

A Work Project, presented as part of the requirements for the Award of a Master's degree in finance from the NOVA – School of Business and Economics.

The Future Green Source

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Abstract:

The objective of this thesis is to provide a detailed analysis of the financial statements of the German company Heidelberg Materials that belongs to the Building Construction Materials industry and provide a recommendation on whether to buy, hold or sell as of the 31st of December 2023. In order to do so, the DCF model was applied and was then reinforced with a valuation by multiples and a sensitivity analysis. One important factor is that the impact of the recent events in the economy specially the inflation and the new energy crisis had an impact on the company share price.

Keywords: Emission, WACC, Multiples, Costs

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This report is part of the Today's Loser, Tomorrow's Winners report (annexed), developed by Tomás Gaspar Bastos and José Miguel Pereira Fonseca and should be read as an integral part of it.

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Introduction

The main purpose of this report was by merging my part with my colleague part to be able to have an equity research where in the end we reach a price value for Heidelberg Materials of €55,30. The work was divided in three major parts, in the first one we talked about the company overview (my colleague), as well as the market overview (my part), where we incorporated our major competitors and did an overall market analysis focusing on these major key factors, the war in Ukraine, inflation, the energy crisis, the lockdown in China and the CO2 tax weights.

We then proceed to our model, where my colleague was in charge of writing about the DCF, the Revenue Model, Market Share, Working Capital and PPE, and the Capital Structure. I then proceed to talk about the principal costs that Heidelberg incurs, the WACC, the Multiple Valuation and the Sensitivity and my colleague conclude with the Scenario Analysis.

To finalize I end up the equity research with the Final Recommendation, where we recommend a position of Hold.

Market Outlook:

Economic situation

The current global economic climate is being influenced by several key factors, including the war between Ukraine and Russia, inflation, the lockdown in China, the impact of the energy crisis and rising CO2 tax weights. These factors are disrupting trade, causing a decline in economic activity, and contributing to rising prices. They are also disrupting global supply chains and raising production costs for many industries. Overall, these factors are having a significant impact on the global economy and on companies like Heidelberg Materials.

Macroeconomic instability

Throughout our model we input the latest obstacle, the war in Ukraine. This war is leading to the most increases of prices of the recent history and because of that all industries are taking a hit on their profit margins. We are executing from our point of view with all the information we have been gathering, what will happen during this year, as well as the repercussions that this war will lead to the upcoming years.

Impacts in Europe

Companies were just about to recover from the covid impact, where Heidelberg was no exception, by having the first three quarters with positive and better results than the previous 2 years. Nevertheless, for the following years we expect that this growth to diminish, costs to rise above revenues for the first 2 years, leading to negative core result, (*Fig 1*).

The ongoing war in Ukraine and the the crisis in Europe are significant concerns for the building materials industry. These factors will have a negative impact on the industry, particularly for companies that have a high proportion of their sales in Europe. Companies like Heidelberg, which have a large share of their sales across Europe, are in the eminent risk of being more affected by the crisis in Europe than companies like Cemex, which has most of their sales in the North and South America.

It is essential for companies in the building material industry to closely monitor the situation and adjust their business strategies accordingly. By staying up to date with the latest developments and incorporating this information into their forecasting models, companies can better prepare for potential challenges and uncertainties that may arise as a result of the war and the crisis in Europe. By adopting a proactive approach, companies can minimize the negative effects on their business and ensure a stable growth trajectory in the long term.

Growth expectation

In the building material industry, it is essential to be aware of the potential impacts of market changes on the revenue growth. Recent trends, such as the rise in material costs and the decrease in public expenditure on construction, as well as the decrease on the credit line asked by individuals to buy houses have a significant effect. The industry in order to continue growing and thriving, it may be necessary to adapt business strategies and explore new markets or ways of reducing costs. This could involve implementing more efficient production methods, diversifying product or service offerings, or finding ways to reduce expenses. Keeping a close eye on economic developments and being prepared to adapt to changing circumstances is key to navigate in crises and ensuring the long-term success.

Year	Core Result
2022	1 524,4
2023	-1 246,1
2024	-536,3
2025	8,0
2026	224,2
2027	318,8

Figure 1: Core Result from
Source: Own Estimates

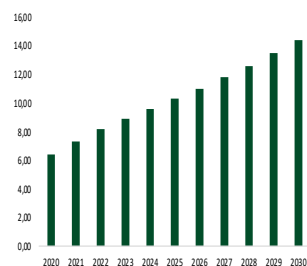


Figure 2: Expected Growth of the Construction Industry
Source: Statista

To sum up this we expect that despite the steady growth, (Fig 2)¹, of the overall construction industry, (highly correlated to the building materials industry) in recent years, even considering the impact of Covid and the latest events. Nevertheless, of the steady growth, and the crisis, our industry is keen to still have demand, since concrete is the second most consumed material, after water, showing the size of industry in terms of consumption. With this we realised that, in fact, the major determinant of next year's bad results forecasted is the fall on operating margins and not the question of demand.

Stagnation

Despite the economic situation, the building materials industry has not stagnated. One of the reasons for Heidelberg to continue with this growth has been by investing in other companies and joint ventures, in a way of reducing costs and expand the locations where it sells the product. With these investments, it makes not only their product more available in other regions that they did not have a presence as well as for the reduction of HCT activity. Important to note that we do not forecast any M&A activity between 2022 - 2045.

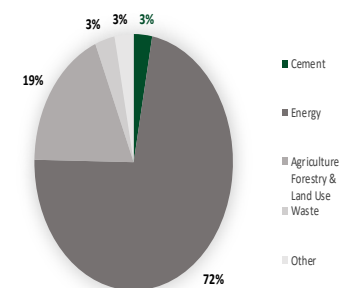


Figure 3: CO2 Emissions by Sector
Source: Own Estimates, OurWorldinData

To sum up, Heidelberg for instance has been showing clear sights that is moving to achieve more efficient as well as more attractiveness to new investors by achieving new ways of reducing and improving their core production.

Emissions

The cement industry is a significant contributor to greenhouse gas emissions, around 3%² (Fig 3) primarily due to the chemical reactions involved in the production of clinker, a key component of cement. The production of clinker produces carbon dioxide as a by-product, and the transportation of raw materials and finished products, as well as the use of fossil fuels in the production process, also contribute to emissions. To reduce the industry's carbon footprint, alternative materials can be used in production, more efficient processes can be implemented (CCUS), and renewable energy sources can be utilized.

The Shift

The cement industry is facing increasing pressure to reduce its greenhouse gas emissions, as cement production is a significant contributor to global emissions. Heidelberg for instance has made the biggest commitment to reduce its emissions by 30% by 2030, compared to 1990 levels. This means reducing emissions from 750 kg CO₂/t to 400 kg CO₂/t.

To achieve the green transformation, the industry is implementing a range of strategies and technologies. One approach is to optimize the materials used in cement production. For example, Heidelberg Materials is using waste materials from other industries to produce new products, reducing the need for raw materials and the amount of waste produced.

Another strategy the industry is using is the optimization of production processes. As new technologies become available, the industry is implementing them to improve efficiency and reduce emissions. For instance, for Heidelberg Materials this strategy has been the most relevant since it has already partnered with the Swedish government to develop a carbon capture, utilization, and storage facility to capture and store CO₂ emissions, which no other

¹ Published by Statista Research Department. "Global Construction Market Size 2020-2030." Statista, November 25, 2022. <https://www.statista.com/statistics/1290105/global-construction-market-size-with-forecasts/>.

² Ritchie, Hannah, and Max Roser. "Emissions by Sector." Our World in Data, May 11, 2020. <https://ourworldindata.org/emissions-by-sector>.

company has made. Besides that, Heidelberg is projecting to invest in CCUS facilities, its biggest bet for the future.

Overall, the cement industry is being pushed towards reducing its greenhouse gas emissions and transitioning to more sustainable production methods. This involves a combination of material and process optimization, and the implementation of new technologies such as carbon capture and storage.

The reasoning

That pressure to turn into a more sustainable industry, comes from both regulatory requirements and investor considerations of environmental, social, and governance (ESG) factors. To meet these challenges, companies in the industry are being forced to implement a range of strategies and technologies to reduce their emissions and improve their ESG scores.

One approach is the use of emissions trading schemes, where companies are allocated a certain amount of emissions permits based on their production levels. If they exceed their allocated amount, they must purchase additional permits from other companies³. This allows companies to produce more cement without incurring additional costs from exceeding their emissions limits.

Additionally, companies can also sell their excess emissions permits to other companies, potentially at a higher price than the market rate, (Fig 4). This can provide a financial incentive for companies to reduce their emissions and sell their excess permits. It can also help to create a market for emissions permits, allowing companies to buy and sell them as needed to meet their emissions targets.

