237	1.440869	1.564002	1.573071	2.176488	2.369394	2.639568	3.231371	4.478117	5.491223	6.660279	7.680624	9.639007	11.10704	9.901663	13.87605	16.30194	22.27593	31.05005	38.78395	41.43217	52.71362	61.71455	82.9009	70.9125	92.61341
1.132237	1.391185	1.726993	2.20279	2.796648	3.103663	4.125289	5.298501	6.319594	8.110119	7.187275	7.605388	9.145051	9.471474	12.25469	14.73649	17.11614	20.49255	30.80125	24.7397	29.77314	35.43497	43.28636	56.54983	74.60831	85.33392
1.132237	1.623575	2.039511	2.233533	2.822389	3.175728	4.205565	5.055501	7.41866	8.825153	11.24823	12.54182	16.47387	21.86158	21.26041	26.81728	38.16959	48.39198	55.06766	60.09162	69.36194	58.67173	69.95935	56.11773	62.45848	80.62026
1.132237	1.557857	2.16445	2.548958	3.799296	4.706744	5.347701	4.188015	4.524001	6.056816	7.789057	9.746385	11.20641	13.00092	15.48689	17.75932	25.47208	32.52581	35.67738	44.71256	52.48099	68.83318	78.70024	49.19121	58.17361	77.07514
1.132237	1.383854	1.72767	2.319677	2.536429	2.510085	2.983553	4.097056	4.916805	4.102207	5.02898	6.738649	8.231194	9.479511	8.548394	10.65951	14.44547	12.58329	17.5487	23.5506	29.24362	36.50572	40.56693	45.40682	61.29274	72.53992
1.132237	1.086713	1.523948	2.053256	2.504069	2.767424	3.526351	4.59371	5.383114	4.592536	6.212955	8.43393	9.963333	11.7106	14.18217	14.67775	17.89747	21.32721	23.72411	28.82282	40.46624	55.02563	38.56222	48.47083	45.52514	68.33711
1.132237	1.498612	1.95549	1.7176	1.82448	2.536015	2.753002	2.781426	2.361485	3.663739	4.716701	5.985021	6.882114	7.857368	8.625916	10.78155	13.51955	15.1175	15.38923	17.51579	22.25431	29.55211	34.69274	39.06892	50.11607	63.93439
1.132237	1.512661	2.123666	1.404852	1.92716	1.641079	1.863167	2.271071	2.72482	3.731328	5.128507	6.932192	9.071311	10.09018	11.75933	12.94586	16.38897	22.41872	28.90998	32.88875	41.34712	52.55793	43.79451	43.21536	57.88821	61.67253
1.132237	1.501583	1.680465	2.112969	2.91738	3.740062	4.15293	5.285078	6.449922	7.179569	9.817529	11.96795	9.744258	11.3565	14.88764	17.25411	23.15202	27.73907	29.6512	40.38509	29.93425	33.19602	28.44582	37.19263	47.46861	60.33374
1.132237	1.306419	1.751942	2.288905	3.138762	3.511629	5.26357	6.190053	5.149875	7.231602	8.592494	10.90302	10.22212	7.965552	7.0645	7.766438	9.05378	10.75057	13.46682	16.03776	19.07085	23.37079	26.7345	37.38277	43.86758	57.89826
1.132237	1.356409	1.878693	2.509084	2.980115	3.807284	4.784122	6.165034	6.795035	7.984781	10.74986	11.92845	14.27985	16.99692	20.35858	17.26025	15.24283	17.73078	21.60797	29.29811	32.64241	36.28	35.05492	43.4878	49.32314	54.58235
1.132237	1.389548	1.662319	2.036977	2.578251	3.202978	2.864167	2.16445	2.270545	2.630594	2.33343	2.645954	3.665399	4.74586	5.972901	5.166491	7.066377	9.978699	12.10066	15.68294	19.49604	21.59523	29.28587	34.01405	43.78812	52.68179
1.132237	1.284163	1.130491	1.411342	1.652069	1.87448	2.279005	2.990984	4.235759	5.15105	6.108375	4.159969	3.422855	4.430076	6.410545	8.003964	9.227477	9.942684	11.81518	13.08659	15.47853	20.68404	24.42162	31.08665	36.9382	50.53571
1.132237	1.420633	1.695286	2.526745	3.068521	2.747454	3.18024	3.854255	5.034809	3.947993	5.077207	5.664303	5.575696	6.270011	8.549121	12.45372	18.51033	15.88593	20.71267	18.0186	25.21871	21.61684	27.06368	31.02832	45.00755	49.136
1.132237	1.384633	1.65663	2.046713	2.429663	2.056111	2.093326	2.362387	2.892937	3.550431	4.530819	3.461911	3.891052	5.168189	7.082796	9.928099	8.448736	11.5364	14.58848	15.10168	19.12335	23.12592	33.98485	38.35397	46.44253	47.83268
1.132237	1.471355	1.913355	2.310216	3.07388	3.453832	3.123231	2.577924	2.553409	2.913647	3.432619	4.397475	3.458144	5.103357	6.197523	5.740901	7.589851	9.220265	10.29774	14.04719	16.58784	18.08501	24.53297	28.81571	34.05741	46.14168
1.132237	1.473416	2.066573	2.451506	3.268749	3.047976	2.728703	3.037387	3.854345	4.692926	5.388879	4.73669	5.692595	6.298941	7.327618	6.094476	7.617409	7.627017	9.580715	11.6689	14.89284	17.88579	21.20078	29.63502	33.38676	44.25211
1.132237	1.639571	2.333361	3.328412	4.177351	5.501008	4.882923	4.109173	4.439925	6.417432	8.252307	9.85211	10.85057	13.60109	15.74492	17.30624	21.78878	20.01389	25.11737	28.13841	19.12703	23.7293	31.01659	24.91736	35.65307	41.39481
1.132237	1.365941	1.587671	2.205924	2.489622	2.854644	3.911721	5.544714	7.400253	8.934904	9.2061	10.70833	11.96871	13.82027	19.43702	21.16972	28.08933	30.77327	27.13187	32.9521	38.98836	43.33109	29.42724	38.55352	44.66014	39.64468
1.132237	1.055366	1.368013	1.078108	1.440761	1.695569	1.406541	1.620914	1.96337	2.186364	2.840907	4.278069	5.504331	7.261882	8.001098	9.340432	10.75584	11.06904	12.35236	14.75414	11.94698	14.36408	16.38754	21.52858	28.29061	38.05081
1.132237	1.50137	1.730169	2.070114	2.322727	2.035393	3.049159	3.617316	3.445101	3.296097	2.264401	2.355349	2.762152	3.491846	4.299592	6.247674	6.931846	8.983184	10.79812	12.0717	13.4153	16.46373	20.86433	26.66518	31.24305	36.49835
1.132237	1.402034	1.802562	2.059205	2.464945	2.910366	3.585322	4.191656	4.675172	7.181447	9.531878	10.57998	14.06402	10.62319	14.07285	19.88479	23.68555	28.05034	20.80723	24.59485	27.77422	36.4204	41.93038	34.60484	30.16094	34.93574
1.132237	1.394773	1.953612	2.340362	3.057036	4.009169	5.869292	6.99061	6.862694	7.618471	8.31249	6.90115	8.073871	7.213064	9.723572	10.75055	11.93572	7.785539	8.608135	12.98834	15.5549	18.29704	21.00785	24.59244	29.62378	33.0102
1.132237	1.328163	1.639892	1.808099	2.1087	1.469484	1.968284	1.673849	2.249726	2.574025	2.902583	2.465182	2.76128	2.749936	4.022324	4.992993	7.47034	10.49068	8.465951	10.10236	13.23648	15.77677	18.9956	19.32642	22.59211	31.50219
1.132237	1.439773	1.613347	1.8345	2.558238	3.40964	2.965483	2.492981	2.915831	3.385899	4.488427	5.386382	6.779943	8.876517	11.33911	13.18497	15.49362	16.9457	14.79527	15.81286	17.18162	25.84331	32.83166	27.14679	26.99507	30.64937
1.132237	1.513542	2.012045	2.408681	2.695963	3.023928	3.961715	5.11597	6.245525	7.196204	8.259962	11.8822	15.34364	18.64355	15.45726	21.73206	27.74247	19.47011	22.84006	26.46673	31.72055	29.50768	28.68553	19.36117	23.17452	29.08319
1.132237	1.438105	1.398425	1.100946	0.747107	0.879819	1.150197	1.221633	1.533621	1.973766	2.213644	2.957291	4.451773	4.648592	5.524008	6.436917	8.78013	10.48644	12.61332	12.85298	15.13188	22.48187	26.72815	32.29381	20.21858	27.65244
1.132237	1.371944	1.691328	2.012174	2.091896	3.00733	3.542676	4.348307	6.126672	6.949808	4.755101	5.212451	6.24893	6.750748	9.206398	11.91533	15.59042	14.59307	11.87575	14.44501	11.99701	16.37495	17.79272	21.0989	26.988	26.87113
1.132237	1.218348	1.30896	1.643405	2.203619	2.789752	3.99085	4.100247	5.169733	5.9698	8.097097	8.349256	7.806352	9.813108	12.41478	8.094297	7.478332	8.798032	7.187372	9.457968	8.116996	9.663959	12.6343	15.44718	22.13847	25.86881
1.132237	1.498511	2.064533	2.822757	3.074639	4.3694	3.653142	2.517972	2.608807	2.885424	3.442641	3.082634	3.995282	4.658151	5.75185	6.892483	6.746617	8.162141	9.147048	10.2215	8.804518	12.08646	13.81498	17.85475	22.48966	25.03337
1.132237	1.384633	1.230632	1.462581	1.794836	2.366438	3.102099	3.07499	3.476819	3.91207	4.533608	5.490479	3.767717	5.652514	6.420556	7.734757	6.43952	8.350589	9.596517	14.72925	10.03793	8.547519	10.03538	13.1698	19.39644	24.27503
1.132237	1.673878	2.191718	2.491747	3.221795	2.773055	3.115885	3.739095	4.520425	6.160853	7.080093	8.903944	10.61115	12.65182	11.92368	10.62642	15.03534	14.01747	11.35117	12.12811	18.53067	22.5328	20.70229	23.97916	28.66641	23.03715
1.132237	1.405504	1.85764	2.306919	2.817188	2.42349	3.218872	3.594063	4.362294	5.107183	5.286271	3.447586	4.449395	4.878312	6.281789	8.075073	11.30935	16.25136	17.40087	12.93034	15.78147	15.71909	20.50223	16.67665	21.9006	21.38572
1.132237	1.473416	1.230706	1.707513	1.192941	1.372458	1.924213	1.694711	2.116457	2.528429	3.077432	4.099593	5.032641	3.578973	4.237022	5.773601	6.795743	8.044266	8.989476	10.62511	12.19374	12.08406	16.24642	21.93889	17.84197	19.8678
1.132237	1.311005	1.222189	1.428438	1.836654	2.058273	1.941187	2.118498	2.8663	3.479223	3.642868	4.82072	5.621059	8.212309	8.152745	11.18852	12.4748	13.66593	15.87451	10.19723	13.52092	12.17577	13.96545	11.96009	13.7449	18.47295
1.132237	1.623407	1.932538	1.272458	1.518426	1.781053	2.607711	3.118518	3.600678	2.374722	3.026789	4.090408	4.521168	5.4782	6.099623	7.421465	6.330565	7.935625	10.698	13.37248	17.13065	12.05199	16.07012	13.0856	15.21411	17.51056
1.132237	1.579058	1.900326	1.716913	1.743095	1.552123	1.850555	2.279209	2.788661	3.195474	3.169234	3.302813	4.252717	4.005652	4.684108	5.535113	3.585958	3.426046	4.162177	4.656262	6.376962	7.739896	7.162773	10.98701	14.81999	15.88498
1.132237	1.319814	1.671986	1.496737	2.020061	1.951289	2.314696	2.858482	2.351899	2.482665	2.778019	3.94406	4.62535	5.084649	4.525822	5.051297	6.910553	9.710535	10.44636	11.24955	12.39439	9.380025	6.631525	10.1793	12.30532	14.36416
1.132237	0.965923	1.300475	1.244292	1.643314	1.868135	2.563858	2.940341	3.588756	4.509927	5.390591	6.364791	8.277075	9.158559	10.43637	6.81162	8.165666	8.741974	11.51849	9.780786	11.55027	14.48604	16.98167	10.98965	13.64509	13.36492
1.132237	1.402034	1.768223	2.302387	1.59311	1.222403	1.398592	2.023591	1.771687	1.236235	1.571478	1.678216	1.845102	2.11752	2.210219	2.967677	3.514919	4.087722	5.409209	7.236082	6.02524	6.694915	8.46334	9.375609	12.32142	11.36092
1.132237	1.325341	1.080947	1.252808	0.925303	0.69718	0.698266	0.725273	0.615508	0.655744	0.782825	0.93534	1.324328	1.090232	1.623617	2.119562	2.690057	3.115849	4.838733	5.513152	6.687047	7.507483	10.53052	11.75819	14.00918	9.555471
1.132237	1.551259	1.986907	2.302747	2.07138	2.862354	3.602663	4.024777	3.203477	3.230259	2.673591	2.341609	2.80527	3.400527	4.008249	3.484249	4.257299	2.790607	3.129518	3.977494	2.736463	3.403809	3.947744	4.415394	5.489152	6.514068
1.132237	1.574038	2.310776	2.812418	2.521229	1.612578	2.520876	3.241085	3.80455	3.321338	4.001498	3.379566	3.157758	3.542384	4.196557	4.724346	4.854483	5.393482	4.806755	4.023069	2.76376	1.833044	2.12644	2.623609	3.236593	3.655149

Key takeaway: 100% Bond portfolio struggles with success defined as 12x RWR.

