Business Valuation is a Question of Trust

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Estimating SMEs Optimal Capital Structure Using Damodaran Synthetic Rating

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If there is a correlation between two variables that are included in a Monte Carlo simulation, this correlation must be explicitly taken into account. In this article, we will show some ways of dealing with the correlation between two random variables and how these can be modeled in Python.

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Cost of Capital Study 2025: Between Past and Future: Bridging Empirical Yields with Return and Growth Expectations

The Cost of Capital Study by KPMG is being published this year in its 20th edition. Once again, a comprehensive analysis of current developments in corporate planning and the derivation of cost of capital has been released and the focus was on the impact on corporate valuations and developments.

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From the Editors

Certified Digital Asset Valuation: Global Developments and Professionalisation Needs

Digital assets have rapidly evolved into a relevant asset class for corporates, investors, regulators, and auditors yet valuation practice is often inconsistent. That creates uncertainty for investors, advisors, corporate decision-makers, and auditors. CDAV is designed to close that gap. You'll build a clear understanding of digital asset fundamentals and learn how to connect value drivers, risks, and market evidence in a structured, defensible way. As regulatory frameworks mature and institutional activity expands, the valuation of digital assets is becoming a material topic for the international valuation profession.

To support the profession in navigating this emerging field, the European Association of Certified Valuators and Analysts (EACVA), is currently developing the Certified Digital Asset Valuator (CDAV) program. The initiative aims to address the shortage of qualified professionals capable of applying established valuation principles to digital assets while considering the unique technological, regulatory, and economic characteristics of this asset class.

Digital assets are now part of M&A, fund portfolios, corporate reporting, tax filings, lending, and risk management. Regulators (MiCA, SEC, FSA), auditors and investors increasingly require transparent, consistent and defensible valuations.

Unlike traditional instruments, digital assets require specialised competencies:

- Blockchain-based economic rights
- Smart-contract-defined value drivers
- Tokenomics influencing supply, demand and incentives
- Fragmented liquidity, 24/7 volatility
- Regulatory uncertainty
- New risk categories (oracle, governance, code, protocol)

The CDAV qualification will enable professionals to meet these requirements. It will provide the necessary valuation expertise needed when crypto and tokenised assets are integrated into mainstream finance.

EACVA has made an introductory overview of the CDAV initiative publicly available for professionals who wish to follow ongoing developments in digital asset valuation. Interested readers may join as CDAV Observers to receive updates, insights, and access to selected materials: www.eacva.de/en/cdav.

We hope you enjoy reading this issue. As always, we welcome your feedback and encourage article submissions for future issues.

Andreas Creutzmann, WP/StB, CVA
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Imprint

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Estimating SMEs Optimal Capital Structure Using Damodaran Synthetic Rating

Corporate finance textbooks usually explain trade-off theory with no math equation and references to determine in practice the optimal leverage. Scientific models imply exogenous (and often arbitrary) financial market data that is not available in the case of private small business firms. This note proposes a simple and practical model to estimate the optimal debt-to-capital ratio for small and medium-sized enterprises (SMEs) using the Damodaran synthetic rating based on interest coverage ratio as a primary driver of credit risk and cost of debt. The model approach is particularly useful for non-listed firms, bypassing the need for financial market-based data. Simulations highlight that the optimal capital structure is positively related to firm performance (ROCE) and negatively related with risk-free rate.

I. Introduction

The optimal capital structure problem has been extensively studied in corporate finance. However, traditional models such as Modigliani and Miller[1], Trade-off theory[2] and Pecking Order theory[3], require market-based inputs (market capitalization, equity beta etc.) that are not available for small and medium-sized enterprises (SMEs). In addition, the trade-off operational models often need the level of bankruptcy costs as input[4], driving corporate finance textbooks to explain trade-off theory with no math equation or reference for an application in practice. This makes it challenging to apply conventional firm value and weighted average cost of capital (WACC) optimization.

To do this in a simple manner we need (1) a model to endogenize distress costs and (2) a leverage – cost of debt link for SMEs. (1) is done using the "Cost of leverage" model of Fernandez[5] and (2) is solved exploiting the Interest Coverage Ratio (ICR) – credit spreads relation provided by Damodaran for smaller and riskier firms. Simulations highlight that the optimal capital structure is positively related to firm performance (ROCE) and negatively related with risk-free rate.

The remaining of the note is structured as following. Section II. develops the link between credit spreads and leverage, Section III. the presents the optimization leverage process and Section IV. concludes.

II. Establishing the credit spread – leverage relation for SMEs

Damodaran provides a credit spread references for each Interest coverage ratio ($\text{ICR} = \text{EBIT} / \text{Interest expense}$) range, by observing this ratio in relation to the rating of the companies that have been assessed. In Table 1 is reported the original Damodaran[6] Rating – ICR – credit spread table for riskier and smaller (non-financial service) firms (data as of January 2025), adding two columns containing the midpoint value of the ICR and the cost of debt[7], based on a 3.5% level of risk-free rate.

Table 1: Damodaran's synthetic rating estimation for smaller and riskier firms

If interest coverage ratio is					
greater than	≤ to	Midpoint[a]	Rating is	Spread is	Cost of debt [b]
-100000	0.499999	0.25	D2/D	19.00%	22.50%
0.5	0.799999	0.65	C2/C	15.50%	19.00%
0.8	1.249999	1.025	Ca2/CC	10.10%	13.60%
1.25	1.499999	1.375	Caa/CCC	7.28%	10.78%
1.5	1.999999	1.75	B3/B-	4.42%	7.92%
2	2.499999	2.25	B2/B	3.00%	6.50%
2.5	2.999999	2.75	B1/B+	2.61%	6.11%
3	3.499999	3.25	Ba2/BB	1.83%	5.33%
3.5	3.9999999	3.75	Ba1/BB+	1.55%	5.05%
4	4.499999	4.25	Baa2/BBB	1.20%	4.70%
4.5	5.999999	5.25	A3/A-	0.95%	4.45%
6	7.499999	6.75	A2/A	0.85%	4.35%
7.5	9.499999	8.5	A1/A+	0.77%	4.27%
9.5	12.499999	11	Aa2/AA	0.60%	4.10%
12.5	100000	14	Aaa/AAA	0.45%	3.95%

a The first value is obtained starting from zero, while the last value is assumed a range between 12.5 and 15.5 (same jump of the 9.5 - 12.499 class) and equal to 14. Those assumptions don't change the relation between Interest coverage ratio and spread.

b The cost of debt is calculated by adding the spread and a risk-free interest rate of 3.5% (corresponding to the current yield on 10-year Italian government bonds).

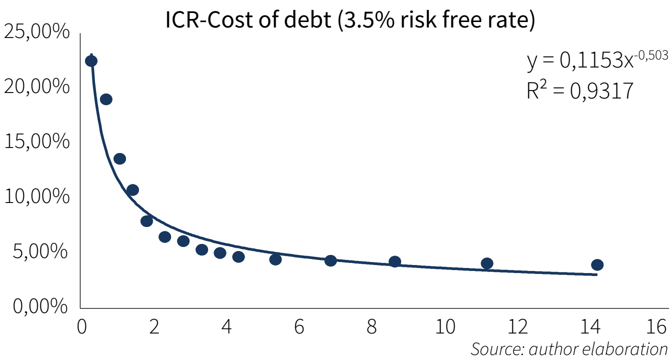
Source: Damodaran data Ratings, Interest Coverage Ratios and Default Spread. Damodaran based his elaborations on FED data sources.

The Damodaran US data is used for illustrative purpose only; for application in a European country, country specific spreads associated to rating and ICR would be more appropriate, as they would better align with the respective currency areas.

Plotting the ICR – Cost of debt (Figure 1), the following power equation approximate well the relation:

$$\text{Cost of debt} = 0.1153 \cdot \text{ICR}^{-0.503} \qquad (1)$$

Figure 1: ICR – cost of debt relation



Source: author elaboration

Since the objective of this note is to determine the optimal leverage ratio in accounting terms[8] ($\text{Leverage ratio} = \text{Debt} /$

1 Modigliani/Miller, Corporate income taxes and the cost of capital: A correction, American Economic Review, vol. 53, no. 3 (1963): 433–443.
2 Bradley/Jarrell/Kim, On the existence of optimal capital structure: Theory and evidence, Journal of Finance, vol. 39, no. 3 (1984): 857–878.
3 Myers/Majluf, Corporate financing and investment decisions when firms have information that investors do not have, Journal of financial economics, vol. 13, no. 2 (1984): 187-221.
4 See for example Leland, Corporate debt value, bond covenants, and optimal capital structure, The Journal of Finance, vol. 49, no. 4 (1994): 1213–1252.
5 Fernandez, Valuing companies by cash flow discounting: Ten methods and nine theories, Managerial Finance, vol. 33, no. 11 (2007): 853–876.
6 See Damodaran (https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ratings.html)
7 The cost of debt is adjusted for default. It is the risk-free rate (Italian 10 years government bond) plus the default spread, accordingly with firm rating.

8 Debt is the book financial total debt (including lease) while the capital employed is the invested capital including cash. The leverage ratio (debt-to-capital ratio) is calculated using those two fundamental elements.

Capital employed)[9], from the ICR formulae I extract the relation between Leverage and cost of debt.

Knowing that:

$$ICR = \frac{EBIT}{Interest\ expenses} =$$

$$\frac{ROCE \cdot Capital\ employed}{Cost\ of\ debt \cdot Debt} =$$

$$\frac{ROCE}{Cost\ of\ debt} \frac{1}{\frac{Debt}{Capital\ employed}} \quad (2)$$

Where: $Cost\ of\ debt = \frac{Interest\ expenses}{Debt}$,

while: $ROCE = \frac{EBIT}{Capital\ employed}$.

$\frac{Debt}{Capital\ employed}$ is the implied Leverage ratio.

Inverting the relation (2), the Cost of debt is function of leverage and ICR[10]:

$$Cost\ of\ debt = \frac{ROCE}{ICR \cdot Leverage} \quad (3)$$

Assuming a risk-free rate of 3.5% and a ROCE of 20%, Figure 2 plots the relation between the estimated cost of debt (eq. 1) and leverage ratio. For a given ICR and related Estimated Cost of debt, the Leverage ratio is extracted.

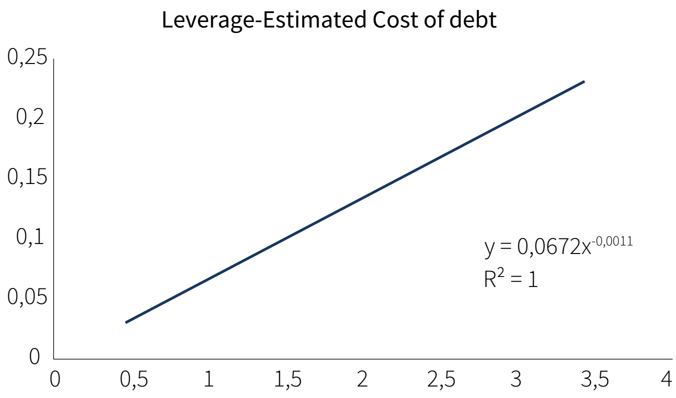
Table 2: Estimated cost of debt and leverage ratio

Midpoint ICR	Estimated Cost of Debt	Leverage Ratio
0.25	23.16%	3,45
0.65	14.32%	2,15
1.025	11.39%	1,71
1.375	9.82%	1,48
1.75	8.70%	1,31
2.25	7.67%	1,16
2.75	6.93%	1,05
3.25	6.37%	0,97
3.75	5.93%	0,90
4.25	5.57%	0,85
5.25	5.01%	0,76
6.75	4.41%	0,67
8.5	3.93%	0,60
11	3.45%	0,53
14	3.06%	0,47

9 Debt is defined as the total firm financial debts.

10 Certainly, the ICR is dependent from the Leverage, but we can interpret the (3) as the joint effect of Leverage debt and ICR on Cost of debt. Running a regression using only the Leverage as explanatory variable, eliminates any multicollinearity problems.

Figure 2: Leverage ratio – estimated cost of debt



Source: author elaboration

The estimated cost of debt – leverage ratio link presents a quasi linear relation in the case of 3.5%[11] risk-free rate, described as:

$$Cost\ of\ debt = \alpha + \beta \cdot Leverage\ ratio \quad (4)$$

Where for the 3.5% risk free case, the β is 0.0672 and α is -0.0011.

III. Optimizing firm capital structure

1. The optimal leverage

For optimizing the firm capital structure, I use the "Cost of leverage" model of Fernandez (2007), useful to incorporate the distress costs via credit spread. The "Cost of leverage" is a concrete way to estimate the present value of tax shield. Assuming that the present value of distress cost can be expressed as:

$$PV\ Distress\ costs = f(Debt) = \alpha D \quad (5)$$

The α is the present value of cost of distress costs for unity of debt and, in accordance with Fernandez, this unitary value can be expressed as the credit spread **(rD - rf)** discounted at the unlevered cost of equity (**r0**):

$$PV\ Distress\ costs = \alpha D = \frac{r_D - r_f}{r_0} D \quad (6)$$

In this framework the side effects for each level of debt can be computed as the present value of tax benefits less the present value of distress costs:

$$Net\ side\ effects =$$

$$PV\ Tax\ benefits - PV\ Distress\ costs =$$

$$D\frac{r_D t_c}{r_0} - D\frac{r_D - r_f}{r_0} = D\frac{r_f - r_D(1 - t_c)}{r_0} \quad (7)$$

with:

r_D = cost of debt

r_f = risk free rate

t_c = coporate tax rate on interest expenses

r_0 = unlevered cost of equity

$D = Debt(book\ value)$

11 For different risk-free rates, the relation can be concave or convex.

We can measure the net side effect for each level of debt-to-capital ratio, by dividing the (7) for Capital employed. In addition, we insert (4) in (7) as following:

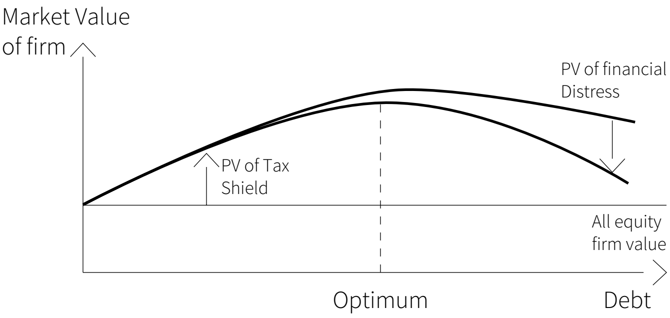
$$\frac{\text{Net side effects}}{\text{Capital employed}} = \text{Leverage ratio}\frac{r_f - (\alpha + \beta \cdot \text{Leverage ratio})(1-t_c)}{r_0} =$$

$$\frac{-\beta(1-t_c)\text{Leverage ratio}^2 +}{r_0}$$

$$\frac{[r_f - \alpha(1-t_c)]\text{Leverage ratio}}{r_0} \qquad (8)$$

In accordance with the classic trade-off theory the, in the point in which the Net value generated by the debt is maximized (and WACC is minimized), we find the optimal level of leverage. Graphically the concept is expressed in figure 3.

Figure 3. A representation of the trade-off between tax shield and financial distress



Source: author elaboration

Mathematically, it is a maximization problem, so:

$$\frac{\partial \frac{\text{Net side effects}}{\text{Capital employed}}}{\partial \text{Leverage ratio}} =$$

$$\frac{-2\beta(1-t_c)\text{Leverage ratio} + r_f - \alpha(1-t_c)}{r_0} = 0 \qquad (9)$$

From which the optimal leverage ratio is:

$$\text{Leverage ratio}_{\text{Optimal}} = \frac{\alpha(1-t_c) - r_f}{-2\beta(1-t_c)} \qquad (10)$$

2. The neutral leverage

The neutral leverage is the debt-to-capital ratio[12] maximum tolerable by the firm. This is the positive leverage that allow for net side effects equal to zero. This represent the maximum level of leverage for witch the net benefits still remain positive. Beyond this reference the firm value is above the unlevered one. The according level of leverage ratio will be the positive solution of (8) equation:

$$\frac{\text{Net side effects}}{\text{Capital employed}} =$$

$$\frac{-\beta(1-t_c)\text{Leverage ratio}^2 +}{r_0}$$

$$\frac{[r_f - \alpha(1-t_c)]\text{Leverage ratio}}{r_0} = 0 \qquad (11)$$

From which:

$$\text{Leverage ratio}_{\text{Neutral}} = \frac{r_f - \alpha(1-t_c)}{\beta(1-tc)} \qquad (12)$$

In Table 2, assuming a tax rate of 24%, we have the optimal leverage and neutral leverage for different levels of risk-free rates and for different levels of ROCE.

Table 3: Optimal capital for different levels of risk-free rates and ROCE

1% Risk-free rate				
ROCE	Alpha	Beta	Optimal Leverage Ratio	Neutral Leverage Ratio
5%	-0,1552	0,4426	0.1902	0.3804
10%	-0,1552	0,2213	0.3804	0.7608
15%	-0,1552	0,1475	0.5707	1.1414
20%	-0,1552	0,1106	0.7611	1.5222
25%	-0,1552	0,0885	0.9512	1.9023
30%	-0,1552	0,0738	1.1406	2.2813
35%	-0,1552	0,0632	1.3319	2.6639
40%	-0,1552	0,0553	1.5222	3.0444
45%	-0,1552	0,0492	1.7110	3.4219
50%	-0,1552	0,0443	1.9002	3.8004
3.5% Risk-free rate				
ROCE	Alpha	Beta	Optimal Leverage Ratio	Neutral Leverage Ratio
5%	-0,0011	0,269	0.0876	0.1753
10%	-0,0011	0,1345	0.1753	0.3506
15%	-0,0011	0,0897	0.2628	0.5257
20%	-0,0011	0,0672	0.3508	0.7017
25%	-0,0011	0,0538	0.4382	0.8764
30%	-0,0011	0,0448	0.5263	1.0525
35%	-0,0011	0,0384	0.6140	1.2279
40%	-0,0011	0,0336	0.7017	1.4034
45%	-0,0011	0,0299	0.7885	1.5770
50%	-0,0011	0,0269	0.8764	1.7529
5% Risk-free rate				
ROCE	Alpha	Beta	Optimal Leverage Ratio	Neutral Leverage Ratio
5%	0,0286	0,2605	0.0714	0.1428
10%	0,0286	0,1302	0.1428	0.2856

12 In accounting terms.

15%	0,0286	0,0868	0.2142	0.4285
20%	0,0286	0,0651	0.2856	0.5713
25%	0,0286	0,0521	0.3569	0.7138
30%	0,0286	0,0434	0.4285	0.8569
35%	0,0286	0,0372	0.4999	0.9997
40%	0,0286	0,0326	0.5704	1.1408
45%	0,0286	0,0289	0.6434	1.2868
50%	0,0286	0,026	0.7152	1.4304
10% Risk-free rate				
ROCE	Alpha	Beta	Optimal Leverage Ratio	Neutral Leverage Ratio
5%	0,0966	0,2776	0.0630	0.1260
10%	0,0966	0,1388	0.1260	0.2520
15%	0,0966	0,0925	0.1891	0.3782
20%	0,0966	0,0694	0.2520	0.5040
25%	0,0966	0,0555	0.3151	0.6303
30%	0,0966	0,0463	0.3777	0.7555
35%	0,0966	0,0397	0.4405	0.8811
40%	0,0966	0,0347	0.5040	1.0080
45%	0,0966	0,0308	0.5678	1.1357
50%	0,0966	0,0278	0.6291	1.2582

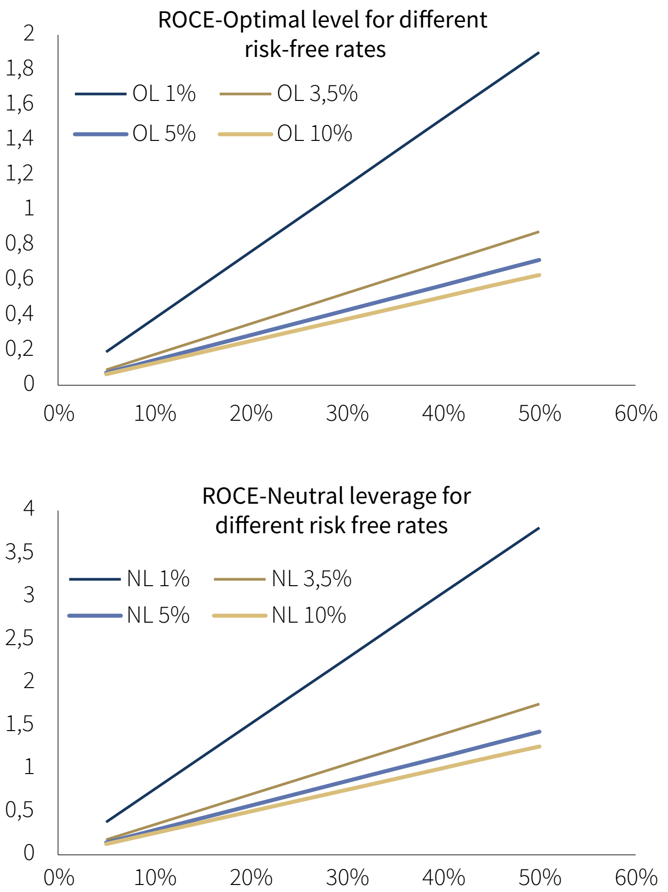
Source: author elaboration. I assume a tax rate of 24% and a risk-free rate of 1%, 3.5%, 5%, 10%. The neutral Leverage ratio can be beyond the unity for higher ROCE, that can be possible for small firms (Negative Book Equity value).