Top 10 Buyers Company	Cap	Emission	%Annual Cap	Short/Long
Heidelberg Materials	18.8	20.9	-12.5	-2.3
Holcim	25.9	27.7	-17.1	-1.9
Cemex SAB de CV	8.6	8	7.5	0.6
Buzzi Unicem SpA	7.7	7.9	-3.2	-0.3
CRH PLC	4.1	4.6	-19	-0.6
Cie de St Gobain	3.6	4.5	-24	-0.9
Titan Cement Co As	3.6	3.5	11.2	0.4
Compor Cimentos de Portugal SGPS	4.5	3.5	23.7	1.1
Sonimpa Sociedade de Investimento e Gestão	2	1.5	28.4	0.6
Cementos Molins AS	0.9	1	-20.6	-0.2

Figure 4: Caps and Emissions of the Top 10 Buyers in Europe
Source: Bloomberg Intelligence

Furthermore, by producing cement with a lower carbon footprint, like Heidelberg is pursuing to do so, they can differentiate themselves from competitors and potentially attract environmentally-conscious customers. Overall, implementing emissions trading schemes and reducing emissions can help companies in the cement industry to become more efficient and profitable, while also meeting regulatory requirements and improving their ESG scores. At our view Heidelberg Materials is by far the best positioned company in the building materials industry to achieve this green transition.

Currency Risk

It is important to consider the potential impact of currency risk on Heidelberg Materials' valuation, not only due to the big diversification of sales around the world that Heidelberg as well as the industry have, but also due to the recent depreciation of the Euro against the Dollar⁴ could have both positive and negative effects on the company. On the one hand, a continued depreciation of the Euro could make it more expensive for the company to buy raw materials from suppliers who negotiate in other currencies, such as the Dollar. This could potentially increase the company's production costs and reduce its profitability.

On the other hand, the Euro depreciation could also have a positive impact on the company's revenues, as it could make its products more competitive in the global market. This increases

³ "EU Emissions Trading System (EU ETS)." Climate Action. Accessed December 15, 2022. https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.
⁴ Ward-Glenton, Hannah. "Euro Trades at Two-Decade Low against the Dollar. and Some Think It Could Slide Much Further." CNBC. CNBC, August 23, 2022. <https://www.cnbc.com/2022/08/23/euro-trades-at-two-decade-low-against-dollar-and-it-could-slide-further.html>.

the company's sales and improve its financial performance.

Overall, while currency risk should be considered as part of the company's valuation, it is not expected to have a significant impact on the company's financial performance at this time.

Industry Competitors/peers

When conducting a market analysis, it is essential to identify and compare a company to its main competitors in the industry. This will provide valuable insights into the competitive landscape and allow the company to identify potential risks and opportunities. In the case of Heidelberg Materials, the company identified several competitors in its market, but excluded those that were not geographically located in the same region or that did not sell the same core products. Based on this analysis, the main competitors for Heidelberg Materials were identified as:

Main Competitors

Holcim is a Swiss building materials company that is present in 60 countries. They operate in four business segments, ranging from cement, aggregates, ready mix concrete, and other building materials. In terms of upside risk, we saw that Holcim has some attractive deals in Solutions and products, new self-help measures to protect their margins, more market in other countries. In terms of downside risk, we saw that Earnings are decreasing, in Europe, a loss in their margin, as well as a depreciation of the Swiss Franc relative to the dollar.

Cemex is a Mexican multinational building materials company that has an active relationship with 96 nations. They operate in four business segments from cement, ready-mix, aggregates, and urbanized solutions. We are also seeing a weaker demand in Mexico. In terms of upside risk, we are seeing an increase in investment grade. In terms of upside risk, earnings are decreasing, are below what was expected for this 3rd quarter and to wrap it up, the dollar has been appreciating.

CRH is an Ireland's multinational manufacturer of building materials including asphalt, aggregates, cement, lime, ready mixed concrete, infrastructural concrete. In terms of upside risk, we saw an increase in buybacks. Our margin is increasing, the price to cost positive in the asphalt business. On the downside risks, we are seeing a decrease as well in the earnings, mostly due not only to the war but mainly to the side effects we are seeing because of it, with the US dollar appreciating, some costs are becoming more expensive.

Sales Diversification

Another important factor to consider when talking about competitors, is the placement they have around the world. Due to the current situations, having a well-diversified sales diversification is better than to be only focused on one country, like have seen with Heidelberg Materials, now we are going to look at competitors, like we can see in (Fig 5).

Holcim is also present well around the world, being there major source of income Europe and North America, it is also represented in both developed and in development markets as Asia Pacific, Latin America, and Middle East & Africa, where this last two are the ones with the lower number of sales.

Cemex is also globally present, being there major source of income EMEA&A, which includes countries like UK to United Arab Emirates as well as Poland, Spain, etc. then in addition the

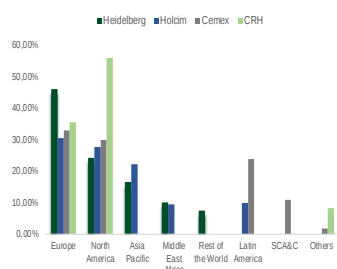


Figure 5: Sales Distribution across peers
Source: Own Estimates, Company's Data

USA and Mexico, being these three it major source of income, representing 87%.

Lastly there is CRH which is also well present around the world, with is major locations being North America, Easter, and Western Europe and lastly with a smaller percentage being Asia Pacific regions.

With this we can see that our company as well as our peers are well diversified in the global market, so we can for instance reach a conclusion that with the new global crisis that is starting to hit mostly Europe, can in a way be sort of mitigated, nevertheless this huge presence in Europe like Heidelberg has, around 46% of sales will suffer an eminent reduction, and having an impact on their revenues, much higher when compared to peers.

Product Diversification

Going a little bit deeper on the type of sales of each competitor, we can see that most of them, besides selling the same as Heidelberg, have some additional products like we can see on the (Fig 6).

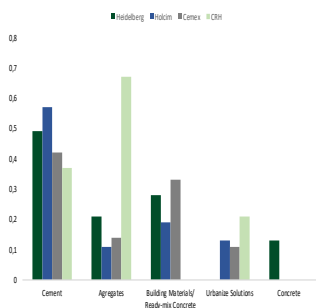


Figure 6: Product Diversification across peers
Source: Own Estimates, Company's Data

Looking at Holcim, we can see that they are diluting their business into selling more of their solutions & products, nevertheless, 87% of their sales comes from cement (57%), ready mix (19%) and aggregates (11%), which has been overcome from the business of solutions & Products. It is also important to refer that they have a target for 2025 to 30% of their business to be of solutions & products, a huge shift but already looking into the future.

Cemex in terms of side business compared to Heidelberg Materials it is also in the market selling urbanization solutions (11%), which is a department more focused to building smarter and efficiency cities with the help of architects, developers as well as local governments, nevertheless their biggest sales consist of cement (42%), ready mix (33%) and aggregates (14%) representing the remaining 89% of the sales.

CRH besides the construction materials productions which represents 74% of their sales, it has also entered in the business of the building products for residential and non-residential, which consists in architectural and infrastructure products as well as construction accessories representing 36% of their sales.

We can see that all our competitors are also expanding their business in the building world, not only on complementing the construction materials they already offer but also coming with the ideas to what people might need, having almost the full business. With this we can see that Heidelberg competitors are starting to expand their business lines when compared to Heidelberg, which can be seen as a 2-way street.

5 Forces of Porter

According to Porter's five forces model, the building materials industry is characterized by high competition among established players and low threat from new entrants and substitutes. The high cost of operating in the industry and the lack of innovation make it difficult for small competitors to enter the market and compete with established players. The wide use of concrete and other construction materials also limits the threat of substitutes. Consumers and suppliers have limited power in the industry, as there are many competitors and providers of construction materials, allowing for negotiation of prices and terms. Overall, the construction industry is characterized by high competition and low threats from new entrants and substitutes.

Costs and Gross Margin

The cost of sales for the building materials segment includes mostly the materials costs, energy cost, supplies, repair materials and packaging. On the other hand, Heidelberg Materials incurs also in the employee and personal costs considering the fifty-one thousand employees around the world. The majority of the remaining costs come from other operating expenses, which includes the selling and administrative expenses, the freight, and the expenses for third party repair and services. This last expense we decided to keep it growing as the percentage of sales from each country.

Material costs

The cost of materials has been increasing in the last 4 years, with an average cost of materials representing about 40% of revenues. This rise is driven due to the increase in commodity prices, mainly regarding to energy costs. The war in Ukraine, the lockdown in China due to the Zero-covid policy, and the problems in the distribution channels still coming from the pandemic are the three big reason impacting dramatically the material costs. As a result, cost of sales of Heidelberg Materials is expecting to increase substantially along the next years.

The reasoning behind our assumptions were the fact that Heidelberg even though is not influenced by it the inflation trends associated to raw materials, bearing in mind that it is the proper company that extracts them, it is deeply affected by the fluctuations of energy prices included in the transportation and the manufacturing phase.

