



International Valuation Newsletter

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kpmg.ch/dealadvisory

Dear reader

Major uncertainties continue to prevail in economics and geopolitics. Not least the results of the US mid-term elections, decelerating Brexit negotiations, nationalist parties making gains across Europe, and President Trump's new wave of sanctions against Iran. In fact, the potential to destabilize the Middle East is very real when taken together with trade sanctions against Turkey, where the inflation rate is already around 25%.

Stock markets are reflecting these uncertainties, with major indices losing ground in late Q3 and into Q4 2018. We believe this is the right moment to consider possible approaches to calculating the risk premiums of equity investments. We also share our insight into the growing necessity for valuing machinery and equipment and the respective challenges that come along.

This third International Valuation Newsletter of 2018 is therefore a timely look at the past 12 months, presenting recent capital market data that are pertinent to any valuation analysis:

- Major stock market performances: US indices still outperform globally
- EURO STOXX 600 sector multiples: Mainly flat while Energy dominates Q3 2018
- Current risk-free rates for major currencies: Interest rates are on the rise
- Recent country risk premiums and inflation forecasts for the BRIC countries: Strong short-term growth expectations for Russia

As 2018 draws to a close and we wait to see what a new year will bring, we wish you an enjoyable holiday season and look forward to discussing with you current valuation trends and practices.

Yours faithfully



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Machinery and equipment -

the challenge of valuing
a wide range of assets



The necessity for valuing machinery and equipment has increased significantly in almost all industries in recent years. In all contexts, the main challenge is to determine an appropriate valuation approach for a typically high number of assets.

Generally speaking, there are no standardized guidelines or principles for valuing machines and equipment, though some bodies have developed essential principles on which valuations are usually based. These include e.g. Germany's IfS (Institut für Sachverständigenwesen) and the US's ASA (American Society of Appraisers).

Selecting the most appropriate valuation method

When choosing a valuation method, the selection of market, income or cost approach depends mainly on the reason for the valuation. It is also directly influenced by the nature of use and the materiality of the asset being valued. On cost-benefit grounds, a detailed valuation of each asset is rarely performed in practice. Instead, in accordance with the materiality principle, high-value assets are valued in as much detail as possible, and low-value or immaterial assets valued in a simplified way. To achieve this, companies or facilities are divided into clusters based on their proportion of total assets. Further distinctions within these clusters can be made according to the major asset classes and subclasses.

Prioritizing your assets

Particularly valuable companies or facilities (Priority 1) are subjected to a detailed evaluation. Less valuable companies or facilities (Priority 2) are more roughly assessed from the desk, taking into account the Priority 1 valuation findings. Companies or facilities classified as immaterial are summarized as Priority 3 for which a projection may be suitable, for example on the basis of a regression analysis.

The three commonly applied valuation methods are used to value the key machinery and equipment of the Priority 1 and Priority 2 clusters. A market-price-oriented method for determining the value of property, plant and equipment is the comparison method. It is based on transaction prices actually paid for comparable machines and equipment on the market. However, a market in which such assets are regularly traded is often lacking, particularly for special machines. As comparable transaction information is therefore not always available, in which case application of the method is limited.

Particular challenges in assigning income or costs

The discounted cash flow (DCF) method under the income approach – which is based on the discounting of

future earnings or payment surpluses generated by an asset over its remaining useful life – could be an alternative if no comparable market information is available.

