KPMG

Equity Market Risk Premium – Research Summary

13 July 2017

We recommend a market risk premium of 5.75% as per 30 June 2017

If you are reading this, it is likely that you are in regular contact with KPMG on the topic of valuations. The goal of this document is to provide a summary to our business partners about our recent observations and conclusions regarding one of the key valuation parameters, the equity market risk premium.

We recommend the use of an equity market risk premium of 5.75% as of 30 June 2017, stable in comparison with 30 March 2017. Although stable overall, the implied equity returns of the European indices have all increased slightly over the last quarter. The US index S&P 500 is the notable exception, showing a significant decline of 0.7%-point in the implied equity returns. The change is basically due to downward adjustments of growth forecasts by analysts – in the more popular press sometimes referred to as 'Trump-dump'

Jeroen Weimer
Partner

Phone: +31 20 656 7469
Mobile: +31 6 5333 7207

Weimer.Jeroen@kpmg.nl

Romy Marsal
Associate Director

Phone: +31 20 656 4544
Mobile: +31 6 2139 0466

Marsal.Romy@kpmg.nl

Herman Engelbrecht
Manager

Phone: +31 20 656 4084
Mobile: +31 6 5129 7439

Engelbrecht.Herman
@kpmg.nl

Niek van Orsouw
Associate

Phone: +31 20 656 4422
Mobile: +31 6 2272 5029

vanOrsouw.Niek@kpmg.nl

Richard van Baardwijk
Associate

Phone: +31 20 656 7534
Mobile: +31 6 1066 7291

vanBaardwijk.Richard
@kpmg.nl

Introduction – valuation and discount rates

Introduction

The discount rate is an important input parameter to any valuation based on the discounted cash flow methodology ("DCF").

A general DCF model can be expressed by the following formula:

$$\text{Present value} = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \ldots = \sum_{t=1}^{\infty} \frac{CF_t}{(1+k)^t}$$

Where

Present value	=	value of the analysed asset (e.g. a company)
CF_t	=	cash flow that the asset will generate in period t
k	=	asset-specific discount rate

It is generally true that, all else equal, a higher discount rate will lead to a lower asset value and vice versa.

In this document, we will specifically focus on the derivation of the cost of equity for company valuations. This discount rate can either be directly applied to equity cash flow forecasts of a company or it can be used in conjunction with the cost of debt and a certain financing structure to derive the weighted average cost of capital ("WACC").
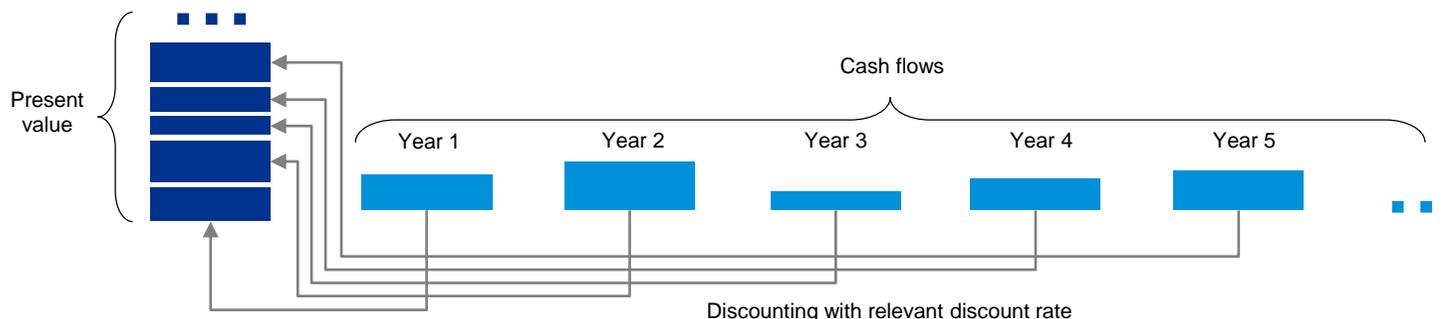
Discount rate derivation

While there are several ways to derive discount rates, the most commonly applied methodology is the 'build-up methodology' based on the Capital Asset Pricing Model ("CAPM"). This methodology builds up the discount rate by summation of several asset-related risk components in order to derive a return at which investors are willing to invest in this asset (e.g. a company).

The build-up of the cost of equity ("k") of a company can be expressed as:

$$k = rfr + \beta \times MRP + \alpha$$

Where

k	=	required return on equity
rfr	=	risk-free rate
β	=	a company's systematic risk
MRP	=	market or equity risk premium
α	=	asset-specific risk factors

The function and derivation of the individual discount rate parameters are briefly discussed on the following slide.