This framework supports the existence of a trade-off point where the marginal benefit of debt (tax shield) is offset by the marginal cost (distress costs value). Main highlights are reported as following.

- The results show a rising optimal Debt-to-capital as ROCE increases, implying that more profitable SMEs can tolerate higher leverage. The empirical evidence that more profitable companies chose less debt[13] does not mean they are optimizing the level of leverage (staying above the optimum). Differently from other studies, here the link between firm performance and Optimal Leverage is investigated. Moving from theory to practice, a firm with higher economic return is able to easily repay the debt, pushing up the leverage largely in respect of other firms, not incurring in default and massively exploiting the tax benefits.
- In addition, the debt-to-capital ratio is negatively related to the risk-free rates (see Table 2).
- Lastly, for low risk-free rates, the neutral leverage can also be beyond the unity. It can be possible since leverage ratio is in accounting terms and not at market value. In those cases, a prudential maximum value should be set equal to one.

13 See for example Li/Niskanen/Niskanen, Capital structure and firm performance in European SMEs: Does credit risk make a difference?, Managerial Finance, vol. 45 no. 5 (2019): 582-601; and Pha/Hrdý, Determinants of S.M.E.s capital structure in the Visegrad group. Economic Research-Ekonomska Istraživanja, vol. 36 no. 1 (2023): 1-23.

Figure 4. ROCE – leverage relations



Source: author elaboration

IV. Conclusion

This note presents an operational, ICR-based model to estimate optimal leverage in SMEs. It bypasses the need for market data, offering a pragmatic alternative to traditional valuation-based models. The results suggest that SMEs can and should pursue structured debt strategies based on internally observed metrics. For each ROCE value, there is a range between the optimal leverage and the neutral leverage where the debt policy generates value.

The model highlights some practical implications. It can serve as a foundation for further research and practical applications in SME financial planning, lending negotiations, and capital structure advisory. In addition, from a banking negotiation point of view, SMEs can use the model to justify sustainable debt levels in loan applications.

Despite its applicability and simplicity, there are some limitations. The model relies on synthetic spreads based on the US capital market for bonds, which may not capture firm-specific or industry-specific risk. Including stochastic ROCE and probability of default (PD) and loss given default (LGD) estimates would enhance realism. Integration with Altman Z-scores or Monte Carlo simulations could also refine the distress cost estimation. In addition, the effect of the tax rate on the results can also be easily examined. Finally, empirical testing across SMEs of different sectors could validate the model's predictive value. ◆

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How to Model Correlated Random Variables in the Context of Monte Carlo Simulations in Python (and Excel)

If there is a correlation between two variables that are included in a Monte Carlo simulation, this correlation must be explicitly taken into account. In this article, we will show some ways of dealing with the correlation between two random variables and how these can be modeled in Python.

I. Introduction

Simulation analyses using the Monte Carlo method are increasingly used in valuation practice. The principle of a Monte Carlo simulation is to solve a problem through a series of random experiments. This is based on the law of large numbers. In valuation practice, simulation analyses can be used, for example, to estimate the effect of the uncertainty intrinsic to the valuation parameters on the company value.

Specifically, this requires assumptions about the range in which the parameter to be analyzed should vary and the distribution of the random variables within this range. An iterative procedure, in which random variables are used for the parameters to be analyzed in each iteration, allows conclusions to be drawn about the range and distribution of possible results.

This is relatively easy to implement by creating suitable random variables and programming a loop. However, it should be noted that this procedure is only correct for uncorrelated variables. If there is a correlation between two variables, this must be explicitly incorporated into the simulation.

In this article, we first want to introduce the necessary methodological principles. We have tried to avoid complex mathematical explanations and to make the basic principle of the facts presented comprehensible to the reader. Nevertheless, further in-depth study of the underlying mathematical relationships is necessary for the correct application of these concepts.

In the rest of the article, we present the necessary code for modeling the correlation between two random variables in Python as well as the results of a simplified simulation by taking the correlation into account.

Python is a high-level programming language known for its clarity and flexibility, making it a popular choice across many industries. In finance, it's particularly useful for building financial models, analyzing data, and automating workflows. With libraries like Pandas and NumPy, it allows users to handle large datasets efficiently, perform complex calculations, and generate advanced visualizations.

A significant recent development is that Python can now be used natively within Microsoft Excel for Microsoft 365 users. This integration allows users to write and execute Python code directly in Excel cells and opens up new possibilities for financial professionals to enhance their models and gain deeper insights.

II. Methodological principles

1. A quick guide on how to use Python natively in Excel

To use Python natively in Excel, you start by entering Python mode in a cell with the function =PY("your_code"). This allows you to write Python code directly in the formula bar. Alternatively, you can open the Python editor under the Formulas tab, which provides a larger space for multi-line code. By default, Excel displays the result of the Python code in the cell, but you can choose to show the code itself as an Excel object if needed. It is possible to reference Excel cells in the Python code, by using the xl() function, for example xl("A1:A10"). It is important to note that Python formulas can only reference cells to the left or above the current cell, not to the right or below. Python in Excel can return numbers, text, tables, or even charts as outputs. The environment runs in a secure sandbox and includes popular libraries like pandas, numpy, matplotlib, and scikit-learn.

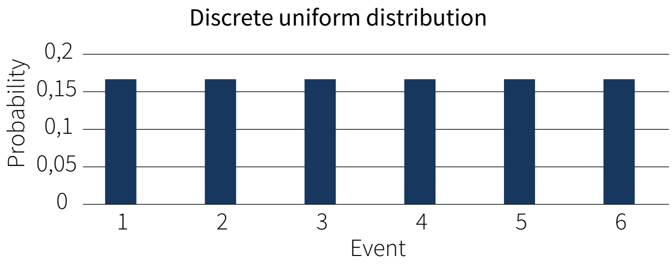
2. Relevant mathematical distributions

For reasons of simplicity, we will limit ourselves to the uniform distribution as well as the triangular and normal distribution.

a. Uniformdistribution

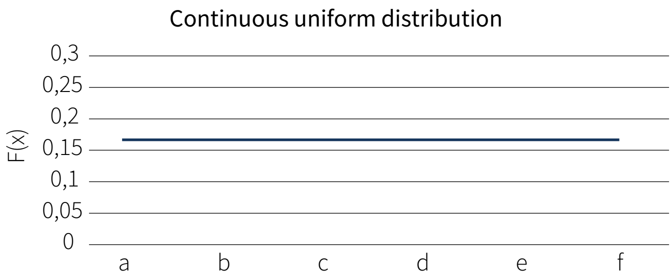
In the discrete form of a uniform distribution, each event occurs with the same probability. The following figure shows such a distribution graphically:

Figure 1: Exemplary discrete uniform distribution



In the continuous case of a uniform distribution, there is a constant probability density on a certain interval, i.e. subintervals with the same length also have the same probability. The following figure shows the probability density function of such a distribution graphically:

Figure 2: Exemplary continuous discrete uniform distribution



It should be noted that each individual value on the x-axis has a probability of occurrence of 0, as the function is continuous. The y-axis can be interpreted as the probability of an almost infinitely small interval. The probability that a random variable takes on a value between two points corresponds to the content of the area under the graph of the probability density function between these two points.

b. Triangular distribution

A triangular distribution is a continuous probability distribution whose density function takes the form of a triangle. It is defined by the minimum and maximum value of the distribution as well as the most probable value. The following figure shows such a distribution graphically:

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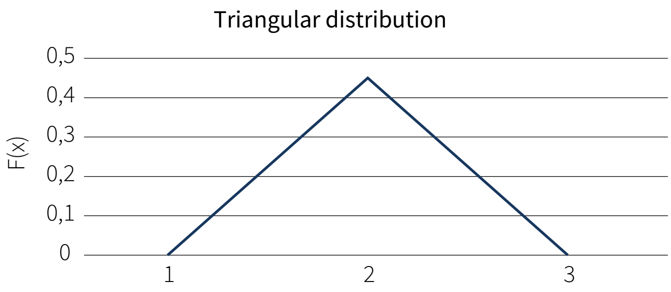
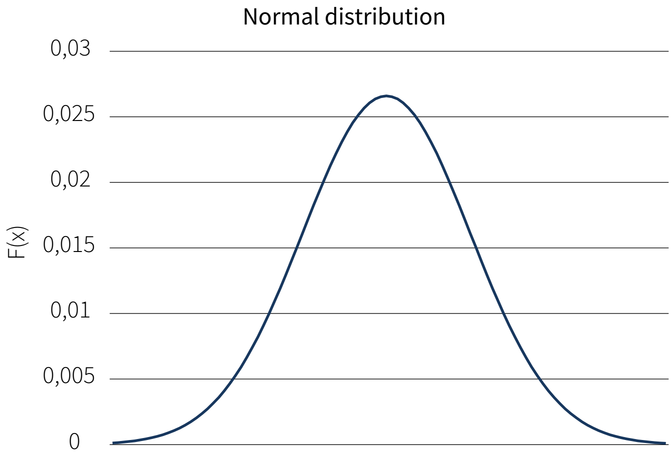
Figure 3: Exemplary triangular distribution



c. Normal distribution

The normal distribution is an important type of continuous probability distribution. The importance of the normal distribution is due, among other things, to the central limit theorem. This states that distributions that arise from the additive superposition of many small independent random effects are approximately normally distributed under weak conditions. The normal distribution is defined by the mean value and the standard deviation of the random variable. The following figure shows such a distribution graphically:

Figure 4: Exemplary normal distribution



3. Correlation

a. Correlation coefficient

Pearson's correlation coefficient p between two random variables x and y is defined as follows:

$$p = \frac{Cov(x,y)}{\sigma_x \sigma_y}$$

It can assume values between -1 and +1 and describes the linear relationship between the variables under consideration.

It should be noted that Pearson's correlation coefficient only allows statements to be made about statistical relationships if both variables are approximately normally distributed and there is a linear relationship. Otherwise, a rank correlation coefficient must be used.

For example, Spearman's rank correlation coefficient can be used for this purpose. The data to be observed must be sorted into ranks, i.e. the smallest data point is assigned rank 1, for example, the second smallest data point is assigned rank 2, and so on. The formula for the Spearman's rank correlation coefficient is exactly the same as for the Pearson's correlation coefficient, only the data (in our previous example x and y) are replaced with their respective ranks. The Spearman correlation measures the monotonic relationship between the data, while the Pearson correlation measures the linear relationship.

A rank correlation coefficient therefore does not require the assumption that the relationship between the variables is linear and is robust against outliers.

b. Bivariate normal distribution

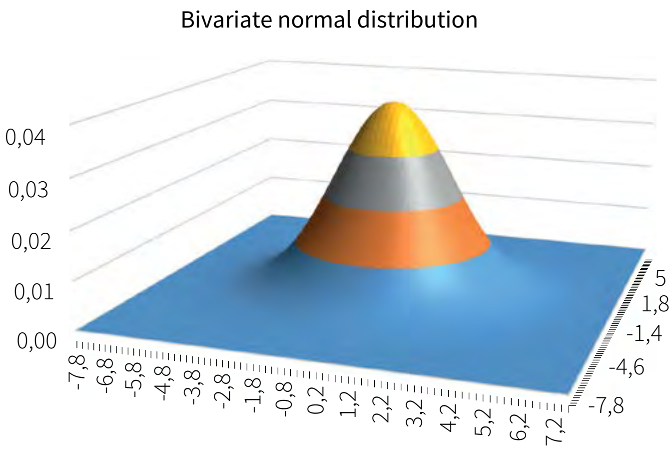
A bivariate normal distribution represents a generalization of the normal distribution to two dimensions.

A one-dimensional normal distribution describes the distribution of a variable based on its mean value and standard deviation. In a two-dimensional normal distribution, two variables are taken into account. Thus, there are five relevant parameters, the means and standard deviations of the variables and the correlation between the two variables.

For explanatory purposes, we first consider the case with no correlation between the variables. Important conditions are that both variables are normally distributed and that for each value of one variable, the values of the other variable are normally distributed. An example can help to clarify this. Let the variables height and IQ of the total population be given. Assume that there is no correlation between the variables and that both are normally distributed. This means that, for example, the IQ of all people who are 170 cm tall is normally distributed and that, for example, the height of all people with an IQ of 110 is also normally distributed.

The following graph shows the probability density function of a bivariate normal distribution of two uncorrelated variables:

Figure 5: Exemplary bivariate normal distribution



The x- and z-axes represent the distributions (also known as marginal distributions) of the two variables (IQ and height in our example above). To simplify, the y-axis can be seen as the probability of the simultaneous occurrence of an almost infinitely small interval around the two variables.

If there is a correlation between the two variables, the density function changes slightly in appearance (the round base of the dome can take on the shape of an ellipse, for example).

In MS Excel, the probability density function can be used to generate a discrete two-dimensional normal distribution in simple tabular form. Two correlated random variables can be drawn from this using a suitable drawing algorithm. However, it should be noted that the discrete form of a two-dimensional normal distribution differs from the continuous form.

c. Incorporating the correlation using the Cholesky decomposition

Another method for accounting for the correlation between normally distributed random variables is the so-called Cholesky decomposition.

The Cholesky decomposition is an algebraic method to decompose a symmetric matrix into the product of a lower triangular matrix and its transpose. The following example shows the result of such a decomposition:

Figure 6: Exemplary Cholesky decomposition

$$\begin{bmatrix} 36 & 30 & 18 \\ 30 & 41 & 23 \\ 18 & 23 & 14 \end{bmatrix} = \begin{bmatrix} 6 & 0 & 0 \\ 5 & 4 & 0 \\ 3 & 2 & 1 \end{bmatrix} \times \begin{bmatrix} 6 & 5 & 3 \\ 0 & 4 & 2 \\ 0 & 0 & 1 \end{bmatrix}$$

This can be used in the context of Monte Carlo simulations to generate correlated random variables without the need to use a multidimensional normal distribution.

The covariance matrix of the underlying random variable is required as a starting point. This results from the correlation factors and the standard deviations of the random variables considered. The Cholesky decomposition of the covariance matrix can then be multiplied by a matrix of uncorrelated variables to generate correlated variables.

The idea behind it is that when a matrix of uncorrelated variables (Z) is multiplied by the lower triangular matrix (L) obtained through the Cholesky decomposition, the result is a linear combination of these uncorrelated variables (X). This mixing introduces statistical dependence between the components of X. The structure of L ensures that the resulting dependencies match the desired covariance (or correlation).

For an application with only two random variables, the formulas can be further simplified. To do this, two uncorrelated normally distributed random variables z1 and z2 must first be generated. By specifying the assumed correlation coefficient p, the two variables can be transformed into correlated random variables x1 and x2. The following formulas can be used for this:

$$x_1 = z_1 \text{ and } x_2 = pz_1 + \sqrt{1-p^2}\, z_2$$

The correlation between two variables is therefore relatively easy to incorporate for normally distributed random variables. However, the assumption of a normal distribution of the variables to be simulated is not appropriate in some applications.

d. Implementing the correlation through a Copula

If the correlation between two random variables that are defined by different and non-normally distributed distributions is to be taken into account, a mathematical function, the so-called "copula", can be used.

Similar to the bivariate normal distribution, a copula is a function that reflects the correlation and the joint probability distribution between the distribution functions of different random variables. Unlike the bivariate normal distribution, a copula can also be used for non-normally distributed variables. For example, to model the correlation between a uniformly distributed and a triangularly distributed variable.

In other words, copulas make it possible to split the joint probability function between several variables into individual, uncorrelated distributions and a function that bundles them together, taking the correlation into account. This function, the copula, enables us to incorporate a correlation assumption between uncorrelated random variables as part of a simulation.

The following example is meant to explain the relationships. Two correlated random variables v1 and v2 are given. Variable v1 is triangularly distributed, variable v2 is uniformly distributed. In this case, we want to use a so-called Gaussian copula, i.e. v1 and v2 are first transformed into normally distributed variables. For this purpose, v1 and v2 are mapped to normally distributed variables u1 and u2. The mapping is based on individual percentiles, i.e. the 1% point of the v1 distribution is mapped to the 1% point of the u1 distribution and so on. We can use this mapping to transform variables with any distribution into normally distributed variables. Since the variables u1 and u2 are normally distributed, we can assume a bivariate normal distribution function with a certain correlation coefficient between u1 and u2. This means that we define the correlation structure between v1 and v2 indirectly by transforming them into two variables u1 and u2 and then inserting a correlation structure between these two variables. Subsequently, u1 and u2 are transformed back into their original distributions.

It should be noted that this method defines a Pearson correlation between u1 and u2. In principle, this does not correspond to the correlation coefficient between v1 and v2. Furthermore, the Gaussian copula is only one of many possible copulas that can be used to define a correlation structure between the two variables.

III. Modelling the correlation in Python

The Cholesky decomposition can be implemented through the formulas shown above. In Python there is a library called NumPy, that also provides the Cholesky decomposition as a function.[1]

1 See also: https://numpy.org/doc/stable/reference/generated/numpy.linalg.cholesky.html.

The following example shows how to use the Cholesky decomposition in Python:

```
import numpy as np
# Step 1: Define the correlation matrix
rho = 0.8  # correlation coefficient between the two variables
corr_matrix = np.array([[1.0, rho],
                        [rho, 1.0]])
# Step 2: Cholesky decomposition
L = np.linalg.cholesky(corr_matrix)
# Step 3: Generate uncorrelated standard normal variables
n_samples = 1000
uncorrelated = np.random.randn(2, n_samples)
# Step 4: Create correlated variables
correlated = L @ uncorrelated
# Now `correlated` contains two rows of correlated variables
```

Rho is the correlation coefficient between the two variables. It must be between -1 and 1. The corr_matrix is a 2x2 symmetric matrix with 1s on the diagonal (since a variable is perfectly correlated with itself) and rho on the off-diagonal. This matrix represents the desired correlation structure.

Np.linalg.cholesky() computes the Cholesky decomposition of the correlation matrix. The result L is a lower triangular matrix, which will be used to transform uncorrelated variables into correlated ones.

np.random.randn(2, n_samples) generates a 2×1000 matrix of standard normal random variables. Each row represents a variable, and each column is a sample. These variables are independent (uncorrelated) by default.

The @ operator performs matrix multiplication. Multiplying the Cholesky matrix L with the uncorrelated variables transforms them into correlated variables. The resulting correlated matrix has the same number of samples, but now the two variables have the desired correlation (rho = 0.8 in this case).

For not normally distributed random variables the correlation can be modeled by using a copula. This can be done as follows in Python:

```
import numpy as np
from scipy.stats import norm, triang, uniform
rho = 0.7
# Generate independent samples
x = triang.rvs(c=0.5, loc=0, scale=1)
y = uniform.rvs(loc=0, scale=1)
# Transform to standard normal
z = norm.ppf([triang.cdf(x, c=0.5), uniform.cdf(y)])
# Apply correlation
L = np.linalg.cholesky([[1, rho], [rho, 1]])
z_corr = L @ z
# Transform back to original distributions
x_corr = triang.ppf(norm.cdf(z_corr[0]), c=0.5)
y_corr = uniform.ppf(norm.cdf(z_corr[1]))
```

X is a random sample from a triangular distribution with mode at 0.5 and range from 0 to 1. Y is a random sample from a uniform distribution based on an interval between 0 and 1. These are independent at this point.

First, we convert x and y to uniform [0, 1] values using their cumulative distribution functions (CDF).[2]

Then, we apply the inverse CDF (also known as percent-point function or PPF)[3] of the standard normal distribution to map them into standard normal space. The result z is a 2D vector of independent standard normal variables.

