The “true” value of the equity risk premium

Key points

- We recommend investors use a 3.5% ERP as a basic assumption in calibrating their strategic asset allocation decisions.
- We examine three ways to determine the equity risk premium (ERP), namely the ex-post ERP, the required ERP and the expected ERP, assessing their strengths and flaws.
- We propose a synthetic approach, reconciling the three measures by focusing on the long-term equilibrium.
- An ERP of 3.5% is consistent with the decomposition of what a steady-state equity return should be.
The equity risk premium, or ERP, can be defined as the return paid to equity investors in excess of the long-term risk-free rate, in practice yield on 10-year US government bonds. It is a key metric for investors looking to set portfolio return expectations and take strategic asset allocation decisions.

It also happens to be one of the most widely discussed issues in portfolio management, filling academic literature with lively debate on whether the ERP is positive, negative, or non-existent. In this way, the story arc mimics that of Superman comics, with the main character being killed off and resurrected time and again.

To complicate matters further, there are multiple ways to calculate the equity risk premium, and each methodology provides a different answer to the fundamental question: what level of excess returns should investors expect from their equity holdings in the future?

In this piece we examine three ways to determine the equity risk premium, weighing their strengths and flaws, and propose a holistic approach that draws from each of the three. Finally, we conclude with a crosscheck via the decomposition of what a steady-state equity return should look like.

Positive it’s positive?

Numerous crises and several bouts of risk-aversion have shaken investor confidence in the ability of equity markets to deliver performance above that of the bond markets. But the fact is that global equities have outperformed government bonds over the past 10 years for the period ending June 2013. There are several theoretical arguments as to why stocks should provide higher returns than ‘risk-free’ investments perceived as safe, such as Treasuries. Essentially, equity investors take on a number of additional risks for which they expect additional return. These risks include the following:

(i) Lower seniority in a firm’s capital structure. Equity is junior to debt, meaning that in the case of bankruptcy bondholder claims have priority. Shareholders are often not repaid. This also applies to a firm’s payout; coupon payments trump dividends.

(ii) More volatile income streams. Dividends are significantly more volatile than more reliable and predictable coupon payments.

(iii) Greater price volatility. Stock price returns tend to be considerably more volatile than bond price returns.

In light of these risks, investors should, in theory, expect additional return for buying equities.

In addition, the equity risk premium can be found in other elements of portfolio theory. For example, the capital asset pricing model (CAPM) theory relates a stock’s expected return to the equity premium: a stock that is riskier than the market - as measured by its beta - should offer above market return.

Multiple definitions for ERP

Misconceptions regarding equity return are sometimes linked to the confusion between different methods for determining the equity risk premium. Let’s examine three main approaches:

(i) Ex-post equity risk premium: this is the realized or historical excess return of equities over risk-free assets. The resulting risk premium is a function of the timeframe selected.

(ii) Required equity risk premium: this is excess return over risk-free assets required by investors to hold equities in their portfolios. The required risk premium is closely linked to the risk aversion and perception of investors: the more stocks are viewed as risky, the higher the premium required to invest in equities.

(iii) Expected equity risk premium: this is the excess return of equities over risk-free assets expected by market participants.

That these approaches, which rely on different sets of measures, do not produce the same result should not come as a surprise. Yet, in a...
steady state environment it would be reasonable to expect these values to converge within a narrow range, if not on a single figure.

The starting date critically matters

A good portion of the debate regarding the absolute value of the equity risk premium of US stocks relied upon the first method for defining the ERP, i.e., the ex-post equity risk premium. As a result of the poor performances of equities during the financial crisis, it has been argued that the US ex-post ERP had either disappeared or, worse, had turned negative, which seems an irrational assumption for the long term since a negative ERP implies investors are punished for taking on risk. However, one’s estimate of the ERP using the ex-post method depends heavily on the time horizon considered, and different time periods provide considerably different values. As a result, those on both sides of the debate could quite easily cherry pick the timeframe that best supported their viewpoint.

