

the tortoise & the hare



| Forecasting the investment weather

'Expected' returns on portfolios are a little like the 'expected' weather in the UK. There is a growing wealth of data, science, models and common sense on which to build forecasts in both areas. Yet, despite generalisations such as that it is usually sunny and warm in the summer and cold and frosty in the winter, we all know that the day-to-day, month-to-month and even year-to-year variation is high. Investors should never believe that expected returns, like the weather, are accurate, single point, consistent outcomes.

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Come rain or shine...

Now that autumn has officially begun, my two small children were immediately expecting me to dust off the kite or play in the fallen leaves. Now that summer is over, they assume that we can no longer swim in the nearby lake. Of course, over the years they will learn that the weather is not as predictable as the calendar.

Forecasting markets is as difficult as forecasting the weather

Parallels exist between the weather and investing when trying to forecast future market outcomes. It is perhaps evident that, if forecasts of future returns of asset classes used in portfolios could be made with a high degree of certainty, one would simply invest in the highest returning asset class and ignore all the others.

However, it is this very uncertainty of outcomes for which investors are compensated. For example, holding a five-year index-linked gilt to maturity has a far more certain outcome than owning shares in a small unlisted biotech company, struggling with another funding round, as the UK government will pay you back at maturity and protect your income and capital from inflation. In the same way that we broadly accept that autumn tends to be warmer than winter in the UK according to data, science and logic, we also know that investments with a wider range of potential outcomes (more 'risky' investments) are likely to produce higher returns than lower risk investments with a narrower range of likely outcomes. Most of the time this works out, but not always.

"Prediction is very difficult... especially if it's about the future."

Nobel Prize-winning physicist Niels Bohr

You can perhaps see the challenge that any financial planner faces; having established what your money means to you and your family and how hard these assets will need to work to meet your financial goals, he or she will have to estimate the future returns for each asset class and, in turn, for your portfolio, in order to build your financial plan. This 'expected' return should be used as a starting point to see how well your financial plan works out. However, to think that the expected return is some sort of accurate point estimate of how your portfolio will consistently grow, misses the point entirely, as we will demonstrate in this short note.

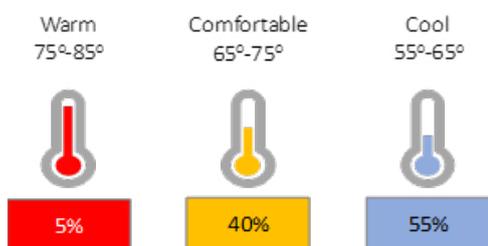
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We're all going on a summer holiday...

To illustrate the point, given that summer holidays with children need to be planned as early as possible, let us look at the average weather in Newquay, Cornwall for 1st August each year from 1980 to 2016. We know that it is more than likely that August will be warmer than January and, an 'average' day would be mainly sunny and warm with a few clouds and a gentle breeze. The schematic below helps to illustrate the wide variation from the expectation that exists¹.

Table 1: The weather in Newquay, Cornwall on 1st August, on average each year at 3pm

Temperature



Range	Temperature
10th percentile	72°
25th percentile	67°
Average	65°
75th percentile	62°
90th percentile	60°

Other metrics

Rain	Wind	Humidity
1-in-4 chance of rain	22 mph (10th percentile)	Dry - 40%
	14 mph (average)	Comfortable - 40%
	6 mph (90th percentile)	Humid - 20%

Data source: www.weatherspark.com. Diagram: Albion Strategic Consulting

As is evident from the above, the average day is more likely to be cool and windy, with significant variation around the 'average' outcome!

Forecasting the investment weather – building asset class assumptions

When it comes to estimating future asset class returns, it is evident that there is no absolute certainty, only reasonable, informed estimates that relate to the long-term, often multi-decade horizons being modelled in clients' financial plans.

"We should humbly recognize the limits of our understanding. Realized returns are dominated by randomness, structural uncertainty, and rare events. Expected returns are unobservable, at best, estimated with noise."

Antti Ilmanen² - Ph.D., author and Principal at AQR

An expected asset class return is simply the most likely, i.e. probability adjusted, outcome from within a distribution of possible outcomes. They are not single point estimates of guaranteed returns.

It is worth noting that whilst long-term historical data is a useful starting point, even with data in the UK going back to 1900, it is insufficient to deliver a level of precision with any great confidence. Although the annual average after-inflation (real) equity return in the UK has been around 7%³ - giving a compound after-inflation return of 5%, with a risk of 20% - statistically speaking we can be 95% confident that the true average annual equity return falls within the range of 3.3% to 10.5%⁴. However, we can be no more precise than that!

In turn, the average temperature in Newquay is 65° on 1st August (at 3pm) based on annual data going back to 1980, with a standard deviation of around 30. Therefore, statistically, we can only be 95% certain that the true average falls within a range of 64° to 66°⁵.

Returns are distributed around the expected average

Let's explore an illustrative example using expected return of 1.5% p.a. above inflation for short-dated high quality global bonds hedged back to sterling and 4.5% p.a. above inflation for global developed market equities, with expected risk levels of 5% and 20% respectively. This means that two thirds of the time, annual returns should fall within the range of the average return +/- the risk number⁶. These expected attributes are illustrated below.

¹ www.weatherspark.com/m/149604/8/Average-Weather-in-August-at-Newquay-Cornwall-Airport-United-Kingdom

² Expected Returns: An Investor's Guide to Harvesting Market Rewards, by Antti Ilmanen, ISBN: 978-1-119-99072, John Wiley & Sons, NY: NY, February 2011.