We construct a correlation matrix and apply the Cholesky decomposition to get a lower triangular matrix L. Multiplying z by L introduces the desired correlation between the two variables.

Then we convert the correlated normal variables back to uniform using the standard normal CDF. Then we apply the inverse CDFs of the triangular and uniform distributions to get the final correlated samples.

So to summarize, in this example a sample of two variables was taken, the variables were transformed into standard normally distributed variables, the Cholesky decomposition was used to apply the correlation manually and then the variables were transformed from a standard normal distribution back to their original distributions.

IV. Example

Let's start with the following simplified DCF-valuation:

Table 1: Simplified DCF valuation

€	Act. 2024	Plan 2025	Plan 2026	Plan 2027	Plan 2028	Plan TV
Revenue	1.000	1.050	1.103	1.158	1.216	1.228
revenue growth rate	*n.a.*	*5,00%*	*5,00%*	*5,00%*	*5,00%*	*1,00%*
EBIT	200	210	221	232	243	246
EBIT margin	*20,00%*	*20,00%*	*20,00%*	*20,00%*	*20,00%*	*20,00%*
Taxes	-60	-63	-66	-69	-73	-74
Depreciation	30	32	33	35	36	37
Capex	-30	-32	-33	-35	-36	-37
Change in NWC	-5	-5	-5	-6	-6	-1
Free Cashflow	135	142	149	157	164	171
WACC		8,00%	8,00%	8,00%	8,00%	7,00%
Present value factors		0,9259	0,8573	0,7938	0,7350	10,50043
Present values		131	128	124	121	1.792

Enterprise Value	2.297
- Net Debt	-200
Equity value	2.097

2 A CDF, or Cumulative Distribution Function, is a fundamental concept in probability and statistics. It describes the probability that a random variable takes on a value less than or equal to a certain number.

3 The inverse CDF describes, given a certain probability, what value corresponds to that cumulative probability.

We now want to perform a Monte Carlo simulation by simulating the following parameters:

- Revenue growth rate: Assuming a symmetrical triangular distribution with min. 3%, max. 7% and most likely value 5%.
- EBIT margin: Assuming a uniform distribution with min. 15% and max. 25%
- WACC: Assuming a normal distribution with an average of 8,0% and a standard deviation of 0,5%.
- Iterations: 10.000
- Correlation between revenue growth rate and EBIT margin: 0,50

The idea behind this is that revenue and EBIT margin can be correlated, especially in the short therm, because both metrics are influenced by the scale and efficiency of a company's operations. As revenue grows, fixed costs are spread over a larger sales base, which can lead to improved operating leverage and higher profitability, provided that variable costs and operating expenses do not increase disproportionately.

We can do that with the following Python code:

```
import numpy as np
import pandas as pd
# Parameters
time = 5
rev = 1000
nwc_perc = 0.1
tax_rate = 0.3
wacc = 0.08
tv_growth = 0.01
capex_perc = 0.03
dep_perc = 0.03
net_debt = 200
# Monte Carlo parameters
n_simulations = 10000
cagr_mode = 0.05  # Most likely value for triangular distribution
cagr_min, cagr_max = 0.03, 0.07
ebit_margin_min, ebit_margin_max = 0.15, 0.25
wacc_std = 0.005
correlation = 0.5
```

In the first part of the code the basic parameters for the DCF-valuation and the simulation are defined.

```
# Copula-based sampling using Gaussian copula
mean = [0, 0]
cov = [[1, correlation], [correlation, 1]]
copula_samples = np.random.multivariate_normal(mean, cov, n_simulations)
copula_uniform = norm.cdf(copula_samples)
# Transform uniform samples to desired distributions
# Triangular distribution for CAGR using inverse CDF
cagr_c = (cagr_mode - cagr_min) / (cagr_max - cagr_min)
cagr_samples = triang.ppf(copula_uniform[:, 0], c=cagr_c, loc=cagr_min, scale=cagr_max - cagr_min)
# Uniform distribution for EBIT margin
ebit_margin_samples = ebit_margin_min + (ebit_margin_max - ebit_margin_min) * copula_uniform[:, 1]
# Normal distribution for WACC
wacc_samples = np.random.normal(wacc, wacc_std, n_simulations)
```

In this part we want to generate pairs of correlated samples using a Gaussian copula, which we will later use to model the correlation between the revenue growth rate and the EBIT margin.

The variable mean is simply a variable used to input the mean of the standard normal distribution in the next part. It includes two zeros, because we want to model a pair of correlated variables. The variable cov is the covariance matrix. The variable copula_samples is an array with two columns and as many rows as the number of simulations. Each row contains a pair of correlated standard normal variables.

The variable copula_uniform converts copula_samples into a uniform distribution, where all values are between 0 and 1. This gives us uniformly distributed values that are still correlated.

Now we can take these uniform random variables (which are correlated due to the copula) and transform them into the actual financial input distributions we want to use in our simulation.

Cagr_c calculates the shape parameter c for the triangular distribution, which indicates the relative position of the mode between the min and max. Triang.ppf is the percent point function (inverse CDF) of the triangular distribution. This transforms the uniform values into triangularly distributed CAGR values. Cagr_samples now follow a triangular distribution with the desired min, mode, and max and are still correlated with EBIT margin.

The variable ebit_margin_samples linearly maps the second column of uniform values to the predefined range of EBIT margins. No further transformation is needed since the uniform distribution is the desired distribution for this parameter. The result is a uniform distribution of EBIT margins, still correlated with CAGR due to the copula.

Wacc_samples generates values from a normal distribution with the given parameters. These are independent of the copula and other variables.

As opposed to the example above, where we showed the Python code to implement a Gaussian copula by using the Cholesky decomposition, in this case we used NumPy's np.random.multivariate_normal to directly sample from a bivariate normal distribution and then mapped these samples to the target distributions using inverse CDFs. This approach is generally more scalable and efficient for Monte Carlo simulations.

In theory it is also possible to expand the code shown above in order to consider three or more correlated variables instead of two. This could be done by replacing the 2x2 correlation matrix with a kxk correlation matrix and expand the mean vector to k elements. Caution should be used, because not every set of pairwise correlations is feasible. It would be therefore advised to implement additional statistical checks, in order to make sure that the correlation matrix is valid.

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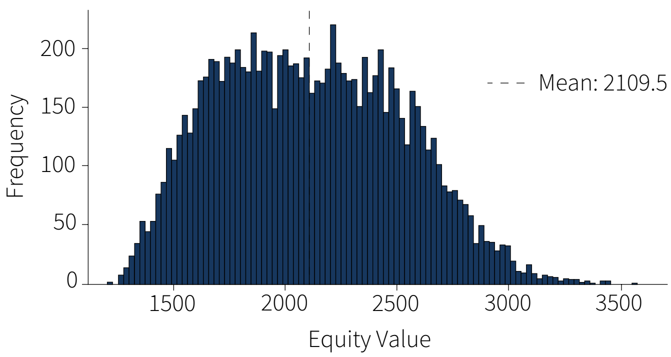
```
equity_values = []
for i in range(n_simulations):
    cagr_sim = cagr_samples[i]
    ebit_margin_sim = ebit_margin_samples[i]
    wacc_sim = wacc_samples[i]
    years = np.arange(time + 1)
    revenue = rev * (1 + cagr_sim) ** years
    revenue[-1] = revenue[-2] * (1 + tv_growth)
    ebit = ebit_margin_sim * revenue
    tax = -tax_rate * ebit
    nwc = revenue * nwc_perc
    nwc_chg = np.zeros_like(nwc)
    nwc_chg[1:] = nwc[:-1] - nwc[1:]
    capex = -revenue * capex_perc
    dep = revenue * dep_perc
    fcff = ebit + tax + nwc_chg + capex + dep
    pv_factor = 1 / (1 + wacc_sim) ** years
    pv_factor[-1] = (1 / (wacc_sim - tv_growth)) * pv_factor[-2]
    pv = fcff * pv_factor
    entity_value = np.sum(pv) - pv[0]
    equity_value = entity_value - net_debt
    equity_values.append(max(equity_value, 0))
```

In the code shown above a simplified DCF-valuation is performed for each simulation by using a for-loop. The results are stored in the variable **equity_values**.
The following histogram shows the distribution of the resulting equity values:

Figure 7: Histogram of simulated equity values



The distribution of the simulated variables are shown in the following histograms:

Figure 8: Histogram of simulated revenue growth rates

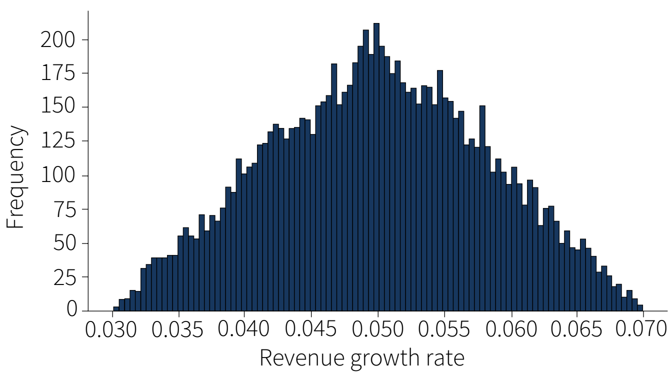


Figure 9: Histogram of simulated EBIT margins

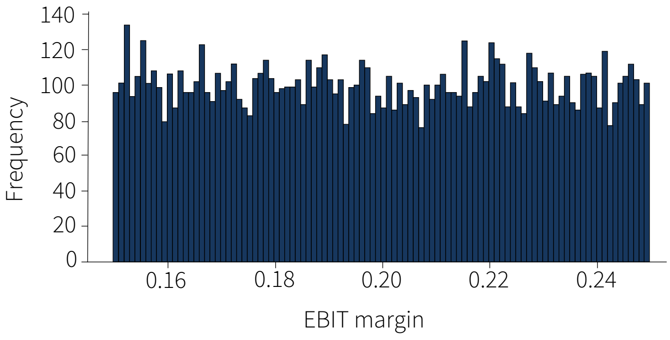
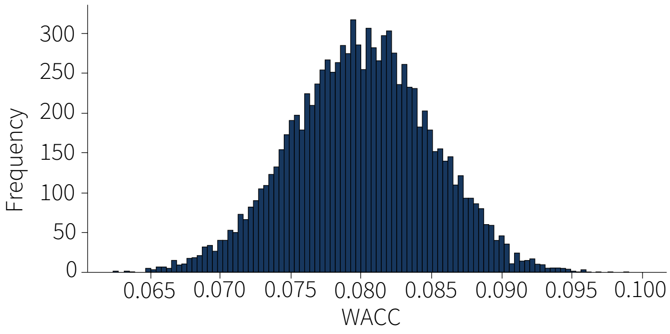


Figure 10: Histogram of simulated WACC



The resulting correlation between the revenue growth rate and the EBIT margin, calculated ex-post on the simulation results in our example, was equal to approx. 48%. In summary, it can be concluded that the correlation assumption could be successfully implemented using the Python code shown above.

V. Conclusion

There are many ways to factor in the correlation between the parameters of a Monte Carlo simulation. For normally distributed variables, this can be done by using a multivariate normal distribution or the Cholesky decomposition. The latter method can also be easily applied due to the simple form of the resulting formulas. Modeling the correlation between non-normally distributed parameters is somewhat more complex and can be solved by using a copula. The correlation is taken into account indirectly by first transforming the marginal distributions of the parameters into normal distributions and incorporating a correlation between these transformed distributions. The resulting random variables are then transformed back into their original distributions. The correlation structure remains unchanged.

The code presented in this article shows how a copula can be modeled in Python. An application example illustrates the results of a simulation taking into account the correlation between the parameters. ◆

Cost of Capital Study 2025: Between Past and Future: Bridging Empirical Yields with Return and Growth Expectations

The Cost of Capital Study by KPMG is being published this year in its 20th edition. Once again, a comprehensive analysis of current developments in corporate planning and the derivation of cost of capital has been released. This year's anniversary edition is themed: "Between Past and Future: Bridging Empirical Yields with Return and Growth Expectations." As in previous years, the focus was on the impact on corporate valuations and developments.

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I. Preliminary Remarks

The Cost of Capital Study 2025 analyzes the relationship between historical and implicit returns and the impact of growth expectations on implicit market risk premiums, taking into account the implicit return requirements of the markets. It explores whether risk expectations or growth expectations play a more significant role in explaining implicit return demands. Additionally, it examines the influence of different business models and corporate developments on the growth expectations that markets consider. The accompanying focus topics also follow the study's theme:

- Europe under pressure: Central bank autonomy, debt and AI innovation will shape the continent's economic trajectory.
- Empirical returns: Do regional differences persist in the long run?
- Estimating implied returns: Are differences driven by risk or growth expectations?

The study is based on a survey of over 300 companies from Germany, Austria, and Switzerland. The survey was conducted between March and July 2025. The consolidated financial statement dates depicted in the study ranged from March 31, 2024, to March 31, 2025.

The empirical data collected from participants is based on impairment testing under the International Financial Reporting Standards (IFRS) that are mandatory for all IFRS users.

The study continues to include extensive analyses by sector and sub-sector, as well as evaluations of family-owned and non-family-owned companies.

The digital presence of the Cost of Capital Study provides access to interactive evaluations of key cost of capital parameters and facilitates the execution of impairment tests. The website offers a clear presentation of the results in the form of ranges and makes the complete study available for download (here).

II. Overview of the Current Study Results

Planning horizon: Compared to the previous year, a decline in both short-term and long-term planning horizons was observed. Instead, the medium-term five-year planning gained importance, indicating a more cautious assessment of short-term uncertainties and more stable expectations in the medium-term horizon.

Growth: As in the previous reporting period, companies on average expected a higher increase in EBIT (Earnings Before Interest and Taxes) than in revenue. Overall, growth expectations, driven by the Technology sector, have risen compared to the previous year. In the current reporting period, participating companies anticipated revenue growth of 6.2% and EBIT growth of 10.2%, compared to 5.4% and 9.7% in the previous reporting period.

The vast majority of surveyed companies indicated that they primarily achieve their growth targets through organic growth, with a particular focus on product innovations and optimizations as key measures. Additionally, companies rely on expanding their product portfolios, increasing efficiency in production and sales, and implementing measures to strengthen customer loyalty to achieve their growth objectives.

Approximately 18% of participants plan to grow through acquisitions in the coming years, primarily to complementarily expand their business model. On average, companies primarily aiming for organic growth expect significantly higher growth rates.

Inflation Expectations: As in the previous year, the short-term inflation expectations of the participants exceeded the European Central Bank's (ECB) medium-term consumer-oriented inflation target of 2.0%. In the medium to long term, the majority of participants continue to anticipate company-specific inflation rates ranging between 1.0% and 3.0%, unchanged from the previous year.

Planning Uncertainty: Compared to the previous year, the situation has slightly improved. 63% of the participating companies assessed the current economic uncertainty as negative or very negative for business planning. In the previous year, this figure was 75%. Nevertheless, only 11% of companies considered an adjustment to the planning process necessary due to high uncertainties, while 73% wanted to maintain the existing planning process. The remaining participants did not provide any information on this matter.

WACC: The average Weighted Average Cost of Capital (WACC) across all sectors was 8.5%, representing a slight increase compared to the previous year (8.2%). Comparatively high WACCs were recorded on average by the sectors Industrial Manufacturing (9.4%) and Technology (9.4%), while both the Energy & Natural Resources sector (6.3%) and the Real Estate sector (7.0%) had the lowest average WACCs.

Risk-Free Rate: After last year's increase, the average risk-free rate remained constant at 2.5% in the current survey period. The comparison between Germany and Austria versus Switzerland shows different developments. While the risk-free rate in Germany and Austria slightly decreased from 2.6% to 2.5%, Switzerland recorded a significant increase from 1.8% to 2.6%.

Market Risk Premium (MRP): After the MRP set by the participating companies decreased last year, it remained constant at 6.7% in this year's reporting period. 43% of the participants set an MRP between 6.51% and 6.75%, while one in four companies set an MRP between 6.76% and 7.00%. While the MRP in Germany and Switzerland each decreased by 0.1 percentage points to 6.7% and 6.0%, respectively, it remained unchanged in Austria at 6.7%.

Beta Factor: During the survey period, the average unlevered beta factor of the participating companies slightly increased to 0.86 compared to the previous year. As in previous years, the highest unlevered beta factors were observed in the Technology (0.99), Industrial Manufacturing (0.97), and Automotive (0.93) sectors. The lowest values were recorded in the Energy & Natural Resources (0.58) and Real Estate (0.74) sectors.

Cost of Debt: After a significant increase last year, the average cost of debt for the participating companies decreased from 4.4% to 4.3%. Consequently, the implicit average credit spread (the difference between the cost of debt and the risk-free rate) slightly decreased compared to the previous year to 1.8%.

Impairment Test: In the current study, 48% of the participants reported having recognized an impairment. This figure remained constant compared to the previous year, highlighting the ongoing economic pressures caused by geopolitical crises and increasing uncertainties across sectors. As in previous years, impairments on assets continue to be the most frequently observed form of impairment. The proportion of companies making such impairments slightly increased from 34% to 35%. At the same time, the proportion of companies with impairments on goodwill rose from 20% to 22%.

Triggering Event: Compared to the previous year, the proportion of companies conducting an unscheduled impairment test based on a so-called "triggering event" slightly increased from 40% to 42%. The main reason for the impairment tests was reportedly less favorable long-term prospects (57% of participants vs. 46% in the previous year), while losses of orders increasingly prompted impairment tests (21% of participants vs. 17% in the previous year). In contrast, increased cost of capital as a "triggering event" significantly decreased from 19% in the previous year to 8%.

Monitoring: Value-oriented monitoring of investment decisions remains of central importance to companies. As in the previous year, the participating companies reported observing changes not only in performance (planning) but also in risk (return expectations/cost of capital).

Megatrends: As in the previous year, the study analyzed the significance of megatrends concerning the business models of the respondents. The majority of participants from all sectors indicated that the influence of megatrends on their business models has increased. Participants from the Chemicals & Pharmaceuticals and Consumer Markets sectors have significantly heightened their perception of the impact of megatrends compared to last year's study. Overall, the megatrend 'Digitalization' was rated as the most relevant, followed by Artificial Intelligence and ESG (Environmental, Social, Governance).

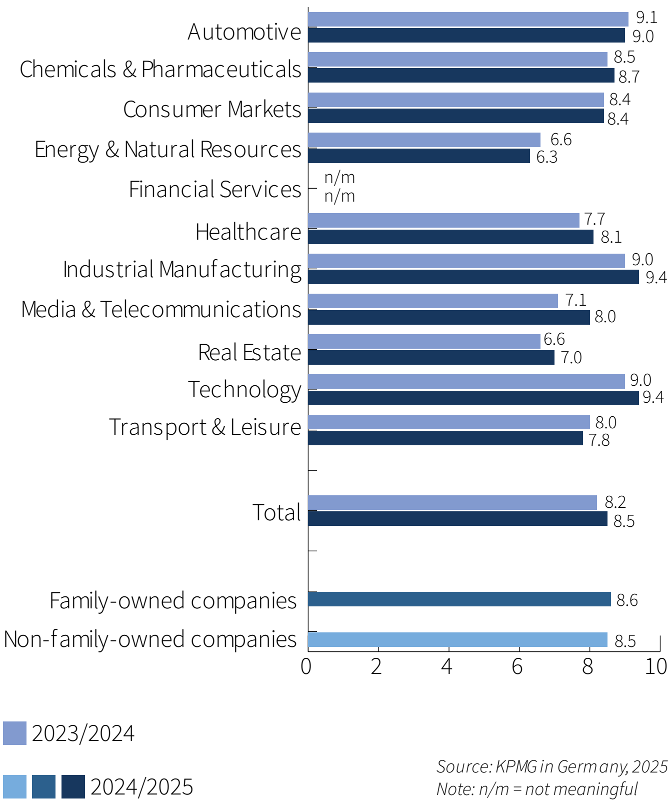
III. Selected Results in Detail

1. Increasing Cost of Capital

This year's Cost of Capital Study shows an increase in the weighted average cost of capital (WACC) from 8.2 percent in the previous year to 8.5 percent. This continues the upward trend of the last three years and raises the WACC to its highest level in the past 20 years (cf. figure 1).

The increase in WACC is reflected differently across various sectors. The largest increases in WACC are observed in the Media & Telecommunications sector (from 7.1% to 8.0%), Healthcare (from 7.7% to 8.1%), Industrial Manufacturing (from 9.0% to 9.4%), Real Estate (from 6.6% to 7.0%), and Technology (from 9.0% to 9.4%).