100% Real Estate Blend

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.357933	1.583374	1.899591	2.123646	2.482662	3.242409	3.838691	4.529837	5.44114	6.333065	7.292439	8.278199	9.7144	10.71376	11.82965	14.67175	17.96567	22.84273	24.99741	29.36836	32.52509	35.18055	47.05425	53.98102	59.36927
1.132237	1.559179	1.819793	2.049692	2.278903	2.554352	3.132378	3.516099	3.726385	4.036188	4.664792	5.595336	6.286791	7.600424	8.290342	9.966752	11.44017	12.42809	15.84608	18.1792	20.48712	24.11633	29.34965	34.19471	43.47298	51.7004
1.132237	1.31605	1.586811	1.904861	2.230642	2.72105	3.307401	4.019875	5.048033	5.945183	6.785768	7.809113	8.861322	11.90134	12.80155	15.34745	19.7357	24.12926	25.91057	28.78281	30.87293	30.62675	32.94695	36.71326	39.59737	47.02375
1.132237	1.304507	1.596841	2.125891	2.50776	2.834502	3.161162	3.663374	3.997456	4.709576	4.839849	5.311742	5.94525	7.237116	8.00038	8.943458	9.544376	11.11386	11.78606	14.41163	17.71285	21.75079	26.04257	29.71949	33.96701	43.18582
1.132237	1.431392	1.737204	1.970224	2.362667	2.53228	2.61748	3.167876	3.542081	4.05104	4.86745	5.789458	7.486227	8.582911	9.320775	11.27934	12.91211	13.52427	14.68073	15.90334	19.64122	22.4311	26.30856	30.43549	35.45836	40.57366
1.132237	1.284636	1.511554	1.686464	2.006946	2.138161	2.520812	2.78517	3.410411	4.341972	4.911895	6.128395	7.053146	7.773683	8.489687	9.507563	10.57154	13.12075	14.23228	16.48132	20.96494	24.09156	25.79394	28.18647	33.07085	37.96494
1.132237	1.284032	1.500818	1.766616	2.028378	2.394832	2.788887	3.064169	3.437632	4.426485	4.869668	5.127317	5.591793	6.478811	7.168532	8.583725	9.627877	11.28998	13.45831	17.18769	20.66761	22.40391	26.30044	30.60677	33.52826	36.47654
1.132237	1.284118	1.436108	1.725598	1.990215	2.35231	2.527235	2.800435	3.63326	3.938301	4.125446	4.921691	6.062352	6.640382	7.994415	8.351376	10.01778	11.0191	14.08505	15.70247	17.26364	19.78169	25.1826	27.72626	32.33782	35.22257
1.132237	1.33537	1.636357	1.829142	2.295366	2.881839	3.06383	3.416788	4.094132	4.755895	5.207262	5.346369	6.447621	7.091752	8.491045	10.89082	12.67696	14.86736	17.04227	19.33669	20.29634	23.84483	27.43009	30.73926	32.57305	34.35105
1.132237	1.341968	1.62721	1.929176	2.220433	2.583392	2.957089	3.697243	3.798605	4.597765	4.994452	5.284052	6.119246	7.121546	7.865976	8.691302	10.24999	11.14276	12.30686	14.76643	16.90254	18.51873	21.73374	26.67297	30.52544	33.06563
1.132237	1.278524	1.446288	1.641735	1.836729	2.175137	2.487433	3.093521	3.430781	3.855427	4.460824	5.143718	5.564144	6.7563	7.522532	8.001963	8.953494	10.0737	12.14214	13.57433	15.10469	16.22548	19.41128	24.09023	29.55744	31.71643
1.132237	1.439226	1.728751	1.94948	2.170094	2.463848	2.86758	3.233004	3.843645	4.522083	5.131731	6.323241	7.69131	8.131096	10.60023	12.38412	13.11227	14.29331	16.85666	19.96801	21.35061	22.32363	24.5504	26.30531	28.16025	31.0134
1.132237	1.183461	1.375793	1.529118	1.864786	2.106385	2.253073	2.632785	3.106951	3.837487	4.401272	4.979679	5.301297	5.717888	6.77879	7.521293	8.747846	9.283593	10.31386	12.69621	13.99341	17.57956	19.03379	22.17248	26.49925	30.27856
1.132237	1.341968	1.672366	2.015404	2.435783	2.975216	3.219645	3.607863	3.817162	4.185199	4.515965	5.862601	4.513443	5.82366	6.849034	8.293264	9.323551	10.70347	11.83574	14.44247	15.93305	17.5537	20.45298	23.10923	26.20231	29.22186
1.132237	1.285025	1.446735	1.596054	1.80498	2.202869	2.540121	3.154581	3.756746	4.344913	5.143215	6.335489	8.185688	9.895445	11.07184	13.91713	17.02086	21.07907	23.23975	29.6235	28.58978	32.69285	21.31972	23.50505	27.95285	28.51385
1.132237	1.44036	1.659894	1.944695	2.263253	2.52113	1.780242	2.230144	2.851577	3.403259	3.573249	3.972362	4.525254	5.035312	5.873285	7.019004	8.313303	10.29991	11.72266	13.82227	15.19592	16.81723	19.44297	22.34308	25.16841	27.14276
1.132237	1.44036	1.841709	2.537253	3.112956	3.220957	2.345382	2.869227	3.143605	3.405478	4.649724	5.605032	6.18133	7.671212	5.77886	7.395638	8.288531	9.504913	10.77456	11.84904	15.5801	15.84047	17.62959	21.58205	24.72838	26.62348
1.132237	1.325244	1.52262	1.68244	1.926533	2.248562	2.455197	2.740747	3.008096	3.535553	4.323856	5.043197	5.327481	6.412159	6.710542	7.728572	9.459931	11.74905	12.24601	14.58333	16.50187	17.54104	19.40069	21.86294	24.23581	25.85424
1.132237	1.269256	1.717301	1.904272	2.225743	2.399216	2.67545	3.096644	3.419458	3.699887	4.276849	4.774443	5.88303	6.494869	7.503887	7.945833	8.40144	11.29324	12.39728	9.305789	9.875527	11.33852	13.95571	17.18878	18.8357	25.43022
1.132237	1.431751	1.721857	1.968506	2.104424	2.520003	2.827414	3.315833	4.056602	3.476052	4.302836	4.968754	5.413798	6.402974	4.625174	5.128285	5.82343	6.47065	7.15519	9.364219	10.18997	11.18086	13.08879	16.72427	19.64707	24.65594
1.132237	1.387938	1.535376	1.231596	1.522939	1.793615	2.257553	2.663032	3.020116	3.434222	3.769947	4.383083	4.629748	5.439515	6.283677	6.995753	8.378494	9.836877	10.43205	11.81993	12.95538	14.02416	15.36324	16.92169	20.48437	24.10675
1.132237	1.364418	1.684031	1.897917	2.021039	2.218809	2.527483	3.180963	3.408697	3.661463	3.582681	3.976837	4.475794	4.98484	5.764266	7.091303	8.245911	9.056659	10.10713	13.13783	14.68538	15.75098	17.46057	19.23238	21.9601	23.78138
1.132237	1.269256	1.481848	1.588847	1.831039	1.426638	1.750774	2.021748	2.366245	2.670608	3.243906	3.863067	4.415203	5.357365	5.63839	6.566881	7.870461	8.647995	10.12694	10.35207	10.96435	12.8987	13.72844	17.58668	21.44514	23.25411
1.132237	1.321428	1.441227	1.65666	1.905562	2.159161	2.529504	2.955577	3.328546	4.544889	4.770655	5.391957	6.21019	4.486478	5.202437	5.927517	7.001685	8.573327	9.451286	10.16211	12.20823	13.63029	15.89915	18.60133	19.76786	22.86556
1.132237	1.233947	1.413973	1.48262	1.87406	2.113017	2.363104	2.520426	3.162251	3.36237	3.910858	4.335371	4.662494	5.334466	6.607861	7.48263	7.913641	9.456566	10.19202	12.21888	14.25789	14.87172	15.48758	16.79414	18.13728	22.39742
1.132237	0.870188	1.143961	1.275448	1.51561	1.787543	1.9701	2.21031	2.880938	3.347955	4.14662	5.115946	5.343309	6.085681	6.101559	6.876568	7.41432	8.117991	9.328081	10.68647	11.49004	12.97031	14.29394	15.3768	17.94625	21.72105
1.132237	1.326973	1.535123	1.737753	1.90776	2.172816	2.830687	2.995204	3.51947	4.205289	4.799135	5.263364	6.743932	8.62681	11.0624	10.7138	13.12002	9.081888	10.40495	11.75712	12.34155	13.41497	14.61488	15.94298	15.85734	21.19176
1.132237	1.302596	1.553525	1.946161	2.202138	2.562583	3.301511	2.541332	2.763168	3.549894	4.028691	3.095246	3.355843	3.753769	4.541706	4.798854	5.247255	5.953921	7.236005	8.291869	10.03291	12.31455	14.52097	16.63933	18.8887	20.85185
1.132237	1.400872	1.580448	1.783631	2.209476	2.464043	3.074553	3.335747	3.724931	4.243686	5.232846	6.033355	4.457724	2.94421	3.892789	4.506192	5.922442	7.142103	8.025269	8.615198	10.46581	11.63723	13.68707	15.85445	17.4446	20.27741
1.132237	1.345951	1.869185	2.206449	2.750114	3.375572	3.779274	4.079897	4.734666	5.676697	6.099559	6.457083	7.237818	8.317727	9.809723	10.67942	11.9258	8.759034	11.41923	12.93894	15.63695	17.16609	20.16053	21.75519	14.71493	19.88696
1.132237	1.415251	1.740433	1.879302	2.012435	2.258667	2.445338	2.595326	3.238459	3.633944	4.341924	4.835142	5.374423	5.530617	6.202152	6.865129	7.64531	7.653027	9.965584	10.82783	10.4515	11.84748	13.79318	17.19131	20.05388	19.48656
1.132237	1.249104	1.383422	1.674399	1.800144	1.93242	2.476844	2.821938	3.310383	3.877701	3.375866	3.866376	4.211878	4.568561	3.97165	4.698823	3.288258	4.07906	4.944056	5.742186	6.385597	8.184215	9.265986	10.8531	14.1404	19.1141
1.132237	1.306125	1.456414	1.825618	2.046413	2.413833	2.660922	3.009886	3.763382	4.988106	5.634128	6.195479	4.398344	4.921933	5.96475	7.537846	8.344217	8.79518	10.20038	12.6658	14.11955	16.74143	18.37288	21.25465	21.69906	18.63924
1.132237	1.251389	1.630421	1.830895	2.153067	2.536626	3.001538	3.241629	3.461202	4.04504	4.697047	5.088774	3.68476	4.507518	5.213343	5.773494	5.004837	5.30253	5.808492	6.616917	7.822373	10.04785	11.93855	14.33329	15.83435	17.91204
1.132237	1.326689	1.468308	1.605579	1.832354	2.102907	2.389685	2.643277	2.851188	3.399403	4.061346	4.792771	5.748355	7.138564	8.237362	9.098422	10.45885	11.35644	12.75741	14.76413	16.29806	10.65394	12.36146	13.04352	14.3163	17.1261
1.132237	1.326492	1.571846	1.76707	2.172723	2.444697	2.666067	1.773762	2.009146	2.195708	2.693559	2.898885	3.604762	4.022914	4.978441	5.525645	7.097909	8.283405	9.511821	11.15768	11.72865	15.10793	15.85799	13.45066	15.69384	16.5748
1.132237	1.462273	1.599358	1.777084	1.193204	1.286594	1.479917	1.872704	2.008963	2.209818	2.726521	3.311907	3.795646	4.16683	5.635404	6.844683	7.244764	8.803885	9.752171	10.8792	11.35612	13.09067	11.1214	13.10617	14.04041	16.26493
1.132237	1.302596	1.514888	1.654885	1.982288	2.56018	2.882644	3.168021	3.521491	3.930733	4.420937	5.001338	5.474524	6.77818	7.339579	8.401368	5.949189	6.629773	8.128427	8.823515	9.029903	9.729716	10.89083	12.04745	13.27528	15.89613
1.132237	1.392015	1.639626	1.924441	2.415619	3.001512	3.846688	4.876466	5.267641	5.993248	7.170144	8.385556	9.237694	10.01009	10.22694	11.58336	12.60293	13.97857	16.44859	18.28565	12.37263	15.81052	17.65769	13.22986	14.27822	15.6655
1.132237	1.404169	1.635472	1.795704	2.050133	2.021489	2.753114	3.514972	4.087253	4.90912	5.547958	6.228924	7.077802	9.490363	6.677067	7.698828	8.423424	8.637237	9.670896	10.26613	12.22452	8.789707	9.785536	11.24372	12.64919	15.22729
1.132237	1.495144	1.88546	2.125376	1.636424	1.799663	2.150227	2.522342	3.072748	3.451063	4.18346	5.357394	5.365181	6.704532	7.018996	5.499864	3.62484	4.019866	4.850003	5.994667	6.898714	8.031437	9.425374	10.88109	12.43537	14.85245
1.132237	1.257307	1.546732	1.856898	2.119755	2.319308	2.760402	3.039578	2.403621	2.98239	3.347166	4.334124	5.204697	5.778741	6.279262	7.113843	7.727951	8.221329	8.995391	10.65611	12.22741	13.38555	11.36226	11.89705	12.77882	14.25282
1.132237	1.256059	1.485014	1.71276	2.096761	1.541812	1.824059	2.058408	2.199702	2.403599	2.629762	1.859761	2.308032	2.52082	3.196614	3.812296	4.511861	5.019396	5.708197	6.597867	7.349252	9.072716	9.592478	10.13856	11.66704	13.74608
1.132237	1.448027	1.623915	2.160944	2.607517	2.99387	3.430697	3.837492	4.082486	5.242413	6.432265	6.700592	4.752416	5.283706	5.58456	6.447281	7.172047	8.666812	9.231218	7.221639	5.521034	6.870401	9.228599	10.47738	12.05411	12.86881
1.132237	1.312519	1.413897	1.734213	1.851411	2.064847	1.788701	1.388922	1.067777	1.173074	1.313924	1.323315	1.704688	1.914896	2.299212	2.737158	3.276496	3.903204	4.181121	4.683496	5.590722	6.801693	7.510606	9.610609	10.47748	12.29542
1.132237	1.251205	1.416472	1.608985	1.734281	1.813198	2.238287	2.558249	2.531477	2.947226	3.490253	3.828491	4.312179	5.010918	5.13521	5.777718	6.403072	7.249256	8.801961	7.489341	8.802726	9.584938	11.61896	9.879573	10.87729	11.75483
1.132237	1.404169	1.822498	2.349569	2.313218	2.903799	3.702787	4.450003	5.391728	5.865226	4.428739	4.854464	5.176178	5.673677	6.098833	6.753537	7.934677	8.292212	9.827494	12.47274	13.09547	14.59746	15.6258	11.88579	8.551606	11.18622
1.132237	1.363785	1.626654	1.758506	2.174972	2.457779	2.686293	2.988062	3.558991	4.425064	4.883326	6.567611	4.95433	3.797745	4.210674	4.601937	5.055374	5.910932	7.180196	7.483161	5.092454	6.282277	6.781774	7.617156	8.552522	10.1279
1.132237	1.312519	1.618174	1.993356	2.240802	1.619037	1.97041	2.241372	2.79486	2.140635	2.408627	2.674387	1.783285	2.044083	2.642338	3.225847	3.266259	2.816983	2.438656	2.86854	3.438854	4.545398	5.619111	6.230569	7.375331	8.759882
1.132237	1.369679	1.574725	2.052912	2.309114	2.68908	3.046784	3.387831	4.045301	4.654801	3.372908	3.75673	4.24726	4.621918	5.163153	6.112485	7.49279	4.922175	5.468128	6.37179	7.332353	8.230774	5.807393	7.015743	7.784129	5.878796
1.132237	1.238563	1.418724	1.695929	1.228029	1.440335	1.591032	1.855305	2.089475	2.301918	2.612244	2.895268	1.993291	1.424021	1.126483	1.388958	1.596593	1.930219	2.346462	2.738551	2.371997	2.662974	2.982804	2.581872	2.907473	3.283333

Key takeaway: Overall positive outcomes with less volatility than 100% Stocks.

