



# Valuation of umicore

**Finance - LINGE1315**

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# 1. Introduction

## Umicore in a nutshell

Umicore is a global materials technology and recycling group. The company is both a stable international group and a 100% Belgian company with four subsidiaries in Belgium. Their materials and services offer tomorrow's sustainable solutions for clean mobility and recycling.



Jewellery & Industrial Metals  
Platinum Engineered Materials  
Precious Metals Management  
Precious Metals Refining  
Technical Materials



Automotive Catalysts  
Precious Metals Chemistry



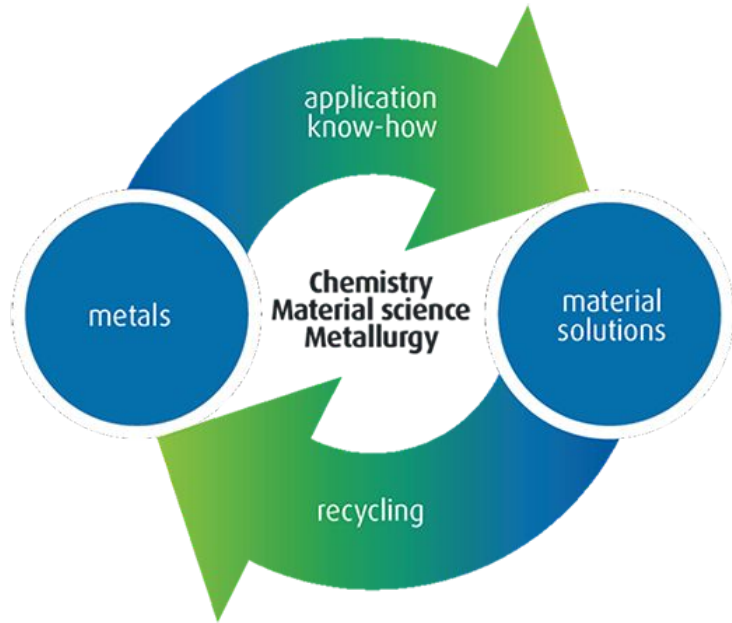
Cobalt & Specialty Materials  
Electroplating  
Electro-Optic Materials  
Element Six Abrasives  
Rechargeable Battery Materials  
Thin Film Products

In the field of materials technology, we focus on three areas: Catalysis, Energy and Surface Technologies et Recycling.

Each of these sectors is subdivided into different market-oriented business units.

Their strategy is to follow the model of an efficient and environmentally responsible closed materials loop. Umicore transforms metals into functional materials and recycles them to produce new ones.

*Diagram of Umicore's loop model.*



Umicore has a unique position in automotive catalysts and recycling. They are well-positioned to capture unprecedented value growth in automotive catalyst market, and to capture growth as the world's largest and most complex precious metal recycler with world-class environmental and quality standards.

The competition in the materials technology market is tough and the market is in constant evolution.

# 2. DCF method

## 2.1. WACC

WACC is the average after-tax cost of a company's various capital sources, including common stocks, preferred stocks, bonds, and any other long-term debts. In other words, WACC is the average rate a company expects to pay to finance its assets. It is used in the discounting of Cash-flows and terminal value.

$$\text{WACC} = \left( \frac{E}{D+E} \right) * K_e + \left( \frac{D}{D+E} \right) * K_d * \left( 1 - t \right)$$

Where:

- E = Market value of equity
- D = Market value of debt
- K<sub>e</sub> = Cost of equity
- K<sub>d</sub> = Cost of debt
- t = Marginal corporate tax rate

Equity (E): Obtained by multiplying the total number of shares by the share price (market value)

Effective tax rate (t): Obtained by dividing the income taxes by the EBT

Debt (D): book value of the debt

### 2.1.1. Cost of Equity (Ke)

Cost of equity is the return that a company requires to decide if an investment meets capital return requirements.

$$K_e = R_f + \beta L * (E(R_m) - R_f)$$

For the computation of Ke, we need the following values :

Rf : Risk-free rate = 1,60%

- We used the 10-year T-Bond to estimate the Risk-free rate.