³ Barclays Equity Gilt Study 2017

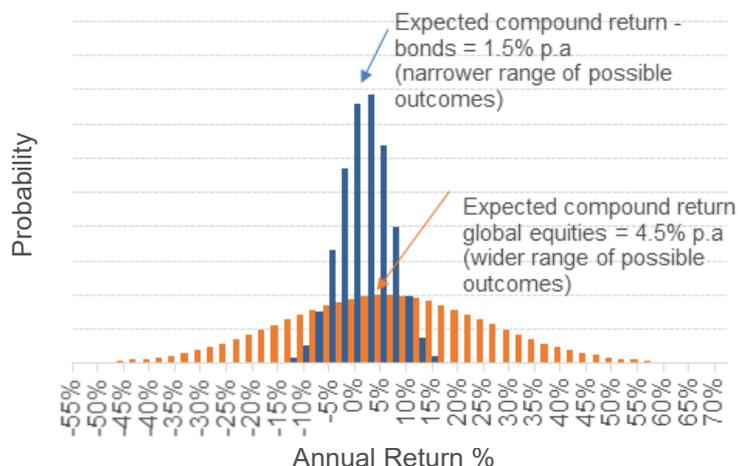
⁴ Based on confidence limit 95% $\approx 7\% \pm 2 \times (20\%/\sqrt{118}) = 7\% \pm 3.6\%$

⁵ Based on confidence limit 95% $\approx 65\% \pm 2 \times (30/\sqrt{36}) = 65\% \pm 10$

⁶ So for bonds one might expect the annual range of outcomes to fall within a range of (approximately) 1.5% +/- 5% - a range of -3.5% to +6.5% two thirds of the time.

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Figure 1: Expected after-inflation return distributions of short-dated bonds and global equities



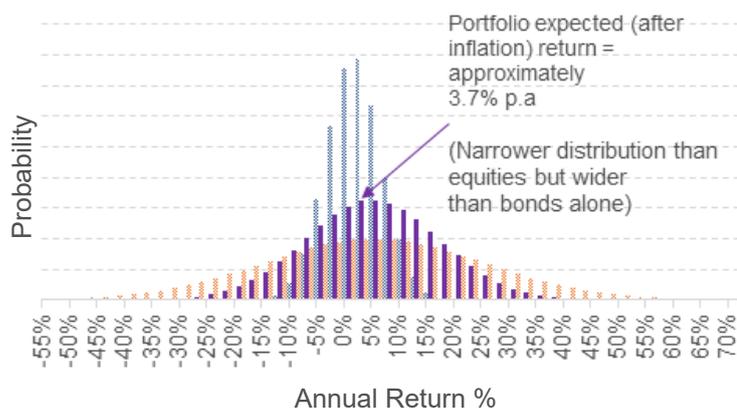
Source: Albion Strategic Consulting

The above graph demonstrates that the ‘expected’ return⁷ sits within a distribution of other possible returns and the range of these potential outcomes is wider for equities than bonds. Summers are hotter than winters.

Building portfolio level expected returns

These individual asset class assumptions can then be built into portfolio level expected returns, which, in practice, is a bit more complicated than simply pro-rating the expected asset class returns by their allocation weights in the portfolio; we need to consider the diversification benefits of combining different asset classes. The figure below illustrates the return distribution of a basic illustrative portfolio⁸ made up of 60% global equities and 40% short-dated bonds (as above).

Figure 2: Expected portfolio returns - 60% global equities and 40% short-dated bonds



Source: Albion Strategic Consulting

Much like the weather in Cornwall, it is hopefully evident that expected returns come with an average outcome that lacks certainty in its magnitude, and that around this average a wide range of alternative outcomes could occur. It might be tempting to wonder why we bother but, just as we know that summers are generally hotter than winters, we know that equities should have higher returns than bonds because they are riskier. This risk-return relationship provides a useful framework for suitable portfolio construction made up of multiple asset classes.

Despite these limitations, building a set of asset class as well as portfolio expected return (and risk) assumptions provides a sensible starting point away from which other less favourable return scenarios can and should be run. For example, testing the outcome of a financial plan if returns are 1%, 2% or even 3% lower than anticipated. This will highlight areas of potential risks to the plan as it stands, help generate workable strategies for mitigating poor returns and initiate meaningful and informed discussions between wealth manager and client.

“In an uncertain environment, rigour is not found in precise single-point predictions, but rather in precisely defined uncertainty estimates. It is not obtained by selecting one right vision for the future, but through rigorous process that will enable you to anticipate and prepare for multiple futures.”

J. Russo and P Schoemaker⁹

Don’t get fixated on ‘expected’ returns

If there is any message worth taking away from this short note it is that you should not be too fixated on the spurious precision of ‘expected’ returns, as none exists. As with any average, you have a 50% chance of getting higher than the average and a 50% chance of getting lower than the average. Knowing and planning for ‘what happens if...’ is a really important part of the planning process and ongoing progress discussions with your wealth manager.

⁷ To be precise the arithmetic return – not the compound or geometric return - sits in the middle of the distribution

⁸ This is not a recommendation nor is it a strategy offered or provided MASECO but is meant to provide educational insight for the reader of the article.

⁹ J. E. Russo, P. J. H. Schoemaker, (2002), *Winning Decisions*, New York: NY Doubleday, p. 102.

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Other notes and risk warnings

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