Year	Variation %
2021	55%
2020	-21%
2019	35%
2018	-25%
2017	12%
Average	11%

Figure 7: Forecasted Prices and Variations of the Oil Barrel
Source: Own Estimates

To forecast them we used the price of the barrel in UK as reference⁵, (Fig 7) with the historical variations. The first reason was the fact that UK is the country which performance is highly correlated with the global markets, so the fluctuation of its energy prices tends to be very similar to the global fluctuations, besides the fact that it was highly covered by credible pricing forecasts. Those two reasons lead us to assume and consider it as a benchmark for the market and extrapolate its values for the rest of the world (Fig 8). Having those values, the final inflation level available was for 2027, with an inflation premium comparing with the 2021 prices of c.30%, an extremely high value in our perspective. We believe that the values along the forecasted period still contain a deep effect of the economic turmoil generated by those three major factors. That said we consider that, for 2028 onwards, the historical average of changes in energy prices capture in a better way the “natural” variance of that commodity, without being intoxicated as, indeed, before the War, the inflationary tendency existed but still in reasonable terms – indeed, it was the combo of that three main factors that made the hyperinflation phenomenon to emerge. To conclude we used the average of the last 5 years variance to calculate the long-term inflation, c.11%, a reasonable value from our point of view, since it does not constitute an extreme number.

With this we then reach the value for the materials costs by grabbing the previous value as the extra inflation and by combining it with the regions dependence on oil and the 2021 material costs, and as we can see on the figure xx, we have a decreasing value for the material costs staring in 2023, because for 2022 we expect to have the biggest impact, material costs to be around 60,05% of the revenues and it will then decrease and finally stabilized in 2028 as a cost

Year	Index Prices	Variation%
2021	51.5	
2022	81.9	55%
2023	75.9	47%
2024	69.5	35%
2025	65.8	28%
2026	65.6	27%
2027	66.7	30%
2028	57.4	11%

Figure 7: Predicted prices of the Oil Barrel
Source: Own Estimates

⁵ “Crude Oil Prices - 70 Year Historical Chart.” MacroTrends. Accessed December 15, 2022. <https://www.macrotrends.net/1369/crude-oil-price-history-chart>.

of 44% of the revenues.

Other Expenses

In terms of Heidelberg Materials operating expenses, we have been seeing the increase in the freight rates, that since the Covid hit and as well as from the Evergreen ship to run aground, the prices have been sky rocking and now with the addition of the war they do not seem to be lowering down. Despite this representing the major of operating expenses, we decide to keep it at a steady growth of 2,5% despite last year growth of almost 15% we believe that was just caused due to covid and the Evergreen ship.

Another important input is the CO2 emissions costs, where here we did what from our point of view would be the costs predictions regarding the future reasoned with Heidelberg expected reduction of 30% of their emission by 2030 and by 2050 be net zero.

The way we incorporated this decrease in the CO2 emission was in proportion of the investments in Green Technology. Assuming the company has nowadays emission amounting to 565Kg/ToneCO2 with €317m invested, through a three simple rule, we can forecast our expectations for future savings. This investment as Heidelberg is doing, will be able to capture their CO2 emissions resulted from their production. With this capturing of CO2 it will imply that their CO2 emissions to reduce, meaning that they will be able to reduce their expenditure in CO2 permits, that for instance as we can see on the table xx, Heidelberg is in a situation where it emits more CO2 then its cap allowed, so to be able to produce above that it has to go to the market and by excess permits from its competitors so it would entail in more costs.

To sum up, we can see that this reduction will not only be an environmental gain as well as a financial gain, since by reducing and having this technology it can then also sell their excess permits to competitors meaning that it would be reducing their costs and probably increasing their profitability.

Still in the category of other operating expenses and with the information we had, we decided to keep the selling and administration expenses as well as the expenses for third party repairs and service to grow with the revenues grow because it was what it made more sense since they are related with our revenue growth.

Personal Costs

In terms of the personal costs, from the data set that was available, we could see that despite in the last 4 years we reduce from 59 thousand employees to 51 thousand, nevertheless the employee and personal costs has been increasing, and due to this we decided to include in our model this same increase. To do so we collected the average salary growth from the last 10 years around the world, even though that for 2022 we are not including a big value increase due to the big inflation this years is providing us, we decided to stick with this value as an average, since this last 10 years have included not only covid as well as the results from the last crisis, and since this value has always kept the same we found it right to stick with the average of the last 10 years that has been these 2% increase every year, so we did the same for Heidelberg Materials incorporating this increase throughout our valuation model.

Nevertheless, despite the hit we anticipate for the next two years, we predict that it will come around in the third year, with the reduction on the material costs, mainly due to the reduction of the fossil fuels as well as the reduction on the CO2 permit taxes also the gain from the

efficiency in the raw material use as well as the recycling of materials to produce, all of this will start to have a major impact in our most higher costs and with this reduction as well as the revenues already coming back up after two years mainly due to the effects that this war will have as well as the crisis we are starting to feel and the confidence of people going down, we believe that after these two upcoming years, Heidelberg Materials will start to have an upcoming year and become to have again profitable results.

Final results

Heidelberg is a company that initially has a lower EBITDA Margin compared to its peers in the industry (*Fig 9*). However, with investments in reducing CO2 emissions and improving operational efficiency, the company is expected to improve its EBITDA Margin and surpass the industry average. This improvement is also expected to be reflected in the company's EBIT Margin, (*Fig 10*), where it will have a higher margin than its peers. The reduction in CO2 emissions and operational improvements are expected to lead to improved profitability for Heidelberg, a "green premium". These findings suggest that investments in sustainability and operational efficiency can lead to improved financial performance for companies.

WACC

In order to discount the operating free cash flow from our company, the cost of capital has been computed. Despite our company being operating with 4 different types of materials, they all belong to the same family and even the fact that it has several business units around the world with diversified markets, only one WACC was computed because we have our statement in euros as well as every country reports to German, where it is the headquarters.

Firstly, the CAPM was applied in order to compute the cost of equity. Since we are placed in Germany and our stock is in the DAX, the German 10 Year Treasury Bond Yield was firstly used as the risk free rate in which we obtained a value of 0,45% as it is globally used as the indicator of investor confidence, protected by the German government. Since this was such a low value when compared to the latest values, we decided to assume a larger one, so we did the average of the last 5 months and we came up with a value of 1,79%, which goes in accordance with the latest situation of the increase on rates and to the economic situation we living.

In terms of the Market Risk Premium, the Damodaran recommendation for 2022 was used, yielding a value of 4,24%⁶, where he uses a conventional approach, meaning that he uses the historical returns on equity and government securities and then evaluates their weakness⁷. We also compared this value to the average of the last 10 years 5,37%⁸ as we can see on the (*Fig 11*), despite this difference we decided to go with Damodaran point of view since this would be a more conservative approach to our model that would go with the economic situation that we are facing, we do not expect this year and the following to have the same average return it has have in the past.

To find our beta, we collected the past returns from Heidelberg Materials stock, 2 years, and we

Company Name	EBITDA Margin - %
Cemex SAB de CV	19,7%
Holcim AG	24,2%
Heidelberg Materials	18,3%
CRH PLC	17,4%
Average Industry	19,9%
Heidelberg Forecaster	25,0%

Figure 9: EBITDA Margin from the Heidelberg' peers
Source: Refinitiv

Company Name	EBIT Margin - %
Heidelberg Materials	10,3%
Holcim AG	15,5%
CRH PLC	11,4%
Cemex SAB de CV	11,9%
Average Industry	12,3%
Heidelberg Forecaster	17,0%

Figure 10: EBIT Margin from Heidelberg' peers
Source: Refinitiv

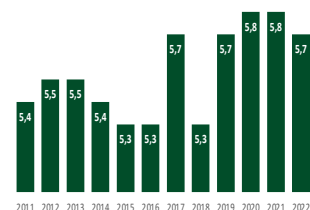


Figure 11: German Market Risk Premium from 2011 to 2022
Source: Statista

⁶ Damodaran, Aswath. "Country Default Spreads and Risk Premiums." Welcome to Pages at the Stern School of Business, New York University, 2022. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html.

⁷ Damodaran, Aswath. "Risk and Return Models." Ch3, 2022. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/RiskPrem.htm.

⁸ Published by Statista Research Department, and Nov 16. "Average Market Risk Premium Germany 2022." Statista, November 16, 2022. <https://www.statista.com/statistics/664825/average-market-risk-premium-germany-europe/>.

	Lower Bound	Median	Upper Bound
β_U Heidelberg	-1,01	0,67	1,54
β_E Heidelberg	-1,73	0,88	2,24
β_U Industry Average	-0,46	0,70	1,55
β_E Industry Average	-0,64	0,98	2,15

Figure 12: Final Results on Heidelberg and its peers β_U and β_E

Source: Own Estimates

then regress it against the market portfolio. In terms of the market portfolio we decided to use as a base the MSCI World Index mainly because of two major factors, being the first since our company has several business units around the world as well as our competitors it would make sense to have used a portfolio that would aggregate the overall movements of the world market and since we are present as how competitors all around the the global market, this brings us to the second major factor to have chosen the MSCI World Index that is the diversified variety of investors we have in not only our company as well as how peers. For instance, Heidelberg Materials investors is composed of 30% from Germany, 30% from North America, 21% from around the world with unknown locations and the remaining in Europe, and the same thing happen to our peers, for instance CRH has 29,7% of their investors in UK, the same amount in North America, 20% across Europe and 3% in Ireland, so in order to aggregate a well diversified variety of investors, we decided that for this purpose this would be the best portfolio that we could compare.

