Do you really understand risk?

Beware of limitations of risk measures and bear in mind there is no such thing as a risk-free return

Hamish Macalister

The headline may seem like an innocuous question for many investors, but the reality is that very few people have a strong grasp of what is meant by risk when making investments.

Returns are generally easy to calculate.

If, for example, the price of an asset we have purchased has doubled in value, then we can generally say that our return is 100 per cent (less any accompanying fees). However, there is arguably no equivalent simple, intuitive and definitive measure of how much risk we are taking to generate that return.

In financial markets, as is often the case in life, there is no free lunch. Returns are generated by the assumption of risk. For all practical purposes, there is no such thing as a risk-free return.

While some assets are used as a proxy for risk-free investments, they still carry some degree of financial risk (such as US government bonds). Even cash is not risk-free in an inflationary environment (as inflation erodes the real return). So to obtain a desired return, we need to take on some degree of risk. Ideally we also want to maximise bang for the buck, that is, we want to obtain the best possible return for the degree of risk we are willing to accept.

However, there are a couple of problems here. First we, the human race, are quite poorly designed for assessing this kind of risk. Our brains are hard-wired to be pattern recognition computers. That is why we are so good at things like facial recognition as well as knowing which trouser holes to put our legs in when dressing in the morning.

Unfortunately our brains developed pattern recognition skills to such an extent that we see patterns where they do not exist. Think of the instance of an ancient hunter hearing a rustle in the undergrowth. Is it a tiger or simply the wind? The safest option is to assume it is a tiger. This is because the penalty of assuming it is wind but being wrong is too great.

One consequence of this behaviour applied to financial markets is to see patterns in the price history of assets, when in fact the data may be entirely random. Another consequence is the notion of "cognitive dissonance", that is, attributing a positive return to one's investment skill, when in fact the truth may be that it was simply good luck (or conversely attributing a loss to bad luck, when it may have been poor skill).

A second problem with measuring investment risk is that there is no single number that captures the myriad dynamics of risk. In the vast majority of instances when an adviser provides an investor with an assessment of risk, they are indeed providing a single number – the standard deviation of returns.

For a retail investor, this number is not intuitively simple. A 5 per cent annualised standard deviation combined with an annualised 5 per cent expected return, for example, means there is a roughly 16 per cent chance of the annual return being 0 per cent or lower and a roughly 2 per cent chance of the return being -5 per cent or lower. Professional investors will of course already be aware of this.

However, less obvious is that this single numeric measure of risk is also based on a set of assumptions. A joke in the field of economics is that you only assume things that are wrong. In other words, you make assumptions to simplify a model, meaning of course you are moving away from reality. In the case of the standard deviation measure of risk, many of the underlying assumptions are patently wrong. Critically, any measure of risk is based on a model. That model will have assumptions. Some of those assumptions can result in a seriously distorted view of risk for

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For example, almost without exception, a standard deviation measure of risk provided to an investor by an adviser assumes that returns are normally distributed (conforming to the classic "bell"-shaped curve).

The reality is, they are typically not. There are often more extreme positive and negative returns than those captured by the standard deviation measure (so-called "fat" tails in the distributions). Arguably more critical is that there are often more large negative returns in particular. In other words, the standard deviation measure may seriously underestimate the probability of a large loss.

Unfortunately, while there are many alternative measures of risk designed to reflect such phenomena, they may sacrifice simplicity for accuracy. They can indeed be extremely complicated. To make matters even worse, measures of risk quite naturally look at past history as a guide for the future. Unfortunately the adage "history always repeats itself" doesn't necessarily apply, at least over the timeframes that investors may be focused on.

Investment products for retail clients often provide some type of risk bucket measure (for example, low, medium or high risk). It is critical that an investor understands what this actually means. What absolute level of risk does the risk category imply? How is it calculated (probably based on the standard deviation of returns)? Is risk measured in a relative sense? If so, what is it relative to?

Alternative measures are the estimated probability of loss and magnitude of loss. Simply, how often should I expect to lose money, and by how much? When based on a suitable history of returns (and employing a method designed to avoid the normal distribution assumptions mentioned above), these measures can provide a relatively robust perspective on a key focus of investors – loss avoidance.

In sum, the world of institutional investment maintains teams of individuals attempting to measure risk with all manner of extremely complicated and esoteric mathematics.

For the individual investor, it is critical to be aware of the pitfalls of common risk measures. Beware of the limitations of these measures and why/when they may provide a misleading assessment of the risk of loss.

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