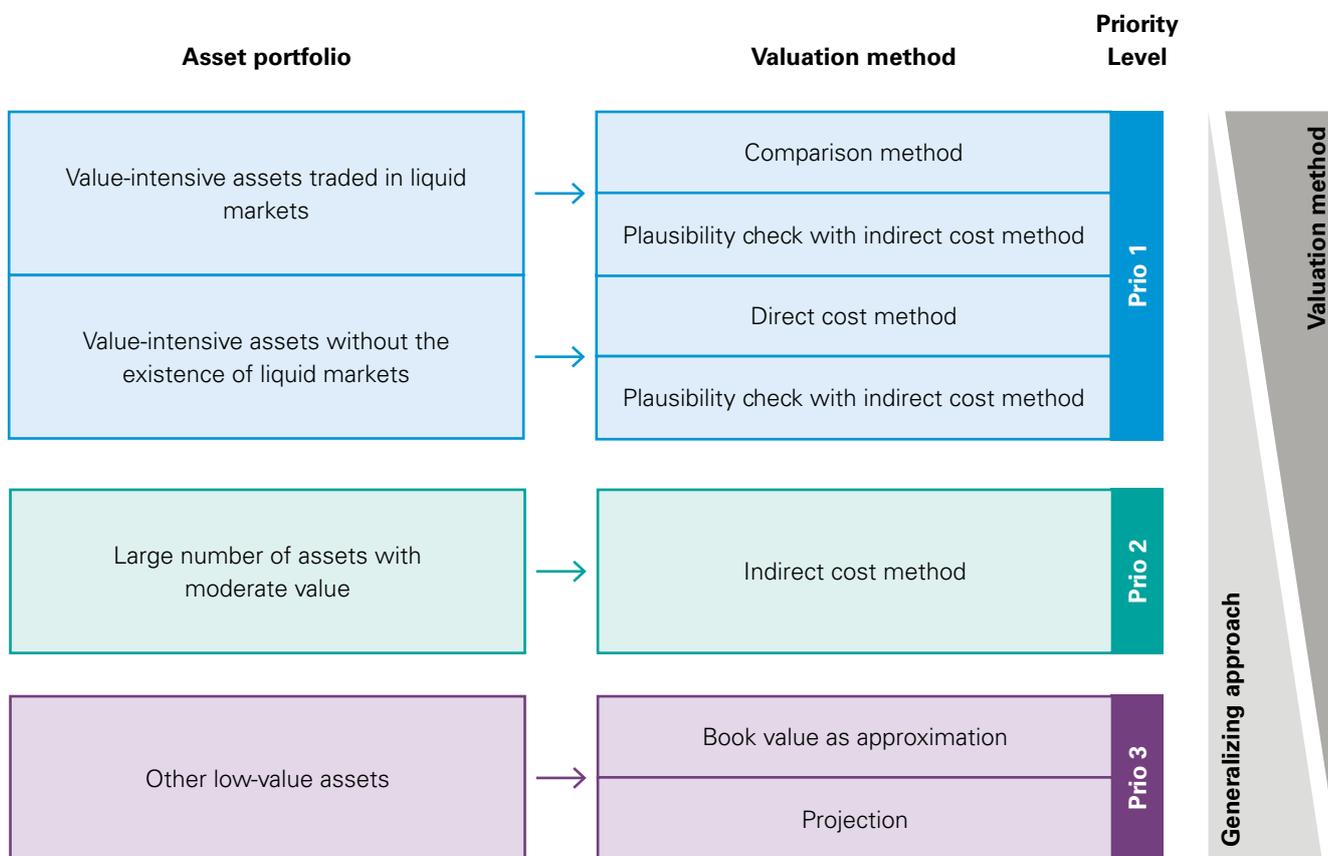
In day-to-day practice, the difficulty is to allocate the income or payments attributable to a larger bundle of assets (e.g. a company, segment, facility or equipment) to an individual asset. This method is therefore rarely used to value machinery and equipment.

The tangible asset method as the cost approach is based on the principle of a new purchase or replacement of an identical asset. Due to the limitations of the comparison and DCF method described, the cost approach is most frequently used in practice for the valuation of machinery and equipment.



The following diagram illustrates the methodology for the valuation of machinery and equipment:

Valuation method by asset category



Source: KPMG

For the tangible asset method, replacement costs for technical equipment are either obtained directly from the respective manufacturer or derived indirectly on the basis of historical acquisition and production costs, including price developments since the date of acquisition. The replacement costs are then reduced by physical, technical or economic impairments. Economic impairments should reflect the actual value depreciation and the conditions of the machinery or equipment being valued.

The useful life has a considerable influence on the derived value of the asset. For this purpose, standard useful lives are determined for each asset class and, in individual cases,

for particularly high-value assets. The cut-off value is also important. If the economically expected useful life of a machine has already expired by a valuation date, the mathematically determined value based on the average useful life would be zero. As the economically useful life is regularly determined as an empirical value using an asset class, this can deviate in individual cases. If a machine is still actually in use and contributes to the operational success, a value – the so-called cut-off value – must also be assigned to it.

The choice of valuation approach and individual valuation parameters naturally have an influence on the result of the valuation of machinery

and equipment. The valuation approach should therefore be chosen on the basis of materiality and the parameters should be individually adapted to each company. In order to meet the high requirements of a valuation, it is therefore advisable to involve an expert to ensure through his or her experience that the basics of the valuation are adequately applied and the correct valuation method is chosen.