Regarding the β_E was obtained, for a wide range, median (0,88), the 10th (-1,73) and the 80th percentile (2,24). Since Heidelberg Materials is planning to maintain their capital structure constant for the near future, the beta obtained was not unlevered. We then repeated the previous steps to the companies we already talked about previous as our industry peers and that we found the most suitable to used as comparables.

With this we were able to reach the industry β unlevered by doing the average of all four companies reaching in the same intervals, meaning the median of the unlevered beta a value of (0,67), the 10th percentile (-0,50) and the 80th percentile (1,51). To get a better confidence of our value we then calculated a confidence interval for our betas unlevered obtained, and with a 95% confidence interval we reached between 1,16 and 1,93. With this we can see that both our beta as well as the industry beta are within the range of the confident interval (1,54 and 1,55), and when we levered to our company debt to equity ratio 55,41% we obtained the Heidelberg and the Industry average as follow (2,24 and 2,15). We can see on the (Figure 12) that we also obtained negative values as well as some values lower than one, in which we decided to discard. Thus we decided to go with Heidelberg beta as it would be the best to continue with the calculations. We could have done an average of both or even include more companies, but in our point of view, these were the ones that could best mimic our company in all aspects from market presence to their structure as well as their core business, leading us to choose the be derived from Heidelberg Materials rolling beta regression.

The cost of equity was obtained with the beta calculated previously and with the value of the 10Y German Bonds adapted as well as with the Damodaran MRP, reaching a value of 11,27%. In terms of the cost of debt, we decided to use the average of the two approaches as we can see in figure 13, in the first approach we obtained the 10 Year bond issued by the company 3,44%, the probability of default, and in addition the loss given default, bloomberg values we then throughout the formula ($rd = YTM - PD \cdot LGD$) reached the value of 3,09%.

In order to better fortify our value obtained, we went with another logic that was to compute the cost of debt by using the Heidelberg Materials credit spread obtained of Bloomberg and then to add the risk-free rate, we reached a 2,99% cost of debt. The German country risk premium is 0%, due to its safety, so this value was not added to the formula. To obtain the final cost of debt we did an average of both, reaching the final cost of debt of 3,01%.

Method 1		Heidelberg
Return on Debt (Rd)		3,04%
β_d		0,29
Return on Debt (Rd)		3,09%
YTM Coporate Bond		3,44%
Loss given Default		0,6
Probability of Default		0,59%
Implied β_d		0,29

Method 2		Heidelberg
Return on Debt (Rd) - Method 2		2,99%
risk free rate		1,79%
Credit spread		1,20%
credit rating		BBB
Implied β_d		0,28

Figure 13: Information on Rd and β_d inputs

Source: Own Estimates

Equity	9 820,00
Net Debt	5 440,86
EV	15 260,86
E/EV	64,35%
D/EV	35,65%

Risk Free Rate	1,79%
Market Risk Premium	4,24%
Re	11,27%
Rd	3,04%
β_d	0,29
β_e	2,24
WACC	8,01%

Figure 14: WACC
Source: Own Estimates

Thus, the WACC was then obtained by using the formula with the previous values obtained, Heidelberg Materials capital structure and their tax rate 29,72%, bridging it into a final value of 8,01% like we can see in *Figure 14*.

Multiples Valuation

In terms of the peer group, companies in the construction materials industry, with sales around the world, very similar percentage of sells by product, similar capital structures and also a similar market capitalization are considered. Companies that fulfill this requirements were selected and have already been analyzed throughout our “file”, being Holcim, Cemex and CRH. All these have around a market cap of 8 to 30 billion of dollars.

In terms of the release of the annual reports, all the peers have a similar release date as ours, around March. Cemex normally releases in the end of March, CRH is a little sooner being on the beginning of March and finally Holcim at the end of February. In addition to the annual reports, we also used information about the quarterly reports/ trading updates in order to obtain the most accurate information of the impact that not only the war is making well as the inflation is starting to influence companies and the way they operate in the market. To sum up this the information was obtained from not only the annual reports as well as the quarter reports/ trading updates and we consider a full year for the purpose of this valuation the 4Q of 2021 to the 3Q of 2022.

	Price	Shares (M)	EV/EBITDA	EV/Revenue
Heidelberg Materials	52,50	198,42	7,10	0,75
CRH	38,07	747,48	8,50	1,31
Cemex	0,42	14 004,89	3,50	0,97
Holcim	48,71	615,93	10,23	1,66
Minimum			3,50	0,75
Median			7,80	1,14
Average			7,33	1,18
Maximum			10,23	1,66

Figure 15: Heidelberg and peers Multiples
Source: Own Estimates

Hereupon, for our competitor analysis we decided to use the following metrics, EV/EBITDA and EV/Revenue and as we can see the final results of the multiples in *Figure 15*. The main reasons to went with the EV/EBITDA instead of the EBIT is the fact that our industry is categorized for having a lot of capital intensity, for instance Heidelberg Materials has around 1470 ready-mixed concrete production sites worldwide plus another couple hundred facilities, which in numbers would mean a lot of cumulated depreciations, it would take a lot of value of the company and since can be used as an overall financial performance we find it more relevant, since is more common on these companies to use EBITDA instead of EBIT.

EV/EBITDA

As we can see also from the *Figure 16*, Holcim as well as CRH have higher multiple values when compared to Heidelberg Materials and Cemex, mainly occurring due to the higher presence they both have in the market, as well as bigger results coming from this, making their multiple values higher but in the contrast there is Cemex, which has a lower presence than the remaining as well as Heidelberg Materials and with this we can almost have a small sample of what the market is by having similar but diversified companies in terms of ranges.

Regarding the actual values obtained from the EV/EBITDA, we can see that we obtain a larger variation in the final share price ranging from €11,99 to €87,73 and an average of all 4 companies of €55,11, which is very close to what we are obtaining in our DCF analysis which is €53,30.

EV/Revenue

As for the EV/Revenue multiple we are seeing the impact of the stock and their performance in a way that most investors used this multiple to determine whether the stock is priced fairly or not, other important factor to have in mind is normally that the lower the value of the multiple the

EV/EBITDA	Minimum	Median	Average	Maximum
EBITDA 2022	2 232,99	2 232,99	2 232,99	2 232,99
EV Estimated	7 820,16	17 417,90	16 375,93	22 847,74
Net Debt	5 440,86	5 440,86	5 440,86	5 440,86
Equity	2 379,30	11 977,04	10 935,07	17 406,88
Number of Shares	198,42	198,42	198,42	198,42
Price Estimated	11,99	60,36	55,11	87,79

EV/Revenue	Minimum	Median	Average	Maximum
Earnings 2022	20 825,34	20 825,34	20 825,34	20 825,34
EV Estimated	15 857,75	23 764,36	24 471,93	34 501,24
Net Debt	5 440,86	5 440,86	5 440,86	5 440,86
Equity	10 416,89	18 323,50	19 031,07	29 060,38
Number of shares	198,42	198,42	198,42	198,42
Price Estimated	52,50	92,35	95,91	146,46

Figure 16: Heidelberg Share Price on Multiples values
Source: Own Estimates

better, because it can mean that the stock price is undervalued. So as we can see from the *Figure 15*, Heidelberg Materials was the one actually that obtained the loweer value for this multiple with 0,74 and the highest going to Holcim with a 1,67. From this number we can take some conclusions, being the first that our stock price might be indeed lower than the actual value should be, mainly because just from this last year has lost 15% of their value even though it has still been more profitable than the previous year, nevertheless one other conclusion can be that we are having more revenues for the EV of our company, in contrary, for instance the amount of revenu Holcim is having.

To sum up, we can see in the *Figure 16* the price per share value that we would obatin in case we used the minimum, the median, the average or the maximum of the combiantion of the values and as expected we have a very diversified range of numbers going from €11,99 to €146,46 that even though is a big range, the average on both gives us a very simmlar value to the one obtained in our DCF valuation.