60/40 Stocks/Bonds

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.379292	1.696358	2.165261	2.391549	2.860661	3.389599	4.171744	4.950161	5.67585	5.278419	6.23677	7.573387	8.775577	9.539971	10.82173	12.74952	15.06769	18.30755	21.39418	25.54699	31.84537	38.93163	49.68802	56.07099	69.34357
1.132237	1.174366	1.452397	1.765299	1.979844	2.154656	2.599241	3.1173	3.686089	4.630383	5.620908	6.948429	8.387697	9.600658	10.49357	12.16845	14.79674	17.52644	19.17095	21.52097	23.2351	28.19415	32.60113	38.66856	49.60722	56.66222
1.132237	1.250604	1.190522	1.402698	1.657138	1.996501	2.506704	2.904601	3.849788	4.301539	5.505671	6.541525	8.128505	10.60675	12.17357	14.83163	18.51718	20.68958	26.93748	32.33536	39.92379	39.81258	36.49468	41.5032	45.10539	53.4221
1.132237	1.379508	1.595688	1.769283	1.983697	2.533192	3.045359	3.507646	4.112952	4.619874	5.656587	6.373902	8.258777	9.607193	7.55081	8.738362	10.64983	14.37586	16.81634	20.04352	20.83289	22.66138	26.89373	33.90162	44.09894	49.67389
1.132237	1.336418	1.419334	1.719032	1.790954	2.037241	2.207985	2.64615	3.191054	3.494335	4.383604	5.506392	7.206272	8.331062	9.998657	12.53914	13.22772	15.36517	19.65495	23.19802	27.43213	32.59673	38.89017	50.21189	41.87472	46.38352
1.132237	1.521079	2.101142	2.821061	3.500783	4.178138	3.940769	4.299866	5.132728	5.649468	6.186176	4.918238	6.288026	6.927357	8.62926	7.033501	8.261481	9.680384	12.03553	16.21464	16.83221	22.68154	27.32206	31.54286	37.85847	43.26291
1.132237	1.403827	1.679298	2.022229	1.898645	2.561841	2.664708	3.121728	3.408925	3.546393	4.325062	5.202517	5.527302	6.584939	7.545347	8.65644	11.40903	14.2634	16.38975	20.15016	22.18403	25.96445	30.91018	35.28678	41.22121	42.33676
1.132237	1.347176	1.465679	2.02796	2.417544	2.881335	3.287044	3.771884	4.839316	5.786358	5.767259	6.866257	8.147359	9.614648	8.855741	10.57301	13.91829	14.2663	16.06515	18.83089	20.3942	20.19713	24.34458	29.52962	31.86384	39.70641
1.132237	1.367935	1.631103	2.192047	2.463451	2.301849	2.84589	2.743836	3.315099	3.845521	4.350033	5.139202	5.38559	6.213588	7.467137	9.27148	10.9784	12.50598	14.71964	15.66972	18.50648	20.83187	25.95486	33.15497	42.97016	38.54931
1.132237	1.345395	1.55908	1.907067	2.248787	2.545421	3.020756	3.648811	4.23474	4.867473	5.278305	5.815522	7.100889	7.906648	7.558078	8.075034	9.436589	10.57945	13.32004	14.11618	16.2899	14.95658	18.80562	22.88401	30.22633	36.38761
1.132237	1.371569	1.636102	1.543778	1.853938	2.146473	2.740471	3.04029	3.471242	4.553861	5.684475	6.701772	7.95379	8.964554	10.37538	13.3151	12.23139	13.96284	15.88518	20.70212	22.58762	28.54549	31.42742	33.80886	32.65043	35.90791
1.132237	1.503141	1.764589	2.250101	2.92464	3.424079	4.124883	4.061189	4.706001	5.407414	6.029968	6.239006	5.86529	6.869599	8.602666	10.15948	11.40392	12.04919	14.08675	16.47018	16.93011	19.42867	25.26902	29.09574	32.09551	34.87739
1.132237	1.44081	1.70684	2.056776	2.549838	2.493844	3.24395	3.769961	4.274203	5.299656	6.999262	7.489142	8.88038	10.7509	12.65846	13.41319	15.59897	16.86135	16.31332	19.18069	21.73091	18.99712	21.31155	26.65629	31.73491	34.31205
1.132237	1.380896	1.161994	1.499611	1.809403	2.113296	2.464498	2.545539	3.224571	4.31871	4.096305	5.020039	5.529499	5.210393	6.108041	7.688438	8.939849	12.11034	12.78035	14.98679	17.62834	19.69956	23.01975	26.55292	27.94781	33.29045
1.132237	1.346929	1.534613	1.972816	2.297942	2.763349	3.317007	3.814592	4.501502	5.370206	6.395818	7.512855	8.013574	9.041785	10.5732	11.25624	9.86879	11.9292	13.99423	17.59617	20.06329	23.58424	29.18611	26.82293	27.56515	31.88053
1.132237	1.37132	1.663778	2.014209	2.238322	2.681677	2.518119	2.895023	2.743704	2.870776	3.607482	4.71687	5.591713	5.344339	6.438574	7.512894	9.542729	8.009676	9.4578	11.54471	12.92493	15.28318	17.1776	19.8044	25.70198	30.95441
1.132237	0.970554	1.359005	1.618283	1.978478	2.458559	2.74699	3.187543	3.779119	4.169757	4.980182	6.466762	7.037145	8.251006	9.556897	10.59781	12.89639	16.37319	18.29792	21.08481	16.83869	22.69024	24.05608	23.97121	29.32976	30.10089
1.132237	1.341626	1.692268	1.970885	2.295746	2.815928	3.213721	3.840326	3.870212	4.331952	4.820473	5.911142	6.798197	7.782114	9.31575	10.98374	13.60484	15.33418	17.75377	19.50004	23.49684	18.1461	20.89473	22.21983	26.29646	29.40816
1.132237	1.324836	1.622916	2.004004	2.462042	2.703909	2.570468	2.652289	3.237809	3.765751	4.905124	5.456159	6.415755	8.707046	10.06473	10.71812	12.3632	13.7171	15.04801	16.19885	17.45992	19.01762	22.30132	24.02225	26.36681	28.80266
1.132237	1.211187	1.490574	1.793416	2.10752	2.286509	2.646115	2.576625	2.982892	3.019563	3.716345	4.051512	5.175433	6.614577	7.803331	9.400348	10.61624	14.30896	15.63236	18.61601	20.5584	23.92237	22.33486	24.74458	29.54488	28.28525
1.132237	1.261547	1.375713	1.508278	1.428419	1.695868	1.811713	1.960181	2.562151	3.06637	3.6332	4.128826	4.540154	4.95116	5.649563	6.795992	7.584943	8.551026	8.908178	10.44885	12.43486	14.74674	15.70239	17.99085	24.20612	27.33998
1.132237	1.536015	1.875778	2.398937	2.627832	2.920312	3.330739	3.232648	3.775145	3.933864	4.130639	4.562395	4.953719	5.866792	7.559337	7.776696	8.926522	8.666953	10.65412	12.30747	13.15492	14.97477	17.80302	19.17279	21.09482	26.95818
1.132237	1.430187	1.335862	1.704946	2.281626	2.843942	3.283683	3.925009	4.551563	3.551204	4.074257	4.631335	4.857664	5.901028	6.582867	7.887025	7.320633	8.516933	9.823371	12.19991	13.51716	16.75178	19.68928	25.86497	24.84154	26.33436
1.132237	1.137665	1.363056	1.651722	1.955762	2.294078	2.573191	3.092938	3.665175	3.792328	4.067417	4.643466	4.318327	4.008854	4.436221	4.610633	5.39744	7.137163	9.072368	10.77704	12.82983	14.99915	16.80484	17.48507	20.18613	25.85259
1.132237	1.308255	1.226098	1.32015	1.595646	1.882381	2.125667	2.341011	2.582875	2.940749	3.539615	4.262636	4.475744	5.227414	5.676273	6.534566	8.132406	7.823117	9.348508	10.58546	12.60317	15.21703	16.62578	21.67017	22.4771	24.89322
1.132237	1.272443	1.696213	2.037982	1.953697	2.355699	2.831615	3.668926	3.940687	4.659102	5.517987	6.322307	5.942812	6.436166	7.085903	8.138397	9.549009	9.956365	11.69228	13.19163	15.42991	17.84541	21.19583	23.21226	25.29078	24.44497
1.132237	1.412516	1.512119	1.838738	2.142179	2.564302	3.032401	3.537634	4.191867	5.179156	5.700488	6.579398	6.070898	7.251614	7.569792	7.904263	8.93035	8.878425	9.744548	11.00185	12.59704	15.44985	16.49686	18.1799	20.52451	23.81387
1.132237	1.48131	1.726906	2.261583	2.729624	2.600777	2.934143	3.609335	4.430095	5.15673	6.761605	7.935124	8.941304	10.54489	12.03608	11.54904	13.22598	14.79302	17.19919	15.04802	17.38148	16.82812	18.19175	22.10318	19.97234	23.15612
1.132237	1.411519	2.004343	2.751051	3.187993	3.788555	4.414632	4.795416	5.202428	4.052171	4.927056	5.581847	6.782055	6.468627	6.174136	7.606997	7.947077	9.619801	11.3344	14.73841	16.39048	19.40626	21.21525	26.94771	26.03986	22.75545
1.132237	1.349655	1.616587	1.590598	1.961698	2.354778	2.696762	3.073173	3.87015	4.478972	5.278826	6.230757	7.136756	8.704544	9.435615	11.09548	10.38973	12.05688	14.34325	16.98611	19.5584	22.87163	21.89832	20.41193	23.4399	21.97155
1.132237	1.336418	1.615325	1.81895	1.711853	1.892087	2.311311	2.533991	3.207787	3.858935	4.607375	4.698955	5.950287	7.193712	6.328531	7.673157	8.303882	9.13283	10.82818	12.50734	15.24389	18.19107	22.49256	25.12489	26.57153	21.48951
1.132237	1.502961	1.765258	1.83636	1.803506	2.288898	2.457221	2.421984	2.461264	2.869545	2.794035	3.060799	3.676155	4.623534	5.808215	6.830957	6.805318	7.890029	10.69884	12.81439	13.69353	12.86144	14.30015	15.46941	18.17406	20.78695
1.132237	1.508557	1.933961	2.078466	1.949023	2.368922	1.929927	2.233893	2.694798	3.057878	3.963288	5.028048	6.068696	7.148972	7.163925	9.125244	10.69834	10.6232	10.97947	10.31591	12.09901	13.61313	15.65686	15.01112	18.28545	20.4441
1.132237	1.096821	1.295519	1.276622	1.467452	1.675833	1.860226	2.509042	2.999268	3.607565	4.230468	4.616085	5.455917	6.149683	7.187763	6.919266	8.2742	9.612419	10.99172	8.947703	10.13617	11.77097	12.26652	14.26287	16.62553	20.09737
1.132237	1.300224	1.262598	1.429095	1.610016	1.883881	2.168751	1.944463	2.067019	2.414629	3.043014	3.756707	4.408198	5.626281	6.405348	7.642171	9.209126	9.980854	11.64986	12.38343	13.15979	14.9026	17.1324	17.66193	21.46355	19.7497
1.132237	1.560144	1.815411	2.030956	2.37898	2.610658	3.113974	2.917051	3.390031	4.246992	5.297868	6.098296	7.779832	8.761476	9.517152	9.176381	10.0241	11.14026	11.76217	13.26468	16.13455	14.12379	17.03025	19.95408	18.3095	19.03165
1.132237	1.357812	1.121862	1.536479	1.628562	1.845789	1.886737	2.092644	2.442498	2.63334	2.927054	3.524683	3.846223	4.134339	4.893266	5.767837	6.277356	7.666439	9.589278	10.81507	12.26799	15.50902	14.85349	16.33709	19.10975	18.28967
1.132237	1.147103	1.355612	1.343749	1.779064	2.25152	2.512328	2.985076	3.61487	3.76922	3.619349	4.11739	5.275611	6.182296	7.088009	8.457773	11.14893	10.6366	11.41809	11.89908	13.55111	15.51417	17.65138	19.96596	22.98548	17.75752
1.132237	1.349655	1.643442	2.223369	1.79343	1.455994	1.854748	2.031161	2.696046	3.208502	3.900669	3.305544	3.963439	4.370099	5.094253	6.39926	6.977109	9.211887	9.738182	9.163936	10.77637	13.81344	17.30617	19.62482	21.74316	17.36876
1.132237	1.248225	1.594149	1.796733	1.789904	2.148081	2.838737	3.496499	4.153845	3.853955	4.486889	5.078503	5.998061	7.035167	8.116442	8.950662	11.53644	13.10165	14.86936	16.11019	12.73716	14.70792	13.81042	16.93335	15.8336	16.81368
1.132237	1.177927	1.17321	1.514293	1.686574	2.137587	2.696383	2.848293	2.288792	2.512162	2.873539	3.372328	3.683568	4.322569	5.262604	6.61459	7.021488	7.471727	7.27118	8.355025	9.684323	10.10361	12.07965	14.99064	16.2561	16.2259
1.132237	1.174366	1.446928	1.645694	1.918022	2.281693	2.695557	3.15119	3.320362	4.155412	3.774212	5.137262	5.988805	6.781228	5.34536	6.269282	7.798641	8.955088	7.867637	9.215837	10.817	11.50608	11.16585	12.85404	14.07705	15.78801
1.132237	1.17661	1.162911	1.353596	1.732017	2.041342	2.375341	2.904944	3.368721	3.727041	4.211623	5.125231	5.369169	6.241727	6.530194	7.24815	8.791908	8.537256	8.132978	8.35764	9.048574	10.29403	11.18168	11.65031	13.49776	15.40679
1.132237	1.351484	1.603905	1.57793	2.078966	2.523038	2.39609	2.418227	2.371039	2.270014	2.991649	3.275537	3.557869	4.210218	3.566804	4.159177	5.561224	5.590505	6.155621	6.969379	8.182183	8.447701	9.270518	11.24115	12.37133	14.96848
1.132237	1.244601	1.444136	1.443106	1.318373	1.058993	1.343952	1.424754	1.378199	1.557461	1.780985	2.143314	2.371149	2.721668	2.947715	3.893566	4.78999	5.118649	6.12523	6.990724	7.969321	9.667017	10.48082	12.67175	12.34102	14.27681
1.132237	1.139666	1.13133	1.319084	1.405396	1.539127	1.603462	1.78529	1.775684	1.616182	1.991674	2.239509	2.777922	3.723742	3.91796	4.613764	5.237904	5.434801	5.896854	5.674628	6.534993	7.990404	9.043571	10.48174	11.46513	13.60481
1.132237	1.407096	1.506509	1.86894	1.758398	1.915396	1.811413	2.028278	2.333161	2.559711	3.505555	4.022198	4.754459	4.313888	5.12466	5.904685	5.678243	6.585596	7.029405	7.93278	8.613302	9.455305	10.95147	11.83781	13.14758	12.61955
1.132237	1.038239	1.270094	1.434538	1.521898	1.905028	2.026056	2.627537	3.382663	4.023545	4.436764	4.84912	5.262139	5.787449	6.658218	7.981927	9.017413	10.59521	10.32259	11.79298	13.1157	10.32736	11.71654	13.89726	10.94286	11.67621
1.132237	1.260402	1.246156	1.522859	1.630359	1.82847	2.090029	2.287254	2.228726	2.400923	3.053459	3.358476	4.316208	5.102298	4.068434	4.739566	5.61864	6.599697	7.455335	8.075084	7.77227	8.853176	10.12955	9.548087	10.60115	10.18036
1.132237	1.214212	1.374065	1.555803	1.2603	1.703427	1.975619	2.373404	2.030794	2.226402	1.762502	1.97952	2.677484	3.145601	3.442839	3.090824	2.887496	2.81001	3.15432	3.40471	3.780152	4.436933	4.783978	5.987484	7.291165	8.455061
1.132237	1.526939	1.984729	2.088392	1.735639	1.97738	1.819837	2.360625	2.30597	2.820458	2.595706	2.957497	3.677429	4.273767	3.342372	3.868224	4.557473	5.033706	3.996625	4.105821	3.272446	3.189739	3.841277	3.740068	3.997705	4.475339

Key takeaway: Overall success but with some volatility later in the horizon.