$\beta L$  : Levered Beta = 1,17

- We found the levered Beta on yahoo finance

$E(R_m) - R_f$ : Market risk premium = 5,5%

- We use an estimation of  $E(R_m) - R_f$  that we found on [evaluation.data.pwc.be](http://evaluation.data.pwc.be)

### 2.1.2. Cost of debt ( $K_d$ )

Cost of debt is the effective interest rate that a company pays on its debts, such as bonds and loans

$$\text{Cost of debt} = \frac{\text{Interest expenses}}{\text{Total debt}}$$

### WACC final computation

$$\frac{E}{D + E} = 0,8552$$

$$\frac{D}{D + E} = 0,1448$$

$$(1 - t) = 0,697$$

$$K_e = 0,0804$$

$$K_d = 0,0321$$


$$\text{WACC} = 0,07195$$

## 2.2. Forecast performance

General method : We used the ratio to forecast the Balance Sheet and Income Statement. The only values we forecasted with a linear regression were the Total Sales and the Total Debt. For the rest, we were always forecasting from ratios with three different options.

- **Linear Forecast** : The linear forecast is a method based on statistics, the linear regression. This takes the general trend of the figures and forecasts figures that could fit with this tendency.
- **Average** : This method is really simple. We take the average of the previous years and apply it to the future results. When we thought it wasn't relevant to take the whole 6 years (from 2015 to 2020) we took only the last 3 years that were more accurate.
- **Evolutive Average** : This method is the same as the previous one apart from the fact that the year is not the same. If the 2021 year is forecasted based on the years 2015 to 2020, the 2022 year will be forecasted based on the 2016 to 2021 years, and so on.



## 2.3. Free Cashflow

Free cash flow (FCF) represents the cash a company generates after accounting for cash outflows to support operations and maintain its capital assets. Unlike earnings or net income, free cash flow is a measure of profitability that excludes the non-cash expenses of the income statement and includes spending on equipment and assets as well as changes in working capital from the balance sheet. In order to calculate the FCF, we used projected values of CAPEX from the analyst reports of Kepler Chevreux.

**EBIT (operating income)**

- Taxes

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**= EBIAT**

+ Depreciation

- Capital expenditures

- Increase in working capital

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**= Free cash flow**



Forecasted Cashflows	
2021	153,04276
2022	74,4373
2023	211,34483
2024	452,1164
2025	865,2467

To compute these figures, we used 2 different methods :

- Linear forecast
- Evolutive average.

## 2.4. Terminal Value

### 2.4.1. Growing perpetuity

This method assumes that the activity will grow indefinitely.

$$TV = \frac{FCF_n * (1 + g)}{(r - g)} \quad \text{where } r = WACC$$

Based on the Earnings, the Dividends and Equity, we found a growth rate of 2,557%.

This gives us a Terminal Value of 19.129,03. (in million €)

### 2.4.2. Price-earnings ratio

This method assumes that the enterprise value is what we could sell it for in year n

$$TV = \frac{P}{E} * \text{Net Income}$$

where  $E = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted average shares outstanding}}$

$\frac{P}{E} = \frac{\text{Share price}}{\text{Earning per share}}$

$P = \text{share price}$

With this method, the terminal value is 34.371,5 (in million €)

### 2.4.3. Terminal Value : Choice of the method

#### P/E ratio Method

This method is based on what an enterprise could sell in one year. The proposition is strong and relatively aggressive. This also prospects good growth in the future. Still, we can use this method if  $g$  (growth rate) is high.

This evaluation of enterprises is optimistic but not as much as the growing perpetuity method.

#### Growing Perpetuity Method

This method is an optimistic way to see the future but also the more common way to evaluate enterprises. We assume that the enterprise will continue to grow without any problems. Most of the time, given the current economic model, this method is the most accurate. But we should remain careful and not use this method if  $g$  (growth rate) is too high.

We finally chose the growing perpetuity method because we think that it is reasonable to assume that Umicore could continue its operations in the long term and grow exponentially. Furthermore, the P/E ratio method gave us an NPV too high for what we could expect for Umicore, this could be due to a decrease in net income in 2020.