Sensitivity

WACC	Return on Equity							
	8.02%	9.77%	10.27%	10.77%	11.27%	11.77%	12.27%	12.77%
Return on Debt	1.54%	6.68%	7.00%	7.32%	7.64%	7.97%	8.29%	8.61%
	2.04%	6.81%	7.13%	7.45%	7.77%	8.09%	8.41%	8.74%
	2.54%	6.93%	7.25%	7.58%	7.90%	8.22%	8.54%	8.86%
	3.04%	7.06%	7.38%	7.70%	8.02%	8.35%	8.67%	8.99%
	3.54%	7.19%	7.51%	7.83%	8.15%	8.47%	8.79%	9.12%
	4.04%	7.31%	7.63%	7.96%	8.28%	8.60%	8.92%	9.24%
	4.54%	7.44%	7.76%	8.08%	8.41%	8.73%	9.05%	9.37%

Figure 17: WACC Target
Source: Own Estimates

In our sensitivity analysis we decided to firstly perform it against the weighted average cost of capital in order to see which values we could achieve if we had different returns on equity as well as different returns on debt and to do so, a delta of 0,5 percentual points was used in both of the returns. With this we were able to reach a variation of 6,68% to 9,37% and where our value of the weighted average cost of capital was placed on the middle with 8,02% as we can see on the (*Figure 17*). In terms of analysis, as expected, the variations of both returns have an impact on the value of WACC, as we can see, as both go up, our WACC value also go up, and as they go down, they also go down.

Price	55,30	Growth					
		1.62%	2.12%	2.62%	3.12%	3.62%	4.12%
WACC	6.68%	77.91	82.54	86.27	89.56	105.18	119.50
	7.02%	68.63	72.20	76.55	81.87	88.80	96.24
	7.52%	57.80	60.13	63.08	66.67	71.15	76.90
	8.02%	48.91	50.64	52.68	55.10	58.04	61.70
	8.52%	41.87	43.09	44.50	46.15	48.12	50.50
	9.02%	36.15	37.01	37.99	39.13	40.45	42.02
	9.37%	32.80	33.48	34.25	35.12	36.13	37.31

Figure 18: Price Target
Source: Own Estimates

Price	55,30	RONIC					
		11.00%	11.50%	12.00%	12.50%	13.00%	13.50%
WACC	6.68%	80.20	93.51	94.81	96.19	97.37	98.44
	7.02%	78.89	89.17	91.34	92.43	93.43	94.36
	7.52%	64.34	65.16	66.11	66.97	67.77	68.51
	8.02%	53.00	53.93	54.60	55.30	55.95	56.55
	8.52%	44.41	45.09	45.71	46.29	46.82	47.31
	9.02%	37.65	38.23	38.74	39.22	39.66	40.06
	9.37%	33.62	34.32	34.77	35.19	35.63	36.04

Figure 19: Price Target
Source: Own Estimates

Final Recommendations

For the following years, a stable, slight decreasing market performance for building materials companies, a decrease in the profit margins that is being driven by the spike in prices of not only the main materials used, but as well as in the energy sector with the most recent crisis to embrace Europe and where with the most recent predictions the worse is yet to come with the beginning of Winter. One other aspect to highlight is the CO2 costs that are expected to account up to 14% of total cement costs, and in addition the sanctions that are being imposed

on Russia that is also having an effect on the energy crisis in Europe due to the power that Russia has. Nevertheless, we are already seeing Heidelberg Materials implementing new technology in order to capture the CO₂ release from the production facilities and with this capture up to 95%. This will be important since with the phase IV regulation for carbon credits, the CO₂ allowances are being reduced meaning the prices of metric ton of CO₂ will increase, as just in 2022 increased 12%.

We strongly believe that if Heidelberg keeps their overall strategy and situate itself and the brand that is building in the more sustainable production of materials as well as be able to expand their geographic position to other regions where it is not so strong, it would be able to increase their market share despite of the decrease in the profit margins.

According to our DCF valuation as we strongly believe to be the most accurate method in order to evaluate the company, otherwise we would have considered a premium to reflect any outstanding market performance, we believe that Heidelberg Materials will be traded at €55,30 as of December 31st of 2023. This would indicate a shareholder return of 5,0%, that includes a constant pay-out ratio of 28% considering a dividend per share of €2,4. All in all, given, we recommend the shareholders to Hold when comparing our analysis to the current price, as there is a return in the range of 0% to 10%.

HEIDELBERG MATERIALS

CONSTRUCTION BUILDING MATERIALS

STUDENT: JOSÉ FONSECA | TOMÁS BASTOS

COMPANY REPORT

16 DECEMBER 2022

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Today's Losers, Tomorrow's Winners

The search for the Green Revolution

- DCF model resulted on a €55,30 price target for FY23, culminating on an 5,06% return, translating into a Hold position, take into care a €2,4 dividend with expectations to increase to €4,9 until 2045.
- Heidelberg Materials has a higher proportion of its sales in Europe than its peers, 46% compared to an average of 33%. This strategic position put the company at a disadvantage in the short term due to economic challenges in the European market, in result from war in Ukraine. The problem extends to firm's EBIT, with a margin of 10,3%, 19,5% lower compared to competitors.
- To counterbalance the current reality Heidelberg Materials craves to excel in the shift towards net zero CO2 emissions, to differentiate itself from competitors and become market leader. Firm's focus on sustainability is expected to reduce the CO2 emissions to 61Kg/ton, and taxes in €113,21m until 2045.
- Heidelberg Materials' prospects is overshadowed by its current critical short-term conditions. This dynamic creates a challenging balancing for the company as it seeks to address its current challenges while also positioning itself for future success.

Company description

Heidelberg Materials is German-based company specialized in selling building materials, especially cement, aggregates, asphalt, and ready-mixed concrete. It is spread worldwide and the principal end-market for its products is the construction industry.

Recommendation: Hold

Price Target FY23: 55,30 €

Price (as of 28-Feb-23) 52,50 €

Source: Refinitiv

52-week range (€) 38,73-68,08

Market Cap (€m) 10.020

Outstanding Shares (m) 198,416

Source: Refinitiv



Source: Refinitiv

(Values in € millions)	2021	2022E	2023F
Revenues	18.808	20,825	17.979
Material Costs	10.413	15.426	13.341
Gross Profit Margin	45%	23%	25%
Operations Result	3422	2946	168

Source: Company Data, Analysts' estimates

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Company Overview

Heidelberg Materials is a company specialized in producing, selling, and distributing cement, aggregates (sand, gravel, and crushed rocks), ready-mixed concrete, and asphalt, through a fully integrated process since all the steps, including the extraction of raw materials, are controlled by the firm. It operates worldwide and is segmented into 5 different regions, Western and Southern Europe, Northern and Eastern Europe-Central Asia, North America, Asia-Pacific, and Africa-Eastern Mediterranean Basin. Additionally, there is a sixth segment, referred as Group Services, that comprise Heidelberg Cement Trading (HCT) activities, an entity responsible for controlling global trading activities, harmonizing the match between supply and demand, reallocating the products that are not sold in a particular region to another, contributing to high Utilization Rates (UR). The company constitutes the ninth name on building materials industry in market capitalization terms¹, and the end-markets of its products are the construction businesses of houses, traffic routes, public infrastructures, and commercial/industrial facilities. Heidelberg Materials operates at 2.570 locations in five different continents, employing 51.209 people with additional c.350 production sites in form of joint ventures.

The firm's portfolio is characterized by its heavy nature, so they do not "travel" for large distances. Cement does not exceed 200Km whereas for the aggregates, ready-mixed concrete, and asphalt travel, in maximum 100Km², compelling the firm to have manufacturing facilities in c.50 countries around the world, to face the international demand. This evidence reasons the large interest the company has towards the join-venture system, since in some circumstances, partnering with local entities constitute a great tactical advantage due to its privileged strategical position, and the importance of HTC segment.

The main factors influencing the company economic expansion are the weather conditions, population, and economic growth. Those factors will be furthered detailed in the Revenue Model Section.

Strategy

The main goal of the firm is to proceed with a green transformation, by increasing its enterprise value with the least environmental impact possible. In fact, Heidelberg Materials is the building materials company with the highest commitment with the environmental issues, at a point that CO2 emissions are

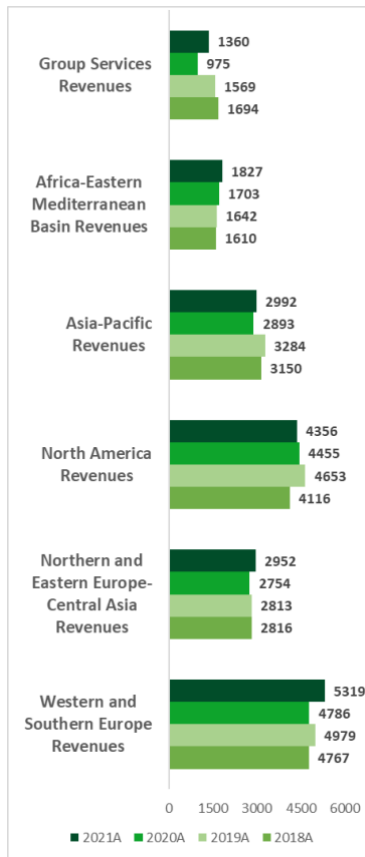


Figure 1: Revenue split across each segment between 2021A - 2022A; Company financials

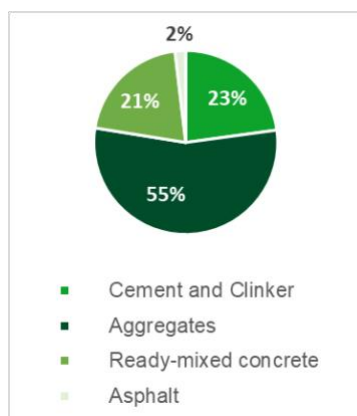


Figure 2 - Revenue split across product, 2021A; Source: Company Financials

¹ Contributors, M. (2022) Largest building material companies by market cap, CompaniesMarketCap.com - companies ranked by market capitalization. Available at: <https://companiesmarketcap.com/building-materials/largest-companies-by-market-cap/> (Accessed: December 16, 2022).