Figure 1: WACC (after corporate taxes) by sector (in percent)



Source: KPMG in Germany, 2025
Note: n/m = not meaningful

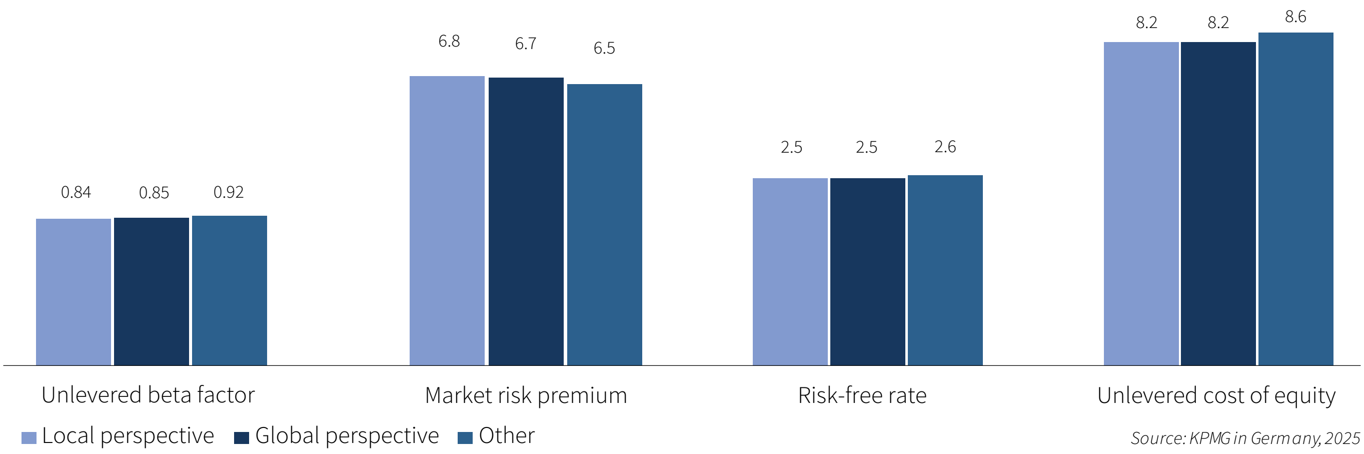
The overall high WACC is primarily influenced by the average applied risk-free rate, which, after a significant increase in 2024, remained at the previous year's level of 2.5%. The increase in WACC observed in most sectors primarily results from sector-specific developments.

2. Derivation of Cost of Capital from a Local vs. Global Perspective

The insights from this year's Cost of Capital Study on deriving cost of capital from a global versus local perspective enrich the discussion on the potential advantages and disadvantages of both methods with empirical data.

The study shows that, on average, there is no difference in the derivation of cost of capital parameters for German companies, regardless of whether a sufficiently broad local or broader global perspective is adopted when incorporating empirical data. The key factor is not solely the choice of data scope, but also the consistent application of the chosen approach in deriving parameters such as the risk-free rate, market risk premium, and beta factor, provided a sufficiently broad dataset is utilized.

Figure 2: Average of cost of capital parameters based on perspective (Germany only), Total (in percent)

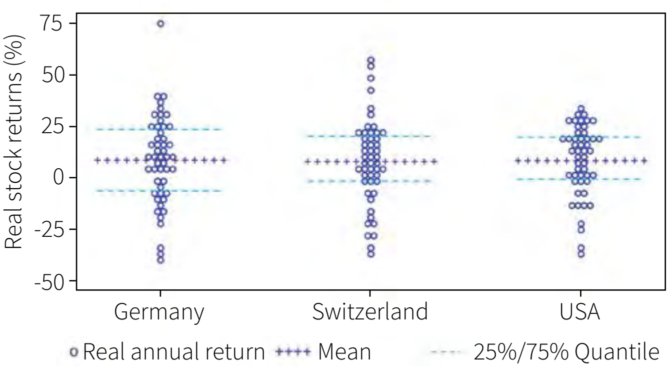


Source: KPMG in Germany, 2025

3. Return Differences Between Different Economic Areas

Building on the aforementioned survey results and against the backdrop of recent indications of alleged discrepancies between historically observed returns and risk premiums on one hand, and (calculated) implicit returns and risk premiums on the other, the long-term average return differences between different economic areas were examined. A period from 1960 to 2023 was applied for the regions of Germany, Switzerland, and the USA. The real annual stock return was considered to eliminate differences in inflation levels. The results are as follows:

Figure 3: Empirically Observed Real Stock Returns



Source: Stehle/Schmidt (2015): Returns on German Stocks 1954 to 2013; Shiller (2000, 2005, 2015): Irrational Exuberance; Ibbotson (2003): Long-Run Stock Returns: Participating in the Real Economy; Pictet (2024): The long-term performance of Swiss equities and bonds (1926-2023); German Central Bank (2025); FED (2025); SNB (2025); Bundesamt für Statistik (2025). Calculation/Presentation: KPMG in Germany

It is evident that across the three capital markets considered since 1960, very comparable real returns of approximately 7.5% per annum have been achieved on average. The superior performance of certain regional capital markets compared to others—such as the American market outperforming the German market in recent years—is typically temporary and tends to even out over the long term. If this pattern continues in the future, it offers valuable insights for estimating required (future) return expectations and for discussing the use of empirical data from different economic regions.

4. Slight Recovery of Growth Expectations

This year's projected revenue growth expectations for the participating companies show an increase of 0.8 percentage points, but they remain strongly influenced by geopolitical uncertainties and their effects (see Figure 4). The main factors include Russia's war of aggression against Ukraine and the Middle East conflict, as well as uncertainties due to intended changes to existing tariff regimes, the potential implementation of trade restrictions, and other protectionist measures that put pressure on companies.

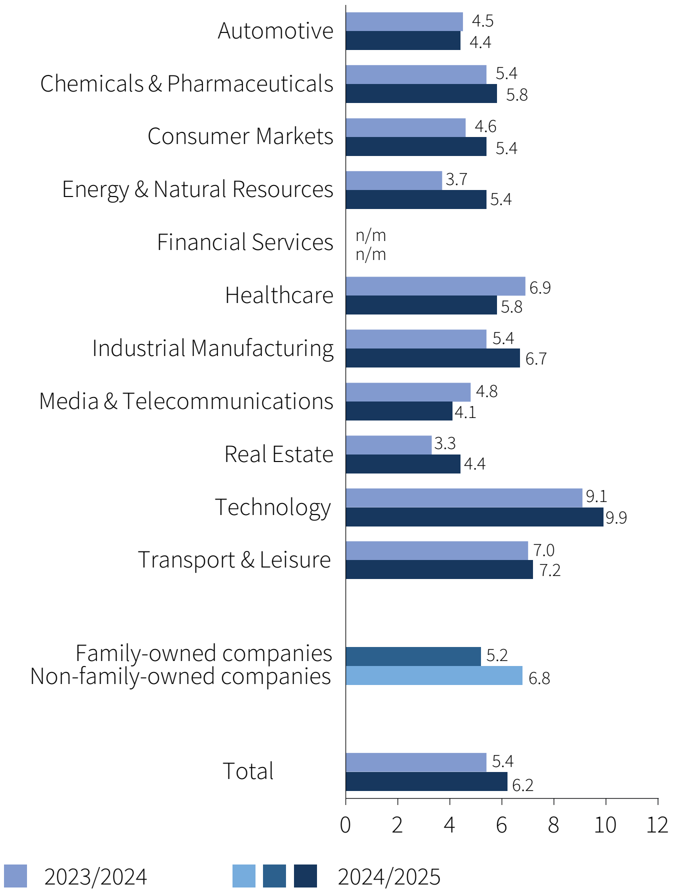
Particularly Affected Sectors

Energy & Natural Resources: In this sector, revenue expectations have increased by 1.7 percentage points, likely resulting from the recovery of industrial demand as well as persistently high energy and raw material prices. Additionally, political measures to secure and diversify energy supply in Europe are creating new investment and growth opportunities for companies in the industry.

Industrial Manufacturing: In this sector, revenue expectations have increased by 1.3 percentage points. Possible reasons could include increased production and export demand, particularly in the defense sector, as well as persistently high inflation rates, especially for energy and resources.

Real Estate: In the real estate sector, revenue expectations have increased by 1.1 percentage points. A key driver could be the strong demand combined with a limited supply of new properties. Additionally, stagnant or slightly declining construction interest rates may also contribute to greater willingness to buy.

Figure 4: Forecast revenue growth by sector (in percent)



Source: KPMG in Germany, 2025
Note: n/m = not meaningful

The Importance of Regional Growth Expectations

Further analyses reveal substantial differences in regional growth expectations. Therefore, when deriving implicit returns and risk premiums, it is essential to account for these structural variations and their impact on regional growth. This can be addressed by using longer estimation horizons or by applying different sustainable growth rates that reflect both quantity and inflation-related effects.

When regional growth differences are incorporated into the calculation of implicit returns, the results for returns and risk premiums become far more consistent—compared to historical long-term return comparisons across individual regions—when using data from diverse economic areas. In this case, the calculated implicit (real) returns and risk premiums align with historical and comparable ranges.

5. Artificial Intelligence (AI), Digitalization, and ESG (Environmental, Social, and Governance) Still the Most Significant Megatrends for Business Models

In line with last year‘s results, two-thirds of the study participants assessed that the influence of megatrends has intensified over time and will have a disruptive impact on business models in the future. Particularly in the Media & Telecommunications, Financial Services, and Real Estate sectors, participating companies emphasized the increasing importance of megatrends. The survey analysis showed that AI, digitalization, and ESG are of great relevance in almost all sectors (see Figure 5). The reasons for this are rapid advancements in AI and digitalization, as well as increasing requirements due to sustainability regulations.

In particular, AI has gained further importance compared to the previous year, with significant relevance now attributed to it across all sectors. The advantages in data analysis, automation, and decision-making are immense for data-driven industries and drive innovation forward. Additionally, AI enables additional growth potential by developing new products.

AI is widely regarded as a key driver of economic growth over the next decade, with the United States currently leading the way. While Europe lags behind, it has the potential to catch up—particularly by reducing bureaucratic barriers, expanding access to venture capital, and strategically attracting international talent. These measures could significantly enhance productivity and competitiveness, ultimately supporting growth and employment.

6. Companies Increasingly Consider Regulatory and Political Risks

To adequately account for the estimation uncertainty of future cash flows, it is crucial to consider all relevant opportunities and risks of the operational business when preparing financial forecasts. The majority of participating companies incorporate macroeconomic risk factors, particularly economic risks, into their financial forecasts. Compared to the previous year, a significantly larger proportion of companies now include regulatory and political conditions, such as protectionism, in their financial forecasts.

The focus topics of this year‘s Cost of Capital Study reflect, among other things, the presence of such risks that put European companies under pressure:

Firstly, the independence of central banks is a crucial factor, as it prioritizes long-term macroeconomic stability over short-term political interests. Current developments in the US and Europe highlight potential political attempts to influence the independence of central banks, which can threaten the autonomy and credibility of monetary policy.

Secondly, rising government debt in Europe threatens long-term fiscal stability, as structural reforms are displaced by debt-financed transfer payments. This leads to increasing uncertainty in assessing the creditworthiness of states and rising yield requirements for government bonds, which could also affect the cost of capital for companies.

IV. Summary

The average cost of capital (measured by WACC) has continued to rise in the reporting period, primarily due to sector-specific developments. The average risk-free rate remains at a high level during the observation period; however, companies expect medium- to long-term declining inflation, accompanied by slightly increasing growth rates.

After a period of declining inflation rates, inflation in Germany initially stabilized at a moderate level during the observation

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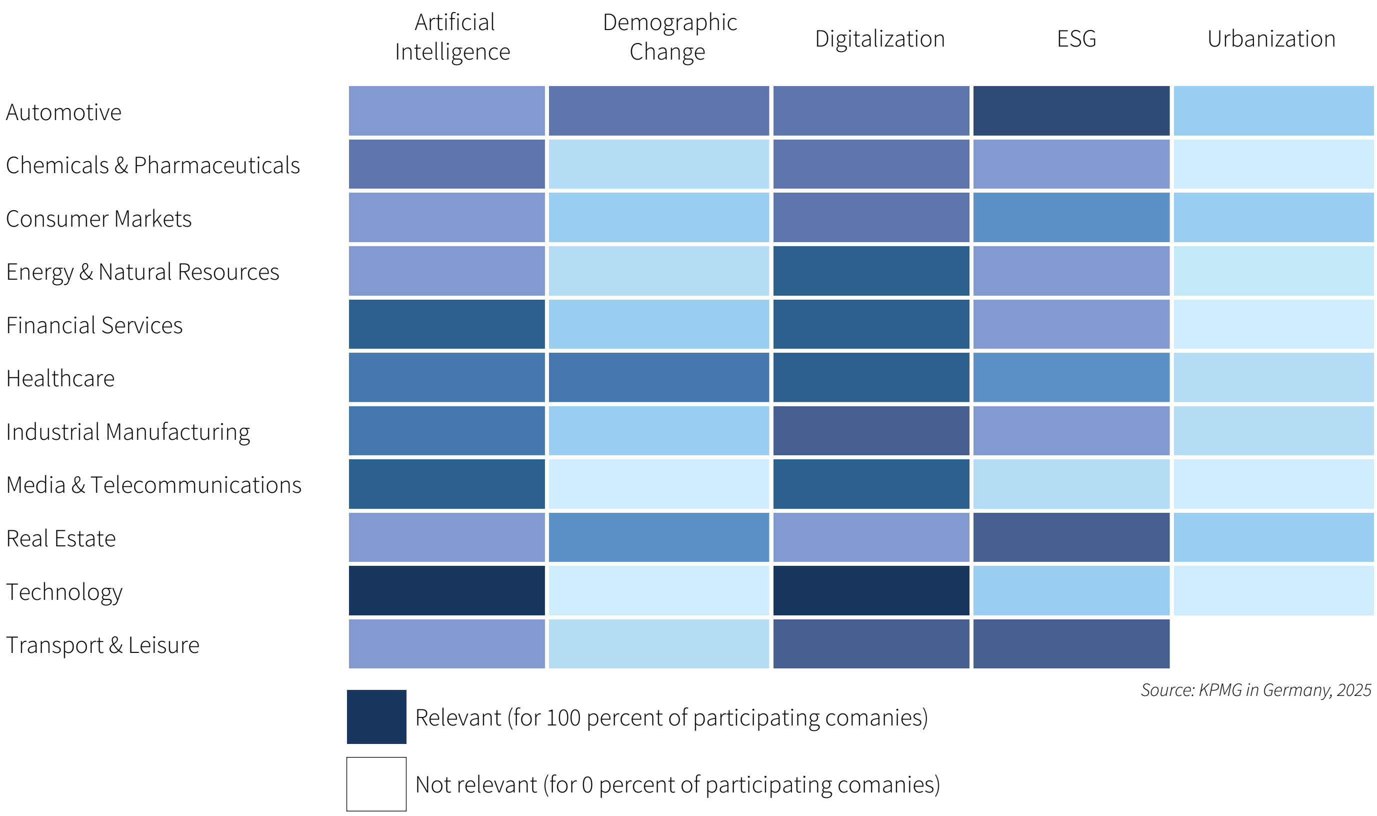
Figure 5: Relevance of megatrends by sector Total (in percent, multiple choices possible)



Source: KPMG in Germany, 2025

period but has recently risen above the ECB's 2.0% target again. This trend is reflected in financial markets through persistently high nominal return requirements. The high-inflation phase up to early 2024 significantly increased awareness of inflation risks and their impact on nominal interest rates. Consequently, the inflation environment remains a key factor in investment decisions and interest rate strategies, while ongoing uncertainty in monetary policy continues to drive higher risk premiums.

Companies are now looking to the future with greater confidence and anticipate a return to modest growth in their business models. However, these growth expectations are threatened by a number of structural and political risks. Long-term economic stability and growth potential in Europe critically depend on maintaining the independence of central banks, sustainably reducing government debt, and accelerating the integration of artificial intelligence.

Market participants' expectations regarding future returns are a central parameter for asset pricing and valuation models. Against the backdrop of geopolitical tensions, increasing fiscal burdens, and the transformative impact of AI, new levels of complexity must be considered in calculations. These factors challenge traditional assumptions and require a more nuanced approach to forecasting and estimating cost of capital.

The growing convergence of developed capital markets is pushing the regional origin of empirical data used to derive historical and implicit returns into the background. At the same time, the increasingly divergent growth dynamics across economic regions are gaining importance and must be properly reflected in valuation models and cost of capital calculations.

In the context of corporate valuations, capital market data is regularly used. Due to increased uncertainties, it is advisable to analyze (irrational) over- or underestimations of the markets to avoid an unreflective transfer of possible market overreactions to valuations. In the current environment, it is crucial to focus on both implicit inflation expectations and market participants' risk assessments. We therefore recommend ongoing monitoring of valuation-relevant capital market parameters, which we regularly track and update. These can be accessed via the link: KPMG Valuation Data Source. ◆

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EACVA's International BV Conference on 13 and 14 November 2025 in Munich – Detailed Review

On 13 and 14 November 2025, EACVA welcomed around 450 business valuation professionals from 17 countries to Munich for its 18th International Business Valuation Conference. Taking place in EACVA's 20th anniversary year, the conference marked a significant milestone for Europe's largest business valuation gathering and once again underlined EACVA's role as a leading international network for valuation professionals from practice, academia, advisory and regulatory institutions.

The two-day programme featured two keynotes and 24 expert sessions delivered by 28 distinguished speakers, addressing the most pressing challenges and developments shaping today's valuation landscape. Topics ranged from the transformative impact of AI and automated valuation models to implications of revised standards in Germany and Austria (IDW ES 1 & KFS BW 1), practical perspectives on DCF, multiples and terminal value, as well as industry insights into valuing digital business models and biotech.

Beyond its technical depth, the conference once again demonstrated the value of personal exchange and professional dialogue within the international valuation community. And of course: beyond the content, it's the connections that count. From the cozy "Royal Mountain Lodge Magic" evening at the cozy Alpine Hut to the unforgettable Networking Dinner at the historic Augustiner Keller with Harthauser Musi these moments reminded us how strong and vibrant our community is. They provided ample opportunity to strengthen existing relationships and build new ones. With its record attendance and consistently high-quality content, the Munich conference set a strong benchmark for the future.

In their welcome address, Andreas Creutzmann and Wolfgang Kniest, highlighted the special position of the EACVA as a network of experts in the context of its 20th anniversary, as well as the outstanding development of the conference since its inception. The continuous development of training and certification opportunities was reflected in the announcement of the new [CDAV (Certified Digital Asset Valuator)] credential.

Opening Keynote: Trump, Putin and the United States of Europe
Prof. Dr. Dr. h.c. mult. Hans-Werner Sinn | former president of the ifo Institute

Professor Sinn opened the event with a presentation on 'Trump, Putin and the United States of Europe', based on his new book of the same name. He pointed out that the US has been acting increasingly selfishly in recent years, e.g. through protectionist customs measures and political pressure on its allies. In this area of tension between the US and Russia, Sinn emphasised the importance of Europe's economic and political sovereignty, particularly regarding a common security policy that can effectively protect the continent in times of growing foreign policy uncertainties. To this end, he appealed to those in power to seize the opportunity to establish a democratically elected parliament with control over joint armed forces, which was missed in the past.

Keynote: Switch On Brain First, Then Technology – IT Productivity Beyond the Hype
Thorsten Jekel, MBA | jekel & team

Thorsten Jekel, a leading expert in digital working and productivity, highlighted in his keynote that the technology is not a dream of the future, but the present – 'use it or lose it.' He roused the audience at the start of the second day of the conference with his provocative thesis: 'A fool with a tool is still a fool – a fool with AI makes the disaster faster.' With a wealth of expertise, he made it clear that artificial intelligence is not a magic solution for poor processes, but that meaningful digitalisation can only be achieved by following the principle of 'eliminate, optimise, automate'. Jekel demonstrated how tools such as Microsoft 365 Copilot or Perplexity (when used 'correctly') can revolutionise everyday work, as long as the human mind remains in control ('leading' rather than just "prompting"). He warned against simply accelerating 'garbage in, garbage out' with AI. The following masterclass session Thorsten Jekel discussed interesting AI tools and their practical applications, along with questions from participants.