55/35/10 Stocks/Bonds/RE Blend

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.238567	1.705801	1.858841	2.046383	2.354359	2.936257	3.685039	4.386688	5.774769	5.662961	6.545418	7.938184	8.831322	10.26814	12.59294	15.20619	18.87504	22.13117	25.28693	27.2139	31.7039	38.67246	45.85439	51.74137	60.37326
1.132237	1.320765	1.499333	1.808604	2.143222	2.513488	2.953254	3.70721	4.333929	4.705178	6.190566	7.208937	7.673223	8.229009	10.81651	12.7855	12.39795	13.20372	17.34336	23.48214	29.4748	33.82521	31.31725	36.97934	39.34658	53.1814
1.132237	1.386306	1.643527	1.820808	2.144712	2.860492	2.772961	3.237379	3.533049	4.009443	4.402343	5.201802	6.169416	7.135542	8.289943	9.815595	11.91413	13.95688	16.91252	20.02408	21.28693	24.35463	28.54073	31.30945	39.83571	48.57509
1.132237	1.300224	1.515627	1.872969	2.230043	2.621804	2.894782	3.402245	4.420308	5.020962	6.258668	6.944419	6.800533	7.875784	9.246361	11.4775	14.91911	17.72955	17.49415	19.63267	21.56789	28.78358	27.44192	33.86064	38.48387	45.79295
1.132237	1.218069	1.611695	1.914465	2.086453	2.25892	2.640835	2.773163	3.030934	3.978252	4.975054	5.535814	6.639504	8.166279	9.232905	10.84425	12.33929	14.90279	17.77232	18.94378	23.79957	28.23271	27.22541	33.1732	38.56678	42.35175
1.132237	1.380263	1.668895	1.991718	2.398307	3.35802	3.758109	4.396648	4.185096	5.270571	5.470538	6.439224	7.820712	9.738246	10.57929	9.983713	10.99363	12.99657	16.53105	20.55828	23.57112	25.0474	29.6877	33.89065	36.14729	40.10055
1.132237	1.416951	1.686688	1.985783	2.215748	2.359411	2.595872	3.420435	3.773966	3.985575	5.155159	6.342686	6.966453	7.985274	7.706836	8.930963	11.62575	13.71476	16.05328	17.27618	19.00346	22.99483	28.11943	32.10478	30.26033	38.84811
1.132237	1.310927	1.65759	1.756941	2.198888	2.56084	2.858909	3.134553	3.545994	4.25683	5.221387	6.21363	7.025212	7.81949	8.385929	9.764736	11.16988	12.31476	14.27107	16.29608	18.8742	21.2177	25.90942	28.3777	32.76856	37.05022
1.132237	1.503271	1.765982	1.450912	1.428969	1.627207	1.91321	2.511761	3.199156	4.275423	5.504365	6.571095	6.259452	7.774277	9.220924	10.01323	9.742168	11.30999	12.76117	15.06089	17.68336	20.36591	19.34396	23.46999	29.42138	35.89953
1.132237	1.15266	1.397046	1.881927	2.276212	2.567878	2.892203	2.861889	3.703587	4.458162	5.357879	6.77685	5.456311	5.937101	6.544831	7.492145	9.295753	10.81945	13.15745	15.1639	14.97527	17.51602	18.71683	22.65244	29.38428	34.74205
1.132237	1.25096	1.336576	1.685102	1.996859	2.45931	2.901173	3.047445	3.784967	4.341929	4.662867	5.734039	7.276366	8.418714	10.26918	11.07503	12.20358	12.80384	14.59621	14.6347	16.58616	18.65513	19.65839	23.00761	26.17997	33.89724
1.132237	1.29382	1.42206	1.696001	2.121397	2.604316	2.545921	3.040017	3.316992	3.862149	4.310097	4.997327	6.099392	7.457737	9.062371	9.496953	10.9246	12.43162	16.30979	15.89922	18.42217	20.81442	19.23604	21.99489	26.51793	32.87326
1.132237	1.436669	1.525591	1.83268	2.133603	2.696819	3.107609	2.868345	3.605649	4.745344	4.425204	5.658497	5.429333	5.801162	6.747766	7.77521	9.523576	9.858054	10.97748	11.73532	13.84773	18.30389	20.94041	25.41433	27.35674	31.59429
1.132237	1.388756	1.630919	2.049421	2.285142	2.587525	2.923496	2.974744	3.316729	4.158421	4.05661	3.870974	4.509804	5.506319	6.144177	7.037663	7.783859	8.564882	9.489509	11.24712	13.43156	16.41636	18.23826	22.86658	27.91975	30.90101
1.132237	1.393911	1.860012	2.249253	2.569493	2.378844	2.29693	3.003273	3.156974	3.117217	3.61288	4.131657	4.644293	5.582431	6.503495	6.172469	7.314761	9.317	10.80246	13.60519	13.44329	15.24373	19.86992	24.23377	26.4129	30.33368
1.132237	1.464468	1.375109	1.565601	1.816473	2.248631	2.588561	2.915819	3.580444	3.998955	4.531196	5.273794	6.590342	7.454603	8.678504	9.835199	12.21545	15.54309	16.05586	18.32464	16.94078	16.87606	22.29006	26.48263	30.24579	29.30887
1.132237	1.230612	1.488085	1.65205	2.020425	2.332061	2.673195	2.595929	3.559965	4.394258	5.363052	6.493272	7.684969	9.556607	7.675759	7.447621	8.611664	11.44647	13.40754	15.80861	16.34261	17.92637	20.60367	23.77004	27.64408	28.53199
1.132237	1.318048	1.478424	1.604126	1.721799	2.25835	2.293092	2.629613	3.056527	3.622379	3.907943	4.219214	5.204887	6.160155	5.758321	6.985724	7.837193	7.717516	8.987405	10.69933	12.42018	14.49126	16.99097	20.12249	23.50432	27.86862
1.132237	1.415678	1.778213	2.062058	2.430373	1.982883	2.415656	2.970653	3.867476	4.498627	5.105798	6.372759	7.038042	7.964885	8.783467	10.90652	13.39143	15.96546	19.03429	22.22988	27.57669	31.68912	24.35658	25.4503	29.28159	27.53514
1.132237	1.365284	1.458956	1.823228	2.075761	2.404	1.962441	2.362345	2.603455	2.596934	3.135367	3.492792	4.099131	3.73865	3.447893	3.785701	4.621512	5.976995	7.969926	10.3875	13.7495	15.62924	17.98764	22.29639	22.96987	26.87298
1.132237	1.367753	1.549081	1.814245	2.05004	2.406719	2.83221	3.520919	4.128066	4.875413	5.853385	6.877383	8.168535	9.370101	8.971781	9.48392	11.01218	12.56612	10.08077	11.7911	12.99724	14.77835	17.10799	19.3893	22.46101	26.23836
1.132237	1.476676	1.881223	2.355027	2.231592	2.669894	2.633455	2.636129	3.255271	3.853888	4.480313	4.710551	5.813242	7.431339	8.106184	10.11488	9.549495	11.61625	11.88806	13.4314	14.17208	16.42794	17.53157	20.05806	21.9889	25.43568
1.132237	1.370718	1.369696	1.48143	1.559123	1.880754	2.213908	2.523898	2.649291	3.036422	3.329129	3.724841	4.362988	4.650507	5.553255	6.475367	7.577564	9.714931	7.504602	9.820234	12.92223	14.90353	16.80836	19.66535	20.83935	24.7492
1.132237	1.346831	1.502047	1.668725	1.76807	1.983653	2.125316	2.733016	3.341528	3.674169	4.353764	4.870325	5.393166	6.849156	8.529313	9.376133	8.696122	10.32959	11.91491	13.08191	14.77525	17.42937	19.63216	20.52833	23.07624	24.34543
1.132237	1.487081	1.451461	1.750922	2.065112	2.033518	2.245483	2.519579	2.619728	3.302701	3.63683	3.856253	4.721878	5.162234	5.102372	5.641867	6.718274	7.405589	8.551341	10.1634	12.04423	12.87174	14.91923	18.11526	20.3732	23.90095
1.132237	1.328224	1.62584	1.898449	2.212532	2.13897	2.058708	2.434695	2.44664	2.650267	3.383237	4.086548	4.691465	5.11481	6.142406	6.557338	6.799136	7.432862	8.900187	10.05278	10.91749	12.32458	13.10597	15.46097	18.22611	23.66162
1.132237	1.352895	1.662815	1.618254	1.899509	2.28691	2.402701	2.921693	3.336982	3.916787	3.736513	4.584768	5.276121	5.825713	6.754695	7.7899	8.812896	10.18798	11.50811	12.44475	14.59964	16.31568	13.9279	15.72948	18.11393	23.08475
1.132237	1.303608	1.491787	1.483567	1.429813	1.542296	1.659557	1.94422	2.426091	2.914843	3.253596	3.975251	4.695469	5.330298	6.204359	6.61666	5.326918	5.886569	6.851614	7.446908	9.058102	10.58078	12.28654	13.85502	17.2233	22.57787
1.132237	1.264325	1.38664	1.511969	1.789806	2.090086	2.456678	2.827116	2.88196	3.40632	3.854673	4.425089	5.142134	5.583454	5.828949	6.766724	7.820348	6.050945	7.549936	9.748306	12.26472	14.11415	16.08851	16.6916	19.34284	22.17246
1.132237	1.350742	1.581836	1.897635	2.097024	2.460554	3.099621	3.242206	4.003585	3.246353	3.392273	4.080995	4.459168	4.777434	5.977039	6.998505	7.890282	9.177279	10.59329	11.76841	12.95536	14.66014	18.12739	20.53084	19.32786	21.59671
1.132237	1.374274	1.551082	1.801654	2.125454	2.523738	2.061525	1.958936	2.221989	2.683166	3.13359	3.634486	4.488863	5.207572	6.179787	7.963788	8.457262	9.192873	10.65561	13.33186	15.53149	16.23825	19.29829	22.23351	22.96148	21.21731
1.132237	1.349963	1.43657	1.664462	1.875866	2.126766	2.409792	2.42366	2.631842	3.045826	3.355921	3.659191	4.581561	4.769722	5.100924	5.838085	6.673265	7.619344	7.673365	8.66991	10.32555	11.57097	13.42884	15.51169	18.00285	20.73888
1.132237	1.195042	1.215774	1.477742	1.882045	2.274121	2.934959	2.986179	3.582496	4.795897	6.661164	7.618927	7.897758	9.314117	9.841972	10.17016	11.19764	12.29596	13.13504	14.97335	17.35075	21.43731	24.8391	22.94324	26.03943	20.02876
1.132237	1.390831	1.415234	1.900393	2.093647	2.317274	2.605688	2.451861	2.820681	3.348421	3.833679	4.551639	4.760795	5.704571	5.337194	5.112706	6.388431	7.839648	8.128397	8.684821	9.242064	11.20825	12.95091	14.19991	16.45374	19.55811
1.132237	1.299299	1.297474	1.547415	1.91653	2.306191	2.620866	3.032911	2.999552	3.425515	4.293998	4.673653	5.468659	6.220589	6.775778	6.678769	8.025626	8.761344	9.862598	11.28637	13.02519	14.74386	17.26171	20.00383	15.65041	19.12146
1.132237	1.448712	1.689117	2.063318	2.332613	2.560882	3.079275	3.224439	3.078717	3.514327	3.309324	4.209553	4.787425	5.205944	6.134732	6.84228	7.741181	7.476895	7.94688	9.228525	10.71574	12.099	11.88484	14.35268	15.05677	18.68115
1.132237	1.067558	1.297903	1.596681	2.079783	2.459718	2.860598	3.151672	3.673856	3.967746	4.331392	5.147709	5.848285	7.042397	7.558871	8.203791	7.804958	10.80875	8.885338	10.77561	12.56828	11.99601	13.77998	16.15173	15.35886	18.33229
1.132237	1.454387	1.612864	1.817221	1.458019	1.642588	1.906606	2.368258	2.706931	3.223398	3.098179	3.434562	3.603327	4.653351	5.746356	6.355653	7.100307	8.656329	9.866896	11.14899	13.05359	14.51682	14.99213	16.14932	15.61493	17.88066
1.132237	1.40176	1.563111	1.948204	2.189285	2.550093	3.051417	2.346454	2.694928	2.896933	3.282451	3.24517	2.61193	3.385261	3.865327	4.57615	5.469006	6.613204	8.009709	8.559053	10.13932	9.851348	10.51494	13.83561	15.99074	17.43009
1.132237	1.086957	1.306222	1.5691	1.771519	2.101538	2.382666	2.925632	3.494476	4.066519	4.02794	5.16651	5.1041	5.459337	4.237604	5.061121	5.799996	6.854143	6.177958	7.244611	7.958385	9.643782	12.29266	14.08487	14.60441	16.72172
1.132237	1.361272	1.399183	1.598352	1.895412	2.007961	1.64761	1.997313	2.15424	2.412397	2.837487	3.075045	3.434957	3.858146	4.768232	3.767818	3.741168	5.114066	6.123907	7.352485	8.949119	10.12137	10.48507	12.58726	13.97485	16.29804
1.132237	1.347984	1.571615	1.856031	1.813266	1.475423	1.811529	2.050349	2.290538	2.855511	3.08463	3.401814	4.214637	5.512188	6.127489	6.087083	6.899068	6.216608	6.733069	7.711279	7.989386	8.362585	9.945471	11.22088	12.29119	15.93716
1.132237	1.307579	1.486013	1.718126	2.196386	2.453802	2.242054	2.630471	3.32175	4.451678	4.692083	5.10101	6.035622	5.730493	7.14344	9.283968	10.44357	11.26467	12.47144	12.1219	13.1201	10.11875	11.60958	11.43218	13.39753	15.31473
1.132237	1.336942	1.510379	1.637669	2.003343	2.250623	2.641619	3.160018	3.30303	3.853817	4.153882	4.848718	3.924373	4.327524	5.65195	6.757625	7.820393	7.502032	8.770555	10.02586	9.69548	10.51209	10.01906	12.60807	14.0043	14.48341
1.132237	1.168584	0.975715	1.331795	1.494525	1.807599	1.747974	1.955398	1.945064	2.397784	2.810147	3.442307	3.245402	3.90956	4.210193	4.145389	5.057287	6.190679	7.179222	8.690236	10.08623	10.73374	10.62396	11.76778	12.35927	13.61387
1.132237	1.272443	1.031869	1.251782	1.395234	1.69395	1.674307	1.893487	2.48772	2.393601	2.62641	2.920994	3.277018	3.463019	4.216353	5.200686	5.643136	5.941151	6.962173	8.2231	7.67428	9.881283	11.47139	12.20537	11.1305	12.84405
1.132237	1.36305	1.621712	1.836748	2.174804	2.358729	1.881686	2.257592	2.668187	2.672592	2.47758	1.978843	2.276921	2.760101	2.988422	3.495842	4.003931	5.480035	6.385738	7.395795	8.075946	9.339593	10.47523	9.47703	10.36214	11.70872
1.132237	1.319539	1.320317	1.498224	1.862641	2.084366	2.536305	3.184026	3.995986	3.918327	3.825525	4.273066	4.601766	5.144403	6.037626	4.86483	5.373573	4.348957	4.948453	5.893618	6.797316	7.990173	9.417112	9.089717	9.325869	10.71095
1.132237	1.260653	1.424597	1.520302	2.083025	2.240887	2.531087	2.043636	2.258665	2.823199	2.614	3.387626	3.937209	3.90527	4.128239	3.166306	3.117189	3.703679	4.333016	4.246663	4.658759	5.91343	7.377046	8.209239	9.014223	9.783504
1.132237	1.330699	1.699778	2.073928	2.650978	3.090952	3.025064	3.548933	4.046984	3.099091	2.94068	3.457075	4.239987	5.007613	5.746982	4.589174	5.599346	7.114036	7.450199	5.937616	5.808558	6.070653	6.778458	7.240823	6.946874	7.657137
1.132237	1.238567	1.250132	0.984565	1.360019	1.51677	1.766192	1.420821	1.672616	1.880717	1.875119	1.989563	2.198622	2.473413	2.840065	2.793361	2.938287	2.400141	2.606245	3.002208	3.431573	3.849708	3.137677	3.947442	3.809644	4.164133

Key takeaway: Similar outcomes to 60/40 but with a smoother transition to success.