² Company's Annual Report 2021

aggregated to bonus-eligible employees' payroll. That goal influences deeply the capital expenditures policy, that we expect to be strongly directed to this intention. These two points are extremely important and constitute the two corner stones for company's Strategy. Less diligently, the company is also focused on increasing its quality control measures, relevant in such a standardized market, and on the process's digitalization, to increase the efficiency of firm's operations.

CO2 emissions

ESG's are integrated along with economic measures as key performance indicators, and the ambition to reduce the CO2 emissions is a top priority. With the regulatory framework tightening for environmental issues, shortening the emissions is critical to prevent the shrinkage of margins due to environmental taxes and to keep product competitiveness. That said the company is increasing its investment on Property, Plant and Equipment to turn its manufacturing facilities more efficient and ecological. To control those emissions, the company is focusing on CCUS of carbon dioxide, which refers to a technique where the gases are captured and then used for other activities taking advantage of the circular economy. This means that Heidelberg Materials is not focused on the creation of completely new facilities but in adapting the existing ones to a more environmentally friendly reality.

The corollary of this strategy was the first big commitment made in the whole industry, to decrease its CO2 emissions by 2030 to 400kg/CO2tone³, which is highly more ambitious 2030 targets of competitors (*Figure 3*).

Invested Capital

That pledge requires heavy capital expenditures. Indeed, besides the pretended sustainable transformation, the proper industry of building materials is, by characteristic, capital intensive, so Heidelberg Materials expresses its intention to reach with a "consistent capital allocation" of at least €1.200m per year, mainly directed to PPE⁴. In 2021, the company invested €1.599m, which highlights it among its main competitors (*Figure 4*). In the next years we expect this investment to decrease due to the forecasted poor economic conditions, however we believe the company will reach the target in the long term.

Dynamic Overview

Financial Health and Revenues

Heidelberg Materials is financially stable. Indeed, revenues revealed a positive tendency in the last four years (*Figure 5*), and in Q32021 and Q32022 the results

Companies	2030 Target
Heidelberg Materials	400
CEMEX	520
Holcim	475
CRH	520

Figure 3 - Targets for CO2 emissions in 2030 for Heidelberg Materials and its peers, in Kg/ToneCO2;
Source: Companies' Sustainability Reports

Companies	PPE
Heidelberg Materials	€1599m
CEMEX	€966m
Holcim	€458m
CRH	€1413m

Figure 4 - Investments in PPE in 2021; Source: Companies' Financials

³ Heidelberg Materials; Capital Markets Day, 24 May

⁴ Company's Annual Report 2021

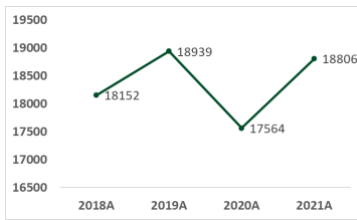


Figure 5 – Revenue of Heidelberg Materials between 2018-2019, in €;
Sources: Company Financials

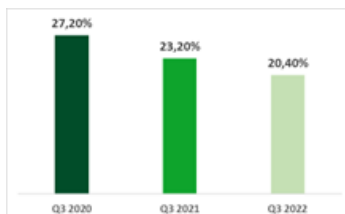


Figure 6 - Quarterly EBITDA margins for Heidelberg Materials;
Source: Company Financials

Heidelberg Materials	55,41%
CEMEX	77,92%
Holcim	66,62%
CRH	53,90%
Peers Average	63,46%

Figure 7 - Market Value Debt/Equity Ratios of Heidelberg Materials and its main peers; Source: Reuters

were above market expectations, with last nine months revenues of €13.996m and €15.808m respectively, meaning a 6,5% and 20,3% variance when comparing with Q32020 results, €13.140m. Between the same three periods is relevant to mention too that there was a substantial increase of material costs, leading to a decrease on the operating margins. Up to now, the company has been able to resist to the negative economical movements – when consulting the last report from the company, Q32022, LFL 9 months revenues of 2022 is substantially higher when comparing to the same period for 2021 and 2020, however there was a relevant decrease on EBITDA margin, comparing the same periods, a reality that even so, do not compromise company's financial health. The only potential concern would be the fact that Cash Ratio values along the last four years was below 1, however this cannot be translated into liquidity problems, since firm have high PPE values, and, in delicate circumstances, it can divest to recover liquidity.

Regarding revenues 2021, is extremely important to mention that 46% are in Europe, whereas the remaining come from the rest of the world. Such an expressive value coming from the “old continent” places Heidelberg Materials in a fragile strategical position when comparing with competitors, since the war in Ukraine is causing a deep impact on demand levels and in materials costs, mainly in Europe, and the proportion of competitor's revenues coming from that continent is way lower when comparing with Heidelberg Materials. This is impacting the firm's strategy to retain market value – leading to a deepen focus on the ecological goals on the company, to develop a clear competitive advantage and, generate market confidence regarding future.

Capital Structure and Dividend Policy

The firm did not issue any additional bond package in 2021, as the board believes the money generated by company activities will be enough to cover future expenses and investments, a reality that, according to our forecast makes sense bear on mind the excess cash that will be generated by the firm and that the current debt levels will be enough to fund the future “short-term, medium-term and long term” activities. That said, the past book D/E ratio, went from 74% in 2020 to 53% in 2021. When looking into the market Debt/Equity Ratios we realize that Heidelberg Materials, in pair with CRH, have a lower value comparing with the peer's average (*Figure 7*).

Since 2017, there was a growth on dividend per share, a value currently fixed on €2,4 per share. The exception was for 2020 due to the unfavourable macroeconomic context that took down company results inducing a lower

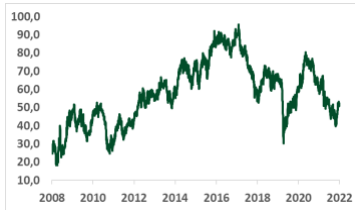


Figure 8 - Heidelberg Materials stock performance between 2008 - 2022; Source: Reuters

dividend. The goal of the company is to increase or, at least, keep the value of dividend per share, due to its powerful signalling effect.

Stock Performance

On 15 December 2022, the price stands at €52,5. Indeed, since 16 February 2022 the share price of Heidelberg Materials started to decrease intensely, firstly due to the fear of a potential invasion of Russia to Ukraine, and then, thanks to the actual invasion. Between that date and 7 March 2022, the stock price of the company fell c.24,5%, the biggest loss in a short period of time since March 2020, with the rise of the pandemic. Indeed, this negative tendency continued until 12 October 2022, the day Heidelberg Materials reaffirmed its ambitious plans to reduce the CO2 emissions and submitted those targets to Science Based Targets initiative, a signal that led to an increase of c.28% up to the current value.

Ownership

Heidelberg Material is a public company, whose IPO was in 1996, and nowadays the company has 193.919m outstanding shares (OS). Institutional shareholders hold 38,52%, being the top three, *Artisian Partners LP*, *Black Creek Investment Management* and *Capital Research and Management* that together retain 11,57% of the OS. The insiders detain 30,70% of the company, being the most relevant one Merckle Ludwig with 27,67% of OS. The remaining amount is owned by the public.

Management

The current Chairman of the Managing Board is Ralph Dominink von Achten. Entered in the company in 2007 and oversaw North America segment between 2009 and 2016. On 1 February 2020, he was appointed to the role is doing nowadays. René Aldach is the current CFO of the company and Nicola Kimm the chief for the sustainable office.

Market Outlook:

Economic situation

The current global economic climate is being influenced by several key factors, including the war between Ukraine and Russia, inflation, the lockdown in China, the impact of the energy crisis and rising CO2 tax weights. These factors are disrupting trade, causing a decline in economic activity, and contributing to rising prices. They are also disrupting global supply chains and raising production costs for many industries. Overall, these factors are having a significant impact on the global economy and on companies like Heidelberg Materials.

Macroeconomic instability

Throughout our model we input the latest obstacle, the war in Ukraine. This war is leading to the most increases of prices of the recent history and because of that all industries are taking a hit on their profit margins. We are executing from our point of view with all the information we have been gathering, what will happen during this year, as well as the repercussions that this war will lead to the upcoming years.