Equity investments:

four approaches
to estimating the
risk premium



The risk connected to an investment in stocks is usually referred to as the equity risk premium (ERP). ERP is a premium return on investment that investors expect to receive for taking on additional risks associated with investing in stocks compared to risk-free assets such as selected government bonds.

ERP is a key parameter in most models applied to estimate risk levels and rates of return. It is also an important component of the cost of equity and the weighted average cost of capital. Here we present four approaches to estimate the risks associated with investing in equity shares:

- historical method;
- country risk premium (CRP);
- implied ERP; and
- market surveys (market practice in applying the premium).

Historical method

This is based on the calculation of the long-term average difference between the annual rate of return on the stock market and the annual rate of return on risk-free assets. Those studies are regularly performed for various countries (stock markets). The US market is of course the largest equity market and offers the longest trading history. However, even for the US, premium values range from 3.0% to 12.0% due to differences in applied assumptions related to the length of the historical period under consideration, the type of equity index and the risk-free asset.

Estimation of the historical ERP requires adopting certain assumptions with regard to:

- The duration of the historical period covered. Morningstar, the institution that calculates the historical ERP for the US market on a regular basis, applies capital market information dating back to 1926. Selection of the historical period can significantly influence the results due, for example, to periods of negative equity risk premium.



Analyzing a short period can reveal a considerable standard deviation (measures the volatility of the results), sometimes even exceeding the obtained results, making the analysis less reliable.

- Stock exchange index and the risk-free rate. The preferred index is usually the one that reflects the broadest part of the capital market (S&P 500 for the US). The most appropriate risk-free assets are long-term Treasury bonds, of which the most commonly used constitute the 10 or 20-year bonds issued by the respective government.
- Application of arithmetic or geometric average to annual rates of return on the stock market and risk-free asset. The geometric average usually provides a lower result.

Upon selection of these parameters, the historical ERP is the difference between the long-term average rate of return on the equity index and the rate

of return on government bonds. While historical ERP can be reliably determined for mature markets, a significant weakness of this method is its lack of practical application for developing countries or countries in which listed companies represent a small fraction of the economy.

Country risk premium (CRP)

Another method is based on the CRP, which assumes that a potential investor requires an additional premium for taking on risks associated with investing in a particular (normally developing) country. This method allows us to measure by how much the ERP in a developing country is higher than that in the developed country. This is expressed by the following formula:

$$\text{ERP}_{\text{Country A}} = \text{ERP}_{\text{EURO/USD}} + \text{CRP}_{\text{Country A}}$$



The advantage of this method is its relative simplicity and the ability to apply it to a country that issues government bonds and is rated by a recognized credit rating agency. Its disadvantages lie in the fact that some of its variations are based on information related to data obtained from the debt market, rather than the stock market that is more appropriate to an ERP. Moreover, in the case of developing countries, the data used may be subject to sudden and significant volatility, meaning that the results may vary depending on the date the estimate is prepared.

Four basic ways to determine the CRP are presented below:

a) Country sovereign rating

The first step is to identify countries whose governments issue long-term bonds denominated in EUR or USD and who have the same rating as the country for which the CRP is required. The difference between the average yield on long-term bonds denominated in EUR or USD issued by the governments of the selected countries, and the risk-free rate for a developed country (i.e. yields on bonds issued by the US) is calculated as of the estimation date. Although sovereign ratings reflect the risk of non-repayment of debt by the issuer of debt securities (so-called default risk) instead of the ERP, similar factors affect both the rating and the premium – among others the stability of the currency, fiscal and political situations.

This method is useful when the CRP is to be determined for a country that does not issue bonds or whose bonds are not denominated in EUR or USD. It allows for averaging the difference in bond yields of countries sharing the same rating, so that calculated premiums are characterized by lower volatility and are independent of sudden changes in the yields on bonds issued by the country in question.

b) Bond default spread

Another relatively simple method involves adjusting the ERP assumed for the US for the difference between yields on long-term bonds denominated in EUR or USD issued by the government of a developing country, and yields of bonds with the same maturity issued by the US Government.