Sequential Investments and Terminal Value in DCF Models – When and Why We Need a Convergence Period

Prof. Dr. Bernhard Schwetzler, CVA | HHL Leipzig Graduate School of Management

In his presentation, Professor Schwetzler shared the key findings of his latest research paper on modelling terminal value in DCF valuations. He demonstrated that the assumptions of a steady state with value-neutral investments and constant growth rates, which are widespread in practice and standard setting, are theoretically incompatible with a value-maximising investment policy in theory. In his model of sequential investments with diminishing returns to scale, equilibrium with positive growth can only be achieved through continuous productivity gains, which require value-enhancing investments. Ignoring this endogeneity of cash flows leads to systematic valuation errors in terminal value. Schwetzler therefore advocated a more realistic modelling of the transition phase to perpetual annuity in order to improve theoretical consistency and valuation accuracy.

Reasonability Cross-Checks in Intangible Asset Valuation for PPA

Prof. Anamaria Ciobanu, Ph.D. | KPMG Romania & Bucharest University of Economic Studies

During her presentation, Prof. Ciobanu offered valuable insights into validating intangible asset valuations. Her presentation focused on plausibility checks ('cross-checks'), which effectively verify classic valuation approaches such as the relief-from-royalty method and the multiple profit excess earnings method (MPEEM). Using a practical case study on radar technology, she demonstrated how the expected returns on individual assets can be harmoniously aligned with the total cost of capital. The presentation also offered an interesting excursion into the specialised valuation of technology transfers (ToTs) in the context of offset agreements, linking complex regulatory requirements with economic models.

Recognise, Review, Act – Corporate Planning Between Ambition and Reality

WP StB Janina Poppe | RSM Ebner Stolz

In her presentation, Janina Poppe highlighted the central importance of sound business planning in an uncertain economic environment. After providing an overview of the legal basis, particularly with regard to early crisis detection in accordance with Section 1 of the StaRUG, she presented the general planning principles set out in IDW Practice Note 2/2017. The focus then shifted to the assessment of business planning, ranging from the analysis of the planning process and the evaluation of assumptions to the derivation of appropriate measures and the analysis of plan/actual deviations. She emphasised that ambitious but insufficiently plausible plans can only be properly assessed through systematic review processes and transparent documentation. Finally, she addressed the role of the consultant and showed how a low-liability planning assessment can be achieved through clear assumptions and unambiguous delineation of responsibilities.

Business Valuation for Accounting Purposes – Pitfalls for Valuers

Prof. Dr. Robert Braun | TH Brandenburg

Professor Braun presented some of the pitfalls in company valuation for accounting purposes. He emphasised the importance of critical distinguishing between purchase price payments and personnel expenses in company acquisitions, particularly in the context of 'bad leaver clauses'. Using specific errors identified by BaFin, he demonstrated how essential market-based assumptions and consistent parameters are in determining fair value and in impairment tests. The presentation offered guidance on the correct allocation of corporate assets and the valid derivation of discount rates. Finally, Prof. Braun gave an outlook on upcoming IASB initiatives that promise to simplify processes.

Stock Market Price and IDW ES 17 – An Economic Assessment
Dr. Andreas Tschöpel, CVA, CIIA, CEFA | KPMG Berlin

In his presentation, Dr. Andreas Tschöpel outlined the conceptual framework of the new German standard IDW ES 17 and classified the stock market price from an economic perspective in relation to the capitalised earnings value. Based on the case law of the Federal Court of Justice, according to which both the capitalised earnings value method and the stock market price are fundamentally suitable methods for company valuation, he showed that both approaches serve the same valuation purpose and must therefore be measured against identical criteria. While the capitalised earnings value is characterised by assumptions and forecasts, the stock market price offers an observable market price. Tschöpel emphasised the requirements of plausibility, equivalence and consistency as guiding principles for ensuring consistent results between calculated income values and observed stock market prices. Finally, he pointed out that IDW ES 17 places high demands on proper price assessment and that the inclusion of the stock market price – taking into account, for example, the cut-off date principle, liquidity and shareholder structure – will require even more precise consideration in future compared to the capitalised earnings value.

Valuation of Private Debt with Equity Features: Special Challenges, New Instruments and Practical Examples
Antonella Puca, CPA/ABV, CFA | BlueVal, USA

The participants were already aware of the increasing complexity of private debt instruments, which go far beyond traditional convertible bonds. However, Antonelle Puca used practical case studies to demonstrate with great technical depth how valuation professionals need to accurately calibrate and model hybrid forms of financing, such as loans with warrants or revenue-based royalties. This included her analysis of a recent SEC case, which demonstrated when credit instruments are considered disguised equity from a regulatory perspective and what risks are associated with them. Puca made it clear that simple models are often no longer sufficient for modern convertible bonds with variable pricing mechanisms and that advanced methods are becoming indispensable. Her presentation concluded with an outlook on the use of AI to analyse complex contract clauses and on new trends such as crypto-backed loans, preparing participants for the future of valuation.

Legal-based company valuations based on the draft of the new Austrian standard KFS/BW 1
WP StB MMag. Marcus Bartl | BDO Austria / WP StB Univ.-Prof. Dr. Klaus Rabel | Rabel & Partner

In their presentation, Marcus Bartl and Klaus Rabel outlined the key changes in the revised Austrian standard KFS/BW 1 on business valuation, which ich is expected to become binding in mid-2026. The new standard replaces the previous 'one-fits-all' concept of KFS/BW 1 (2014) with a new system of valuation standards that distinguishes between objectified and standardised subjective company values as well as market value and arbitration value. While the DCF method is decisive for objectified and standardised subjective company values, market values also take into account realised transaction prices, stock market prices and multipliers. Finally, Bartl and Rabel explained the allocation of legal value standards to the business value standards of KFS/BW 1.

Let's Put an End to the Ever-Present Investment Banking Football Field Chart – A Practical Case Study
Seth Bernström | KPMG Sweden

Seth Bernström subjected the ubiquitous 'football field' charts to critical scrutiny and questioned their methodological usefulness. Using a case study in which the audience themselves became actively involved, he illustrated that significant differences in value between DCF and multiplier methods are usually not due to methodology, but rather to inconsistent assumptions about risk and growth. Using regression analyses and harmonising capital costs, he showed how valuation discrepancies can be logically resolved. Bernström made it clear that the value of a company is determined by fundamental data and not by the choice of method. His plea for more analytical discipline instead of mechanical averaging provided participants with valuable insights for more precise valuation practices.

The New German Standard IDW S 1 and the SME Valuation

Prof. Dr. Ulrich Balz | Münster School of Business / Prof. Dr. Heinz-Gerhard Bordemann | Onvalue

The two speakers presented the key changes in the revised German standard IDW ES 1 for the valuation of small and medium-sized enterprises (SMEs). After describing the typical characteristics of SMEs – such as missing or incomplete management planning – they showed that the new standard includes a gradation of the plausibility check into a 'comprehensive' or 'sufficient' plausibility check of management planning. In the speakers' view, the exact distinction and its impact on the valuation result is an issue that still needs to be clarified in detail. They also emphasised that, due to the limited information available and market conditions for SMEs, a perfect capital market cannot be assumed, which is why the determination of capital costs based on the CAPM should be critically questioned.

Analyst Forecasts in Valuation Practice

Dr. Moritz Bassemir | Kroll

The presentation analysed the methodological challenges and correct application of analyst estimates in valuation practice. It explained the relevance of these forecasts for capital market reactions and their specific areas of application, such as impairment tests or the determination of implicit capital costs. A central focus was on rigorous data validation, with Dr Bassemir using case studies to show how database aggregates for key figures often deviate from the actual definitions used in investor relations. He also highlighted typical distortions such as 'optimism bias' and discussed empirical findings on forecast quality in comparison to statistical time series models.

Valuation of Biotech Companies

WP StB Dr. Alexander Brunner | IVC Independent Valuation & Consulting

In his presentation, Dr Alexander Brunner highlighted the unique challenges involved in valuing biotech companies. These companies are typically characterised by young corporate structures, high initial investments, lengthy development times to market maturity, and numerous risky clinical phases. Due to a lack of positive returns, multipliers are usually unsuitable for valuation purposes. Instead, valuation is regularly carried out using the DCF method. Understanding the company's business model is crucial in order to realistically model key parameters such as market share and sales development over the patent term based on solid data. Dr Brunner emphasised that the high level of model uncertainty should be addressed through sensitivity analyses, scenario simulations, and estimation of transition probabilities between clinical phases.

Valuation of Digital Business Models

Prof. Dr. Marc Goedhart | McKinsey | RSM Erasmus University

Network effects are at the heart of many new digital business models. Professor Goedhart spoke about what exactly distinguishes these from traditional models and how the differences are reflected in valuation issues. He highlighted the difficulties of valuing young and fast-growing companies but nevertheless provided participants with a practical approach. Under the motto 'Start from the future', Goedhart advocated looking to the future, especially in the context of companies that are not yet profitable at the time of valuation and may only have minimal revenues. In many cases, this situation prevents the meaningful use of multiples and must be replaced by working with alternative scenarios and their probability to reflect the risk. His presentation made participants acutely aware of the inherent volatility of valuing these companies.

Save the dates! We are pleased to invite you to our 2026 conferences:

- 1st **EACVA & EVI European Valuation Summit 2026** on **15 June 2026** in **Prague** (Congress Centre of the Czech National Bank)
- 19th **EACVA International Business Valuation Conference 2026** on **19 and 20 November 2026** in **Berlin** (Titanic Chaussee Hotel Berlin)

Please mark your calendars. You can also already make a non-binding reservation by e-mail (info@eacva.de). ◆

Industry Betas and Multiples

Dr. Martin H. Schmidt
Senior Manager Deal Advisory KPMG AG WPG Germany
Contact: ebvm@eacva.de

Dr. Andreas Tschöpel, CVA, CEFA, CIIA
Partner Deal Advisory KPMG AG WPG Germany, Member of the Technical Committee for Business Valuation and Economics (FAUB) of the IDW e.V., Board Member of the EACVA e.V.

I. General

To derive the provided betas and multiples, only companies from the Eurozone have been considered. The included companies have been grouped on an industry level and on a sub-industry level based on the Global Industry Classification Standard (GICS). In each issue of the journal, aggregates for all eleven main industries and one individually selected sub-industry will be shown. Due to the special characteristics of companies operating in the financial industry (high leverage, leverage as part of the operating business, high dependency on the interest rate level, etc.), we only provide levered betas and equity-based multiples for that industry.

All presented values are based on raw data and raw calculations. They have carefully been checked and evaluated but have not been audited nor have individual values been verified. Certain results may be misleading in your setup or specific context. All results should be critically evaluated and interpreted. The data and usage are at your own risk.

II. Data source

All data has been obtained from the KPMG Valuation Data Source. The data source provides access to cost of capital parameters from more than 150 countries and sectors as well as peer-group-specific data from over 16,500 companies worldwide. The data covers the period from 2012 to the present. The data is updated monthly and is accessible from anywhere around the clock.
See www.kpmg.de/en/valuation-data-source for details.

III. Eurozone Cost of Capital Parameters as at 30 November 2025

The typified, uniform risk-free rate based on AAA-rated government bonds currently lies at 3.25% for the Eurozone. It is derived from yield curves based on Svensson parameters and results published by the European Central Bank. The overall long-term market return for the Eurozone is estimated at around 8.5%, leading to a market risk premium of 5.25%. Estimations of the market return rely on historical returns, as well as on forward-looking return estimates and risk premiums based on Eurozone companies with current market share prices and earnings forecasts from financial analysts.

IV. Betas

Levered, debt and unlevered betas are calculated over an observation period of a single five-year period (monthly returns) and for five one-year periods (weekly returns).

Raw levered betas are obtained from a standard OLS regression, with stock returns being the dependent variable and stock market index returns (S&P Eurozone BMI Index) being the independent variable. Stock and index returns are total returns, thus including dividends, stock splits, rights issues, etc. (if available). Levered betas below zero and above three are treated as outliers and are excluded.

Unlevered betas have been estimated based on Harris-Pringle, assuming uncertain tax shields and including debt beta:

$$\beta_u = \beta_L \frac{E}{E+D} + \beta_D \frac{D}{E+D},$$

where $ß_U$ = unlevered beta, $ß_D$ = debt beta, D = net debt, E = market value of equity. Debt betas rely on a company's individual rating on a given date. Monthly rating-specific levels of debt betas are extracted from a broad market analysis. Net debt consists of total debt (incl. lease liabilities) + net pensions + total preferred equity - total cash - short-term investments. In accordance with the observation period, parameter averages of debt beta, net debt and market equity over the individual periods are applied when unlevering levered betas. Unlevered betas below zero and above two are treated as outliers and are excluded.

Table 1: Median Levered Industry Betas for five single 1y-periods and one 5y-period

30 November 2025	Median Levered Betas								
	1-Year, weekly returns							5-Year, monthly returns	
Industries	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Industrials	*261*	0.92	0.86	0.84	0.78	0.90	0.86	*236*	1.00
Consumer Discretionary	*169*	0.98	1.00	0.94	0.86	0.88	0.93	*145*	1.07
Health Care	*127*	0.72	0.77	0.73	0.68	0.83	0.75	*117*	0.78
Financials	*140*	0.93	0.95	0.85	0.77	0.94	0.89	*136*	0.86
Utilities	*47*	0.68	0.63	0.64	0.38	0.38	0.54	*44*	0.68
Materials	*86*	0.89	0.90	0.85	0.81	0.97	0.88	*85*	0.91
Real Estate	*78*	0.39	0.71	0.73	0.45	0.53	0.56	*67*	0.86
Communication Services	*85*	0.67	0.64	0.65	0.47	0.62	0.61	*86*	0.69
Information Technology	*152*	0.90	0.95	0.81	0.86	0.88	0.88	*143*	1.02
Consumer Staples	*75*	0.57	0.62	0.44	0.40	0.46	0.50	*70*	0.55
Energy	*33*	0.84	0.50	0.53	0.51	0.85	0.65	*33*	0.55

Table 2: Median Industry Equity-Ratios for five single 1y-periods and one 5y-period

30 November 2025	Median Equity-Ratios								
	1-Year							5-Year	
Industries	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Industrials	*272*	84.6%	81.1%	82.0%	80.5%	79.9%	81.6%	*239*	80.9%
Consumer Discretionary	*173*	86.4%	78.6%	77.7%	70.7%	73.1%	77.3%	*143*	80.1%
Health Care	*138*	98.7%	95.7%	91.7%	94.8%	94.2%	95.0%	*126*	97.0%
Utilities	*49*	66.9%	62.9%	62.7%	59.3%	60.5%	62.5%	*44*	61.9%
Materials	*89*	77.6%	77.9%	79.2%	76.1%	71.1%	76.4%	*86*	76.9%
Real Estate	*80*	56.4%	47.6%	47.5%	47.7%	48.4%	49.5%	*68*	49.5%
Communication Services	*95*	85.7%	82.0%	71.8%	72.3%	72.3%	76.8%	*85*	77.0%
Information Technology	*160*	99.4%	96.2%	94.1%	93.2%	90.3%	94.6%	*141*	95.9%
Consumer Staples	*80*	75.8%	73.5%	74.0%	69.9%	71.5%	73.0%	*73*	76.2%
Energy	*36*	61.0%	82.9%	86.0%	82.9%	82.1%	79.0%	*34*	75.5%

Table 3: Median Unlevered Industry Betas for five single 1y-periods and one 5y-period

30 November 2025	Median Unlevered Betas								
	1-Year, weekly returns							5-Year, monthly returns	
Industries	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Industrials	*246*	0.70	0.68	0.64	0.59	0.73	0.67	*229*	0.78
Consumer Discretionary	*155*	0.74	0.81	0.69	0.64	0.65	0.71	*134*	0.82
Health Care	*114*	0.50	0.60	0.45	0.49	0.63	0.53	*109*	0.58
Utilities	*47*	0.50	0.46	0.48	0.35	0.28	0.41	*44*	0.50
Materials	*85*	0.72	0.75	0.67	0.64	0.81	0.72	*83*	0.70
Real Estate	*74*	0.32	0.50	0.49	0.33	0.39	0.41	*63*	0.57
Communication Services	*82*	0.44	0.54	0.47	0.41	0.52	0.48	*80*	0.55
Information Technology	*142*	0.75	0.87	0.65	0.53	0.75	0.71	*134*	0.92
Consumer Staples	*73*	0.44	0.57	0.40	0.39	0.41	0.44	*69*	0.48
Energy	*33*	0.64	0.48	0.48	0.45	0.74	0.56	*33*	0.56

Source: KPMG Valuation Data Source, see www.kpmg.de/en/valuation-data-source
**Average = Arithmetic Mean*

Table 4: Median Levered Subindustry (Utilities) Betas for five single 1y-periods and one 5y-period

30 November 2025	Median Levered Betas								
	1-Year, weekly returns							5-Year, monthly returns	
Subindustry: Utilities	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Electric Utilities	*14*	0.68	0.70	0.65	0.35	0.39	0.55	*14*	0.65
Gas Utilities	*6*	0.48	0.48	0.67	0.36	0.13	0.42	*6*	0.73
Multi-Utilities	*10*	0.60	0.80	0.67	0.41	0.31	0.56	*11*	0.88
Independent Power and Renewable Electricity Producers	*16*	0.82	0.61	0.56	0.42	0.46	0.57	*12*	0.67

Table 5: Median Subindustry (Utilities) Equity-Ratios for five single 1y-periods and one 5y-period

30 November 2025	Median Equity-Ratios								
	1-Year							5-Year	
Subindustry: Utilities	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Electric Utilities	*14*	62.6%	62.8%	62.6%	61.5%	64.4%	0.63	*14*	61.3%
Gas Utilities	*6*	62.2%	55.8%	53.8%	60.3%	59.4%	0.58	*6*	58.4%
Multi-Utilities	*11*	58.9%	46.8%	55.6%	54.5%	58.8%	0.55	*11*	54.3%
Independent Power and Renewable Electricity Producers	*17*	73.8%	73.3%	68.6%	59.3%	60.0%	0.67	*12*	70.5%

Table 6: Median Unlevered Subindustry (Utilities) Betas for five single 1y-periods and one 5y-period

30 November 2025	Median Unlevered Betas								
	1-Year, weekly returns							5-Year, monthly returns	
Subindustry: Utilities	Comps incl. (Average*)	12/2020 to 11/2021	12/2021 to 11/2022	12/2022 to 11/2023	12/2023 to 11/2024	12/2024 to 11/2025	Average*	Comps included	12/2021 to 11/2025
Electric Utilities	*14*	0.46	0.52	0.47	0.31	0.30	0.41	*14*	0.48
Gas Utilities	*6*	0.33	0.34	0.46	0.27	0.17	0.31	*6*	0.45
Multi-Utilities	*10*	0.45	0.46	0.39	0.33	0.16	0.36	*11*	0.50
Independent Power and Renewable Electricity Producers	*16*	0.56	0.49	0.53	0.39	0.49	0.49	*12*	0.53

Source: KPMG Valuation Data Source, see www.kpmg.de/en/valuation-data-source
**Average = Arithmetic Mean*

V. Multiples

Multiples are computed based on actuals (based on the annual report) and forecasts (based on consensus estimates by analyst) for the trailing year and the forward +1 year. Trading multiples for Sales, EBITDA and EBIT are each derived by dividing a companies' enterprise value (market value of equity plus net debt) by its sales, EBITDA or EBIT. Earnings multiples are derived by dividing a companies' market value of equity by earnings (net income). The market-to-book ratio is derived by dividing a companies' market value of equity by its book value of equity. Multiples below zero and above 500 are treated as outliers and are excluded. ◆

Table 7: Median Industry Multiples

30 November 2025	Sales			EBITDA			EBIT			Earnings			Market to Book-Ratio		
Industries	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.
Industrials	1.0	0.9	*218*	8.3	7.1	*211*	13.4	11.5	*201*	17.0	13.4	*187*	1.8	1.7	*197*
Consumer Discretionary	0.8	0.8	*135*	6.6	6.1	*128*	11.9	10.3	*121*	13.1	11.4	*110*	1.6	1.5	*126*
Health Care	2.6	2.4	*105*	10.2	9.5	*76*	14.5	13.5	*74*	18.6	15.5	*70*	2.0	1.9	*82*
Financials	n/m	n/m	*n/a*	n/m	n/m	*n/a*	n/m	n/m	*n/a*	11.1	10.4	*100*	1.4	1.3	*95*
Utilities	2.7	2.8	*39*	8.5	8.5	*39*	15.6	15.1	*38*	15.1	15.8	*38*	1.7	1.7	*38*
Materials	1.1	1.0	*77*	7.3	6.6	*75*	13.4	11.6	*68*	15.9	13.3	*65*	1.2	1.2	*73*
Real Estate	12.7	12.2	*51*	18.4	16.9	*50*	18.5	17.0	*51*	14.4	13.1	*42*	0.7	0.7	*44*
Communication Services	1.4	1.3	*77*	6.1	5.7	*76*	11.9	10.7	*67*	14.0	11.1	*62*	1.5	1.4	*66*
Information Technology	1.3	1.2	*126*	9.2	7.9	*121*	14.3	12.3	*107*	20.0	17.0	*94*	2.2	2.0	*108*
Consumer Staples	0.7	0.6	*66*	6.7	6.5	*65*	12.1	11.3	*63*	14.6	12.4	*62*	1.2	1.2	*58*
Energy	1.3	1.2	*26*	5.6	5.6	*26*	8.6	8.6	*26*	11.1	11.4	*25*	1.3	1.3	*25*

Table 8: Median Subindustry (Utilities) Multiples

30 November 2025	Sales			EBITDA			EBIT			Earnings			Market to Book		
Subindustry: Utilities	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.	Trailing	Fwd. +1	Comps incl.
Electric Utilities	2.7	2.7	*13*	8.6	8.5	*13*	13.7	14.2	*12*	16.6	16.5	*13*	2.1	1.9	*12*
Gas Utilities	5.7	6.0	*6*	8.5	9.0	*6*	15.1	16.7	*6*	13.7	14.2	*6*	1.8	1.7	*6*
Multi-Utilities	1.2	1.2	*8*	6.8	6.8	*8*	13.5	13.6	*8*	14.1	13.5	*8*	1.7	1.6	*8*
Electricity Producers	4.5	4.3	*12*	9.7	9.7	*12*	17.3	15.8	*12*	17.1	16.9	*11*	1.4	1.3	*12*

Source: KPMG Valuation Data Source, see www.kpmg.de/en/valuation-data-source
**Average = Arithmetic Mean*

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Transaction Multiples

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The computations of the transaction multiples are based on the transaction and company data collected from various M&A databases, with the data being driven to consistency.