Impacts in Europe

Companies were just about to recover from the covid impact, where Heidelberg was no exception, by having the first three quarters with positive and better results than the previous 2 years. Nevertheless, for the following years we expect that this growth to diminish, costs to rise above revenues for the first 2 years, leading to negative core result, (Figure 9).

Year	Core Result
2022	1 524,4
2023	-1 246,1
2024	-536,3
2025	8,0
2026	224,2
2027	318,8

Figure 9: Core Result from own Estimates

The ongoing war in Ukraine and the the crisis in Europe are significant concerns for the building materials industry. These factors will have a negative impact on the industry, particularly for companies that have a high proportion of their sales in Europe. Companies like Heidelberg, which have a large share of their sales across Europe, are in the eminent risk of being more affected by the crisis in Europe than companies like Cemex, which has most of their sales in the North and South America.

It is essential for companies in the building material industry to closely monitor the situation and adjust their business strategies accordingly. By staying up to date with the latest developments and incorporating this information into their forecasting models, companies can better prepare for potential challenges and uncertainties that may arise as a result of the war and the crisis in Europe. By adopting a proactive approach, companies can minimize the negative effects on their business and ensure a stable growth trajectory in the long term.

Growth expectation

In the building material industry, it is essential to be aware of the potential impacts of market changes on the revenue growth. Recent trends, such as the rise in material costs and the decrease in public expenditure on construction, as well as the decrease on the credit line asked by individuals to buy houses have a significant effect. The industry in order to continue growing and thriving, it may be necessary to adapt business strategies and explore new markets or ways of reducing costs. This could involve implementing more efficient production methods, diversifying product or service offerings, or finding ways to reduce expenses. Keeping a close eye on economic developments and being prepared

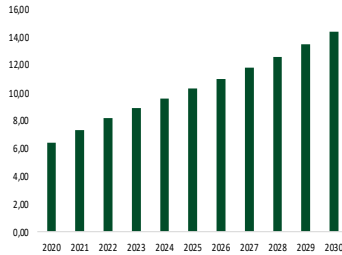


Figure 10: Expected Growth of the Construction Industry

Source: Statista

to adapt to changing circumstances is key to navigate in crises and ensuring the long-term success.

To sum up this we expect that despite the steady growth, (Figure 10)⁵, of the overall construction industry, (highly correlated to the building materials industry) in recent years, even considering the impact of Covid and the latest events. Nevertheless, of the steady growth, and the crisis, our industry is keen to still have demand, since concrete is the second most consumed material, after water, showing the size of industry in terms of consumption. With this we realised that, in fact, the major determinant of next year's bad results forecasted is the fall on operating margins and not the question of demand.

Stagnation

Despite the economic situation, the building materials industry has not stagnated. One of the reasons for Heidelberg to continue with this growth has been by investing in other companies and joint ventures, in a way of reducing costs and expand the locations where it sells the product. With these investments, it makes not only their product more available in other regions that they did not have a presence as well as for the reduction of HCT activity. Important to note that we do not forecast any M&A activity between 2022 - 2045.

To sum up, Heidelberg for instance has been showing clear sights that is moving to achieve more efficient as well as more attractiveness to new investors by achieving new ways of reducing and improving their core production.

Emissions

The cement industry is a significant contributor to greenhouse gas emissions, around 3%⁶ (Figure 11), primarily due to the chemical reactions involved in the production of clinker, a key component of cement. The production of clinker produces carbon dioxide as a by-product, and the transportation of raw materials and finished products, as well as the use of fossil fuels in the production process, also contribute to emissions. To reduce the industry's carbon footprint, alternative materials can be used in production, more efficient processes can be implemented (CCUS), and renewable energy sources can be utilized.

The Shift

The cement industry is facing increasing pressure to reduce its greenhouse gas emissions, as cement production is a significant contributor to global emissions. Heidelberg for instance has made the biggest commitment to reduce its

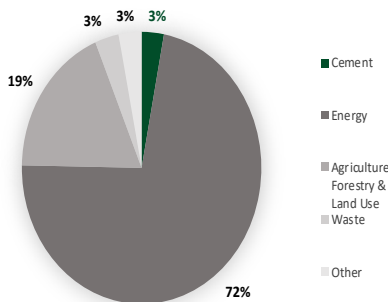


Figure 11: CO2 Emissions by Sector

Source: Own Estimates, OurWorldinData

⁵ Published by Statista Research Department. "Global Construction Market Size 2020-2030." Statista, November 25, 2022. <https://www.statista.com/statistics/1290105/global-construction-market-size-with-forecasts/>.

⁶ Ritchie, Hannah, and Max Roser. "Emissions by Sector." Our World in Data, May 11, 2020. <https://ourworldindata.org/emissions-by-sector>.

emissions by 30% by 2030, compared to 1990 levels. This means reducing emissions from 750 kg CO₂/t to 400 kg CO₂/t.

To achieve the green transformation, the industry is implementing a range of strategies and technologies. One approach is to optimize the materials used in cement production. For example, Heidelberg Materials is using waste materials from other industries to produce new products, reducing the need for raw materials and the amount of waste produced.

Another strategy the industry is using is the optimization of production processes. As new technologies become available, the industry is implementing them to improve efficiency and reduce emissions. For instance, for Heidelberg Materials this strategy has been the most relevant since it has already partnered with the Swedish government to develop a carbon capture, utilization, and storage facility to capture and store CO₂ emissions, which no other company has made. Besides that, Heidelberg is projecting to invest in CCUS facilities, its biggest bet for the future.

Overall, the cement industry is being pushed towards reducing its greenhouse gas emissions and transitioning to more sustainable production methods. This involves a combination of material and process optimization, and the implementation of new technologies such as carbon capture and storage.

The reasoning

That pressure to turn into a more sustainable industry, comes from both regulatory requirements and investor considerations of environmental, social, and governance (ESG) factors. To meet these challenges, companies in the industry are being forced to implement a range of strategies and technologies to reduce their emissions and improve their ESG scores.

Top 10 Buyers Company	Cap	Emission	%Annual Cap	Short/Long
Heidelberg Materials	18.6	20.9	-12.5	-2.3
Holcim	25.8	27.7	-17.1	-1.9
Cemex SAB de CV	8.6	8	7.5	0.6
Buzzi Unicem SpA	7.7	7.9	-3.2	-0.3
CRH PLC	4.1	4.6	-19	-0.6
Cie de St-Gobain	3.6	4.5	-24	-0.9
Titan Cement Co AS	3.6	3.5	11.2	0.4
Cimpor Cimentos de Portugal SGPS	4.5	3.5	23.7	1.1
Semapa Sociedade de Investimento e Gestão	2	1.5	28.4	0.6
Cementos Molino AS	0.9	1	-20.6	-0.2

Figure 12: Caps and Emissions of the Top 10 Buyers in Europe
 Source: Bloomberg Intelligence

One approach is the use of emissions trading schemes, where companies are allocated a certain number of emissions permits based on their production levels. If they exceed their allocated amount, they must purchase additional permits from other companies⁷. This allows companies to produce more cement without incurring additional costs from exceeding their emissions limits.

Additionally, companies can also sell their excess emissions permits to other companies, potentially at a higher price than the market rate, (Figure 12). This can provide a financial incentive for companies to reduce their emissions and sell their excess permits. It can also help to create a market for emissions permits,

⁷ "EU Emissions Trading System (EU ETS)." Climate Action. Accessed December 15, 2022. https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

allowing companies to buy and sell them as needed to meet their emissions targets.

Furthermore, by producing cement with a lower carbon footprint, like Heidelberg is pursuing to do so, they can differentiate themselves from competitors and potentially attract environmentally conscious customers. Overall, implementing emissions trading schemes and reducing emissions can help companies in the cement industry to become more efficient and profitable, while also meeting regulatory requirements and improving their ESG scores. At our view Heidelberg Materials is by far the best positioned company in the building materials industry to achieve this green transition.

Currency Risk

It is important to consider the potential impact of currency risk on Heidelberg Materials' valuation, not only due to the big diversification of sales around the world that Heidelberg as well as the industry have, but also due to the recent depreciation of the Euro against the Dollar⁸ could have both positive and negative effects on the company. On the one hand, a continued depreciation of the Euro could make it more expensive for the company to buy raw materials from suppliers who negotiate in other currencies, such as the Dollar. This could potentially increase the company's production costs and reduce its profitability.

On the other hand, the Euro depreciation could also have a positive impact on the company's revenues, as it could make its products more competitive in the global market. This increases the company's sales and improve its financial performance.

Overall, while currency risk should be considered as part of the company's valuation, it is not expected to have a significant impact on the company's financial performance at this time.

Industry Competitors/peers

When conducting a market analysis, it is essential to identify and compare a company to its main competitors in the industry. This will provide valuable insights into the competitive landscape and allow the company to identify potential risks and opportunities. In the case of Heidelberg Materials, the company identified several competitors in its market, but excluded those that were not geographically located in the same region or that did not sell the same core products. Based on this analysis, the main competitors for Heidelberg Materials were identified as:

⁸ Ward-Glenton, Hannah. "Euro Trades at Two-Decade Low against the Dollar, and Some Think It Could Slide Much Further." CNBC. CNBC, August 23, 2022. <https://www.cnbc.com/2022/08/23/euro-trades-at-two-decade-low-against-dollar-and-it-could-slide-further.html>.