Present value

Cash flows

Year 1   Year 2   Year 3   Year 4   Year 5

Discounting with relevant discount rate

Introduction – discount rate parameters

Risk-free rate

The risk-free rate forms the basis for any discount rate estimation using the build-up methodology. As the name implies, this rate should not take into account any risk factors. Thus, it should only include two general components:

— The time value of money; and

— Inflation.

Since there are no investments that are truly risk-free, the risk-free rate is commonly approximated by reference to the yield on long-term debt instruments issued by presumably financially healthy governments (e.g. AAA-rated government bonds with a maturity of 30 years).

Beta

Beta measures how the returns of a certain company behave in relation to the returns of the relevant market benchmark.

— A beta greater than 1.0 means that the share price of a company is more volatile than the general market and therefore investors will require a higher return as compensation for this volatility; and

— A beta smaller than 1.0 means that the share price of a company is less volatile than the general market and therefore investors will require a lower return.

It is important to note that for the overall market, beta will by definition always be 1.0, since the sum of all returns of individual stocks equals the overall return of the market, and therefore, the two are perfectly correlated.

Alpha

Alpha is an asset-specific adjustment factor that may need to be applied for a number of different reasons. If a financial forecast does not account for certain operational risks, it may be appropriate to include a forecast risk premium. Other examples of alpha adjustments are size premia, illiquidity premia, etc.

Equity market risk premium

The equity market risk premium ("MRP") is the average return that investors require over the risk-free rate for accepting the higher variability in returns that are common for equity investments.

As previously discussed, the beta of the overall market is 1.0. Since alpha only relates to company-specific adjustments, it can be omitted if considering the overall market. As such, the general formula for the cost of equity is simplified if the overall market is considered:

$$k = rfr + \beta \times MRP + \alpha$$

$$k = rfr + 1.0 \times MRP + 0.0$$

$$k = rfr + MRP$$

As the final formula shows, the required return for the overall market is defined entirely by the risk-free rate and the equity market risk premium.

The remainder of this document will focus on movements in the equity market risk premium and the appropriate adjustments to derive valuation outcomes that are in line with other valuation-relevant market observations.

Measurement of the equity market risk premium - methodologies

Quantification

In order to quantify the change in the equity market risk premium, a number of methodologies can be applied.

Historical observation methodology

This methodology assumes that the expected equity market risk premium can be derived by studying historical equity returns.

While this methodology is well established and theoretically sound, it does not allow for the incorporation of the most recent market developments:

— Depending on the methodology, annual short-term swings (e.g. 1-3 years) may be insignificant in the long-term (e.g. 30 years); and

— If the expected equity market risk premium increases because investors require a higher return, market data will show lower realised returns, and thus a lower historical equity market risk premium would be derived. For this reason, short-term observations based on historical data only are not conclusive.

So while historical research can be important to derive reasonable equity market risk premium ranges, historical observations are not necessarily a robust methodology to determine changes in the equity market risk premium.

Implied equity market risk premium methodology

This methodology derives the equity market risk premium by assessing current income, growth expectations and current prices. The general DCF formula discussed earlier can then be used to solve for the implied discount rate that reconciles these parameters.

Deducting the risk-free rate from this implied discount rate will yield an implied equity market risk premium.

This methodology is also well established and theoretically sound, and it does allow for the incorporation of the most recent market developments.

The implied equity market risk premium methodology is to some extent sensitive to input assumptions and careful consideration must be given to:

— The selection of income proxies (e.g. dividends, buy-backs, cash flow);

— The basis of expected growth rates (e.g. macroeconomic considerations, analyst forecasts); and

— The trade-off between outcome stability and current relevance with regards to certain historical inputs (e.g. dividend yield normalisations, pay-out ratios).

Other methodologies

There are a number of other prominent methodologies which may lead to additional insights, the most common being:

— The multi-factor model;

— The yield spread build-up; and

— The survey approach.

While each of these methodologies offers some unique advantages, the application of these methodologies involves similar trade-offs as the ones between the historical and the implied equity market risk premium methodology.

Methodology KPMG

We deem the implied equity market risk premium methodology the most appropriate methodology in order to derive changes in the equity market risk premium as a result of the financial crisis, because it incorporates recent market developments, expectations, and it can be logically deduced from observable market data.

On the following page we present our findings based on the application of the implied equity market risk premium methodology.