We publish transaction multiples for Europe and resulting regression parameters (including transactions of the period *1 October 2022 until 30 September 2025*) for the following multiples:

- Deal Enterprise Value/Sales
- Deal Enterprise Value/EBITDA
- Deal Enterprise Value/EBIT
- Deal Enterprise Value/Invested Capital

The multiples in this issue cover Europe as a total. In the following issues we will provide a regional breakdown into:

- Central and Western Europe, Southern Europe
- Scandinavia and Britain
- Eastern Europe

When using the data (multiples and regression), please consider the following:

- Sectors and resulting sector multiples are formed according to the *NACE Rev. 2 industry classification system.*
- The multiples indicate the Deal Enterprise Value *(DEPV = Market value of total capital corrected)* for a private firm. They are scaled to the levels of value Control Value, Pure Play Value and Domestic Value. Additionally, the multiples do not *include any identifiable Synergistic Values*. When applying the multiples to other levels of value without adjusting the value driver (reference value), respective *Valuation Adjustments* (Minority Discount for Minority Values, Conglomerate Discount for Conglomerates, Regional Premiums for Cross-Border transactions by international acquirors and Strategic Premium for Synergistic acquisitions) must be applied.
- The multiples are computed using transaction data collected from the previous three years. Therefore, the available multiples include transactions of the period *1 October 2022 until 30 September 2025*, with the transactions of the *latest six months given double weight.*
- The reliability of the recorded transaction data and the resulting multiples was analyzed according to the fraction of the transacted share, low and high values of the value driver as well as up-side and down-side percentiles of the observations on multiples; recognized outliers were eliminated.
- The trailing multiples are computed employing the value driver available closest to date of the transaction.
- The EBITDA multiples and the EBIT multiples are based on companies with only a positive EBITDA or EBIT at date of the transaction.
- The regression assumes a linear relationship between the value driver and the Deal Enterprise Value. Furthermore, it is assumed that the observed Deal Enterprise Values as well as the respective value drivers show no trend over time, making them ready for a cross-section analysis. The error terms are assumed to be normally distributed, having constant variances (homoskedasticity), being independent (no autocorrelation) and showing an expected value of zero.
- The range of the multiples (confidence interval) applies a 95% confidence level, assuming the observed multiples to be normally distributed (after elimination of outliers).
- Sectors with less than 20 observations were ignored.
- The various regions are compounded as follows:
  Central and Western Europe: Andorra, Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, The Netherlands, Switzerland
  Southern Europe: Croatia, Cyprus, Gibraltar, Greece, Italy, Malta, Portugal, San Marino, Slovenia, Spain, Turkey
  Scandinavia: Denmark, Finland, Iceland, Norway, Sweden
  Britain: Ireland, United Kingdom
  Eastern Europe: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Latvia, Lithuania, Moldova, Montenegro, North Makedonia, Poland, Romania, Russia, Serbia, Slovakia, Ukraine.

The data is evaluated carefully; however, the author denies liability for the accuracy of all computations.

I. Notes for application:

n indicates the number of observations (sample size) included in both, the computation of the multiples and the regression.

$\bar{x}_a$ indicates the arithmetic mean, $\bar{x}_h$ indicates the harmonic mean

$$\bar{x}_h = \frac{n}{\sum_{i=1}^{n}\frac{n}{x_i}}$$

and $\bar{x}_t$ indicates the truncated mean (10% level = 10 % of the observations sorted in ascending order being eliminated up-side and down-side)

$$\bar{x}_t = \frac{\sum_2^{n-1} x_i}{n-2}$$

The first quartile *Q1* indicates the boundary of the lowest 25%, the third quartile *Q3* indicates the boundary of the highest 25% of the observed multiples. Using this information, the actually employed multiple may be related to the group of the 25% lowest (highest) multiples observed. *Q2* indicates the median of the observed multiples. The confidence interval reports the range (lower confidence limit to upper confidence limit) of the multiples applying a 95% confidence level. Assuming the multiples observed to be normally distributed, this indicates all multiples lying within these limits.

To evaluate the assumption of normally distributed multiple observations, the results of the Jarque-Bera Test for Normality:

$$JB = n\left[\frac{(skewness)^2}{6} + \frac{(kurtosis-3)^2}{24}\right]$$

and the corresponding p-values are reported in brackets. P-values below (above) the defined level of significance (0.01, 0.05 or 0.10) indicate that the null hypothesis of the multiples being normally distributed is rejected (accepted). Consequently, a p-value above (below) the defined level of significance indicates the multiples (not) to be normally distributed.

The skewness $\mathbf{sk}$ indicates the symmetry of the distribution of multiple observations. A negative skewness indicates the distribution to be skewed to the left, whereas a positive skewness indicates the distribution to be skewed to the right (a skewness of zero indicates the distribution to be symmetric). The coefficient of variation cv indicates the dispersion of the observed multiples adjusting for the scale of units in the multiples, expressed by the standard deviation as a percentage of the mean. It allows for a comparison of the dispersion of the multiples across sectors. A lower (higher) coefficient of variation indicates a lower (higher) dispersion of the observed multiples and, similarly, a higher (lower) reliability of the sector multiples.

The (linear) regression equation allows for computing the Deal Enterprise Value of a private firm directly from the observed transactions (without using a multiple). Disregarding the error term, it consists of a slope expressed in terms of the value driver employed and a constant (intercept):

$$\hat{y} = \text{DEPV} = \text{slope x value driver} + \text{constant}(+\text{error term})$$

The reliability of the OLS regression equation (goodness of fit) is indicated by the adjusted coefficient of determination:

$$\bar{R}^2 = 1 - (1 - R^2)\frac{n-1}{n-p}$$

(with $\mathbf{p}$ indicating the number of explaining variables + 1 = 1 + 1 = 2; being sensitive to the number of observations), indicating the variability of the observed multiples that is explained by the regression equation. Unlike the (unadjusted) coefficient of determination, the adjusted coefficient of determination is not limited to the range between zero and one. A higher (lower) coefficient indicates a better (poorer) regression. The standard error of the regression equation similarly indicates the goodness of fit of the regression equation, indicating the degree of similarity between the regression residuals (error terms) and the “true” residuals. A lower (higher) standard error indicates a better (poorer) regression. ◆

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Trailing DEPV/Sales (operating), 1 October 2022 until 30 September 2025

NACE Rev. 2 Sector			n	
				$\bar{x}_a$
A	01 - 03	Agriculture, forestry and fishing	1,025	0.82
B	05 - 09	Mining and quarrying	4,857	1.20
CA	10 - 12	Manufacture of food products, beverages, tobacco products	2,678	1.00
CB	13 - 15	Manufacture of textiles, wearing apparel, teather and related products	5,968	1.71
CC	16 - 18	Manufacture of wood/products, paper/products, printing	1,530	0.89
CD	19	Manufacture of coke and refined petroleum products	923	1.37
CE	20	Manufacture of chemicals and chemical products	4,755	1.53
CF	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1,465	1.48
CG	22 - 23	Manufacture of rubber, plastic products, other non-metallic mineral products	3,065	1.07
CH	24 - 25	Manufacture of basic metals, fabricated metal products	4,954	1.11
CI	26	Manufacture of computer, electronic and optical products	4,948	1.29
CJ	27	Manufacture of electrical equipment	3,655	0.89
CK	28	Manufacture of machinery and equipment	3,446	1.01
CL	29 - 30	Manufacture of motor vehicles, trailers, other transport equipment	2,501	0.92
CM	31 - 33	Manufacture of furniture, other manufacturing, repair/installation of machinery and equipment	3,628	1.42
D	35	Electricity, gas, steam and air conditioning supply	2,104	0.82
E	36 - 39	Water supply, sewerage, waste management, remediation activities	853	0.71
F	41 - 43	Construction - Buildings, civil engineering, specialized construction activities	4,981	0.76
G	45 - 47	Wholesale/Retail trade, repair of motor vehicles and motorcycles	10,852	0.81
H	49 - 53	Transportation and storage - Land/pipelines, water, air; warehousing, postal/courier activities	4,036	1.00
I	55 - 56	Accommodation and food/beverage service activities	961	1.56
JA	58 - 60	Publishing, motion picture/video/television programme production, music publishing, broadcasting	7,229	1.25
JB	61	Telecommunications	1,712	1.32
JC	62 - 63	Computer programming/consultancy, information service activities	9,661	1.20
K	64 - 66	Financial and insurance activities	2,281	1.20
L	68	Real estate activities	1,090	1.17
MA	69 - 71	Legal/accounting activities, management consultancy, architectural/engineering activities, technical testing	5,179	1.00
MB	72	Scientific research and development	1,878	1.61
MC	73 - 75	Advertising/market research, other professional/scientific/technical activities, veterinary activities	886	0.78
N	77 - 82	Rental/employment/security activities, travel agency, facility management, office/business support activities	2,662	0.96
P	85	Education	542	1.03
Q	86 - 88	Human health and social work activities	730	1.19
R	90 - 93	Arts, entertainment and recreation	955	1.41
S	94 - 96	Other service activities - repair of computers/personal/household goods, other personal service activities	343	0.88

<table>
<tr><th colspan="8">Trailing DEPV/Sales (operating) Multiples</th><th colspan="3">Trailing Sales (operating) Regression</th></tr>
<tr><th>$\bar{x}_h$</th><th>$\bar{x}_t$</th><th>Q_1</th><th>Q_2</th><th>Q_3</th><th>95% (JB | p-value)</th><th>sk</th><th>cv</th><th>$\hat{y}$ = DEPV (TEUR)</th><th>$\bar{R}^2$</th><th>se_y</th></tr>
<tr><td>0.08</td><td>0.73</td><td>0.23</td><td>0.64</td><td>1.16</td><td>[0.75 ; 0.88] (32.19 | 0.0000)</td><td>0.98</td><td>0.84</td><td>ŷ = 0.983 x Sales + 45</td><td>0.57</td><td>247,869</td></tr>
<tr><td>0.34</td><td>1.16</td><td>0.48</td><td>1.10</td><td>1.83</td><td>[1.16 ; 1.23] (58.91 | 0.0000)</td><td>0.37</td><td>0.63</td><td>ŷ = 1.329 x Sales - 4,328,478</td><td>0.72</td><td>43,517,109</td></tr>
<tr><td>0.26</td><td>0.89</td><td>0.30</td><td>0.69</td><td>1.53</td><td>[0.93 ; 1.06] (72.35 | 0.0000)</td><td>0.91</td><td>0.86</td><td>ŷ = 2.259 x Sales - 370,962</td><td>0.88</td><td>7,414,432</td></tr>
<tr><td>0.69</td><td>1.76</td><td>1.13</td><td>1.90</td><td>2.25</td><td>[1.68 ; 1.74] (88.86 | 0.0000)</td><td>-0.63</td><td>0.41</td><td>ŷ = 0.776 x Sales + 1,289,919</td><td>0.41</td><td>989,856</td></tr>
<tr><td>0.32</td><td>0.81</td><td>0.38</td><td>0.77</td><td>1.13</td><td>[0.84 ; 0.94] (48.95 | 0.0000)</td><td>1.01</td><td>0.75</td><td>ŷ = 0.833 x Sales + 86,107</td><td>0.94</td><td>739,638</td></tr>
<tr><td>0.41</td><td>1.38</td><td>0.81</td><td>1.43</td><td>1.95</td><td>[1.29 ; 1.45] (4.49 | 0.1062)</td><td>-0.07</td><td>0.54</td><td>ŷ = 1.314 x Sales + 10,610,934</td><td>0.74</td><td>63,235,387</td></tr>
<tr><td>0.71</td><td>1.54</td><td>1.02</td><td>1.71</td><td>1.95</td><td>[1.50 ; 1.56] (26.30 | 0.0000)</td><td>-0.22</td><td>0.46</td><td>ŷ = 1.612 x Sales - 353,206</td><td>0.77</td><td>3,813,248</td></tr>
<tr><td>0.39</td><td>1.50</td><td>0.90</td><td>1.44</td><td>2.18</td><td>[1.41 ; 1.56] (12.07 | 0.0024)</td><td>-0.06</td><td>0.55</td><td>ŷ = 2.450 x Sales - 562,243</td><td>0.97</td><td>2,330,072</td></tr>
<tr><td>0.24</td><td>1.00</td><td>0.47</td><td>0.85</td><td>1.64</td><td>[1.02 ; 1.11] (42.96 | 0.0000)</td><td>0.61</td><td>0.71</td><td>ŷ = 1.753 x Sales - 320,705</td><td>0.93</td><td>5,208,742</td></tr>
<tr><td>0.11</td><td>1.05</td><td>0.30</td><td>0.87</td><td>1.98</td><td>[1.06 ; 1.16] (92.14 | 0.0000)</td><td>0.50</td><td>0.80</td><td>ŷ = 0.304 x Sales + 623,963</td><td>0.85</td><td>1,411,716</td></tr>
<tr><td>0.60</td><td>1.25</td><td>0.71</td><td>1.17</td><td>1.80</td><td>[1.25 ; 1.33] (46.52 | 0.0000)</td><td>0.41</td><td>0.58</td><td>ŷ = 1.440 x Sales - 431,518</td><td>0.72</td><td>6,971,653</td></tr>
<tr><td>0.49</td><td>0.85</td><td>0.60</td><td>0.84</td><td>1.09</td><td>[0.87 ; 0.91] (831.50 | 0.0000)</td><td>1.69</td><td>0.54</td><td>ŷ = 1.128 x Sales - 934,728</td><td>0.78</td><td>3,696,646</td></tr>
<tr><td>0.42</td><td>0.93</td><td>0.46</td><td>0.87</td><td>1.36</td><td>[0.97 ; 1.05] (91.26 | 0.0000)</td><td>0.92</td><td>0.71</td><td>ŷ = 1.188 x Sales - 290,729</td><td>0.66</td><td>3,393,667</td></tr>
<tr><td>0.08</td><td>0.81</td><td>0.32</td><td>0.66</td><td>1.31</td><td>[0.87 ; 0.96] (83.57 | 0.0000)</td><td>1.03</td><td>0.81</td><td>ŷ = 0.253 x Sales + 3,147,191</td><td>0.47</td><td>9,133,154</td></tr>
<tr><td>0.46</td><td>1.41</td><td>0.71</td><td>1.19</td><td>2.29</td><td>[1.36 ; 1.48] (60.08 | 0.0000)</td><td>0.15</td><td>0.61</td><td>ŷ = 1.940 x Sales - 440,922</td><td>0.82</td><td>5,778,290</td></tr>
<tr><td>0.13</td><td>0.73</td><td>0.23</td><td>0.61</td><td>1.19</td><td>[0.77 ; 0.88] (62.53 | 0.0000)</td><td>0.98</td><td>0.90</td><td>ŷ = 0.625 x Sales + 1,524,662</td><td>0.78</td><td>8,676,123</td></tr>
<tr><td>0.31</td><td>0.59</td><td>0.22</td><td>0.34</td><td>1.07</td><td>[0.64 ; 0.79] (68.50 | 0.0000)</td><td>1.46</td><td>0.97</td><td>ŷ = 0.283 x Sales + 528,908</td><td>0.40</td><td>2,044,597</td></tr>
<tr><td>0.07</td><td>0.65</td><td>0.18</td><td>0.55</td><td>1.13</td><td>[0.72 ; 0.79] (285.98 | 0.0000)</td><td>1.25</td><td>0.92</td><td>ŷ = 0.611 x Sales + 11,876</td><td>0.84</td><td>910,993</td></tr>
<tr><td>0.09</td><td>0.70</td><td>0.26</td><td>0.60</td><td>1.14</td><td>[0.79 ; 0.83] (513.39 | 0.0000)</td><td>1.20</td><td>0.89</td><td>ŷ = 1.189 x Sales - 663,225</td><td>0.81</td><td>21,206,213</td></tr>
<tr><td>0.19</td><td>0.91</td><td>0.30</td><td>0.67</td><td>1.67</td><td>[0.95 ; 1.06] (84.91 | 0.0000)</td><td>0.72</td><td>0.84</td><td>ŷ = 0.611 x Sales + 405,541</td><td>0.49</td><td>5,432,297</td></tr>
<tr><td>0.91</td><td>1.56</td><td>0.88</td><td>1.53</td><td>2.30</td><td>[1.46 ; 1.67] (11.14 | 0.0038)</td><td>0.08</td><td>0.53</td><td>ŷ = 2.268 x Sales - 41,651</td><td>0.89</td><td>620,976</td></tr>
<tr><td>0.39</td><td>1.20</td><td>0.52</td><td>1.10</td><td>1.91</td><td>[1.21 ; 1.29] (94.25 | 0.0000)</td><td>0.40</td><td>0.66</td><td>ŷ = 1.893 x Sales - 232,225</td><td>0.94</td><td>3,917,160</td></tr>
<tr><td>0.33</td><td>1.29</td><td>0.63</td><td>1.20</td><td>1.94</td><td>[1.25 ; 1.40] (21.58 | 0.0000)</td><td>0.41</td><td>0.63</td><td>ŷ = 1.203 x Sales + 1,263,706</td><td>0.83</td><td>5,834,160</td></tr>
<tr><td>0.32</td><td>1.14</td><td>0.48</td><td>0.99</td><td>1.87</td><td>[1.16 ; 1.23] (143.82 | 0.0000)</td><td>0.46</td><td>0.70</td><td>ŷ = 1.757 x Sales - 314,760</td><td>0.87</td><td>4,606,105</td></tr>
<tr><td>0.20</td><td>1.14</td><td>0.46</td><td>1.05</td><td>1.87</td><td>[1.13 ; 1.27] (31.38 | 0.0000)</td><td>0.45</td><td>0.72</td><td>ŷ = 0.675 x Sales + 66,710</td><td>0.89</td><td>1,961,188</td></tr>
<tr><td>0.24</td><td>1.12</td><td>0.49</td><td>1.09</td><td>1.73</td><td>[1.08 ; 1.26] (11.73 | 0.0028)</td><td>0.45</td><td>0.69</td><td>ŷ = 0.541 x Sales + 98,229</td><td>0.85</td><td>350,675</td></tr>
<tr><td>0.22</td><td>0.92</td><td>0.33</td><td>0.76</td><td>1.60</td><td>[0.96 ; 1.04] (98.58 | 0.0000)</td><td>0.74</td><td>0.80</td><td>ŷ = 1.971 x Sales - 827,700</td><td>0.93</td><td>4,372,153</td></tr>
<tr><td>0.43</td><td>1.64</td><td>1.04</td><td>1.57</td><td>2.38</td><td>[1.54 ; 1.67] (15.72 | 0.0004)</td><td>-0.20</td><td>0.50</td><td>ŷ = 2.353 x Sales - 479,943</td><td>0.94</td><td>5,286,377</td></tr>
<tr><td>0.16</td><td>0.69</td><td>0.27</td><td>0.53</td><td>1.20</td><td>[0.71 ; 0.85] (36.12 | 0.0000)</td><td>1.12</td><td>0.87</td><td>ŷ = 1.564 x Sales - 9,629</td><td>0.80</td><td>2,248,702</td></tr>
<tr><td>0.23</td><td>0.87</td><td>0.25</td><td>0.72</td><td>1.55</td><td>[0.90 ; 1.02] (60.65 | 0.0000)</td><td>0.80</td><td>0.86</td><td>ŷ = 0.760 x Sales + 105,580</td><td>0.46</td><td>2,087,080</td></tr>
<tr><td>0.34</td><td>0.97</td><td>0.48</td><td>0.94</td><td>1.55</td><td>[0.92 ; 1.13] (6.75 | 0.0342)</td><td>0.54</td><td>0.72</td><td>ŷ = 1.505 x Sales - 30,278</td><td>0.88</td><td>659,989</td></tr>
<tr><td>0.18</td><td>1.15</td><td>0.41</td><td>1.12</td><td>1.92</td><td>[1.06 ; 1.32] (9.89 | 0.0071)</td><td>0.30</td><td>0.74</td><td>ŷ = 1.708 x Sales + 8,892</td><td>0.98</td><td>441,572</td></tr>
<tr><td>0.46</td><td>1.39</td><td>0.76</td><td>1.31</td><td>1.88</td><td>[1.32 ; 1.49] (6.95 | 0.0310)</td><td>0.24</td><td>0.54</td><td>ŷ = 1.551 x Sales - 19,156</td><td>0.92</td><td>751,903</td></tr>
<tr><td>0.34</td><td>0.78</td><td>0.25</td><td>0.52</td><td>1.37</td><td>[0.73 ; 1.03] (11.24 | 0.0036)</td><td>1.02</td><td>0.89</td><td>ŷ = 0.173 x Sales + 160,710</td><td>0.80</td><td>352,540</td></tr>
</table>