c) Relative equity market standard deviation

The CRP should reflect the difference between the stock market of the given country and the risk of a developed country's stock market. A commonly used measure with regard to stock market risk constitutes the standard deviation of returns on equity index. The ERP can be computed as follows:

$$\text{ERP Country A} = \text{ERP the US} * \left(\frac{\text{Standard deviation of Country A}}{\text{Standard deviation of the US}} \right)$$

d) Credit Default Swap (CDS) spreads

Another method is based on the size of CDS spread for government bonds. CDS is a derivative applied to hedge against a credit risk. The buyer of the CDS instrument receives from the seller a guarantee of debt repayment by the third party in case of a credit event such as bankruptcy. In exchange the buyer makes periodic payments until the debt is repaid. The annual cost of the CDS instrument to the buyer – the CDS spread – incurred in connection with securing a repayment of debt by a third party is expressed by applying basis points as a percentage of a notional amount of secured debt. The CDS market has developed significantly in recent years, with information on CDS spreads having become readily available. Related literature recommends using CDS spreads for long-term liquid government bonds and calculating the difference between the spread for the analyzed country and the US.

Implied equity risk premium

This method involves neither historical data nor adjustments to the premium of a developed country via the CRP. It does, however, assume that the stock market capitalization reflects the fair value of shares listed on the stock exchange. The implied ERP is often referred to be the best prediction of premiums to be realized in the future, in contrast with the result obtained by the historical method.

The disadvantage of this approach is its dependency on the availability of data –expected dividend, dividend growth rate and the fact that the change in stock market sentiment will affect the value of the implied ERP. For instance, the ERP value is higher during an economic downturn, characterized by low interest rates as well as greater expectations regarding dividend yield and future growth rates, in comparison to boom stock market periods. One of the methods used to estimate the implied ERP is the Dividend Discount Model (DDM). This implies that the value of equity (shares) is the sum of the discounted value of expected future dividends. One version of the DDM – the Gordon Model – assumes a constant rate of growth in net income and dividends in the future.

Assuming that the observed share price at the valuation date reflects the fair value, and considering reliable estimates of dividends for the coming period as well as the expected nominal growth rate of dividends in subsequent periods, the only unknown factor to be determined is the required rate of return on equity. After subtracting the risk-free rate from the required rate of return on equity we obtain the implied equity risk premium. Having appropriately modified the Gordon Model, the required rate of the return on equity can be calculated as the sum of the dividend yield and the expected growth rate of the future dividend, expressed as follows:

$$\text{Required rate of return on equity} = \text{Dividend yield} + \text{Expected growth rate}$$

Following which, the implied premium is calculated according to the following formula:

$$\text{Implied equity risk premium} = \text{Required rate of return on equity} - \text{Risk-free rate.}$$

Market surveys

Considering the fact that the ERP reflects the expectations of investors and market participants with regard to the rate of return from the stock market over the risk-free rate, the level of premiums, used on a daily basis by investors, has been obtained through market surveys.

For example Pablo Fernandez, a professor at IESE Business School, and his team conducted such a study regarding the level of the ERP applied by analysts, professors and companies in 59 countries in 2018.

USA
5.4%
UK
5.5%
Germany
5.3%
Austria
6.2%
Switzerland
6.9%

Source: Fernandez, Pershin and Acín, IESE Business School, "Market Risk Premium and Risk-Free Rate used for 59 countries in 2018: a survey"

Germany
6.5%
Austria
6.7%
Switzerland
5.9%

Cost of Capital Study 2018, Link, 276 responses

Critical considerations

The historical method is widely used as a basis for estimating the ERP, in particular for developed countries. Countries, where local studies are not available often refer to USD or Euro studies as a reference. The main

disadvantage is the fact that historical observations are applied to forward looking cash flows.

In practice, the historical method is not appropriate to estimate the ERP for developing countries due to the short available history of market information and the lack of reliable historical data. For such developing markets the CRP method is often used, i.e. a contribution of a historically derived USD- or Euro-ERP plus the CRP.

It should be noted that methods based on the CRP may indicate relatively wide ranges of premium and can be volatile, depending on the date when a measurement is carried out.

The implied ERP method is gaining more and more popularity as it is a forward looking approach. However, the specific application of the implied method requires certain assumptions (e.g. dividend payout ratio, long-term growth rate), which have a significant impact on the result. Such assumptions are more based on professional judgement rather than on empirical evidence. So far, no consistent approach has been generally accepted yet.

The reference to market surveys is of course a simple approach and thus attractive for the many businesses that are not dealing with complex valuation questions on a regular basis. It should be of course carefully assessed whether a broad industry average is actually appropriate for a particular equity investment in a specific environment.