T Rowe Price Glidepath

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.394232	1.811796	2.324472	2.834907	3.376393	3.451464	4.557996	5.979738	6.987637	8.249673	12.20769	13.64042	19.16025	21.24724	23.91769	29.78276	36.77607	44.8358	50.92476	59.01236	69.97194	80.18234	81.92755	90.41159	101.4706
1.132237	1.492585	2.026538	2.27064	2.108238	3.120266	3.605838	5.163105	5.914889	6.489146	8.047659	9.117734	11.06692	13.57678	14.48228	15.88973	18.05186	21.77232	28.553	32.25046	38.05889	45.47809	51.05857	61.72776	80.22529	83.64293
1.132237	1.263825	1.474884	1.741559	2.06845	2.739971	3.259126	3.841002	4.673832	5.673898	6.224075	7.16265	9.306788	10.13844	10.91505	12.35946	14.44683	16.1794	17.59576	22.87176	31.20113	35.66237	40.10047	50.44175	57.82717	70.77541
1.132237	1.203097	1.423238	2.077401	2.471566	2.427362	3.345411	4.102228	5.654931	6.131538	7.117059	9.152648	10.60826	7.854345	9.039019	11.79628	13.33515	14.02231	17.77629	23.63861	28.97023	34.86289	39.21684	50.21191	59.20928	63.48796
1.132237	1.34422	1.376241	1.576298	1.894306	2.264013	2.687039	3.346629	4.370939	5.053247	5.976461	6.84812	8.197039	8.882773	11.30625	13.36042	15.25519	17.59744	19.65976	23.41093	27.04798	35.99234	37.24655	44.86128	51.80705	58.8924
1.132237	1.405363	1.92782	2.061266	2.481705	3.203222	3.574959	4.413858	5.574195	6.694926	6.566431	8.563406	11.58317	13.36697	15.64857	20.0823	24.84777	26.76083	27.21111	30.99783	35.26661	38.50773	44.49488	51.37338	46.70025	56.10281
1.132237	1.247425	1.524647	2.088819	2.832997	3.288659	3.074143	4.207541	4.756809	5.760225	6.04133	6.858062	8.23039	10.45289	11.88774	14.0281	14.36124	16.75752	17.77118	19.8081	21.12151	27.69974	30.29084	37.13252	48.70926	53.18674
1.132237	1.293564	1.576019	1.758588	1.980308	2.672689	3.595466	4.412485	4.102744	4.937756	6.392147	8.065075	10.33246	10.43265	10.93999	12.4339	13.51996	15.34728	21.79047	27.86817	30.89063	41.81537	47.53358	37.61901	43.86545	49.85506
1.132237	1.386235	1.764426	1.992847	1.888795	2.329528	2.851247	2.494805	2.971375	3.30672	3.551136	4.348789	5.388169	6.29885	8.395749	10.06259	12.68905	14.7767	17.50265	20.47584	21.1693	22.83014	27.02692	33.58253	41.9251	47.27285
1.132237	1.056848	1.206024	1.257982	1.555407	1.854988	2.07358	2.691428	3.012813	3.782586	4.975658	6.687225	7.904638	10.0026	12.07377	14.2626	17.17329	19.42523	21.08171	27.52989	25.40491	27.53791	29.6485	33.45876	39.47458	45.38555
1.132237	1.396813	1.571378	1.965499	1.458962	1.772324	2.374559	3.123702	3.437577	4.260221	4.614343	5.121436	6.052363	8.265257	10.31458	12.08297	15.95666	17.49883	20.94761	24.69255	29.00257	35.73911	42.41276	32.84109	37.40056	43.93795
1.132237	1.293564	1.778995	2.225713	2.843481	3.406115	3.930781	3.865691	4.570599	5.528119	6.571879	5.800383	5.937689	5.507373	6.632303	8.285683	8.852044	9.662062	10.69661	12.45886	16.25533	18.63871	21.77303	25.57796	32.56188	41.33764
1.132237	1.490447	1.913377	2.368904	1.930108	2.431465	3.152788	3.650659	3.335429	2.988725	3.477709	4.699647	6.427452	7.072079	8.640957	9.414174	11.5547	13.97308	16.49882	19.20854	21.69873	23.70669	26.78456	29.21758	34.64212	39.86254
1.132237	1.327402	1.207798	1.61327	1.82766	2.005207	2.535877	2.953199	3.489655	4.091802	4.543915	5.1938	6.665835	6.912606	7.348241	8.282065	10.86342	14.30549	17.18331	19.21828	21.2041	22.48175	26.01054	28.84208	35.77033	39.06674
1.132237	1.30219	1.544948	1.81382	1.847689	2.158913	2.602342	3.3709	4.323688	5.3706	5.846494	6.811408	8.556226	10.51132	12.61743	12.78181	15.53501	15.47386	14.09058	16.39792	19.07946	26.62204	30.52194	34.30249	30.18124	37.90999
1.132237	0.996667	1.155006	1.6567	1.284367	1.605302	2.291412	2.748122	2.812878	3.43521	4.423529	4.885283	5.925645	6.870538	8.002978	9.662758	8.474805	9.962175	10.17888	12.33556	15.45786	17.70682	21.03711	25.29269	29.62192	36.74648
1.132237	1.138011	1.345032	1.684411	1.832496	2.345437	2.822158	2.098589	2.423209	3.036219	4.010659	5.105916	6.11704	6.741287	8.727403	11.11868	11.63834	14.44172	13.35303	13.38744	15.86841	14.82902	17.39937	22.26484	29.24147	35.40123
1.132237	1.368541	1.572468	2.042772	3.186677	3.688975	3.198761	3.923412	5.546944	6.614532	8.392794	10.09231	10.69601	11.73151	10.44215	13.61601	15.99151	17.46026	17.87684	18.44984	22.39724	23.18219	27.47166	28.41275	32.67458	34.60483
1.132237	1.382445	1.629773	1.517529	1.554265	2.121316	2.690998	2.961667	3.67537	4.37327	5.261532	4.928998	6.200677	7.048519	7.806041	9.552763	8.893324	9.972061	11.29583	13.82951	15.54669	18.81857	20.50402	24.09589	28.11434	32.94257
1.132237	1.315474	1.699529	2.006215	1.863187	1.900627	2.26188	2.095273	2.280429	3.317379	4.257716	5.282327	6.529984	8.149451	9.793846	11.34931	8.871551	9.457248	11.93139	14.20617	14.61397	17.28654	17.81019	20.83917	27.17416	32.12579
1.132237	1.150257	1.359999	1.55614	1.41577	1.658727	2.155466	2.931087	3.596669	4.384599	5.090933	5.840608	7.251661	8.536912	9.149035	6.728822	6.878635	8.290955	9.99003	12.20467	15.10751	14.94296	19.51195	24.62432	26.37024	31.61619
1.132237	1.502602	2.088279	2.595326	2.169094	2.763279	3.799711	4.744135	4.842963	5.885026	5.255905	5.827521	6.311535	7.65748	9.740651	11.97573	13.95756	16.38195	20.17507	23.73716	26.73091	27.82516	26.04912	29.95846	28.0744	31.02494
1.132237	1.318765	1.70952	1.514705	1.802194	2.03778	2.512524	2.805995	3.219253	3.719117	4.468319	5.571136	7.275419	8.521246	6.224613	6.945946	7.665592	7.887124	9.564023	10.20187	12.20116	13.8362	15.64076	18.96634	23.23299	29.94398
1.132237	1.429339	0.986165	1.41985	1.536006	1.88649	1.950997	2.659318	3.081791	3.676795	3.271617	3.752254	4.312122	5.00675	5.836518	6.155094	6.894742	7.66041	8.328259	10.92029	12.19236	15.61772	19.52407	21.81133	24.47384	29.38614
1.132237	1.403189	1.911584	1.346651	1.292842	1.66063	2.233863	2.616538	2.404822	2.372954	2.814953	3.321364	3.908538	5.094831	5.944164	6.917773	7.807199	8.867299	9.633266	12.263	14.57755	18.56368	23.1327	22.39881	24.58112	28.56943
1.132237	1.398075	1.449707	2.068784	2.757479	3.383574	4.117695	4.738991	4.476226	6.079319	7.956856	9.692178	9.138167	10.42499	13.20297	15.393	15.28858	19.07923	22.50016	24.45457	28.09227	22.5704	25.99107	23.03413	23.86754	27.65959
1.132237	1.346758	1.802768	2.139428	1.983713	1.868706	2.48393	2.364775	2.762205	3.520808	4.856125	5.646318	6.848021	7.500546	8.358297	9.017433	10.78157	12.91259	12.36576	15.35841	18.38507	22.47716	28.54287	22.42245	22.76452	27.04098
1.132237	1.327402	1.505561	1.375124	1.788481	1.881592	2.316059	2.740525	2.939361	3.523108	4.285698	5.612326	5.186721	5.871218	6.025087	6.795528	7.683557	9.684231	12.50904	13.97109	16.24505	18.91183	22.83057	24.83207	23.67311	26.52589
1.132237	1.30432	1.87232	1.690692	1.594634	2.207814	2.866448	3.311173	3.810156	5.374869	6.352801	6.901322	7.587233	10.2666	12.8329	11.44428	12.67013	14.48522	15.90966	18.91743	19.33804	18.30235	20.58868	23.80775	27.29502	25.72213
1.132237	1.399234	1.758898	2.085877	2.424537	3.308642	3.896842	4.231215	4.688429	5.495205	6.392454	7.000744	7.16065	8.328281	11.19533	11.46136	12.33952	10.84207	11.61767	12.97546	15.29443	15.86906	19.19893	21.29356	23.86119	24.68208
1.132237	1.131799	1.404566	1.650186	1.685638	2.020258	2.220623	2.907813	3.195738	3.70919	3.684797	3.768085	3.990347	5.67279	6.218148	7.604425	7.125871	9.498856	10.98514	12.80062	15.31119	16.15889	20.42248	18.40323	24.68677	23.89179
1.132237	1.317439	1.494355	1.83133	2.17056	2.462731	2.951099	3.902765	4.647348	5.191599	5.760672	7.122855	8.116911	8.60173	10.7315	13.32076	11.88763	13.50292	10.5352	12.14792	13.99425	15.78242	19.06593	20.9608	22.45901	23.05162
1.132237	1.280705	1.738883	2.192255	2.731659	3.300461	3.615724	4.015132	4.436715	4.882681	4.475243	5.823467	6.462799	7.060028	8.918122	11.34267	12.91671	11.77378	15.37965	16.58055	19.54502	22.47115	26.24338	21.35426	19.73604	22.44829
1.132237	1.329527	1.809814	2.160079	2.613719	3.109686	3.786011	4.393093	5.797109	7.489917	9.944973	12.86461	16.71201	16.44928	14.59043	13.5022	15.71392	17.01544	17.60946	16.62119	19.20212	22.59499	24.0778	21.68478	23.05034	21.88063
1.132237	1.183646	1.409065	1.69325	1.179951	1.625528	1.924473	2.170831	2.572217	3.316192	3.700449	2.83572	3.883561	4.310043	4.85388	5.717085	7.371098	9.832018	12.08807	12.48581	13.96017	17.07145	20.18377	19.18493	21.47202	21.50866
1.132237	1.099775	1.465998	1.789139	2.425826	3.259027	3.69656	4.310926	3.115524	3.189741	2.960505	3.23416	4.619099	5.558347	5.677544	6.774377	7.320962	8.68022	10.72713	10.33301	13.42078	15.1193	16.54191	17.82684	18.42186	20.59874
1.132237	1.269288	1.746679	2.033363	2.278794	2.329545	2.917537	3.826606	2.97675	2.911327	3.431204	4.634016	5.5476	7.075768	6.942042	7.937032	7.582837	7.999891	8.69426	9.943009	10.6384	11.38468	14.12994	17.03709	17.04939	19.56305
1.132237	1.399011	1.640341	1.967648	2.295268	2.857112	3.693816	4.113611	4.876881	6.520115	8.470544	10.4413	10.26955	11.08879	11.74524	13.5465	16.53651	14.08355	12.89734	13.59107	13.66451	15.02946	17.81971	15.63806	16.93261	18.90214
1.132237	1.265009	1.855315	2.248792	2.985642	3.572763	3.260901	4.195857	4.630816	4.231359	3.897124	4.545316	5.635459	5.027734	5.310911	6.96127	8.168899	9.476612	10.55486	12.47492	12.57127	14.57372	17.8978	18.41747	19.8149	18.39487
1.132237	1.405004	1.223469	1.277154	1.558925	1.932992	2.386311	2.418867	2.719368	3.095072	3.390457	3.064038	3.81787	5.0402	4.664292	5.274832	5.837013	6.380294	7.050471	7.655927	8.461531	10.62464	12.58303	14.07457	16.47903	17.69272
1.132237	1.390394	1.583884	1.221798	1.488094	1.667148	2.354928	2.818461	3.34025	4.02344	4.631703	4.877108	5.952403	6.599373	7.493695	8.797088	8.699466	7.950309	9.276314	10.59004	9.993706	12.00163	13.0409	15.40875	16.58737	17.14643
1.132237	1.402098	1.313904	1.596374	1.789339	2.342265	2.974574	3.48057	3.567294	4.352233	4.73761	5.03765	5.985977	4.453827	5.467058	6.650173	7.73296	8.148979	9.528793	10.72776	10.61163	12.07322	13.10126	12.35843	13.97878	16.74587
1.132237	1.307622	1.608998	1.908241	2.252886	3.078924	3.597041	4.072374	4.973028	3.599545	4.048576	4.924384	5.759196	6.318273	7.906683	9.482319	7.41402	8.724352	6.670023	8.14033	8.458337	9.418242	10.51268	12.54766	13.52568	16.04001
1.132237	1.269288	1.212678	1.369732	1.672133	1.879835	2.333044	2.6218	3.011999	2.709334	2.95625	3.286515	3.044076	3.318489	3.799666	5.002461	5.423692	4.153657	4.479093	5.910316	7.36429	8.54752	10.24101	12.56588	14.11147	15.64281
1.132237	1.399234	1.606586	2.238811	2.721993	2.569553	3.673985	4.244386	6.155605	6.714139	6.152896	8.369066	10.30539	10.82883	14.91083	16.17312	14.12629	10.69327	8.191351	9.25997	11.49428	10.75439	11.69366	14.5819	15.91543	14.7888
1.132237	1.492585	1.403552	1.675603	1.516421	2.012504	2.693321	3.094926	2.835787	2.365156	2.648368	2.740526	3.186815	3.847008	5.639384	6.129319	6.962386	6.912711	7.850703	6.06839	7.326774	9.8102	10.61164	12.67664	13.42588	13.89458
1.132237	1.550248	1.767457	2.205515	2.433556	2.102589	2.752618	3.827693	4.758027	5.574804	6.372844	5.460376	6.54052	7.687438	8.632875	10.34657	12.75818	11.99446	15.74203	14.2652	15.3616	14.27808	11.20782	10.19278	11.29432	13.03174
1.132237	1.368751	1.611241	1.470288	1.406866	1.451145	1.860216	2.168017	2.611539	3.537105	4.166595	4.276254	4.681512	5.174961	3.97605	4.76595	5.977486	6.997495	6.203548	7.442077	9.013515	9.330308	7.566615	8.54835	9.858154	12.17528
1.132237	1.321742	1.480584	1.76704	2.291189	2.156144	3.18493	3.714316	3.269188	4.437541	3.487129	4.433291	5.154929	3.980585	3.00091	2.584786	3.175001	2.914082	2.965762	3.854428	5.127164	6.646368	6.892768	9.056847	9.672253	11.03986
1.132237	1.306996	1.183285	1.371168	1.375944	1.21717	1.389322	1.668586	1.994008	2.400991	2.391348	2.677713	3.389091	2.637753	3.04659	3.331022	4.008275	3.707479	3.937679	4.489443	4.513218	4.355279	4.580664	5.773755	7.431044	8.27413
1.132237	1.30432	1.353948	0.96521	1.187389	1.33731	1.643332	2.217655	2.12411	2.583524	3.08407	3.902779	3.624508	4.000375	3.57842	4.312084	3.902019	3.102646	3.473232	4.021991	4.637395	5.003935	5.527879	6.110378	6.897012	5.905386

Key takeaway: Good outcomes with some volatile paths due to higher equity weights.