## 2.5. Discounted TV and discounted FCF

The Net Present Value (NPV) is a way to evaluate the current value of an enterprise. Here the “i” is the WACC, the average rate a company expects to pay to finance its assets. To compute the NPV, we had to discount the FCF and the terminal value. The discount permit us to see future cash flows as if they were perceived at the reference year. Thanks to the discount it is possible to compare CF at a fixed year.

$$NPV = \frac{FCF_1}{(1+i)^1} + \frac{FCF_2}{(1+i)^2} + \dots + \frac{FCF_n}{(1+i)^n}$$

Following this method, the discounted Terminal Value is worth 13.514,87 and Umicore’s value going with this method (perpetual growth) is 14.849,45 (against 14.314,3 the value found in the Key Stats)

The discounted CFs are the following.

CF1	CF2	CF3	CF4	CF5
142,7699	66,5202	171,5785	342,4092	611,306

## 2.6. Sensitivity analysis

The sensitivity analysis is a good way to observe the potential variation of the Net Present Value, the discounted CashFlows, and the discounted Terminal Value when the WACC and the growth rate fluctuate.

### *Variation of Net Present Value*

WACC	Growth rate (g)					
		1,56%	2,06%	2,56%	3,06%	3,56%
	6,20%	15409,67549	17181,4016	19440,019	22418,205	26524,98309
	6,70%	13725,90197	15126,2964	16865,044	19081,621	22004,37227
	7,20%	12344,30228	13475,0049	14849,454	16555,987	18731,49649
	7,70%	11190,95629	12120,0153	13229,866	14578,967	16254,02844
	8,20%	10214,21525	10988,8455	11900,849	12990,326	14314,66115

Umicore's NPV increases when the WACC decreases and the growth rate increases.

This is in line with what we would expect since the WACC represents a cost to Umicore and the growth rate shows the development of the enterprise.

## 2.7. Estimation of Stock price

$$\text{Share price} = \frac{NPV - \text{Net Debt} + \text{Excess Cash}}{\text{Number of shares}}$$

**Enterprise Value**

Outcome of DCF

**- Net Debt**

= Financial Debt

– Cash & Short term equivalents

**= Equity Value**

/ (Divided by) Number of shares

**= Estimated Stock price**

The share price calculated using the terminal value of the P/E ratio method is 100,57 which is way higher than the price calculated with the growing perpetuity method. This could be explained by a decrease in the net income in 2020 due to covid-19.

Based on the growing perpetuity method, we obtain a share price of 55,83 which is higher than market share price (44,450 on 20/11/21)

# 3. Comparables method

## 3.1. Introduction

The comparable valuation method is an alternative way to estimate the value of a company. The objective is to find companies that are active in the same sector as Umicore and to identify the trends that the market has on these companies. With the help of performance indicators, we can assess the value of Umicore and its share price through comparables.

This method is convenient to vary the ways of analyzing the valuation of a company but has its limitations. Indeed, the choice of comparable companies is very important and can change the final value. This is why the number of comparables could help to reduce the variability of Umicore's value.

The value computed with this method can be compared to the value found with the DCF method.

# 3. Comparables method

## 3.2. Justification of comparables

### Similarities

### Differences



- Same sector : energy
- Company present in Europe

- BASF is a larger company than Umicore



- Manufactures catalysts for escape control
- Company present in Europe

- Faurecia is a larger company than Umicore
- Faurecia manufactures other equipment for cars (seat, dashboard,...)



- Same sector : recycling and production of materials

- Posco Chemical is a smaller company than Umicore





### Similarities

- Same sectors : energy and surface technologies



- Same size
- Similar sector : catalysts
- Similar enterprise value



- Sectors close to Umicore's ones
- Belgian company
- Same size

### Differences

- Easpring is a smaller company than Umicore
- Easpring is not present in Europe

- Less actions
- Not present in energy and batteries sectors

- Solvay doesn't work in catalysts

### 3.3. Comparable indicators

**Sales** : The sum of income that the company earned with the activity.

**EBIT** : Revenue-Operating expenses-Depreciations-Amortization. This measure shows the capacity of a company to generate income from its activities every year.