Cost of Capital Study 2018 New Business Models – Risks and Rewards

[Click here to read more about the results of the study](#)

Capital market data





In this section we provide a selection of key financial market data, covering:

- Comparison of major stock market performances for the 12 months ending 30 September 2018
- EURO STOXX 600 sector multiples
- Risk-free rates for major currencies
- Country risk premiums and inflation forecasts for the BRIC countries

Major stock market performances: US indices continue to outperform

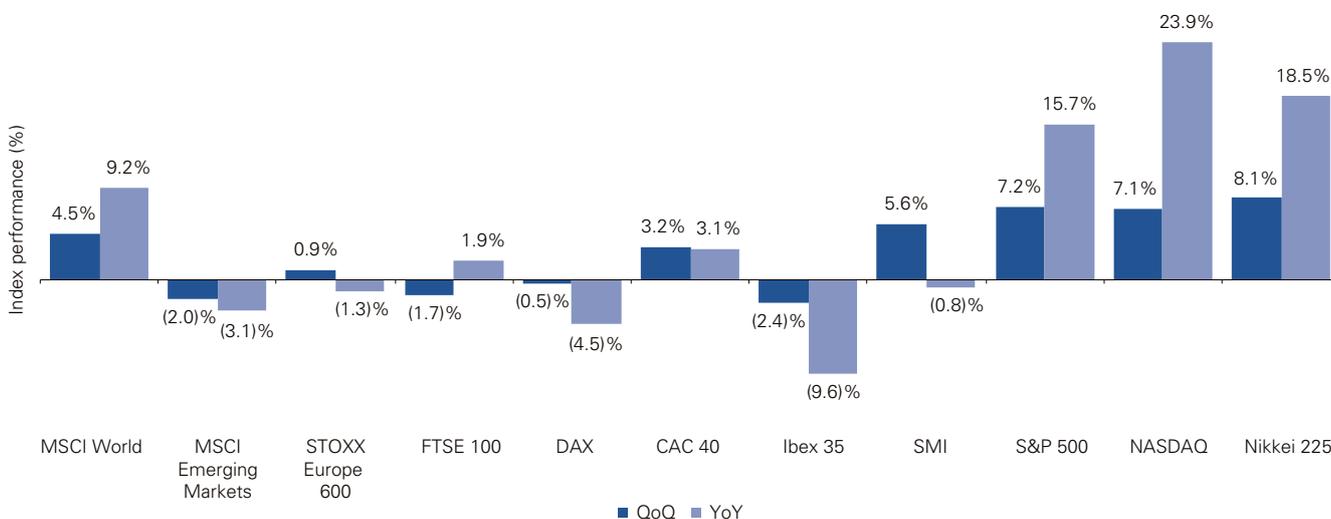
The NASDAQ Index continued to perform extremely well over the past 12 months, at +23.9%. The S&P 500 Index (+15.7%) and the Nikkei 225 Index (+18.5%) also posted outstanding performances. European stock indices as well as emerging markets continue to lag far behind their US and Asian counterparts, with some showing a negative performance over the past 12 months. The Spanish Ibex 35 recorded the lowest performance at minus 9.6% while other European Indices such as the

DAX (minus 4.5%) also deteriorated. The Swiss SMI, however, managed to recover compared to the last update to minus 0.8% over 12 months.

The Nikkei 225 Index outperformed its peers globally on a quarterly basis by posting growth of 8.1% in Q3 2018, followed by the S&P 500's growth of 7.2% for the same quarter. The two indices that performed the most negatively in Q3 2018 were the Ibex 35 at minus 2.4% and the MSCI Emerging Markets Index at minus 2.0%.