T Rowe Price Glidepath with Real Estate Blend

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.553473	2.078089	2.664467	3.30168	4.408318	5.611461	7.703292	9.025662	9.734843	13.21353	17.11227	15.60147	14.2932	16.88777	21.6129	24.89042	31.30396	37.30691	49.19393	57.44996	59.03874	68.03662	77.21184	90.57912	101.8218
1.132237	1.353217	1.670613	2.036446	2.552871	2.834631	4.337367	5.328086	6.261911	7.124757	8.240908	11.21286	14.86859	16.58723	22.15101	25.34659	27.86038	32.61163	43.58474	50.33641	56.89625	66.44272	51.69337	59.31637	69.65667	81.03081
1.132237	1.254917	1.408327	1.713221	2.43246	3.051546	3.650382	3.847418	5.213878	5.96064	6.94094	8.69811	10.98296	14.21509	16.15937	18.23526	21.25459	28.19997	26.66495	32.74225	31.40803	37.55785	43.36783	52.40573	63.04035	72.5979
1.132237	1.248949	1.492184	2.183105	2.643841	3.071347	3.407556	3.814751	4.360808	5.249514	7.36285	7.52625	8.97655	11.03589	12.32226	14.30718	17.20908	18.66428	25.76296	29.13003	33.51395	38.7101	44.47334	48.19875	55.32496	65.2942
1.132237	1.314938	1.417052	1.373037	1.520642	1.855799	2.161742	2.339481	3.121161	3.866777	3.702828	5.498799	6.048776	8.559107	10.29876	12.0351	13.17532	17.10827	18.52199	21.96417	26.3553	30.23229	38.55624	46.60082	53.58835	60.98687
1.132237	1.345291	1.636134	2.361774	3.416822	3.757989	4.345304	5.126992	5.697287	6.764039	6.216124	7.836634	8.496918	10.03244	11.80336	12.14716	16.22951	18.41811	19.39997	25.09604	30.88718	35.77829	33.62415	44.22597	55.26319	58.5129
1.132237	1.487245	2.250834	2.032827	2.356497	2.633628	3.094362	3.295908	4.046711	4.717911	5.712049	7.141857	9.051412	10.63239	14.27629	17.05407	19.7151	24.20164	26.24765	30.5041	32.14509	36.17606	39.68481	41.98378	49.65319	55.64594
1.132237	1.403979	1.624881	1.943727	2.182091	2.940724	3.237322	3.583529	3.906598	4.746522	5.410606	6.879809	7.976547	8.595629	10.90509	12.05574	13.36845	14.0859	17.26308	19.57061	23.73367	29.11659	33.46386	41.35623	45.39587	52.83556
1.132237	1.339198	1.62897	1.80189	1.98872	2.585236	3.431019	3.501753	4.530972	5.388257	7.223886	9.717948	11.49119	10.28024	12.01298	14.02809	14.60823	16.58892	21.56388	24.71782	26.89869	30.81555	40.1419	41.94731	46.87092	50.79953
1.132237	1.534921	1.81079	2.045978	2.670197	3.551268	3.966752	4.550488	5.009837	5.114243	5.679307	6.066418	7.477484	8.902787	10.63477	12.57357	15.10481	17.45925	17.02152	19.27002	25.15628	28.78095	32.57052	38.92895	41.07244	48.1516
1.132237	1.377337	1.78208	2.21328	2.597136	2.770113	3.271936	3.665219	4.327483	5.185674	7.714364	9.123883	9.00595	11.99554	14.82455	19.76906	23.46382	26.21423	31.11638	36.41455	35.16561	40.3599	30.40519	35.09305	40.23601	46.48091
1.132237	1.471211	1.770622	2.376269	2.929479	3.215812	2.723133	3.896136	4.624416	5.496516	6.752757	7.298491	9.034711	9.754613	10.89933	14.17765	16.04755	21.31044	21.85995	22.55599	26.41532	24.74045	27.19944	31.86406	37.18557	43.48679
1.132237	1.496129	1.554744	2.084998	2.65784	3.110225	4.026894	3.41477	4.022814	4.944461	5.9127	6.867206	8.713321	10.21473	9.592742	12.22191	15.0061	18.2422	21.32819	24.27474	26.75411	30.93466	30.90064	32.01231	33.84384	42.11826
1.132237	1.270664	1.596985	1.456071	1.727985	2.141597	2.613187	2.940244	3.741042	4.090104	4.856362	6.173387	8.024438	9.260382	8.673922	11.31855	10.03956	13.64637	15.56941	19.35924	22.55049	26.77015	31.28428	37.78332	37.08627	40.18607
1.132237	1.168993	1.382594	1.629842	2.024466	2.348148	2.784544	3.264582	4.497475	5.630115	6.547866	7.796303	6.035375	6.557268	7.742935	7.121523	7.790697	9.891278	13.06946	15.1604	17.61726	20.30132	24.78483	27.82627	34.30604	38.69332
1.132237	1.388234	1.987747	2.431378	2.508886	2.934446	3.291627	3.931535	4.879097	5.916472	6.759479	8.263146	9.914248	10.68607	9.605113	12.57308	15.56266	17.02485	19.89276	22.606	24.16096	25.20405	24.62886	26.64885	33.71001	37.75208
1.132237	1.508514	1.948566	2.628337	2.336315	2.862623	3.193953	3.832344	4.269717	5.098265	5.83491	7.293351	7.473886	9.817449	7.467462	9.557495	12.23504	15.19062	19.2886	22.72955	25.32751	30.12945	34.79785	29.70696	32.83461	36.45804
1.132237	1.306779	1.656464	2.023538	1.85021	2.281058	2.760318	3.193285	3.663329	3.577019	5.000567	6.98989	8.103107	9.428148	11.75918	12.57937	13.25813	14.35338	17.27648	19.59636	20.63296	25.14739	27.78946	30.20504	33.12285	35.68069
1.132237	1.002998	1.332624	1.524542	2.288513	2.566041	2.183192	2.492815	2.933835	3.457978	4.225528	5.099785	6.607768	9.102472	9.993687	10.41818	11.46252	10.93009	13.49196	14.88107	15.68549	18.24066	21.1034	23.83057	27.34953	34.51842
1.132237	1.398192	1.848894	2.318562	3.076128	3.285706	4.170891	5.377907	6.324203	7.485749	7.322666	7.910891	7.243891	8.320328	10.08952	11.4761	14.33068	17.19792	19.02193	19.74019	20.42635	23.99147	26.15247	25.80808	28.18619	33.48045
1.132237	1.305309	1.461819	1.753311	1.81301	2.20184	2.398839	2.130386	2.480809	3.206886	3.765929	3.52814	4.137499	4.957302	5.511612	6.835076	7.486957	9.754587	11.08243	15.26396	15.14778	17.94111	23.2906	25.48403	25.23144	32.54031
1.132237	1.471211	1.845575	1.647117	2.008254	2.282809	2.671663	3.048858	3.838513	4.393444	4.095042	5.044759	5.681301	7.107097	8.873456	9.986303	10.87209	12.15837	14.04635	13.95082	16.46901	18.34719	17.74206	18.59837	24.72608	31.7046
1.132237	1.080157	1.429308	1.326892	1.851013	1.772737	2.330267	2.708299	3.951643	4.762495	6.267823	5.902697	5.682004	6.813027	8.767134	10.31587	12.11226	14.1137	14.46267	16.01075	18.83455	21.08149	23.78054	27.34161	28.98957	30.44821
1.132237	1.379206	1.697647	1.989606	2.411615	2.492726	2.87162	3.409041	2.947049	3.543683	4.755764	5.041031	5.173498	5.66445	7.242318	8.585859	9.905592	9.369095	10.4031	11.80876	15.90563	18.93746	22.1825	22.68258	25.98081	29.8561
1.132237	1.351177	1.251659	1.638829	1.955242	2.585348	3.430284	4.027622	5.034681	5.910642	7.41886	8.049025	9.361601	10.1356	11.65993	11.56103	13.28606	15.95402	15.11152	19.8182	24.1139	22.41862	27.3929	28.46798	31.27409	28.7875
1.132237	1.11508	1.463999	1.828379	2.08485	1.77306	2.087227	2.349445	2.629478	3.120681	3.781707	3.537755	4.443485	4.464268	5.708539	6.686993	8.144309	10.79585	11.10739	12.9246	15.64666	17.83782	19.56626	22.05196	24.05481	28.02692
1.132237	1.434028	1.713368	2.043998	2.164324	2.525498	3.269279	4.289092	4.842527	4.456757	4.005072	5.587299	6.531273	5.956305	6.82673	7.942497	9.342668	11.64393	14.96832	17.50306	13.82991	15.68049	18.20987	20.57871	23.66524	27.48181
1.132237	1.145387	1.43735	1.955654	2.631787	3.089719	4.184672	4.848831	5.84157	6.765274	6.43478	8.151641	10.29464	11.71988	14.21074	16.9826	16.03801	14.00331	15.95786	14.26671	13.48076	15.5013	17.71089	20.62295	21.63518	26.30592
1.132237	1.359125	1.595097	2.162371	2.528827	2.144583	1.791648	1.768073	2.066907	2.421817	2.98349	3.443759	3.970546	4.319931	5.823378	6.159854	7.230946	8.88274	10.33249	11.72504	14.42343	15.66832	18.88308	20.30234	24.05417	25.91717
1.132237	1.169682	1.514098	1.854366	2.073155	2.70079	3.279817	3.120111	3.494476	3.080459	3.835419	5.350222	6.537249	7.815507	7.222783	9.365691	10.0156	12.44178	15.63115	13.81644	16.21653	17.51749	19.75463	19.52186	22.26669	25.23913
1.132237	1.390665	1.249175	1.692027	2.069644	1.959446	2.200811	2.756658	1.915415	2.142155	2.451971	3.01063	3.011616	3.527255	4.895681	4.890908	5.390135	6.909571	8.91462	10.53759	10.19373	11.95411	14.13849	16.59923	21.86061	24.28066
1.132237	1.359125	1.79187	2.143157	2.605703	3.199561	3.721047	3.825443	4.243541	4.340592	5.223227	5.685238	6.533001	8.427233	9.63208	10.55798	11.92429	14.34195	15.87508	17.97688	20.27785	22.39315	17.18111	18.88077	20.89795	23.78954
1.132237	1.244014	1.030498	1.248345	1.492027	1.749986	2.122143	2.508518	2.401634	2.751354	3.238887	3.815154	5.015101	5.980858	7.090253	6.515691	8.299618	10.00434	13.80944	15.82761	19.20936	23.27317	21.89717	24.60738	22.14983	23.22922
1.132237	1.233161	1.426054	1.285297	1.46046	1.984726	1.887805	2.217585	2.864536	3.495584	4.324667	4.816707	5.69608	6.448587	6.118912	4.517631	5.874194	6.654941	8.616537	9.414687	10.02449	11.86275	16.0813	17.42723	17.9576	22.37333
1.132237	1.344439	1.253966	1.762017	2.152719	1.989492	2.3655	2.802893	2.085303	2.502346	2.6722	3.378657	3.68869	5.105264	7.434317	8.222344	9.302335	10.65386	13.07339	10.52026	12.79418	13.9068	15.43307	17.48126	18.07302	21.53065
1.132237	1.361029	2.157401	2.776209	3.324701	4.075364	4.980943	6.440577	9.329014	10.87698	12.04557	14.06528	9.885393	11.3647	12.0216	9.446985	11.96221	13.20998	12.52374	11.21102	12.27413	14.50746	16.70856	18.36891	17.41369	20.61152
1.132237	1.391942	1.319935	1.490108	1.809481	2.179641	2.518191	3.152625	3.597627	4.593553	5.812869	5.416264	6.617121	8.430416	7.788772	10.20247	9.499791	11.57654	12.21896	9.369192	10.26998	12.91816	14.83842	16.21246	16.9678	19.96185
1.132237	1.492802	1.857014	2.639326	3.163646	2.373859	2.413847	3.04795	3.92872	2.946764	3.396394	3.961845	4.692803	5.201064	5.785803	6.689182	7.974356	8.758034	6.576602	7.466368	8.281109	9.883142	11.43746	11.91015	15.50631	19.20498
1.132237	1.344439	1.638119	2.155836	2.379944	2.949143	3.514267	4.670973	4.28229	4.673229	5.491694	5.956978	6.654109	7.216939	7.828432	8.396778	9.287759	8.596418	10.40795	11.7003	11.49496	12.0109	12.95417	14.71977	16.40562	18.83971
1.132237	1.3629	1.599379	1.647122	2.229049	1.520811	1.484727	1.942811	2.225769	2.516223	2.384636	3.446905	4.376863	4.928639	6.003746	7.090881	8.064686	7.848083	8.092909	8.925816	10.75617	12.33144	11.40334	13.00903	14.3787	18.14527
1.132237	1.12544	0.835937	0.959473	1.21925	1.477963	1.777177	1.948641	2.353911	2.9731	2.839495	3.323301	4.039651	5.469274	5.02183	5.801979	7.176131	8.119828	8.524245	9.791028	9.162128	10.86311	11.24092	13.1699	14.94085	17.5951
1.132237	1.168749	1.782214	1.882767	2.334626	2.862865	2.432339	2.083959	2.489098	2.868659	3.680996	3.489746	4.178686	3.8231	4.582247	5.248936	5.870882	6.609833	8.637965	9.996801	9.040607	10.85868	11.71883	13.00851	15.04599	17.17528
1.132237	1.255893	1.545525	1.857057	1.971059	1.839814	2.393344	2.705339	2.608873	3.128692	3.765506	4.181611	5.449047	6.22817	5.911879	6.082047	6.298198	8.21831	6.448762	5.947366	7.580021	9.924254	10.28252	13.08878	14.47172	16.63153
1.132237	1.169682	1.089813	1.413886	1.865154	2.357619	2.742043	2.952005	3.546562	4.352859	4.16098	3.870262	4.55565	5.685439	7.371993	7.72447	10.12933	10.09176	11.15218	10.4683	12.14897	14.12772	13.84855	12.6547	14.95767	15.97092
1.132237	1.454148	1.381019	1.628047	1.966921	1.895464	1.890191	1.419813	1.489504	1.758271	1.977352	1.878333	2.361134	3.240868	3.656286	3.864398	4.920589	5.737074	7.763964	9.317569	10.37709	11.08625	11.9872	11.44871	14.15939	14.98849
1.132237	1.239093	1.500638	1.792959	2.028224	2.398958	2.793964	3.245359	3.560031	4.261221	5.407975	6.491084	8.315373	9.033188	8.546563	11.06882	9.759092	9.846815	9.760008	9.716217	10.16919	8.004055	9.598605	11.07848	10.77965	14.3295
1.132237	1.363693	1.004834	1.157895	1.518106	1.12757	1.54485	1.424849	1.730629	1.680363	1.870505	2.725314	3.098518	4.564703	4.942642	4.608357	5.262997	5.441847	6.439563	7.33873	8.289988	6.35577	8.553525	9.906132	12.10988	13.4311
1.132237	1.35814	1.672101	2.138178	2.257992	2.630166	2.426992	2.49312	3.210294	3.731142	3.222345	4.203421	4.420543	5.210418	4.906936	5.96127	7.995959	7.661827	5.760339	6.548797	7.531058	8.829278	9.569467	9.253467	10.93076	12.58071
1.132237	1.392405	1.729363	2.297961	2.789729	3.641523	3.467534	4.182886	4.283281	4.535923	5.01214	4.762801	3.627868	4.1733	4.306234	4.825531	5.919334	7.000327	7.207614	8.483044	10.09287	7.944441	7.864401	9.019037	10.14889	11.48863
1.132237	1.31014	1.185267	1.410177	1.620685	2.025212	2.380311	2.804049	3.41579	4.368816	4.83616	5.67171	4.922923	3.767545	4.186273	4.162152	5.155129	6.118301	7.140583	6.029668	7.580026	7.879758	7.461626	7.099922	8.227317	9.095441
1.132237	1.169649	1.266654	1.536222	1.870671	2.202434	2.439159	3.0017	3.902511	4.341965	5.319248	4.130002	3.386886	3.10921	3.427738	2.501515	3.12975	3.056444	3.325871	3.757036	4.290868	4.72404	3.820604	4.17968	5.36442	6.317749

Key takeaway: Smoother transition to success as with other strategies that include the real estate blend.