Trailing DEPV/EBITDA, 1 October 2022 until 30 September 2025

NACE Rev. 2 Sector			n	
				$\bar{x}_a$
A	01 - 03	Agriculture, forestry and fishing	633	8.82
B	05 - 09	Mining and quarrying	4,143	5.21
CA	10 - 12	Manufacture of food products, beverages, tobacco products	1,997	8.25
CB	13 - 15	Manufacture of textiles, wearing apparel, teather and related products	3,709	10.96
CC	16 - 18	Manufacture of wood/products, paper/products, printing	1,191	7.75
CD	19	Manufacture of coke and refined petroleum products	1,122	6.25
CE	20	Manufacture of chemicals and chemical products	2,378	8.96
CF	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1,760	10.11
CG	22 - 23	Manufacture of rubber, plastic products, other non-metallic mineral products	2,260	6.47
CH	24 - 25	Manufacture of basic metals, fabricated metal products	2,549	7.11
CI	26	Manufacture of computer, electronic and optical products	4,616	10.91
CJ	27	Manufacture of electrical equipment	2,528	7.82
CK	28	Manufacture of machinery and equipment	2,517	8.24
CL	29 - 30	Manufacture of motor vehicles, trailers, other transport equipment	1,497	8.00
CM	31 - 33	Manufacture of furniture, other manufacturing, repair/installation of machinery and equipment	3,156	9.36
D	35	Electricity, gas, steam and air conditioning supply	2,002	6.32
E	36 - 39	Water supply, sewerage, waste management, remediation activities	649	8.51
F	41 - 43	Construction - Buildings, civil engineering, specialized construction activities	4,594	7.18
G	45 - 47	Wholesale/Retail trade, repair of motor vehicles and motorcycles	6,880	6.84
H	49 - 53	Transportation and storage - Land/pipelines, water, air; warehousing, postal/courier activities	2,834	7.48
I	55 - 56	Accommodation and food/beverage service activities	2,072	7.96
JA	58 - 60	Publishing, motion picture/video/television programme production, music publishing, broadcasting	6,236	8.11
JB	61	Telecommunications	2,120	7.43
JC	62 - 63	Computer programming/consultancy, information service activities	7,847	7.80
K	64 - 66	Financial and insurance activities	2,351	8.25
L	68	Real estate activities	1,626	10.45
MA	69 - 71	Legal/accounting activities, management consultancy, architectural/engineering activities, technical testing	4,074	7.81
MB	72	Scientific research and development	1,937	9.61
MC	73 - 75	Advertising/market research, other professional/scientific/technical activities, veterinary activities	676	6.60
N	77 - 82	Rental/employment/security activities, travel agency, facility management, office/business support activities	3,515	7.27
P	85	Education	381	8.48
Q	86 - 88	Human health and social work activities	397	7.51
R	90 - 93	Arts, entertainment and recreation	762	7.88
S	94 - 96	Other service activities - repair of computers/personal/household goods, other personal service activities	279	5.39

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Trailing DEPV/EBITDA Multiples								Trailing EBITDA Regression		
$\bar{x}_h$	$\bar{x}_t$	Q_1	Q_2	Q_3	95% (JB | p-value)	sk	cv	$\hat{y}$ = DEPV (TEUR)	$\bar{R}^2$	se_y
1.28	8.60	3.06	7.29	15.00	[1.42 ; 16.21] (10.23 | 0.0060)	0.32	0.73	ŷ = 16.010 x EBITDA - 55,826	0.87	811,706
2.11	4.48	2.52	3.64	6.00	[3.95 ; 6.46] (382.67 | 0.0000)	1.52	0.81	ŷ = 4.257 x EBITDA + 5,311,103	0.38	72,931,659
3.23	8.00	4.00	7.65	11.95	[5.69 ; 10.81] (22.14 | 0.0000)	0.36	0.61	ŷ = 8.723 x EBITDA + 1,374,209	0.95	7,913,295
4.73	11.23	3.49	14.08	16.58	[7.88 ; 14.03] (85.90 | 0.0000)	-0.38	0.59	ŷ = 1.168 x EBITDA + 2,410,883	0.10	1,999,106
3.37	7.44	3.73	6.74	10.90	[4.69 ; 10.80] (14.43 | 0.0007)	0.49	0.62	ŷ = 5.981 x EBITDA + 346,526	0.83	1,341,502
3.69	5.57	2.66	5.01	8.73	[3.33 ; 9.18] (52.10 | 0.0000)	1.20	0.74	ŷ = 6.018 x EBITDA - 384,605	0.50	85,158,147
5.34	8.69	5.29	8.67	10.95	[7.09 ; 10.82] (15.93 | 0.0003)	0.46	0.50	ŷ = 7.780 x EBITDA + 1,220,237	0.71	3,745,895
3.19	10.02	6.16	9.01	14.08	[7.18 ; 13.04] (14.38 | 0.0008)	0.26	0.51	ŷ = 8.493 x EBITDA + 735,123	0.94	14,781,620
2.28	5.93	2.94	4.96	9.06	[4.42 ; 8.52] (62.45 | 0.0000)	0.94	0.72	ŷ = 4.215 x EBITDA + 1,477,536	0.56	30,813,490
1.03	6.60	2.97	5.94	10.13	[4.72 ; 9.50] (49.19 | 0.0000)	0.77	0.73	ŷ = 3.309 x EBITDA + 904,989	0.77	2,859,064
2.51	10.98	7.46	11.19	14.27	[9.32 ; 12.51] (23.12 | 0.0000)	-0.14	0.45	ŷ = 13.557 x EBITDA - 1,113,934	0.83	9,127,483
4.74	7.48	5.14	6.81	9.80	[6.53 ; 9.11] (77.94 | 0.0000)	0.92	0.48	ŷ = 11.267 x EBITDA - 1,865,671	0.88	2,892,969
3.26	7.82	4.37	6.78	12.15	[5.65 ; 10.84] (43.25 | 0.0000)	0.68	0.65	ŷ = 16.258 x EBITDA - 2,767,257	0.94	6,670,704
0.94	7.69	4.91	7.22	10.61	[5.55 ; 10.45] (19.44 | 0.0001)	0.63	0.57	ŷ = 3.324 x EBITDA + 5,008,158	0.39	10,764,493
3.14	9.27	2.81	9.19	15.70	[6.16 ; 12.56] (63.10 | 0.0000)	0.05	0.67	ŷ = 2.791 x EBITDA + 1,596,611	0.28	3,181,925
1.83	5.65	2.24	4.99	9.30	[3.54 ; 9.10] (57.15 | 0.0000)	0.95	0.83	ŷ = 1.416 x EBITDA + 3,746,735	0.68	10,186,936
4.18	8.29	4.85	7.68	12.58	[3.83 ; 13.18] (6.74 | 0.0344)	0.36	0.60	ŷ = 10.847 x EBITDA - 200,268	0.84	3,253,606
0.56	6.75	3.09	6.02	11.22	[5.45 ; 8.90] (71.65 | 0.0000)	0.63	0.71	ŷ = 6.021 x EBITDA + 348,663	0.70	2,113,889
2.57	6.24	2.74	5.40	10.00	[5.42 ; 8.26] (162.47 | 0.0000)	0.86	0.74	ŷ = 6.314 x EBITDA + 1,973,917	0.73	33,104,274
3.00	6.95	2.91	5.75	11.48	[4.96 ; 10.00] (52.20 | 0.0000)	0.68	0.73	ŷ = 2.697 x EBITDA + 1,886,558	0.46	8,343,109
6.25	7.50	5.74	7.68	8.83	[6.66 ; 9.25] (154.82 | 0.0000)	1.23	0.45	ŷ = 6.166 x EBITDA + 318,834	0.83	815,140
3.52	7.71	3.99	6.71	11.96	[6.60 ; 9.62] (86.27 | 0.0000)	0.58	0.63	ŷ = 7.751 x EBITDA - 252,365	0.77	7,920,611
4.19	6.85	4.09	5.85	9.76	[5.20 ; 9.67] (73.86 | 0.0000)	1.05	0.64	ŷ = 6.159 x EBITDA + 423,445	0.55	20,078,787
2.98	7.37	3.80	6.40	11.75	[6.50 ; 9.10] (115.75 | 0.0000)	0.62	0.65	ŷ = 9.972 x EBITDA - 840,037	0.89	4,692,342
1.27	7.93	3.43	6.60	13.35	[5.13 ; 11.37] (35.98 | 0.0000)	0.42	0.70	ŷ = 12.312 x EBITDA - 286,286	0.94	3,400,526
3.03	10.54	6.84	10.36	14.54	[7.40 ; 13.50] (10.93 | 0.0042)	-0.09	0.50	ŷ = 12.996 x EBITDA - 110,538	0.95	968,442
2.92	7.46	3.59	6.65	11.83	[5.95 ; 9.67] (51.91 | 0.0000)	0.51	0.65	ŷ = 11.573 x EBITDA - 380,697	0.94	5,167,535
1.10	9.48	5.97	8.81	13.78	[6.87 ; 12.35] (14.03 | 0.0009)	0.28	0.54	ŷ = 8.435 x EBITDA + 603,495	0.94	15,278,908
1.15	6.04	2.61	5.30	9.74	[2.24 ; 10.97] (19.09 | 0.0001)	0.95	0.76	ŷ = 12.679 x EBITDA - 16,373	0.80	2,579,787
3.17	6.98	4.26	6.71	9.13	[5.91 ; 8.63] (48.98 | 0.0000)	0.67	0.58	ŷ = 11.875 x EBITDA - 931,217	0.91	3,349,965
3.01	8.15	3.85	7.55	13.29	[0.82 ; 16.13] (5.90 | 0.0523)	0.51	0.68	ŷ = 8.470 x EBITDA + 270,739	0.85	1,013,863
3.33	7.23	3.75	7.31	10.75	[2.82 ; 12.20] (3.22 | 0.1997)	0.46	0.60	ŷ = 9.541 x EBITDA - 75,533	0.99	381,987
4.73	7.63	4.76	7.08	11.05	[5.00 ; 10.76] (8.39 | 0.0151)	0.60	0.53	ŷ = 9.363 x EBITDA - 243,154	0.88	963,436
3.39	4.81	2.37	3.58	7.87	[1.14 ; 9.64] (27.85 | 0.0000)	1.40	0.73	ŷ = 2.946 x EBITDA + 106,760	0.87	308,379

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Trailing DEPV/EBIT, 1 October 2022 until 30 September 2025

NACE Rev. 2 Sector			n	
				$\bar{x}_a$
A	01 - 03	Agriculture, forestry and fishing	907	11.56
B	05 - 09	Mining and quarrying	4,074	10.30
CA	10 - 12	Manufacture of food products, beverages, tobacco products	2,340	12.04
CB	13 - 15	Manufacture of textiles, wearing apparel, teather and related products	3,360	18.88
CC	16 - 18	Manufacture of wood/products, paper/products, printing	1,014	10.40
CD	19	Manufacture of coke and refined petroleum products	1,116	14.69
CE	20	Manufacture of chemicals and chemical products	2,480	13.88
CF	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	1,889	13.85
CG	22 - 23	Manufacture of rubber, plastic products, other non-metallic mineral products	2,431	11.72
CH	24 - 25	Manufacture of basic metals, fabricated metal products	3,269	11.85
CI	26	Manufacture of computer, electronic and optical products	4,895	16.48
CJ	27	Manufacture of electrical equipment	2,179	12.53
CK	28	Manufacture of machinery and equipment	3,016	13.15
CL	29 - 30	Manufacture of motor vehicles, trailers, other transport equipment	1,675	15.20
CM	31 - 33	Manufacture of furniture, other manufacturing, repair/installation of machinery and equipment	3,161	16.81
D	35	Electricity, gas, steam and air conditioning supply	2,238	10.02
E	36 - 39	Water supply, sewerage, waste management, remediation activities	821	13.26
F	41 - 43	Construction - Buildings, civil engineering, specialized construction activities	4,927	9.32
G	45 - 47	Wholesale/Retail trade, repair of motor vehicles and motorcycles	6,848	11.63
H	49 - 53	Transportation and storage - Land/pipelines, water, air; warehousing, postal/courier activities	2,619	9.69
I	55 - 56	Accommodation and food/beverage service activities	1,997	9.82
JA	58 - 60	Publishing, motion picture/video/television programme production, music publishing, broadcasting	6,134	12.16
JB	61	Telecommunications	2,260	13.44
JC	62 - 63	Computer programming/consultancy, information service activities	7,820	11.01
K	64 - 66	Financial and insurance activities	3,650	11.03
L	68	Real estate activities	2,211	13.03
MA	69 - 71	Legal/accounting activities, management consultancy, architectural/engineering activities, technical testing	4,138	10.76
MB	72	Scientific research and development	2,115	13.00
MC	73 - 75	Advertising/market research, other professional/scientific/technical activities, veterinary activities	682	9.47
N	77 - 82	Rental/employment/security activities, travel agency, facility management, office/business support activities	3,703	10.12
P	85	Education	370	12.27
Q	86 - 88	Human health and social work activities	408	10.93
R	90 - 93	Arts, entertainment and recreation	644	12.64
S	94 - 96	Other service activities - repair of computers/personal/household goods, other personal service activities	225	9.32

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Trailing DEPV/EBIT Multiples								Trailing EBIT Regression		
$\bar{x}_h$	$\bar{x}_t$	Q_1	Q_2	Q_3	95% (JB | p-value)	sk	cv	$\hat{y}$ = DEPV (TEUR)	$\bar{R}^2$	se_y
1.16	10.94	2.84	9.39	21.92	[-2.12 ; 25.24] (16.92 | 0.0002)	0.47	0.82	$\hat{y}$ = 22.810 x EBIT - 108,898	0.91	824,936
2.95	9.44	4.46	6.95	15.78	[5.68 ; 14.91] (98.05 | 0.0000)	0.84	0.78	$\hat{y}$ = 3.159 x EBIT + 14,248,333	0.30	41,092,512
4.39	11.44	5.28	9.92	18.10	[5.29 ; 18.79] (37.56 | 0.0000)	0.55	0.70	$\hat{y}$ = 12.883 x EBIT + 1,734,444	0.91	11,505,827
11.15	19.64	17.27	20.81	22.34	[15.66 ; 22.10] (160.79 | 0.0000)	-1.15	0.34	$\hat{y}$ = 19.625 x EBIT + 146,967	0.80	1,189,749
3.94	9.65	4.47	9.19	14.43	[2.91 ; 17.90] (20.60 | 0.0000)	0.81	0.70	$\hat{y}$ = 7.927 x EBIT + 328,272	0.75	1,500,661
7.44	14.56	7.98	13.50	21.99	[5.50 ; 23.88] (11.39 | 0.0034)	0.17	0.56	$\hat{y}$ = 9.737 x EBIT + 8,389,959	0.82	29,397,059
8.01	13.55	8.14	12.33	18.98	[8.61 ; 19.16] (23.60 | 0.0000)	0.38	0.55	$\hat{y}$ = 8.134 x EBIT + 3,271,257	0.51	5,227,565
3.45	13.61	8.51	12.26	19.44	[8.41 ; 19.29] (11.81 | 0.0027)	0.30	0.52	$\hat{y}$ = 10.967 x EBIT + 1,968,177	0.94	14,913,424
2.60	11.09	4.51	10.30	18.38	[5.44 ; 17.99] (35.83 | 0.0000)	0.55	0.70	$\hat{y}$ = 14.818 x EBIT + 535,470	0.84	10,946,550
2.72	11.30	4.73	9.59	19.83	[5.98 ; 17.71] (52.51 | 0.0000)	0.48	0.73	$\hat{y}$ = 6.990 x EBIT + 992,488	0.59	4,844,065
6.32	16.73	11.05	17.28	22.23	[12.80 ; 20.16] (37.66 | 0.0000)	-0.28	0.46	$\hat{y}$ = 18.755 x EBIT - 927,353	0.89	12,870,993
6.14	11.86	7.82	10.17	16.18	[7.61 ; 17.46] (52.67 | 0.0000)	0.88	0.57	$\hat{y}$ = 21.761 x EBIT - 2,525,511	0.89	4,496,281
4.45	12.82	6.65	11.82	20.35	[7.70 ; 18.60] (32.99 | 0.0000)	0.31	0.62	$\hat{y}$ = 22.124 x EBIT - 1,925,368	0.96	9,349,485
6.72	15.14	8.60	13.61	22.92	[7.02 ; 23.38] (17.77 | 0.0001)	0.15	0.56	$\hat{y}$ = 12.062 x EBIT + 1,886,229	0.61	9,560,059
4.93	17.23	11.25	19.32	22.40	[11.57 ; 22.04] (45.95 | 0.0000)	-0.54	0.48	$\hat{y}$ = 12.558 x EBIT + 733,672	0.89	6,699,462
2.73	9.23	2.98	7.11	17.55	[3.56 ; 16.49] (41.37 | 0.0000)	0.67	0.82	$\hat{y}$ = 1.623 x EBIT + 5,972,650	0.45	13,239,525
6.43	12.82	6.52	11.81	19.45	[2.95 ; 23.57] (9.53 | 0.0085)	0.42	0.61	$\hat{y}$ = 8.248 x EBIT + 1,351,394	0.69	5,138,138
0.63	8.48	3.99	7.35	13.40	[6.10 ; 12.55] (146.53 | 0.0000)	0.97	0.76	$\hat{y}$ = 11.674 x EBIT - 115,333	0.70	3,308,392
1.31	11.05	4.45	9.33	19.25	[7.82 ; 15.44] (109.09 | 0.0000)	0.51	0.72	$\hat{y}$ = 10.995 x EBIT + 2,109,098	0.83	20,757,535
1.17	8.79	3.74	7.07	13.99	[4.64 ; 14.73] (69.48 | 0.0000)	0.92	0.78	$\hat{y}$ = 4.277 x EBIT + 1,508,792	0.56	7,489,065
7.09	8.81	5.96	8.41	10.90	[6.24 ; 13.40] (179.61 | 0.0000)	1.50	0.60	$\hat{y}$ = 6.062 x EBIT + 687,685	0.52	1,601,608
4.62	11.75	6.16	11.65	16.85	[9.08 ; 15.24] (48.37 | 0.0000)	0.38	0.60	$\hat{y}$ = 12.882 x EBIT - 52,626	0.96	3,254,407
6.03	13.26	8.41	12.52	18.50	[9.03 ; 17.85] (13.79 | 0.0010)	0.27	0.51	$\hat{y}$ = 12,398 x EBIT + 788,844	0.83	6,387,576
2.96	10.35	4.48	9.51	15.87	[8.03 ; 13.99] (113.29 | 0.0000)	0.62	0.69	$\hat{y}$ = 12.933 x EBIT - 207,889	0.96	2,812,635
1.49	10.40	4.81	8.95	16.42	[6.45 ; 15.61] (54.13 | 0.0000)	0.63	0.71	$\hat{y}$ = 14.324 x EBIT - 280,931	0.94	2,789,204
3.26	12.70	7.39	12.48	17.94	[7.15 ; 18.91] (15.22 | 0.0005)	0.33	0.60	$\hat{y}$ = 14.505 x EBIT + 50,082	0.93	1,097,596
2.65	10.13	4.42	9.13	16.03	[6.75 ; 14.77] (55.42 | 0.0000)	0.60	0.70	$\hat{y}$ = 13.483 x EBIT - 667	0.96	4,195,392
2.69	12.93	8.38	12.19	17.69	[8.91 ; 17.09] (4.97 | 0.0833)	0.16	0.49	$\hat{y}$ = 11.091 x EBIT + 2,391,467	0.93	16,157,043
1.12	8.60	3.10	6.66	14.50	[-1.46 ; 20.39] (15.58 | 0.0004)	0.83	0.84	$\hat{y}$ = 17.415 x EBIT + 23,604	0.80	2,578,206
3.57	9.39	5.62	8.45	13.96	[6.70 ; 13.54] (106.45 | 0.0000)	0.95	0.67	$\hat{y}$ = 13.777 x EBIT - 936,132	0.90	3,512,559
3.39	11.84	4.78	11.15	19.18	[-4.45 ; 29.00] (4.25 | 0.1194)	0.29	0.69	$\hat{y}$ = 13.121 x EBIT + 393,490	0.86	1,096,154
3.88	10.37	4.48	10.10	15.85	[-1.32 ; 23.18] (4.29 | 0.1169)	0.54	0.68	$\hat{y}$ = 16.307 x EBIT - 90,995	0.99	393,990
6.19	12.18	6.24	9.45	19.03	[0.71 ; 24.56] (10.16 | 0.0062)	0.48	0.65	$\hat{y}$ = 20.236 x EBIT - 86,317	0.86	2,724,103
5.02	8.51	3.28	7.75	13.14	[-5.91 ; 24.54] (5.06 | 0.0796)	0.79	0.76	$\hat{y}$ = 8.390 x EBIT + 8,192	0.90	285,272