Performance of leading indices

30 September 2017 – 30 September 2018



Source: Capital IQ, KPMG analysis

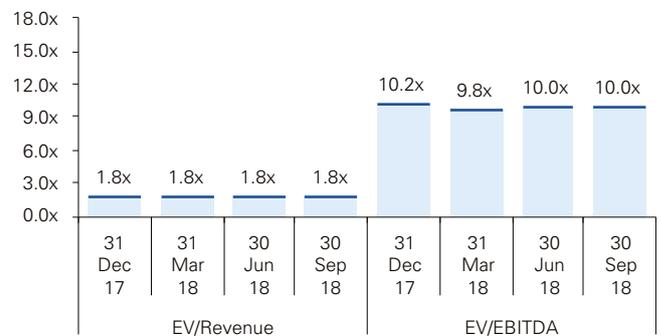


EURO STOXX 600 sector multiples: Mainly flat while Energy dominates Q3 2018

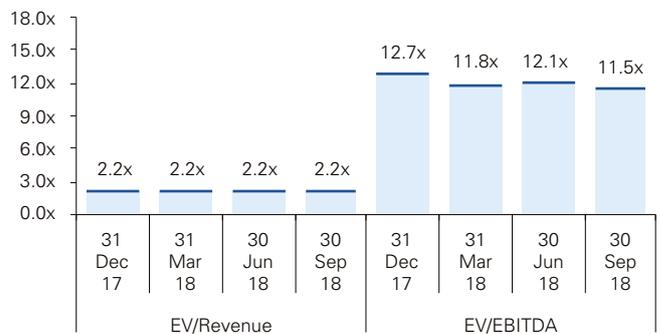
The enterprise value (EV) multiple states the market value of the business in relation to an appropriate base metric. Commonly used EV multiples are revenue and EBITDA. The numerator (EV) and denominator (revenue, EBITDA) represent all investor claims on the business.

The Euro STOXX 600 sector overview of trading multiples showed different valuation trends. Based on EV/revenue and EV/EBITDA, most sectors in Q3 2018 remained flat (e.g. consumer discretionary, healthcare or industrials) or returned to Q1 2018 levels (e.g. information technology or consumer staples). Only the energy sector shows some outlying behavior with a continuous increase over the past three quarters giving rise to a new high over the past year.