MarketGlide Benchmark Glidepath

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.415524	1.613873	2.160832	2.706228	3.472643	4.567169	5.607673	7.221993	9.225855	11.0765	12.26172	16.16813	14.84209	15.98087	18.60596	20.09575	21.57252	26.49103	34.51182	42.23061	46.73219	54.42034	63.69579	77.19211	84.08655
1.132237	1.350396	1.640462	1.980905	2.222325	2.76419	3.376718	4.011838	4.935194	5.975007	7.132118	9.226047	11.33563	13.39393	15.35491	17.99871	21.24585	25.15623	30.6403	37.93809	43.22909	49.714	52.53732	61.99762	69.51781	73.92633
1.132237	1.337192	1.452	1.8037	2.487867	3.405996	3.783239	3.879334	5.053194	5.590321	6.357713	7.209195	9.274808	10.50078	11.4416	13.42979	17.44418	21.94852	27.97341	32.94107	35.15859	38.28144	45.38254	50.60291	52.68031	59.12538
1.132237	1.357975	1.829348	2.13407	2.534719	3.282149	3.493077	4.198464	4.657505	5.10721	6.263228	7.756095	9.328214	11.029	13.7768	18.03001	20.14575	21.12102	23.09544	26.09089	32.08063	34.39199	33.82408	40.58418	47.47235	52.83969
1.132237	1.310758	1.606261	1.385046	1.663282	2.041782	2.45004	2.996854	4.108279	4.580504	6.062106	7.413513	8.901068	10.56225	12.85803	15.47626	17.38349	20.24837	22.7491	23.45928	23.94904	27.31132	30.49667	37.57462	43.01474	49.97449
1.132237	1.464155	1.720491	2.154194	2.526599	2.92839	3.365699	3.011402	3.604333	4.702324	6.279986	7.678664	9.677807	10.95533	12.7985	13.61602	14.99266	16.21969	19.2995	23.8317	27.59482	31.68528	38.39385	39.37266	41.75888	47.52758
1.132237	1.272025	1.474828	1.774489	2.12239	2.631118	3.598975	4.898856	5.734025	7.040103	6.28387	6.767375	6.364112	8.18992	10.17827	11.41346	14.13739	15.81943	17.2833	19.09112	23.16555	26.26883	27.79215	31.6663	38.20034	45.76357
1.132237	1.268713	1.555779	2.041218	2.37914	2.942104	3.595637	4.318449	4.78405	6.304173	8.356688	9.911339	12.47204	14.36231	16.34755	17.44692	20.22234	19.4665	21.46166	24.27373	22.79958	26.29133	30.45181	36.73819	42.6944	42.30887
1.132237	1.313179	1.36468	1.642459	1.824562	2.019831	2.337891	2.615203	3.17861	4.224984	4.943933	6.105756	6.110624	6.459343	7.651021	8.650911	11.26298	13.28242	16.51705	19.33422	23.96115	28.02384	28.68035	30.85211	38.34502	40.81248
1.132237	1.505814	2.082035	2.575608	2.536245	3.610579	4.505231	5.118882	6.239635	5.857023	7.376831	8.949977	9.51861	12.33207	13.99418	15.27159	17.42975	23.34695	25.80601	26.38336	27.73946	30.25887	32.40604	32.60495	34.77429	39.74405
1.132237	1.436773	1.687144	2.132198	1.952394	2.157607	1.641538	2.314069	2.819792	3.403643	4.661719	5.837055	6.854782	7.893722	7.375484	8.756138	8.988602	10.50469	12.38314	16.10167	21.58866	24.69081	27.86923	30.8933	34.77559	38.10551
1.132237	1.379221	1.860938	2.097983	3.210068	3.649733	4.209343	4.308229	4.067108	5.201483	6.115812	7.173024	6.689621	7.648122	9.613075	11.61632	13.7369	15.80097	16.65787	18.97405	23.16422	23.59727	24.55588	27.24846	31.93932	36.30281
1.132237	1.062703	1.549265	1.873724	2.4954	3.347217	4.029644	4.678337	5.929084	5.491098	5.069938	5.491255	6.362725	7.074324	7.777343	9.259816	10.84803	13.19267	15.19257	17.75059	21.20819	23.63524	24.2007	27.85439	31.90556	35.06648
1.132237	1.481498	1.806193	2.157074	2.713755	3.858822	4.696395	5.194627	6.425741	7.393076	7.996793	8.779766	9.963309	11.18394	10.59886	13.62128	14.67777	16.48795	19.91308	21.90795	23.50969	19.51436	23.88226	26.30547	28.99614	33.35367
1.132237	1.209935	1.592059	1.433677	1.97504	2.743611	3.352827	4.18518	5.067203	6.940108	8.079934	9.488343	10.96411	13.14799	14.82761	15.80068	18.32334	14.95468	16.07135	16.61013	18.86906	22.99802	22.52315	25.21829	28.55082	32.416
1.132237	1.274035	1.186993	1.450578	1.789953	2.388635	2.831292	3.094304	3.567613	4.242959	4.879978	5.343033	6.530381	6.896583	8.169988	9.739459	9.491666	11.30025	12.32732	13.86468	16.56709	19.05961	25.01475	25.89044	28.75826	31.50237
1.132237	1.066179	1.255719	1.541652	1.848001	2.443331	2.787139	3.27967	3.589257	4.223711	5.006741	6.471268	7.580358	10.47097	8.126998	9.472955	12.57044	14.97728	16.56284	21.1552	22.60564	22.01042	24.35038	25.48925	29.12806	30.19273
1.132237	1.369668	1.550977	1.891078	1.958547	1.636941	1.900686	2.334242	2.807981	3.316228	3.85961	4.687682	4.370002	5.783048	6.945412	7.684713	8.727095	9.060997	11.42179	13.70051	14.72927	17.15178	20.40212	23.44162	28.20242	29.40635
1.132237	1.355979	1.582654	1.590382	2.048211	2.440109	2.190445	2.59781	2.566935	3.468897	3.54762	4.36703	5.126237	5.5893	6.586827	7.793744	9.197323	10.10194	11.58661	12.49273	14.64399	17.00842	20.62894	23.80454	27.39463	29.08525
1.132237	1.332918	1.928074	1.994059	2.200737	2.272993	2.791559	3.402896	4.12449	4.77173	6.022484	7.870964	8.036707	9.877934	12.18654	13.5733	14.84803	16.87341	13.70307	15.98878	19.57433	19.17466	22.04648	24.45567	26.2836	28.6984
1.132237	1.241012	1.585827	2.196896	2.632721	3.223676	3.724444	4.488933	5.493461	6.515256	7.118336	10.29404	9.834371	7.539589	9.161845	11.44646	12.08085	11.84635	13.12164	15.36371	17.18909	20.2431	17.31023	19.56009	25.10587	28.07358
1.132237	1.350396	1.655973	1.993463	2.17005	2.624126	2.935708	2.703001	3.486451	3.795243	4.652739	5.322245	5.881182	7.646426	9.334266	9.027608	10.79828	12.45205	14.16854	14.59659	14.72323	17.77278	17.60651	19.93513	21.62503	27.13424
1.132237	1.379221	1.7569	2.113228	2.181238	2.589191	3.601817	4.379256	5.054795	6.155728	6.316016	6.882187	9.281977	11.48429	14.06495	14.6647	14.06416	15.14226	16.26555	19.93769	23.32658	26.67226	22.06844	23.72127	25.49668	26.4758
1.132237	1.355031	1.65234	1.930786	2.630011	3.105167	4.089802	3.648834	3.488497	4.79886	5.793047	5.957529	7.540778	9.058934	10.05837	8.366511	9.717428	11.20781	12.90442	14.67739	16.20807	18.39847	20.91039	23.16756	26.9428	25.97736
1.132237	1.34304	1.554865	1.927631	2.341985	2.942309	3.437295	3.93457	4.520712	6.304819	8.553104	8.144063	8.154738	8.959438	11.29679	13.0663	10.62063	12.09602	13.0757	17.39484	19.17895	21.81245	22.77434	22.32519	23.83528	25.30879
1.132237	1.312152	1.413527	1.601846	1.95571	2.645418	3.321558	4.248923	5.058723	5.6265	7.50131	6.953584	7.584344	7.34148	8.554211	10.44843	12.27594	14.9807	15.79669	17.41943	18.13311	17.76801	19.39367	21.76903	23.59207	24.46929
1.132237	1.275726	1.324985	1.755917	1.877595	1.415295	1.929472	2.295393	2.657262	3.24189	3.105509	3.723427	4.738057	5.740864	5.970463	7.124731	8.183744	9.693292	11.10155	12.59173	14.07196	14.67792	17.82973	21.37797	23.95342	24.1092
1.132237	1.302848	1.535425	1.642188	2.040718	2.710307	3.326313	3.704139	4.610085	5.545893	6.200882	7.098762	7.48751	6.804284	7.571327	8.583666	10.10152	11.20894	14.57172	16.23246	17.18142	19.10142	23.64135	26.17864	22.75566	23.80293
1.132237	1.361319	1.790327	2.091339	2.44657	2.416013	2.898039	3.479519	3.796407	4.053761	4.625508	4.429089	5.679539	6.870798	8.29919	7.92727	9.069559	10.01276	9.526995	11.49129	14.17541	16.25796	18.64193	20.64268	22.27025	23.32078
1.132237	1.345604	1.654786	2.260023	2.618063	3.649049	4.248787	4.202196	5.01502	5.828246	6.856965	7.340527	9.198725	8.67732	10.09905	9.754626	11.37822	13.70618	14.50693	13.80835	13.53451	15.63122	18.86561	17.95581	21.11273	22.99654
1.132237	1.31113	1.558818	1.866735	2.114419	2.686432	2.363873	2.4795	2.788045	2.757417	3.379998	3.505676	3.72818	4.110532	3.858018	4.236903	5.042528	5.773731	6.859919	8.008857	8.95856	11.56087	13.74669	16.50146	19.89454	22.47943
1.132237	1.3146	1.270917	1.765654	2.006724	1.462727	1.863877	2.618681	3.361742	4.159801	5.470504	5.997777	6.441766	8.131708	8.629746	10.05223	12.2613	14.0227	14.68361	15.18577	16.90999	16.50494	19.24519	21.64715	18.71934	21.92374
1.132237	1.402074	1.796965	2.198467	2.667117	3.586018	3.912869	4.770244	5.45428	6.636347	7.291278	8.261225	9.720765	8.922308	10.84872	10.47399	11.65152	13.99014	16.56957	16.76514	20.70511	24.0158	27.96698	27.82283	23.47933	21.12001
1.132237	1.297424	1.477106	1.776108	1.914057	2.116204	2.622571	3.321342	3.63412	4.300852	4.305105	5.2721	5.680466	6.062485	6.852908	7.815765	8.870726	9.18715	10.10538	13.15205	15.98416	18.46614	17.59794	16.54373	19.42446	20.29908
1.132237	1.430369	1.883128	2.273984	2.766519	3.652402	4.339305	5.32356	6.455088	7.446059	5.948681	5.338495	6.85117	7.748835	9.073369	9.38351	7.439426	7.029552	9.17702	9.861632	12.16039	13.02934	14.07151	16.8416	18.39692	19.72003
1.132237	1.350107	1.525605	2.115682	2.407885	2.650419	3.31784	3.963456	4.856782	4.387517	4.632027	4.915052	4.89054	3.784326	4.269744	5.076287	4.925626	5.865157	6.107888	7.00454	7.720441	10.14876	12.04032	13.62487	15.74708	19.3526
1.132237	1.275486	1.459267	1.868431	2.358804	2.774983	2.56557	2.718511	3.299055	3.657557	3.436168	3.728276	4.910651	4.947218	5.833252	7.541123	7.575378	7.328672	9.083158	9.820356	10.96749	13.03924	14.69677	16.03677	17.22998	19.06356
1.132237	1.327274	1.71179	1.926936	2.395253	2.930676	3.271925	2.896604	3.335242	3.41983	3.272406	3.812572	3.943622	3.731858	4.016393	4.726321	5.408997	5.868451	6.698976	7.784294	9.949851	11.06861	13.73498	15.10125	15.8095	18.553
1.132237	1.197345	1.255468	1.479557	1.98545	2.182715	2.614979	2.868402	3.827248	3.637526	4.296	4.391463	5.94838	6.643246	7.110391	6.886764	7.345013	7.985741	8.974034	10.33841	11.51791	11.47811	12.63955	13.98677	17.29142	18.03718
1.132237	1.278388	1.481947	1.784055	2.356318	2.659696	3.214304	2.762751	2.600488	3.186126	4.169839	5.087256	4.796988	5.463767	6.353577	7.303566	5.771511	6.558157	8.310388	9.359786	10.72343	11.58144	13.04135	13.70276	15.96938	17.40638
1.132237	1.358964	1.627847	1.803757	2.11688	1.60689	1.598255	1.913784	2.379376	2.201593	2.101105	2.658853	3.236694	3.73413	4.384896	5.247114	6.258352	8.271036	9.454461	7.560979	8.577036	10.66206	12.27003	13.83064	16.25261	16.93598
1.132237	1.343514	1.714144	1.8061	2.029053	2.475453	3.197852	3.894925	4.838802	4.499244	5.184214	5.799172	5.975646	7.53149	7.26697	8.097328	10.44362	10.81184	11.49426	13.65629	11.24837	12.64989	11.83633	12.78611	14.20313	16.1589
1.132237	1.310496	1.497918	1.710209	2.163679	2.234338	2.230664	2.602711	2.436477	2.912722	3.562284	4.806213	6.096551	6.250508	5.959275	7.786524	9.306291	10.14832	10.53625	10.88834	12.46205	12.2524	10.44968	13.28834	14.1444	15.02166
1.132237	1.330337	1.554525	1.935849	2.363716	2.352707	1.960255	2.218079	3.073553	3.66399	4.28497	4.72628	5.652717	7.413399	7.96211	9.446225	9.691805	7.760834	7.951723	6.541097	8.418515	9.218961	11.70964	13.2175	14.50595	14.49301
1.132237	1.222564	1.536591	1.326886	1.741484	2.278025	2.335561	1.961521	2.304584	3.01963	3.473778	3.904087	3.705788	4.477467	5.591518	4.900246	6.437133	7.098486	8.087997	8.741928	10.80717	10.69339	11.47387	12.71833	12.8619	13.50215
1.132237	1.359425	1.885113	2.286513	3.002859	3.789791	4.604843	5.054619	5.563387	5.116157	4.646715	4.449132	3.840284	4.299598	5.598303	6.563286	7.449104	5.978194	7.0015	8.316006	7.943808	8.274907	9.12672	11.54965	12.17803	13.02684
1.132237	1.301062	1.210985	1.426155	1.297358	1.462611	1.972854	2.748931	3.544587	3.614672	4.284831	4.737115	4.891372	5.937407	6.390071	7.418426	8.159856	8.966616	7.6568	9.047982	9.751939	11.48107	9.648841	10.42233	10.8759	12.12492
1.132237	1.350396	1.734684	1.88781	2.650541	2.403238	2.796818	2.056461	1.913328	2.272209	2.499689	2.795495	3.112257	3.406054	4.005651	3.762014	3.951286	4.31912	4.63378	4.550187	5.169956	6.436122	7.179701	8.243598	9.287314	10.90517
1.132237	1.230932	1.401134	1.27251	1.611854	1.872067	2.343426	2.119274	2.519281	2.793064	3.285957	3.653285	3.824834	3.57062	4.143371	3.98911	5.158227	6.079012	6.138181	6.364482	7.425735	8.686119	9.830481	11.88872	9.984875	9.930569
1.132237	1.348709	1.583037	1.861774	2.023702	1.867467	2.447317	2.78423	3.210826	3.770432	4.412691	3.275073	3.9562	3.435202	3.890283	5.046853	6.37612	6.792914	7.678894	7.965675	9.695234	8.084982	7.93679	6.889574	6.771173	7.920743
1.132237	1.454984	1.915951	1.785853	2.130356	1.954471	1.759268	1.304562	1.121816	1.371627	1.662984	1.794155	2.150329	2.646886	3.493515	2.762321	3.040216	3.26644	2.655351	2.937946	3.01973	3.952007	4.642616	4.875931	5.948758	6.541095

Key takeaway: Lower risk version of the T Rowe Price glidepath with similar success.