Development of discount rates

Recent developments

As stated earlier, the equity market risk premium can be seen as the difference between the implied equity returns and the risk-free rate.

In the upper graph the interest rate movements for a number of highly developed markets are displayed. As can be observed, the interest rates as per 30 June 2017 did slightly increase in the Netherlands, the UK and Germany compared to our last MRP update on 31 March 2017. However, in the US the interest rates decreased slightly compared to the last quarter.

The lower graph shows the movement in the implied equity returns for a number of major equity markets over time. As can be seen, the implied equity returns of the European indices (i.e. AEX, Stoxx 50, FTSE and the Stoxx 600) have slightly increased compared to last month. The US index S&P 500 is a notable exception here, showing a decline in the implied equity return mainly due to a downward adjustment of growth as forecasted by analysts, compared to the forecasts in the previous quarter, in the more popular press sometimes referred to as 'Trump-dump'.
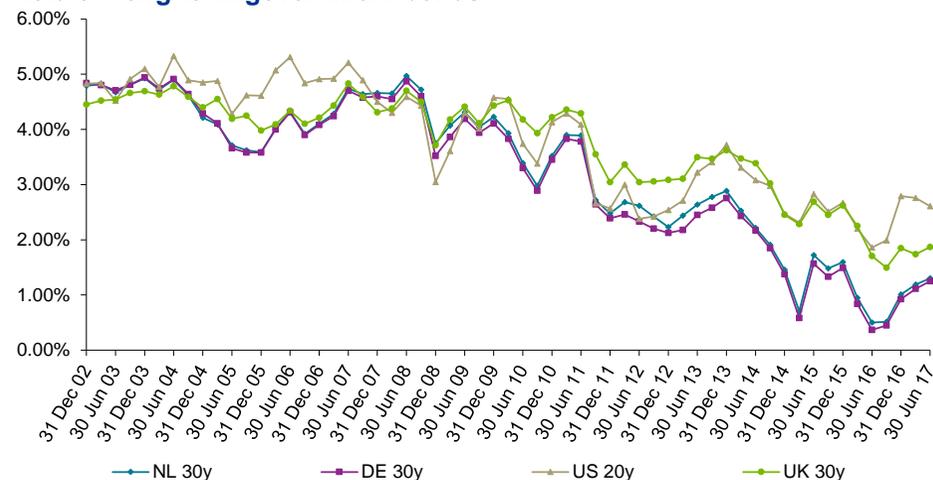
No conclusive downward or upward trend can be observed in the overall market risk premiums relative to the first quarter of 2017, as further discussed on the next page.
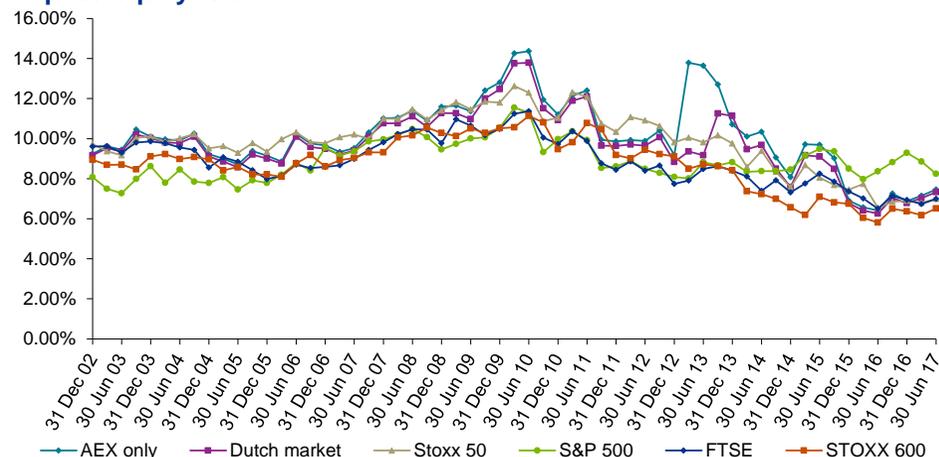
Comparison to pre-crisis levels

The spread between the implied equity returns and the risk-free rates was comparatively lower in the period before the crisis as compared to more recent periods. A possible explanation is that before the crisis the perceived market risk was lower, as demonstrated by relatively more stable expected equity returns and higher government bond yields.

Other evidence for a higher equity market risk premium compared to pre-crisis levels can be found in yields on government bonds having been lower than expected inflation rates at certain points in time. This implies that the risk aversion of investors has increased ('flight to safety'), accepting zero or negative real returns in order to protect against significant capital loss.