Looking back to early 2009, it is true that the ex-post ERP for US stocks was negative on 10- and 20-year horizons, positive over a 30-year period, and all periods show ERP now back in positive territory. While the equity premium has varied considerably over time, it is intuitive that the longer the time window used to estimate the ERP, the lower the variability of the premium (Exhibit 1).

In order to overcome time period dependency, we have calculated the average value of ex-post ERPs over various time horizons (10, 15, 20, 30 and 40 years) for all possible starting points from 1945 to present. Exhibit 2 shows that the average value of the ERP over all the possible starting dates stays consistently above 4%, regardless of the time horizon.

This suggests that over the course of the post-World War II period, US equity investors received on average more than 4% excess return over Treasuries whatever their investment horizon. Admittedly, the financial crisis has significantly reduced the ERP: the 30-year ex-post ERP is currently at 1.6% (Exhibit 1), but has been increasing since the crisis lows.

What’s required is priced in

The second way to look at the ERP is the required ERP, or the difference between the total return required by investors to hold equities and the risk-free rate. Required ERP is based upon estimates of what is priced in equity valuation multiples, since these should theoretically reflect the required rate of return for investors. For instance, the Gordon Growth Model for valuing stocks requires that for a higher required risk premium, a higher discount rate be applied to future dividend payments, which results in lower multiples. Starting from the multiples, it is therefore possible to estimate the required ERP for investors. We use a proprietary Dividend Discount Model to extract the ERP over the 10-year US Treasury yields.

Exhibit 3
The required ERP hovers around 3% long term

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3 The AXA IM Research Dividend Discount Model links the trailing earning yield to future earnings growth and to the discount factor corresponding to market-implied required rate of return (RRR). We plug the expected earnings growth obtained thanks to our top-down earnings growth model in our DDM and extract the resulting RRR from current multiples. The ERP for the US market is obtained by subtracting the 10-year US bond yield to the RRR.
This method puts the current required ERP quite high, at nearly 6%, implying that the equity market is significantly undervalued relative to government bonds. Looking back since the early 1970s, the historic average required ERP is significantly lower at roughly 3% (Exhibit 3).

Note that the required ERP has for the most part been steadily increasing since the early 2000s. The 2004-2006 period in particular stands out, since there is no specific reason for the risk premium to have increased in a context of very low volatility. Part of the explanation for the artificial upward trend in the required ERP can be found in the strong downward trend in interest rates observed over the last 30 years. And while the required ERP is now strongly positive, the total required rate of return – which is the sum of the required ERP and the 10-year US bond yield – is simply in line with its historical average (Exhibit 4). This implies that, while equities are cheap compared to bonds, they are bang in line with the average on an absolute basis.

**Exhibit 4**
The required rate of return is at its historical average

Market expectations for equities

The third approach to ERP involves investors’ future expectations for equity returns, based on the Black-Litterman concept of equilibrium expected returns, i.e., the set of expected returns that equate supply with demand for the different asset classes, thus clearing the market.

Within this framework, if the market were expecting zero equity excess return over US Treasuries, then investor portfolios should hold 0% equities. Therefore, if the long term expected ERP were zero and nobody wanted to hold equities, then equity prices and market capitalisations would fall to zero. To the extent that market capitalisations are positive, the market expects to be rewarded for taking on additional risk.

Using our proprietary optimizer and risk model, we have calculated the equilibrium expected returns implied by the current market capitalization weights of the different asset classes.4

We find that the average expected ERP over the past decade is roughly 3.5% for US equities as well as for other developed market equities, and 4% for emerging market equities. Currently, the expected ERP trades at 4.3% for US stocks (Exhibit 5).

**Exhibit 5**
The expected ERP is currently above its long-term average

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4 Technically speaking, the equilibrium returns are derived using a reverse optimization method in which the vector of implied excess equilibrium returns $\mathbf{\Pi}$ is extracted from known information using the following formula:

$$\mathbf{\Pi} = \lambda \mathbf{\Sigma} \mathbf{\omega}$$

Where $\mathbf{\Sigma}$ is the asset covariance matrix of assets excess returns derived from the AXA IM risk model, $\mathbf{\omega}$ the assets’ market cap weights and $\lambda$, the risk aversion coefficient.
Box 1: the equity premium puzzle

The risk premium puzzle refers to the magnitude of the historical or ex-post ERP: the ex-post premium for bearing risk is too high to be explained in the context of the standard neoclassical framework under reasonable assumptions (e.g., with a reasonable level of investor risk aversion). Several explanations have been formulated to try to reconcile empirical evidence and theory. Here is a review of the three main arguments.