MarketGlide Benchmark Glidepath with Real Estate Blend

40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
1.132237	1.455567	2.099057	2.553187	3.544189	4.104862	5.3742	7.329437	9.063037	10.57335	10.86699	11.73848	12.77841	15.21453	20.8081	24.31069	30.09221	37.89785	41.55776	49.23895	56.10824	63.66306	63.58152	72.78815	81.42356	83.40542
1.132237	1.34859	1.637263	1.996135	2.414258	3.005076	3.647267	4.386798	5.518827	7.114737	7.547177	8.590245	9.95564	13.21599	15.7666	18.41201	23.3324	28.04262	36.10057	41.57801	43.05431	39.58218	44.07051	49.11511	57.04135	64.37179
1.132237	1.242393	1.388495	1.837246	2.252526	2.875294	3.880663	4.312724	5.550389	6.563469	7.58526	7.823266	8.894141	11.01205	12.64128	14.80532	18.09525	21.00636	23.25065	28.47626	30.55721	35.55122	41.31354	43.13074	52.37141	54.36995
1.132237	1.297359	1.223538	1.494551	1.818762	2.383439	2.967321	2.238632	2.785062	3.542616	4.43674	5.974739	6.647689	7.844985	9.329125	10.88547	12.35625	14.8857	16.72256	22.06099	29.44911	33.21812	37.49387	41.44654	45.35948	50.72502
1.132237	1.382752	1.595684	2.078006	1.990843	2.231003	2.974465	3.411962	3.98531	4.729084	5.124065	6.729567	8.983381	10.75019	12.56188	14.57555	16.793	17.81037	21.89893	23.74257	25.46783	27.47767	32.25174	36.32942	38.17836	46.95842
1.132237	1.287587	1.511555	2.010732	2.612015	2.931583	3.358351	4.095719	4.448451	4.946941	6.061446	4.689057	5.407903	6.286361	7.044746	9.263961	10.26124	11.82557	13.28169	13.75151	16.78015	20.3671	25.38855	31.78732	36.62347	45.48677
1.132237	1.360303	1.704611	2.101264	2.601019	3.594849	4.040695	4.778208	5.259796	6.553296	8.05363	10.09599	11.41477	14.33486	17.0743	19.44243	19.15962	21.33198	20.96756	23.79512	20.853	23.79451	28.78258	32.60104	34.31159	43.03175
1.132237	1.354177	1.654753	1.699251	1.912484	2.475638	3.08296	4.207815	5.609751	5.780878	6.3781	7.649165	8.758441	11.74814	14.18359	16.00076	20.42911	25.50816	29.72591	30.68939	39.25622	40.06768	41.8703	35.51063	41.00866	41.46648
1.132237	1.269045	1.754994	2.060388	2.420269	2.468153	2.902737	3.846614	4.617223	4.556601	5.898678	6.532597	7.234793	7.456485	8.504708	9.826246	11.1304	13.76661	15.52907	19.26612	22.7089	25.38842	28.30806	31.26239	36.33772	40.20055
1.132237	1.315315	1.603425	2.045529	2.124631	2.506385	3.39885	4.002199	4.43283	4.979912	5.824011	6.426324	5.948624	7.285728	7.940232	10.0478	13.34083	15.1789	17.88879	20.78585	22.53771	20.75583	23.87104	26.93209	32.43508	38.24923
1.132237	1.454484	1.732713	2.061891	1.857566	2.174156	2.630493	3.470028	4.013083	4.594365	5.648778	5.092344	6.690761	7.653537	8.845572	10.2173	11.53183	14.08873	17.12124	20.64797	22.61942	25.62564	28.2147	28.44915	30.87887	37.3187
1.132237	1.378884	1.702115	2.083903	2.55387	2.294463	2.857833	2.495475	2.948542	2.815106	3.209639	3.834391	5.257219	6.736762	8.283464	10.42623	12.39573	14.28872	16.91472	18.16932	20.41401	22.41842	26.32805	30.66892	34.27636	36.5421
1.132237	1.212842	1.551699	1.662469	2.079092	2.41501	2.978697	3.357861	4.396057	4.859178	5.338404	6.283479	8.569759	9.274934	10.8001	12.68281	14.62691	18.06888	13.96396	16.32262	17.8841	20.27009	21.71014	24.20314	29.01786	35.01605
1.132237	1.471177	1.642241	1.894721	2.583915	3.10363	3.296149	3.155325	3.881823	4.651666	4.678293	6.127891	8.321118	10.24611	12.64955	11.4676	11.12642	12.63066	14.98341	16.89489	20.84941	23.1412	25.05762	27.90846	30.81205	32.90178
1.132237	1.185703	1.497446	1.822053	2.482082	2.852345	3.294618	3.979922	4.398067	5.051594	3.972595	4.411226	4.849568	6.426337	7.456976	7.718736	9.090974	11.11624	12.80338	14.64338	17.11236	19.89488	21.57395	23.2796	30.08377	32.30678
1.132237	1.303565	1.635855	2.040826	2.162662	2.528224	2.944025	3.673301	4.222481	5.355472	5.619318	5.781281	6.652618	8.12195	6.162301	7.364149	8.519458	10.32687	12.43159	14.20487	18.34177	21.05033	23.03642	26.28263	28.40192	31.28616
1.132237	1.336066	1.888857	1.727015	2.004857	2.683203	3.647162	3.344377	3.726751	4.500762	5.939265	6.292683	7.162891	7.928999	9.480345	10.31566	12.27923	14.50749	16.65127	18.65788	17.64021	20.41421	24.05864	28.17692	31.64269	30.69674
1.132237	1.162775	1.087989	1.311654	1.603119	1.966468	2.16866	2.60605	3.305014	3.696567	4.015467	4.376425	5.184245	6.201426	7.570103	7.444731	10.12121	11.88558	12.98398	14.93146	14.17188	16.07891	19.70446	21.80332	23.88532	29.84607
1.132237	1.340953	1.639244	1.580942	2.065859	2.24701	2.811335	3.482226	4.588413	4.989751	5.392648	6.327276	7.046687	7.519168	8.830104	9.852789	7.73103	9.833897	11.12052	11.97038	13.39724	15.86428	19.88147	23.23662	24.21858	29.46236
1.132237	1.340841	1.55677	1.758677	1.601652	1.999105	2.834651	2.309275	2.539771	2.413159	2.729707	2.8973	3.648286	4.325132	5.456628	6.076418	7.238581	9.371649	10.2809	11.92413	14.78089	18.50404	20.5076	22.68879	25.41005	28.87036
1.132237	1.263695	1.039626	1.243735	1.554567	1.911133	2.109562	2.780168	3.530003	4.329901	5.574652	6.756574	7.992995	9.297132	10.66982	9.875999	11.92079	13.74243	14.53572	17.09995	19.45571	20.21393	23.20497	23.05153	26.09368	28.26254
1.132237	1.312199	1.605148	1.242393	1.683832	2.214417	1.547042	1.866715	2.196468	2.5958	3.297414	3.568514	4.771734	6.169434	7.143492	8.364137	9.624236	10.38572	11.86056	14.20652	17.36874	17.8933	18.63592	20.73975	24.4103	27.69107
1.132237	1.445064	1.317929	1.584796	2.104923	2.577526	2.332657	2.731787	3.177928	4.032471	4.603876	5.279742	6.138013	7.584629	7.970793	9.343544	8.930064	9.545953	11.10784	13.23996	17.70591	18.47362	19.76573	22.48779	24.09157	27.32992
1.132237	1.274373	1.691545	1.918129	2.406827	2.829051	3.289401	3.67287	3.291477	3.870076	4.42105	4.384743	4.805688	6.368838	7.489753	8.734489	9.924496	11.55454	14.6504	16.16068	19.01406	20.37202	19.64235	22.44713	24.40637	26.96023
1.132237	1.3552	1.716131	2.02284	2.443114	3.380333	3.733947	4.082651	5.25768	6.176027	7.098137	8.163193	8.768722	9.985617	10.98632	11.3793	12.66641	11.42293	11.39322	13.12201	16.33059	18.47006	19.67254	19.9369	23.42492	26.2486
1.132237	1.33158	1.727443	1.605261	2.089098	1.953923	2.223487	2.587339	3.057049	3.538791	3.841975	5.158128	6.429102	7.406109	7.924372	9.435373	9.761727	10.1071	11.14699	11.54936	13.43364	15.49604	16.08742	17.91374	20.80386	25.74375
1.132237	1.401431	1.7463	2.036705	2.652432	3.025567	3.778879	3.990463	4.678678	5.289736	5.832582	4.618369	5.416217	5.961704	7.068415	8.505181	9.690056	12.30631	13.30354	12.71123	15.24727	17.23653	19.4253	21.89926	22.0995	24.88139
1.132237	1.092418	1.298156	1.520789	1.708915	1.901943	2.406293	2.491432	2.877355	3.644842	4.822334	4.996609	6.043126	6.376393	7.503621	8.740238	9.163188	9.990333	9.725011	10.7855	12.64154	13.64377	17.25999	19.39842	21.93296	24.26312
1.132237	1.353218	1.824068	1.731057	2.017118	2.472836	2.550447	3.005208	3.499863	3.688489	4.517105	4.74576	5.388949	5.479518	6.444192	7.748753	8.525243	8.375074	9.935985	11.46431	14.18358	16.34288	18.27308	19.56743	21.28555	23.30945
1.132237	1.333096	1.765133	1.958378	2.337316	2.98739	3.470269	3.880397	4.420777	5.259388	6.176124	7.214185	7.923686	8.538019	10.43523	10.20995	11.43486	13.58996	10.67292	13.61795	16.16464	16.98015	17.68865	20.15877	20.39276	22.53312
1.132237	1.364652	1.613954	1.537148	1.849996	1.68435	1.932231	1.475274	2.009738	2.902068	3.199223	3.982717	4.739431	5.958081	7.107245	8.651972	10.15371	12.13641	13.46415	15.18935	12.53995	12.54046	14.46653	16.45486	20.05415	21.95555
1.132237	1.340953	1.578795	2.053349	2.175607	3.0361	3.589355	4.580889	4.804051	4.373964	4.522937	4.931204	3.947842	4.797868	6.629873	7.873888	8.533918	10.34427	10.9566	11.77511	14.42486	17.55053	21.29293	21.22075	21.31911	21.53953
1.132237	1.247539	1.488189	1.381364	1.731695	1.712407	1.565451	2.098446	2.359763	2.435343	2.681768	3.265643	3.856567	4.237625	5.006489	5.963297	7.326574	9.095163	10.53586	8.676386	10.32061	12.23982	13.28914	15.47781	18.09915	20.9158
1.132237	1.489817	1.55213	2.013177	2.280358	1.586929	2.01388	2.471266	3.123508	3.460196	4.448448	4.716912	5.560211	6.0618	7.397783	7.111052	8.855609	8.585263	9.712537	11.98212	14.31503	13.52463	14.64026	17.09001	19.54561	20.58045
1.132237	1.318494	1.250386	1.53723	1.72746	1.955049	2.412357	3.11926	3.882469	5.292024	3.797922	4.613369	4.075526	4.626884	5.658869	6.230881	7.333749	8.571683	9.747743	10.66827	13.29175	14.1352	14.02468	15.54136	17.86581	20.14106
1.132237	1.333096	1.66331	1.846216	2.180846	2.566001	3.302013	3.71574	4.135568	4.910195	5.654635	5.93642	6.881082	7.410608	8.242147	10.87706	13.74788	15.83747	18.06216	23.93149	22.29952	17.75321	14.67164	17.01298	18.88462	19.6658
1.132237	1.305316	1.531056	1.827571	2.366885	2.354075	3.004941	3.680289	4.42772	5.136861	6.076495	4.678024	5.862005	7.051528	5.445194	6.063826	7.136321	8.28365	9.691855	11.21051	12.83977	14.19104	17.94897	15.59289	18.50386	18.75429
1.132237	1.380122	1.298583	1.561009	1.18298	1.242774	1.625087	1.900664	2.302591	2.456339	2.837251	3.393417	3.760953	4.65396	5.61599	6.502318	5.962552	6.830311	6.345866	7.167718	7.964984	9.882954	10.78743	13.7161	15.14485	18.40396
1.132237	1.3033	1.607577	1.909163	2.356315	2.726391	1.895164	2.217901	2.72022	3.028861	3.717058	4.25702	5.0074	6.390762	7.318069	8.751148	7.035364	8.553313	9.838412	11.0428	11.88602	11.72903	13.60055	15.94334	17.46332	17.86631
1.132237	1.216508	1.596468	1.167566	1.51619	1.91385	2.313582	2.689772	2.579723	3.25079	3.045638	3.668262	4.037405	4.726262	3.666238	4.185287	5.056271	5.885682	6.799353	7.261221	8.579892	9.713985	12.39429	13.4305	14.90202	17.24634
1.132237	1.237647	1.089359	1.33736	1.272398	1.206644	1.612221	1.942878	1.841883	2.208256	3.089095	3.849528	4.308121	4.726081	5.390562	6.406308	7.538143	8.394746	10.99731	11.909	11.99957	12.79489	14.67508	16.52799	16.59214	16.95674
1.132237	1.335274	1.770702	2.165594	2.561438	2.380636	2.207059	2.559606	3.592184	3.98517	5.018996	6.242153	5.798818	4.489331	5.161251	6.337124	7.297359	9.064368	10.51654	12.31191	13.45795	13.26044	13.6361	15.40653	14.87626	16.31597
1.132237	1.198585	1.584989	1.801073	1.712434	2.097208	1.580576	1.841624	2.247898	1.739266	1.536331	1.870562	2.072669	2.267438	2.762476	3.421788	4.072896	4.656223	5.483657	6.272139	7.054918	8.872821	10.08911	12.34163	12.66367	15.24242
1.132237	1.355143	1.575051	2.075919	2.276865	1.658409	1.951024	2.281591	2.21088	2.602423	2.91759	2.564316	3.257728	3.98069	4.93266	5.701115	6.53622	7.011899	8.375744	6.903252	7.664237	8.369198	9.727601	10.71562	12.96579	14.83851
1.132237	1.335608	1.662201	1.885768	2.211693	2.556198	2.380679	2.465481	2.744707	2.048471	2.262788	2.667282	3.13223	3.854962	4.647941	5.285424	4.22606	4.517548	5.166705	5.392025	5.946653	7.485233	9.569867	10.90055	12.29169	13.8219
1.132237	1.325186	0.929553	1.264692	1.502124	1.807472	2.460006	2.968537	3.832276	5.206672	6.39363	7.465986	6.827053	7.462731	8.651588	8.238445	6.636166	6.121033	8.214269	8.057912	7.819015	9.511683	11.128	13.07851	10.7595	12.95142
1.132237	1.32696	1.392486	1.742066	2.036033	2.242623	2.112368	2.295711	2.394492	3.162842	2.923592	3.487825	3.125088	3.993274	4.561062	5.410735	4.202442	5.068023	6.29691	7.26286	6.928841	9.118659	9.615293	9.986136	11.13758	12.2434
1.132237	1.324172	1.637975	2.061941	1.869281	2.383349	2.866693	3.20005	3.706933	5.055808	6.592911	7.101476	7.822795	7.236673	7.786199	9.187744	10.72175	11.68113	11.27115	9.269278	8.909868	8.539435	9.732604	9.449691	10.11826	11.44334
1.132237	1.29103	1.467245	1.360737	1.672328	2.125463	2.108397	2.688941	2.347778	2.96213	3.541469	4.04647	4.412543	3.925464	4.588327	4.341222	4.52385	5.448437	5.406119	6.525073	7.49039	8.040486	6.967729	7.966904	9.198989	10.62681
1.132237	1.34426	1.755898	1.891921	1.71924	2.108379	1.785071	1.858742	2.096769	2.503293	3.11618	4.053371	4.328859	5.199069	4.132545	4.961752	5.468656	4.453341	4.720303	5.420508	5.786953	6.087455	6.864691	7.724566	8.451094	8.483988
1.132237	1.162775	1.070782	0.8177	0.955404	0.705079	0.886931	1.217251	1.394481	1.344707	1.629961	2.062324	1.638483	1.95215	2.316033	2.572374	2.793203	3.00886	3.681558	2.96131	3.497029	3.526324	4.193467	4.45663	5.021797	5.428939

Key takeaway: Smoother version of the MarketGlide Benchmark glidepath because of the effects of increased diversification.

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