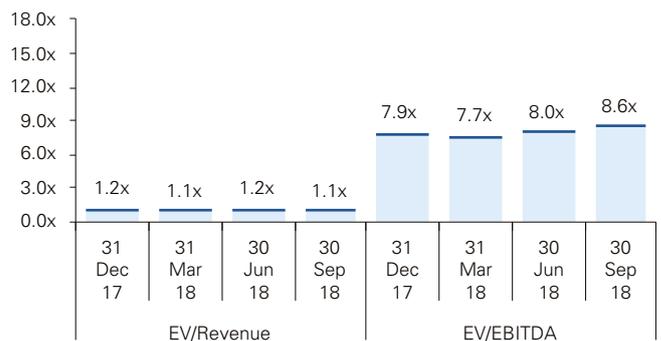
Consumer Discretionary Median



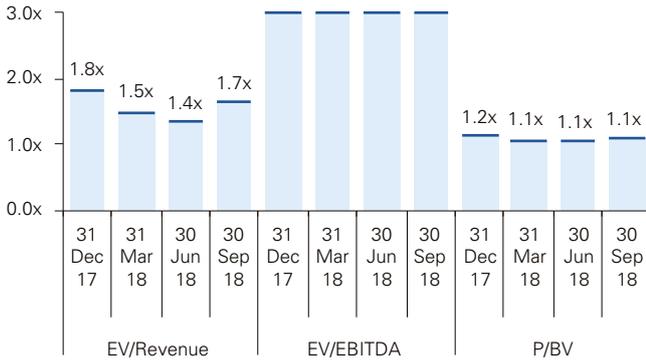
Consumer Staples Median



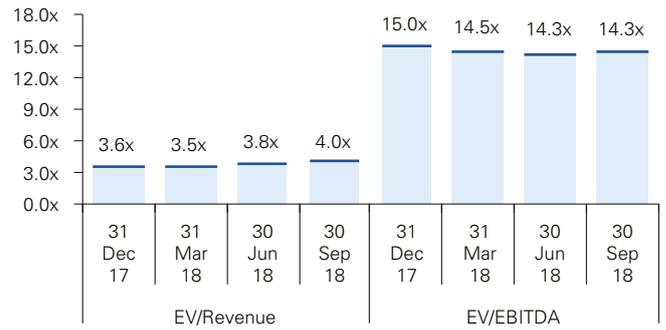
Energy (Oil and Gas) Median



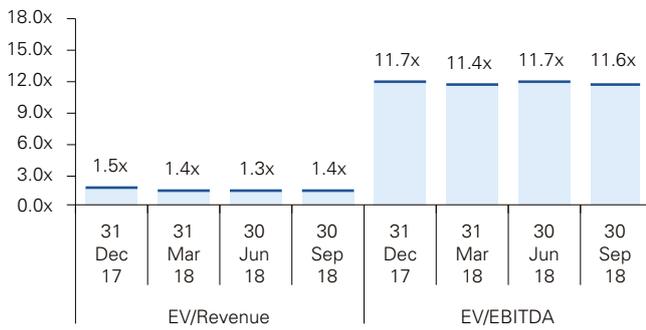
Financials Median¹



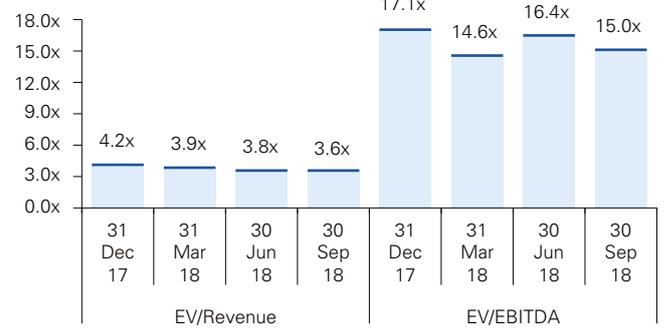
Healthcare Median



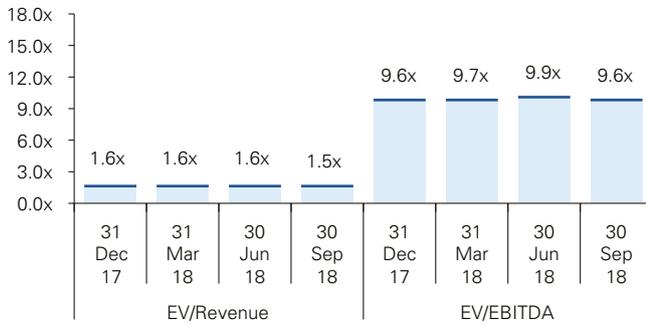
Industrials Median



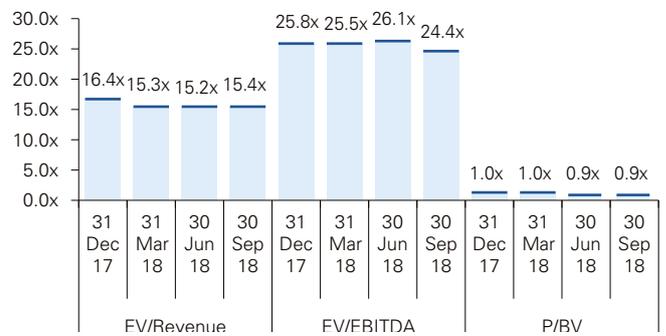
Information Technology Median



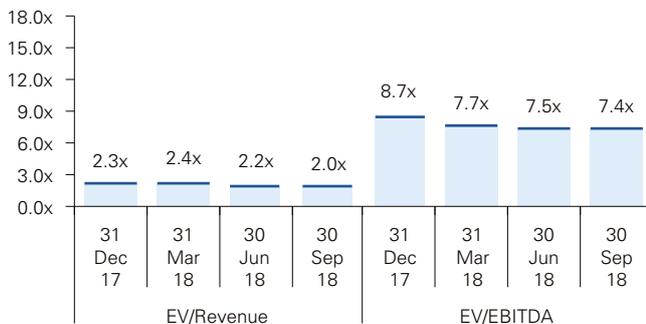
Materials Median



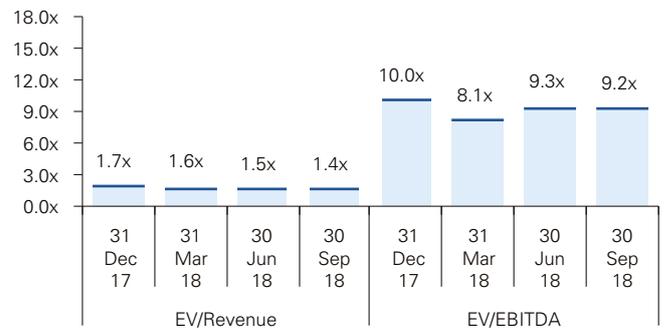
Real Estate Median



Telecommunication Services Median



Utilities Median



Source: Capital IQ, KPMG analysis

Note: ¹ Financial services companies differ from many other companies in how they operate. Debt acts more like 'raw material' than operational capital for financial services companies. A common valuation metric used by analysts evaluating such firms is the price to book (P/B) ratio.

Risk-free rates: Interest rates are on the rise

The risk-free rate (or base rate) can generally be broken down into two key components that seek to compensate the investor: the first for expected inflation and the second for deferred consumption. The base rate is considered to be free of risks except for risks embedded in the underlying currency and risks related to investments in the particular country (including general political, legal, regulatory and tax risks, as well as the risk of a moratorium). As no investment is truly risk free, the risk-free rate is typically approximated by reference to the yield on long-term debt instruments issued by presumably financially healthy governments. The historical risk-free rates for Germany, the Eurozone, the US, the UK and Switzerland are below.