**EBITDA** : Computed doing the sum of EBIT + depreciation + amortizations. This measure ignores the investing cash flow and the working capital changes.

**Price-Earnings (P/E)** : It is the ratio between the share price of a company and the earnings per share. This measure can show if a company is overvalued or not.






**Enterprise Value (EV)** : We can find an addition between the market cap and the net debt.

### 3.4. Comparable multiples

Computation of the comparable multiples :

$$\text{Multiple} = \frac{\text{Entreprise value (EV)}}{\text{Performance indicator}}$$

By the application of this formula, we obtain the following multiples.

COMPARABLE MULTIPLES	 <b>BASF</b> <small>We create chemistry</small>	 <b>faurecia</b> <small>inspiring mobility</small>	 <b>POSCO</b> <b>CHEMICAL</b>	 <b>SOLVAY</b>	 <b>当升科技</b> <b>EASPRING</b>	<b>JOHNSON MATTHEY</b>	<b>MEAN</b>
EV / SALES	0,78236	0,56237	2,4872	1,27004	4,67354	0,6085	2,1772
EV / EBIT	13,9808	0,56237	64,6351	9,20309	50,4385	17,53404	33,21578
EV / EBITDA	6,50865	7,04166	31,247	6,70225	40,03092	12,9953	18,86197
P/E ratio	-1,15	-3,3	214,48	-6,3	73,58	30,55	59,0264

### 3.5. Other criterias comparables

Here are some other indicative figures which have not been taken into account in the formula for calculating the enterprise value and share value, but which are nevertheless interesting for comparing Umicore with companies in the same market.

OTHER MULTIPLES	BASF	FAURECIA	POSCO	SOLVAY	EASPRING	JOHNSON MATTHEY	MEAN
Number of employees	117922	113931	1795	23660	828	14582	45453
Market cap	29596,37	5110,64	2877,32	9934,14	2135,418	10163,811	9969,6172
EV	46276,541	8238,743	2882,71	12332,143	2080,215	11085,852	13816,034
Number of shares	460,285	134,549	60,9925	103,158	453,62	192,094	234,61641

### 3.6. Share value : comparable method

**First step :** Equity Value is the value of the company that is owned by the shareholders. We use these 4 multiples to estimate the Equity value of Umicore

$$\text{Equity Value} = (\text{mean multiples} * \text{indicator}) - \text{net debt}$$

in million €	EV / Sales	EV / EBIT	EV / EBITDA	P/E ratio
Equity value	8806,448	12596,235	14564,2962	12991,8172

$$\text{Average} = 12239,69916$$

**Second step :** compute the Equity value average of these 4 multiples and divide by the number of shares of Umicore

$$\text{Share Value} = \frac{\text{Equity Value average}}{\text{Number of share}} = 50,8765$$

**Third step :** we estimate the enterprise value with the Equity value average and the net debt of Umicore

$$\text{Enterprise Value} = \text{Equity Value Average} + \text{Net Debt (in million €)} = 13653,72316$$

## Comparable method for 2021

For information and comparison, here are the same calculations for the year 2021. These are imprecise as the data only covers the period from January to November 2021.

We chose to do the comparables method for 2021 because we had some problems with the 2020 comparables method. We thought that 2020 was not the best year to apply the comparables method, or at least it could not be a reliable reference.

For example, in 2020, some of our comparables had negative revenues, so negative price/earnings ratios, whereas in 2021, we did not find any comparables with negative net revenues. We want to estimate whether this would change our equity value and our final share price.

### First step :

in million €	EV / Sales	EV / EBIT	EV / EBITDA	P/E ratio
Equity value	3919,42	20855,8746	14564,2962	11510,3169

Average = 12298,34552

### Second step :

*Share Value* = 51,12036

### Third step :

*Enterprise Value* = 13712,36952

### 3.7. Comparison between DCF method and comparable methods

in million €	DCF method	Comparable method
Share Value	55,826	50,8765
Enterprise Value	14849,45	13653,72316

The two answers are close but not identical. Each method has its strength and weaknesses.

