Invesco Vision Case Study 13: Model portfolio analytics

Evaluating target-date funds

The use of model portfolios within retail and defined contribution plans is becoming prevalent. The approach offers pre-packaged, single-fund solutions that are constructed to help investors achieve their investing objectives. These solutions are frequently structured in the form of target date portfolios, where allocations become increasingly aggressive as target dates extend further into the future. In this case, we examine a set of target date fund series from 2020 to 2060. We discuss some key pitfalls to be cognizant of as well as some relevant practical capabilities provided by Invesco Vision that allow for easy comparisons of the different solutions.

In Figure C13a we present the five hypothetical target date portfolios. The blue dots indicate how these portfolios look when measured using expected arithmetic returns while the purple dots show the results in terms of geometric (compound) returns. First, we examine the portfolios in arithmetic return terms and notice how the shorter-term portfolios have lower total risk and lower expected return than their longer-term portfolio counterparts. We also see how the expected returns of the portfolios are rising at a rather linear pace as we move from shorter to longer dated solutions. We then examine the portfolios in geometric terms. Here, we notice that while the longer-dated portfolios show increasing levels of risk, they offer only marginal benefits in terms of expected return. This is driven by the volatility drag that is expected from these more aggressive solutions. In this context, it is unclear whether the 2060 portfolio should ever be preferred over the 2050 portfolio. The expected return pickup in geometric terms is a mere 19 bps while risk increased by over 120 bps.

In Figure C13b we present the underlying isolated factor risks, contributions to risk, along with fund asset class weights. As can be seen, the shorter dated portfolios have a heavy weight to credit and rates while the longer dated portfolios are increasingly reliant on equities. This can be seen in terms of both weights as well as in isolated risk. The contribution to risk makes this apparent shift even more transparent where equity drives more than 95% of the total portfolio risk for the 2060 portfolio. While this is not necessarily a bad thing, especially for the very long dated solutions, this level of transparency can help provide valuable insights regarding how the portfolio is expected to behave.

Figure C13a: Model Portfolios
Expected arithmetic and geometric returns

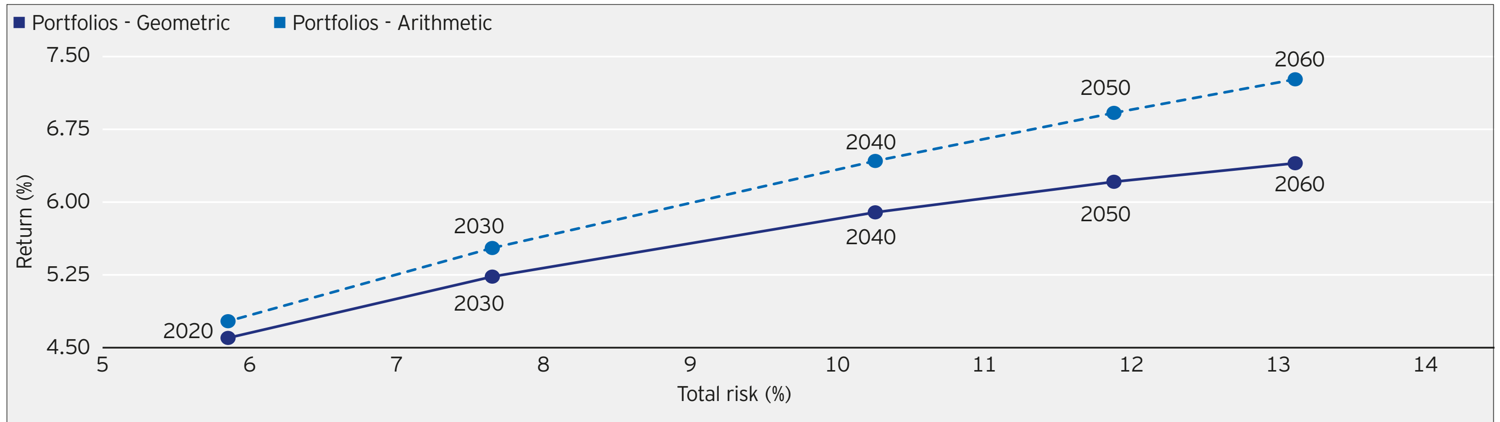

Figure C13b: Portfolio characteristics
Portfolio weights, isolated risk, and contribution to risk

2020 **2040** **2060**

FI = US Treasury Long EQ = US Large Cap Equity A = Alternatives MA = Mixed Asset

Weights (%)

FI
EQ
A
MA

0 20 40 60 80 100

R = Rates I = Inflation CR = Credit EQ = Equity C = Commodities FX = Currency T = Total

Isolated Risk (%)

R
I
CR
EQ
C
FX
T

0 2 4 6 8 10

0 2 4 6 8 10

0 2 4 6 8 10 12 14

R = Rates I = Inflation CR = Credit EQ = Equity C = Commodities FX = Currency T = Total

Contribution to Risk (%)

R
I
CR
EQ
C
FX
T

0 20 40 60 80 100

-20 0 20 40 60 80 100

0 20 40 60 80 100

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