For the first time in a long period, all analyzed risk-free rates increased slightly in Q3 2018. On a year-on-year basis, the Swiss and US risk-free rates reached new highs while the Eurozone and UK rates continue to lag.



Risk-free rates					
Rounded Date	Euro-countries EUR	Germany EUR	UK GBP	Switzerland CHF	USA USD
31/3/2014	2.53%	2.51%	3.58%	1.65%	3.67%
30/6/2014	2.28%	2.26%	3.49%	1.56%	3.44%
30/9/2014	1.92%	1.97%	3.12%	1.28%	3.30%
31/12/2014	1.46%	1.56%	2.58%	0.80%	2.85%
31/3/2015	0.69%	0.70%	2.39%	0.43%	2.66%
30/6/2015	1.79%	1.65%	2.80%	0.79%	3.31%
30/9/2015	1.51%	1.38%	2.58%	0.81%	3.06%
31/12/2015	1.70%	1.55%	2.77%	0.70%	3.17%
31/3/2016	1.03%	0.90%	2.39%	0.25%	2.81%
30/6/2016	0.46%	0.49%	1.85%	(0.03)%	2.50%
30/9/2016	0.53%	0.47%	1.61%	(0.06)%	2.48%
31/12/2016	0.97%	0.95%	2.03%	0.35%	3.06%
31/03/2017	1.25%	1.24%	1.88%	0.32%	3.27%
30/06/2017	1.39%	1.33%	2.02%	0.39%	3.04%
30/09/2017	1.40%	1.38%	2.05%	0.45%	3.04%
31/12/2017	1.34%	1.34%	1.89%	0.36%	2.89%
31/03/2018	1.25%	1.24%	1.79%	0.56%	3.08%
30/06/2018	1.09%	1.12%	1.83%	0.51%	3.00%
30/09/2018	1.13%	1.15%	1.87%	0.61%	3.10%

Source: KPMG analysis

Approach: Determination of a present value-equivalent uniform interest rate based on the yield curve of the specific central bank

Country risk premium: Geopolitical uncertainties influence short-term risk premiums

The country risk premium is a measure of risk faced by businesses when investing in sovereign states. It reflects a number of risks including economic, financial, political and institutional. The country risk premium is effectively the risk of low probability, high impact events that could lead to significant losses in investment values. These types of risk are at the forefront of many investors' thinking now more than ever due to a number of major economic and geopolitical events such as the Eurozone sovereign debt crisis and events in the Middle East and North Africa, all of which have led to previously stable countries becoming

much riskier. KPMG's Valuation practice has been analyzing and measuring country risk for 15 years and covers more than 150 sovereign states in a proprietary KPMG analyst model.

The country risk premiums for Brazil, Russia, India and China are set out below as of 30 September 2018 for an investment period of between 0.5 and 2.0 years. The country risk premium for China is substantially lower than that for Brazil, Russia or India. Especially short-term country risk (0.5 years) increased significantly compared to our June 2018 update for Brazil, Russia and India due to ongoing geopolitical uncertainties.

Country risk premium	0.5 year	1.0 year	2.0 year
Brazil	2.4%	2.2%	2.4%
Russia	2.0%	1.8%	1.9%
India	1.7%	1.6%	1.8%
China	0.5%	0.5%	0.8%

Source: KPMG CRP study as of 30.09.2018

Growth rates: Strong short-term growth expectations for Russia

Growth rates are a major component of the terminal value calculation for the discounted value method and are based on country-specific inflation forecasts. The growth rates for Brazil, Russia, India and China are based on the International Monetary Fund Economist Intelligence Unit inflation forecast for the years 2019 to 2023.

Overall, higher growth rates are expected for Brazil, Russia and India compared to China. Russia in particular demonstrates a strong increase in the short-term inflation forecast for 2019 compared to last quarter's update. This is due mainly to expected economic growth, supported by recovering domestic demand and increasing fuel prices.

Inflation forecast	2019	2020	2021	2022	2023
Brazil	4.2%	4.1%	4.0%	4.0%	4.0%
Russia	5.1%	4.8%	4.8%	4.8%	4.6%
India	4.9%	4.6%	4.3%	4.1%	4.0%
China	2.4%	2.6%	2.8%	2.9%	3.0%

Source: IMF

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