With the DCF method, we judge the company itself by forecasting the balance sheet and income statement so that we can anticipate the future sources of revenues, future costs, and growth. With the comparable method, we analyze the effect of the market on Umicore through other similar companies. As we can see, the two methods have a completely different approach but tend to estimate the same concept: the value of Umicore.

In the DCF method, as we are centered on the target enterprise, it's impossible to have a reference point to include Umicore in its competitive environment. On the other hand, the comparable method doesn't take the potential sources of growth.

In conclusion, the two methods of valuation are complementary, and using both could help us to have a more complete overview of the Umicore situation.

# 4. Project that Umicore might undertake

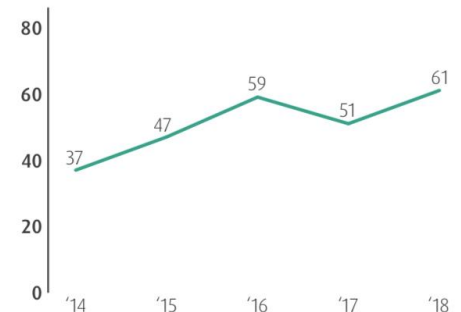
## 4.1. Context

A very important objective that is in line with Umicore's values is to improve the safety culture within its various sites. The safety of their employees is a key priority.

Their success is measured by their ability to provide a safe working environment for their employees. Umicore seeks to embed a safety culture within its workforce and to monitor, manage and protect them from exposure to risks.

Despite management's focus on safety, Umicore claims that its performance in terms of the number of accident is relatively disappointing (increasing number of accident every year)

**HEALTH AND SAFETY**  
**LOST-TIME ACCIDENTS**





One of the company's long-term goals is to eliminate all lost-time accidents and work-related health problems.

According to a study carried out by OPPBTP, when a company manager commits to occupational health or safety action, this has a very strong positive effect on employee performance. Their motivation at work increases, as well as their productivity. This study calculated the gain per employee to be € 1600 per year for a large company like Umicore.

Measures have already been set up in their "Target Zero Accidents" campaign in 2020, but we would like to propose an additional one.

## 4.2. Project, investment, profitability and NPV

Each manager of Umicore's 18 European\* plants could receive accident prevention training at work and introduce health measures such as sports subscriptions or healthy vitamins for their employees. This investment would allow Umicore to save on the cost of accidents at its facilities, and to increase its profit through improved worker productivity.

In order to estimate the profitability of such a project, we used as reference figures those from a study conducted by the EASHW (European Agency for Safety and Health at Work), whose subject was the value of occupational safety and health and the societal costs of work-related injuries and diseases.

We estimated the average costs of work-related accidents by selecting the types of accidents most likely to occur at Umicore sites.

*\*The EASHW study only provided us the cost data for European plants*

Based on the available data, we calculated the average cost for a European Umicore company of a lost-time accident.

*Average costs of lost-time accidents in factories in Europe  
(including hospitalization and lost value due to absence)*

Wounds and superficial injuries	3338,4
Bone fractures	3338,4
Poisonings and infections	1697,2
Asphyxiations	1886
Effects of sound; vibration and pressure	790,8
Shocks	2947,4
Average cost	2333,033333

Average number of accidents per year in Europe at Umicore	34,125
Average cost of accidents at Umicore's european factories per year	79614,7625

Adding the administrative costs of accidents and taking into account that prevention training reduces the number of accidents by about 10%, we arrive at a value of € 8201.913.

We compared this value with the costs of prevention training for accidents at work and the introduction of health measures discussed earlier.

Umicore could use the services released by Securex, which offers comprehensive prevention training at a cost of € 255. For a training course in each of the 18 european plants, the cost of the training would be € 4590.

In terms of health measures, sport memberships cost € 118,8 per year and vitamins cost € 274,8 for each of the 6102 workers in Europe.