**Non-diversifiable risk:** When it comes to diversifying risks, equities provide poor diversification benefits against any systemic factor that could impact consumption. Indeed, this is the kind of asset that pays off when times are good and consumption is high. But for investors, this is less desirable than assets that pay off when times are bad (with potential large drops in consumption in the “disaster explanation” of the ERP) and the capacity to smooth consumption over time is more highly valued due to loss aversion. This would be one of the reasons why investors ask for a higher premium than the simple volatility and correlation of equities would suggest.

**Survivor bias:** This explanation is related to two statistical biases, implying that the very high level of historical ERP is not due to any particular investor requirement, but rather to measurement issues. The long-term ERP is computed on indices that have been weathering the different crises successfully, which is not the case for all of them, e.g., the Russian market following the 1917 revolution. This introduces a first upward bias. But this argument can also be generalised at the stock level: the computation of the ERP is based on indices whose composition has been changing. Unsuccessful companies with below average equity returns have a higher probability of being removed at some point from their index, which implies a second upward bias.

**Borrowing constraints:** The borrowing constraints prevent people from trading equities as they would like. On one side, young people tend to have low wages and would prefer to smooth their consumption path. This could be achieved by borrowing, consuming a part of the loan and investing the rest in higher return equities. But they can’t because of borrowing constraints. On the other side, and for symmetrical reasons, equities are less desirable for old people. Hence a high ERP. If the borrowing constraint is relaxed, then young people buy equities, equity prices rise and the ERP declines subsequently.

Reconciling different measures of ERP

As this analysis has shown, the different versions of ERP can lead to different conclusions, ranging anywhere from 2.5% to 6% (Exhibit 6).

<table>
<thead>
<tr>
<th>Method</th>
<th>Value for US stocks ERP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current 30y ex-post ERP</td>
<td>1.6%</td>
</tr>
<tr>
<td>Avg. 30y ex-post ERP</td>
<td>4.2%</td>
</tr>
<tr>
<td>Current Required ERP</td>
<td>6%</td>
</tr>
<tr>
<td>Avg. Required ERP</td>
<td>3%</td>
</tr>
<tr>
<td>Current Expected ERP</td>
<td>4.3%</td>
</tr>
<tr>
<td>Avg. Expected ERP</td>
<td>3.5%</td>
</tr>
</tbody>
</table>

Source: AXA IM Research

At the moment, while the 30-year ex-post ERP remains at relatively low levels (1.6%) compared with the historic average (4.2%), the current required ERP is very high (6%) — double the historic average required ERP (3%) — while the current expected ERP (4.3%) remains above the long-term average (3.5%).

There are relationships between the various measures. For instance, a very high required ERP may be due to a rise in investor risk perception, which has a negative impact on equity prices—leading to a decline in the ex-post ERP. In fact, this is exactly what we have witnessed in recent years.

The link between the expected and required ERP works similarly: if the premium required
by market participants to hold equities is higher than the expected equity return, then a rational investor would sell equities, which would result in a fall in prices and thus a rise in expected return. In other words, prices play a key role in the supply and demand dynamic in that they can adjust to meet at the market equilibrium.

However, a large divergence between the different ERP measures is not sustainable in the long run, because the required ERP cannot stay at high levels when risk aversion returns to normal – the increase in the risk appetite pushes investors to revise the premium they asked for to hold equities downward, leading to a convergence of these different ERPs.

This last remark has an important implication: in our view, the most relevant way to compute the ERP involves reconciling the three approaches by focusing on equilibrium over the long run.

As we showed above, the long-run required ERP is 3%, which is significantly lower than the 4.2% average 30-year ex-post ERP. Note that the level of the ex-post ERP is fairly high and relates to what the academic literature calls the equity premium puzzle” (see Box 1).