Trailing DEPV/Invested Capital, 1 October 2022 until 30 September 2025

NACE Rev. 2 Sector			n	$\bar{x}_a$
A	01 - 03	Agriculture, forestry and fishing	1,551	0.51
B	05 - 09	Mining and quarrying	9,349	0.51
CA	10 - 12	Manufacture of food products, beverages, tobacco products	3,247	0.64
CB	13 - 15	Manufacture of textiles, wearing apparel, teather and related products	4,385	0.80
CC	16 - 18	Manufacture of wood/products, paper/products, printing	1,760	0.61
CD	19	Manufacture of coke and refined petroleum products	1,589	0.66
CE	20	Manufacture of chemicals and chemical products	7,031	0.66
CF	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	3,816	0.72
CG	22 - 23	Manufacture of rubber, plastic products, other non-metallic mineral products	5,839	0.63
CH	24 - 25	Manufacture of basic metals, fabricated metal products	8,136	0.51
CI	26	Manufacture of computer, electronic and optical products	7,251	0.66
CJ	27	Manufacture of electrical equipment	4,970	0.70
CK	28	Manufacture of machinery and equipment	6,483	0.63
CL	29 - 30	Manufacture of motor vehicles, trailers, other transport equipment	8,550	0.49
CM	31 - 33	Manufacture of furniture, other manufacturing, repair/installation of machinery and equipment	4,224	0.74
D	35	Electricity, gas, steam and air conditioning supply	6,403	0.54
E	36 - 39	Water supply, sewerage, waste management, remediation activities	2,227	0.57
F	41 - 43	Construction - Buildings, civil engineering, specialized construction activities	13,197	0.58
G	45 - 47	Wholesale/Retail trade, repair of motor vehicles and motorcycles	14,142	0.60
H	49 - 53	Transportation and storage - Land/pipelines, water, air; warehousing, postal/courier activities	7,535	0.56
I	55 - 56	Accommodation and food/beverage service activities	4,567	0.60
JA	58 - 60	Publishing, motion picture/video/television programme production, music publishing, broadcasting	10,428	0.65
JB	61	Telecommunications	3,301	0.66
JC	62 - 63	Computer programming/consultancy, information service activities	14,845	0.61
K	64 - 66	Financial and insurance activities	8,383	0.65
L	68	Real estate activities	6,618	0.61
MA	69 - 71	Legal/accounting activities, management consultancy, architectural/engineering activities, technical testing	9,102	0.61
MB	72	Scientific research and development	3,854	0.72
MC	73 - 75	Advertising/market research, other professional/scientific/technical activities, veterinary activities	1,068	0.65
N	77 - 82	Rental/employment/security activities, travel agency, facility management, office/business support activities	8,534	0.60
P	85	Education	714	0.67
Q	86 - 88	Human health and social work activities	2,152	0.66
R	90 - 93	Arts, entertainment and recreation	1,057	0.69
S	94 - 96	Other service activities - repair of computers/personal/household goods, other personal service activities	574	0.64

Trailing DEPV/Invested Capital Multiples								Trailing Invested Capital Regression		
$\bar{x}_h$	$\bar{x}_t$	Q_1	Q_2	Q_3	95% (JB | p-value)	sk	cv	$\hat{y}$ = DEPV (TEUR)	$\bar{R}^2$	se_y
0.08	0.49	0.20	0.46	0.79	[0.50 ; 0.52] (20.23 | 0.0000)	0.35	0.68	$\hat{y}$ = 1.048 x IC - 77,056	0.98	285,054
0.30	0.49	0.30	0.48	0.68	[0.51 ; 0.52] (110.30 | 0.0000)	0.59	0.53	$\hat{y}$ = 0.678 x IC - 2,637,018	0.81	17,281,972
0.24	0.64	0.37	0.62	0.90	[0.63 ; 0.65] (27.91 | 0.0000)	0.10	0.53	$\hat{y}$ = 0.753 x IC + 554,761	0.96	5,503,541
0.48	0.82	0.56	0.81	1.08	[0.79 ; 0.80] (45.56 | 0.0000)	-0.46	0.38	$\hat{y}$ = 0.701 x IC + 366,824	0.87	698,265
0.36	0.60	0.35	0.57	0.86	[0.60 ; 0.62] (17.94 | 0.0001)	0.25	0.54	$\hat{y}$ = 0.464 x IC + 409,099	0.76	1,565,371
0.45	0.66	0.41	0.65	0.92	[0.65 ; 0.67] (14.32 | 0.0008)	0.09	0.43	$\hat{y}$ = 0.760 x IC + 668,583	0.88	24,728,978
0.30	0.65	0.43	0.63	0.87	[0.65 ; 0.66] (57.19 | 0.0000)	0.26	0.45	$\hat{y}$ = 0.860 x IC - 1,333,457	0.89	6,255,805
0.16	0.73	0.49	0.76	0.97	[0.71 ; 0.73] (33.56 | 0.0000)	-0.35	0.44	$\hat{y}$ = 0.751 x IC + 261,077	0.85	7,221,938
0.37	0.63	0.44	0.64	0.82	[0.63 ; 0.64] (18.11 | 0.0001)	-0.03	0.43	$\hat{y}$ = 0.851 x IC - 936,630	0.89	3,417,485
0.09	0.50	0.27	0.50	0.70	[0.51 ; 0.52] (56.49 | 0.0000)	0.38	0.59	$\hat{y}$ = 0.206 x IC + 879,315	0.60	2,134,512
0.44	0.65	0.43	0.63	0.90	[0.66 ; 0.67] (61.40 | 0.0000)	0.19	0.46	$\hat{y}$ = 0.722 x IC - 770,224	0.86	4,857,533
0.47	0.69	0.51	0.66	0.88	[0.69 ; 0.70] (6.17 | 0.0457)	0.11	0.38	$\hat{y}$ = 0.638 x IC + 287,210	0.93	2,060,119
0.14	0.64	0.37	0.64	0.91	[0.63 ; 0.64] (51.08 | 0.0000)	-0.03	0.55	$\hat{y}$ = 0.250 x IC + 1,161,062	0.26	3,441,738
0.11	0.47	0.28	0.44	0.68	[0.49 ; 0.49] (94.45 | 0.0000)	0.58	0.57	$\hat{y}$ = 0.285 x IC + 2,688,250	0.47	7,047,595
0.40	0.75	0.54	0.76	1.00	[0.73 ; 0.75] (33.89 | 0.0000)	-0.29	0.41	$\hat{y}$ = 0.855 x IC - 169,724	0.92	4,129,762
0.20	0.53	0.37	0.50	0.72	[0.54 ; 0.55] (44.32 | 0.0000)	0.46	0.48	$\hat{y}$ = 0.420 x IC + 962,968	0.86	4,700,889
0.38	0.56	0.42	0.53	0.75	[0.57 ; 0.58] (10.57 | 0.0051)	0.39	0.43	$\hat{y}$ = 0.428 x IC + 810,595	0.87	3,203,604
0.10	0.57	0.35	0.55	0.80	[0.58 ; 0.59] (77.77 | 0.0000)	0.26	0.53	$\hat{y}$ = 0.604 x IC + 134,521	0.79	3,379,220
0.23	0.59	0.36	0.56	0.83	[0.60 ; 0.60] (88.55 | 0.0000)	0.17	0.52	$\hat{y}$ = 0.702 x IC - 786,134	0.89	10,332,159
0.20	0.55	0.29	0.56	0.77	[0.56 ; 0.57] (59.71 | 0.0000)	0.29	0.55	$\hat{y}$ = 0.494 x IC + 244,011	0.55	4,821,199
0.43	0.59	0.35	0.56	0.82	[0.59 ; 0.61] (47.63 | 0.0000)	0.36	0.46	$\hat{y}$ = 0.603 x IC - 37,663	0.63	2,225,957
0.34	0.64	0.38	0.62	0.93	[0.64 ; 0.65] (98.18 | 0.0000)	0.11	0.50	$\hat{y}$ = 0.429 x IC + 815,975	0.76	3,470,468
0.41	0.66	0.41	0.62	0.94	[0.65 ; 0.67] (29.81 | 0.0000)	0.20	0.48	$\hat{y}$ = 0.435 x IC + 2,090,677	0.82	6,687,421
0.30	0.60	0.35	0.57	0.88	[0.61 ; 0.61] (161.32 | 0.0000)	0.27	0.53	$\hat{y}$ = 0.520 x IC + 143,866	0.65	2,684,289
0.13	0.65	0.42	0.66	0.88	[0.64 ; 0.65] (37.89 | 0.0000)	-0.11	0.48	$\hat{y}$ = 0.301 x IC + 912,603	0.54	3,616,327
0.22	0.60	0.44	0.61	0.77	[0.60 ; 0.61] (3.51 | 0.1728)	0.11	0.44	$\hat{y}$ = 0.528 x IC + 347,646	0.89	2,100,724
0.15	0.61	0.35	0.62	0.88	[0.61 ; 0.62] (74.24 | 0.0000)	0.01	0.55	$\hat{y}$ = 0.536 x IC + 373,625	0.55	3,914,536
0.19	0.73	0.49	0.76	0.96	[0.71 ; 0.72] (34.35 | 0.0000)	-0.39	0.44	$\hat{y}$ = 0.842 x IC - 148,378	0.92	5,606,761
0.24	0.65	0.37	0.66	0.93	[0.63 ; 0.66] (9.38 | 0.0092)	-0.07	0.50	$\hat{y}$ = 0.576 x IC + 102,625	0.88	791,060
0.38	0.59	0.38	0.56	0.81	[0.60 ; 0.60] (57.76 | 0.0000)	0.29	0.45	$\hat{y}$ = 0.518 x IC + 431,195	0.75	2,336,037
0.38	0.68	0.48	0.71	0.88	[0.66 ; 0.68] (5.43 | 0.0661)	-0.39	0.44	$\hat{y}$ = 0.789 x IC - 22,800	0.94	696,983
0.38	0.65	0.43	0.69	0.87	[0.65 ; 0.67] (6.30 | 0.0428)	0.09	0.42	$\hat{y}$ = 0.738 x IC - 323,335	0.79	1,416,194
0.40	0.69	0.42	0.63	0.98	[0.67 ; 0.70] (9.99 | 0.0068)	0.01	0.48	$\hat{y}$ = 0.787 x IC + 12,606	0.87	861,953
0.47	0.64	0.41	0.68	0.83	[0.62 ; 0.65] (4.34 | 0.1143)	-0.14	0.43	$\hat{y}$ = 0.672 x IC + 84,317	0.73	1,347,700

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News from IVSC

IOSCO Issues Statement on Valuation with IVSC Collaboration

The International Organization of Securities Commissions (IOSCO) has issued a significant new statement on the importance of high-quality valuation in financial reporting, developed in collaboration with the IVSC and other stakeholders and following an IVSC-IOSCO roundtable in September. The statement outlines key expectations for robust valuation processes, particularly in private markets, and calls for enhanced transparency, governance, and professional judgement. IOSCO recognises IVSC's efforts to support these objectives through the continued development of International Valuation Standards (IVS) and global outreach to promote their adoption. IVSC will shortly establish a Financial Reporting Project Group which will lead efforts to enhance IVS in the area of financial reporting, working with IOSCO, IASB, IFIAR, IAASB and other organisaitons.

Read more about the IOSCO Statement here.

New Appointments to IVSC Board of Trustees

The IVSC has announced the appointment of Paul Muthaura and Ian Johnston to its Board of Trustees, effective January 2026, strengthening the organisation's global governance and public-interest oversight.

Paul Muthaura is Chief Executive Officer of the Africa Carbon Markets Initiative (ACMI) and brings wide-ranging leadership experience across financial regulation, insurance, sustainability, and market development. He previously served as Chief Executive of the Capital Markets Authority of Kenya, where he was elected Africa and Middle East Regional Chair on the IOSCO Board, and led the insurer ICEA LION General Insurance Kenya. Read more here.

Ian Johnston recently completed a second term as Chief Executive of the Dubai Financial Services Au-thority (DFSA), following earlier regulatory roles with the Australian Securities and Investments Com-mission (ASIC) and the Hong Kong Securities and Futures Commission. He has also chaired the Joint Forum of IOSCO, IAIS, and the Basel Committee. Read more here.

Their appointments reflect IVSC's continued focus on strong governance, international engagement, and advancing consistent, high-quality valuation standards worldwide.

IPEV Guidelines Updated – Strengthening Alignment with IVS

The International Private Equity and Venture Capital Valuation (IPEV) Guidelines were updated in December 2025, reinforcing their close alignment with IVS. The revised Guidelines confirm that valuations prepared under IVS, with appropriate application of IPEV guidance, meet investor expectations and financial reporting requirements across private capital markets.

The updates reflect developments in practice, including the increased use of AI and technology tools. Consistent with IVS, the Guidelines clarify that professional judgement remains essential and cannot be replaced by automation. IVSC works closely with IPEV to support a globally coherent valuation framework for private markets.

Access the updated IPEV Guidelines here.

IVS Exposure Draft to Be Considered at Public Meeting

The IVSC Standards Review Board will hold a public virtual meeting on 14 January 2026 to consider approval of the next IVS Exposure Draft. This follows two years of development work across IVSC's technical boards. The Exposure Draft, if approved, will be open for consultation from 31 January to 30 April 2026, with a proposed effective date of 31 January 2028.

Proposed updates include revisions to the General Standards, new guidance on the use of AI in valuation, a new General Standard on Quality Control (IVS 107), and further sustainability-related enhancements.

Register to attend the virtual meeting here.

News from EACVA

EACVA Launches the Brand New CDAV Credential

The **Certified Digital Asset Valuation (CDAV)** program is conducted and certified by the European Association of Certified Valuators and Analysts. For more than 20 years, EACVA has been committed to the highest quality standards in business valuation education and professional training, having now more than 1,300 individual members from more than 20 countries. The CDAV program is the logical evolution of this expertise. It combines established, professional business valuation principles with the specific economic, regulatory, and methodological challenges of the digital asset economy. To set expectations clearly from the start, it's important to understand what the CDAV programme was designed for:

- Methodologically sound, professional valuation of digital assets for business, regulatory, financial reporting, and transactional purposes
- Accounting and reporting in line with international standards (IFRS, US GAAP)
- Application of established valuation approaches (cost, market, and income approaches) complemented by digital-asset-specific and token-based models
- Preparation of valuation reports that stand up in courts, regulatory reviews, audits, and transactions

If you want to learn how to value digital assets objectively, transparently, and in accordance with to recognized standards, start today, and become part of the CDAV community:

- Register as a CDAV Community Observer (free) »
- Register as a CDAV Member (Early Bird) »

Certified Valuation Analyst (CVA) – International Training

13 – 17 April 2026 in Luxembourg

With the **Certified Valuation Analyst (CVA)**, EACVA has established an internationally recognized qualification for valuation professionals in Europe. The CVA programme provides valuation professionals with a comprehensive, practice-oriented foundation, fully aligned with the Core Body of Knowledge for International Business Valuations (BOK). Join over 1,800 professionals across Europe who have been trained by EACVA, Europe's largest business valuation association, since 2005.

Upcoming international in-person CVA training in Europe:

- **13 – 17 April 2026** | Luxembourg (in-person)
- Duration: five days (Monday to Friday)
- 45 hours of continuing training credit
- Expert faculty: An experienced team of six renowned instructors prepares you thoroughly for the CVA exam
- CVA Exam: Is delivered either via computer-based testing at a testing centre or as live remote proctoring (in a candidate's own home or office).
- *10% early registration discount* on the CVA training fee if registered by 13 January 2026

Don't miss this opportunity to enhance your professional credibility and deliver even greater value to your clients by becoming a Certified Valuation Analyst (CVA). Seats are limited – secure your place »

Personal Profile – EACVA Members Introduce Themselves

Laurentiu Stan, CVA, CEPA
specialized in business valuation, value growth advisory, and exit planning. With 20 years of valuation experience, he advises entrepreneurs, investors, and corporates in strategic decisions, M&A, restructurings and capital efficiency.

Explain in one sentence what your company does.

Kapital Minds helps business owners understand, grow, and monetise value through valuation, value-growth advisory, and exit readiness, offering clarity in moments of strategic change and supporting decisions that reshape a company's trajectory.

When and how do you start your workday in the morning?

Early, with a brief planning and prioritisation ritual before stepping into client work — clarity first, action second, and no noise in-between.

Since when have you been valuing companies, and what was the first occasion?

I began valuing companies 15 years ago, the first being an agricultural business preparing for an equity transaction — a project that clarified early how financial discipline and market dynamics shape value.

Which valuation method do you apply most frequently?

DCF with structured sensitivity and scenario overlays, complemented by public and private market multiples — a balance between fundamental valuation and observed market behaviour.

Which book on business valuation can you recommend?

Damodaran's "Investment Valuation" — fundamental thinking that stands the test of cycles.

How would you describe yourself as a boss?

Demanding, pragmatic, and focused on growth rather than comfort.

...and what would your employees answer?

"Expectations are high, but so are the standards and the results."

What is the best part of your work?

Turning complex financial and strategic signals into clear, actionable insights that help decision-makers move with confidence rather than instinct.

What has been your greatest achievement so far?

Building Kapital Minds from scratch into a recognised advisory platform in Romania.

Your secret to success?

Clarity of purpose, choosing battles deliberately, and maintaining enough discipline to walk away from distractions — even when they look attractive.

What are you personally proud of?

Being trusted by clients when stakes are high, timelines are tight, and clarity is non-negotiable.

Your main character trait?

Analytical realism — I challenge assumptions relentlessly until the numbers reflect the underlying economic reality.

How do you deal with setbacks?

Treat them as data, not drama — analyse, adjust, move on.

How and where do you recharge your energy?

Quiet time, travel with family, and reading outside the valuation field.

Why are you a member of EACVA?

Because it elevates professional competence, ethics and international dialogue in valuation. Being part of a community that shapes standards, rather than merely follows them, truly matters. ◆

EBVM

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