Yield on long-term government bonds

Legend: NL 30y, DE 30y, US 20y, UK 30y

Implied equity return

Legend: AEX only, Dutch market, Stoxx 50, S&P 500, FTSE, STOXX 600

Equity market risk premium: 5.75%

Findings

Based on the application of the implied equity risk premium methodology, we have derived market risk premia for several developed markets for the last 15 years.

Since markets fluctuate on a daily basis and there are some differences between market risk premia in different regions, it is difficult to mathematically derive one single point estimate for a universal equity market risk premium for all developed markets.

Similar to the determination of the input parameters, interpretation of the outcomes of the implied equity market risk premium methodology does require an element of professional judgement.

As previously mentioned, we observe an increase in risk free rates and an increase in the implied equity returns in the Netherlands, the UK and Germany, resulting in a small increase in the equity risk premium. US interest rates, however, are declining together with implied equity returns, resulting in a drop in the US equity risk premium.

Implied equity risk premium

Legend: AEX only, Dutch market, Stoxx 50, S&P 500, FTSE, STOXX 600

Equity market risk premium KPMG NL

Based on the analyses set out in this report, no conclusive upward or downward trend can be observed. Therefore KPMG Netherlands recommends the use of an **equity market risk premium of 5.75%** as per 30 June 2017, similar to the rate as per 31 March 2017.

We note that our estimation is based on information available as at 30 June 2017. Developments in the market after 30 June 2017 may have an impact on the perceived market risk which is not reflected in the MRP estimate as at 30 June 2017.
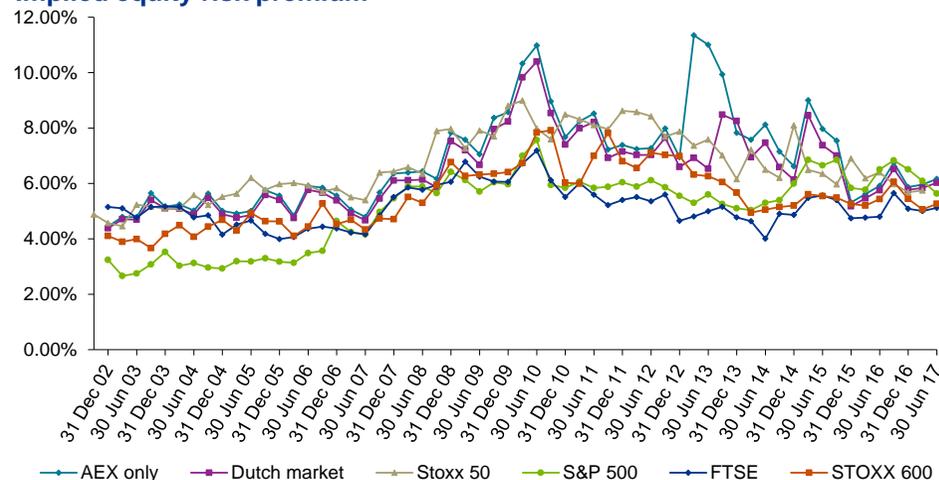
Considerations

In order to assess the reasonableness of the outcomes of our implied equity market risk premium study, we have considered various other methodologies as previously described. To the extent that these methodologies are valid to derive insights about the current level of the equity market risk premium, these methodologies have confirmed our findings.

Based on our research and professional judgement we propose a global equity market risk premium. However, when calculating a discount rate consideration must be given to (amongst others): the basis for the applied risk-free rate, the applicable country risk premia, and expected differences in inflationary outlook. We highlight that individual input parameters should never be viewed in isolation.

Appendix

Historic MRP estimates

Please find an overview of the historic MRP estimates by KPMG in the table below.

KPMG NL - Historic MRP	
As per date	**KPMG estimate**
30 Jun 17	5.75%
31 Mar 17	5.75%
31 Dec 16	6.00%
30 Sep 16	6.50%
30 Jun 16	6.00%
31 Mar 16	5.75%
31 Dec 15	6.00%
30 Sep 15	6.25%
30 Jun 15	6.25%
31 Mar 15	6.25%
31 Dec 14	6.00%
30 Sep 14	6.00%
30 Jun 14	6.00%
31 Mar 14	6.00%
31 Dec 13	6.00%
30 Sep 13	6.00%
30 Jun 13	6.50%
31 Mar 13	6.50%
31 Dec 12	6.50%
30 Sep 12	6.50%
30 Jun 12	6.50%

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