The academic literature provides several explanations for this difference, one of them being a survivorship bias: the ex-post premium reflects the returns on stocks or indices which have managed to survive financial crisis episodes and are therefore subject to an upward bias. The required ERP is obviously not subject to such a bias, but the irrational exuberance of the dotcom bubble is likely to have introduced a downward bias as largely overstated earnings potential has led to amazingly high valuation multiples. Therefore, the truth lies most likely between these two extremes. This is why, in light of the above, our estimate for the “true” ERP is 3.5%, which corresponds precisely to the average of the expected ERP extracted from the market capitalization weights of the assets.

No risk no gain

Even when calculating the ex-post ERP over reasonably long horizons, we still end up with different values, potentially negative, depending on the starting point. For instance, the worst 20-year ex-post ERP observed since 1945 is -1.8%. This is the negative excess return over treasuries that investors who bought US equities in March 1989 would have obtained if they had sold off their stocks in March 2009 (Exhibit 1 and 7).

Here comes a frequent misconception: because equities are perceived as risky, it is sometimes argued that they should always deliver a positive excess return over risk-free assets over long-term horizons to compensate for the extra risk. We can easily reverse the argument. If there were no risk on the ex-post excess return of equities, there would be no reason to earn a risk premium. There is no such thing as zero risk in equities, and this is precisely why equities pay more on average than risk-free assets. But it is also clear from Exhibit 7 that the longer you hold your stocks, the greater the likelihood you have of positive annualised excess return.

Exhibit 7
The volatility of the ex-post ERP declines with the time horizon

Source: Shiller data, Bloomberg, Datastream, AXA IM Research

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ERP of 3.5%: the cross-check

A pragmatic investor may raise the question whether the 3.5% matches reality. We think it does! Let's do the math.

Equity returns can be broken down into three components: changes in price-earnings, dividend yields and earnings growth. In a steady state environment, it is fair to assume that the stock market multiple is a constant and no re- or de-rating has an influence on market returns and thus on the ERP. Regarding dividends, the average US dividend yield since the end of WWII is 3.5%. However, given the clear downward trend observed over the last 60 years, a more reasonable assumption for the US dividend yield is 3% in our view.

Finally, earnings-wise, we expect the US nominal GDP to grow by 4.5%-5% per year over the next 10 years and the global nominal GDP by 6% over the same period. Given the exposure of listed US companies to local and global growth, the average nominal GDP growth of 5.5% seems a reasonable working assumption.

Furthermore, earnings of large cap indices like the S&P500 tend to grow on average at a slightly higher pace than nominal GDP, partly because of a survival bias, but also because the non-tradable sector grows at a slower pace. Given our assumption of US and Global nominal GDP growth and the exposure of US large cap companies to global economic activity, earnings should grow by 6%. All in all, we end up with an expected total return of 9% for US equities: 3% dividend yield plus 6% earnings growth and a constant valuation multiple. At the same time, we think that, in a steady state environment, the 10-year Treasury yield should trade at around 5.5% (5% nominal growth plus a risk premium of 50 bps). These assumptions imply a 3.5% ERP (9% equity return minus 5.5% bond return), matching the above-mentioned ERP assumption. In light of our analysis here, we recommend that investors use a 3.5% ERP in their strategic asset allocation decisions or models.

We assume that dividends grow in line with earnings, i.e., that the dividend pay-out ratio remains constant.

Companies with very low earnings growth have a higher probability of being removed at some point from their index.
Our research on the internet

All our research is available on our website: http://www.axa-im.com/en/research

Our last two publications:

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Matthew Cairns and Florian Grandcolas examine the evolving bail-in legislation and its possible impact on Senior and Subordinated pricing. They conclude that credit quality differentiation will become increasingly important for European banks as changing perceptions of balance sheet health and lower recovery rates for senior debt could place renewed pressure on spreads.

**EU banking union: a progress report**

The project of a European banking union was initiated in June 2012. We judge its successful implementation - at least the first two dimensions, the Single Supervisor and the Single Resolution Authority - as critical to create the financial conditions for a sustained recovery. One year on, it's time to take stock.

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