The cost of this business health & safety improvement investment reaches a total of € 2 406 337,2

cost for security trainings in every umicore plant in europe	
	4590
cost for healthy vitamins	
	1676829,6
cost for sport subscriptions	
	724917,6
total cost of health & safety improvement	
	2406337.2



Regarding the income, taking into account the gains from the increase in employee productivity, we obtain a total income of € 9 771 401,9 for this project.

Thus, the project is profitable of € 9771401.9 - € 2406337.2 = € 7365064.7 which shows that investing in employee health and safety could be a financially profitable project for Umicore. Moreover, the project is in line with the company's values of being a good place to work for its employees. Such an investment could lead to the creation of synergies as a result of the development of a better working environment.

We can also look at the **NPV** of this project in a time horizon of 4 years (until the end of 2025).

$$NPV = initial\ investment + \frac{CF\ year_1}{(1+WACC)^1} + \dots + \frac{CF\ year_n}{(1+WACC)^n} = 23180621,83\ €$$

# What about the funding of the project ?

In order to finance our project, the main source of funding could be potential grants.

Indeed, our project is eligible for 3 different grants :

- The CNT program which fights against burn-out in companies
- The public institution “SPF Emploi et travail” in Belgium which is ready to reimburse 40% of the investment on prevention training
- The IRSST, which invests in health measures for companies that agree to share the variation of our figures before and after our program to help them set up statistical studies.
- The profit of 7365064.7 we are talking about relates only to the European part of Umicore's business. It should be noted that the European turnover is equivalent to approximately 50% of Umicore's total turnover\*.

Beyond the grants, Umicore had at the end of 2020 about 4.5 million euros of available values. As the cost of our investment proposal represents less than half of the available values, this could also be a means of financing in addition to potential grants.

Data : 46,10% in 2019 and 53,67% in 2020

## Inaccuracies and lack of data

However, there are a few inaccuracies in our reasoning due to a lack of data :

- In our calculation of the average costs of accidents at Umicore, we did not manage to take into account the costs of the 3 fatal accidents that took place in the last 4 years on Umicore plants because they are invaluable. However, these fatal accidents have a very high cost, which makes the use of prevention training even more profitable.
- When we calculated the cost and the profitability in our excel, we assumed that the positive effect of prevention training was only perceptible over 1 year. However, the effects are long-lasting and therefore the cost is amortized over several years.

All these factors are not taken into account in our computations because we don't have any data, but they are in line with our hypothesis. The project remains profitable according to our evaluation because taking into account these inaccuracies ignored in our calculations, it leads to even better revenues

# 5. Conclusion

During this assignment, we have had the opportunity to compute several values in order to analyze Umicore current situation (forecast, fcf, enterprise value, share value, etc...)

Now, we are able to have an opinion about Umicore. For instance, one of our insights could be the fact that Umicore is willing to develop itself during the next years and so forth, thanks to its steady financing sources and its ability to generate values. As well as its expecting growth which seems to be high (that is why we took the growing perpetuity method).

Despite of the fact Umicore is in a tricky industry (variations of the prices of raw materials...), the latter has the tools to grow on a long-term basis. Through the help of the comparables, we also had the chance to have a relevant idea on Umicore situation without using any figures provided by Umicore itself.



Finally, the project, which is focused on safety and health, will bring to Umicore about 8 million of the net return on investment. In addition, it will provide a better image of the company, as well as the wellness of each manager, employee, and shareholder of Umicore. Assuming that Umicore would grow further (as our forecasts reveal), we can ask ourselves some questions. Would it be interesting to diversify Umicore's competencies, maybe in green energy or even in medicines? Knowing the risks of certain environments in which Umicore works (for example in the batteries field, in particular when we observe that Johnson Matthey has ceased its activities in this field), can we find a reliable strategy to optimize Umicore's survival in its different environments? It would be interesting to take a look at this as part of a strategic analysis of the company.

In our opinion, the whole assignment enables us to delve into a company deeper than we have ever done previously in our academic courses. From calculating some values to seeking the real context of Umicore, we are now completely informed of Umicore financial part. It also allows us to become more and more versatile with the tools we can manage to assess a company.

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