Main Competitors

Holcim is a Swiss building materials company that is present in 60 countries. They operate in four business segments, ranging from cement, aggregates, ready mix concrete, and other building materials. In terms of upside risk, we saw that Holcim has some attractive deals in Solutions and products, new self-help measures to protect their margins, more market in other countries. In terms of downside risk, we saw that Earnings are decreasing, in Europe, a loss in their margin, as well as a depreciation of the Swiss Franc relative to the dollar.

Cemex is a Mexican multinational building materials company that has an active relationship with 96 nations. They operate in four business segments from cement, ready-mix, aggregates, and urbanized solutions. We are also seeing a weaker demand in Mexico. In terms of upside risk, we are seeing an increase in investment grade. In terms of upside risk, earnings are decreasing, are below what was expected for this 3rd quarter and to wrap it up, the dollar has been appreciating.

CRH is an Ireland's multinational manufacturer of building materials including asphalt, aggregates, cement, lime, ready mixed concrete, infrastructural concrete. In terms of upside risk, we saw an increase in buybacks. Our margin is increasing, the price to cost positive in the asphalt business. On the downside risks, we are seeing a decrease as well in the earnings, mostly due not only to the war but mainly to the side effects we are seeing because of it, with the US dollar appreciating, some costs are becoming more expensive.

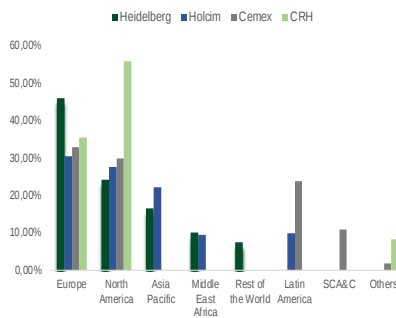


Figure 13: Sales Distribution across peers
 Source: Own Estimates, Company's Data

Sales Diversification

Another important factor to consider when talking about competitors, is the placement they have around the world. Due to the current situations, having a well-diversified sales diversification is better than to be only focused on one country, like have seen with Heidelberg Materials, now we are going to look at competitors, like we can see in (Figure 13).

Holcim is also present well around the world, being there major source of income Europe and North America, it is also represented in both developed and in development markets as Asia Pacific, Latin America, and Middle East & Africa, where this last two are the ones with the lower number of sales.

Cemex is also globally present, being there major source of income EMEA&A, which includes countries like UK to United Arab Emirates as well as Poland, Spain, etc. then in addition the USA and Mexico, being these three it major source of income, representing 87%.

Lastly there is CRH which is also well present around the world, with its major locations being North America, Eastern, and Western Europe and lastly with a smaller percentage being Asia Pacific regions.

With this we can see that our company as well as our peers are well diversified in the global market, so we can for instance reach a conclusion that with the new global crisis that is starting to hit mostly Europe, can in a way be sort of mitigated, nevertheless this huge presence in Europe like Heidelberg has, around 46% of sales will suffer an eminent reduction, and having an impact on their revenues, much higher when compared to peers.

Product Diversification

Going a little bit deeper on the type of sales of each competitor, we can see that most of them, besides selling the same as Heidelberg, have some additional products like we can see on the *Figure 14*.

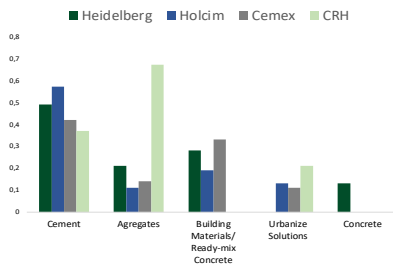


Figure 14: Product Diversification across peers
 Source: Own Estimates, Company's Data

Looking at Holcim, we can see that they are diluting their business into selling more of their solutions & products, nevertheless, 87% of their sales comes from cement (57%), ready mix (19%) and aggregates (11%), which has been overcome from the business of solutions & Products. It is also important to refer that they have a target for 2025 to 30% of their business to be of solutions & products, a huge shift but already looking into the future.

Cemex in terms of side business compared to Heidelberg Materials it is also in the market selling urbanization solutions (11%), which is a department more focused to building smarter and efficiency cities with the help of architects, developers as well as local governments, nevertheless their biggest sales consist of cement (42%), ready mix (33%) and aggregates (14%) representing the remaining 89% of the sales.

CRH besides the construction materials productions which represents 74% of their sales, it has also entered in the business of the building products for residential and non-residential, which consists in architectural and infrastructure products as well as construction accessories representing 36% of their sales.

We can see that all our competitors are also expanding their business in the building world, not only on complementing the construction materials they already offer but also coming with the ideas to what people might need, having almost the full business. With this we can see that Heidelberg competitors are starting to expand their business lines when compared to Heidelberg, which can be seen as a 2-way street.

5 Forces of Porter

According to Porter's five forces model, the building materials industry is characterized by high competition among established players and low threat from new entrants and substitutes. The high cost of operating in the industry and the lack of innovation makes it difficult for small competitors to enter the market and compete with established players. The wide use of concrete and other construction materials also limits the threat of substitutes. Consumers and suppliers have limited power in the industry, as there are many competitors and providers of construction materials, allowing for negotiation of prices and terms. Overall, the construction industry is characterized by high competition and low threats from new entrants and substitutes.

DCF

Discount Cash Flow technique is the one that fits the best to value Heidelberg Materials. It has the required versatility and precision, that allow us to introduce our assumptions in a detailed way, a fundamental process to come up with a fair share price for the company.

The time frame chosen was between 2022 and 2045 since we are including, short-term, medium-term, and long-term assumptions. Besides the need to have a broad enough time frame to introduce inputs, that length is important to stabilize the main drivers of the model - Core Result growth rate, Core Invested Capital growth rate, ROIC, RONIC and investment rate (*Figure 15*) - necessary to have a reliable calculus of the terminal value, accounting for its relevance on share price value obtained⁹. The TV obtained was €54.115m, which discount with the rest of the Operating Free Cash Flows with a WACC of 8,01% resulted in a share price of €55,4.

The long-term growth was c.3%, higher when comparing with world GDP long-term growth in 1,57%, in absolute terms, a number that did not surprise us, due to the historical tendency for this industry to beat the market. Indeed in 2022, the expected world GDP growth is 3,7%, according to World Bank and the CAGR for the building materials industry was 5,7%, a premium of 2%.

The final reason for that decision refers to the possibility to construct scenario and sensibility analysis, two important tools to gauge how sensitive was the share price calculated, which plays an important reasoning in our investment thesis.

Long-term drivers	2045F
Growth Rate CR	3%
Growth Rate IC	3%
ROIC	11%
RONIC	12%
Investment Rate	0,4%

Figure 15 – Long Term Drivers

Terminal Value breakdown	2045+
Core Result (2045)	3409,0
Growth	3%
Core Result (2045+)	3516,6
RONIC	12%
Terminal Value	54115,1
Terminal Value discounted	9923,7

Figure 16 - Terminal Value Break Down, €m

WACC	8%
Number of Shares (in ml)	198,4
Price Per Share	55,4
Current Price	52,5
Capital Gain	5,5%
Dividend Yield	-0,4%
Total Return	5,1%

Figure 17 - Total Return Break down for Heidelberg Materials share price

⁹ Koller, T., Goedhart, M.H. and Wessels, D. (2020) Valuation: Measuring and managing the value of companies. Hoboken, No-info: John Wiley & Sons, Inc.

Revenue Model

Years	Price Index	Growth Rate
2018	145,2	3,6%
2019	148,1	2,0%
2020	153,5	3,6%
2021	189,7	23,6%
2022	217,7	14,8%

Figure 18 - Price Index Building Material and Supplies Dealers Industry between 2018-2022;
Source: FRED

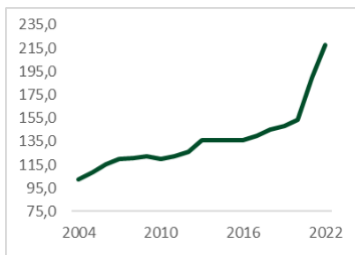


Figure 19 - Price Index Building Material and Supplies Dealers Industry between 2005-2022;
Source: FRED

Years	Price Index	Growth Rate
2023	178,8	-17,9%
2024	183,0	2,4%
2025	187,2	2,3%
2026	191,4	2,3%
2027	195,7	2,2%
2028	199,9	2,2%
2029	204,1	2,1%
2030	208,3	2,1%
2031	212,5	2,0%
2032	216,8	2,0%
2033	221,0	1,9%
2034	225,2	1,9%
2035	229,4	1,9%

Figure 20 - Regressed price Index Building Material and Supplies Dealers Industry between 2023-2035

First, the goal was to find where does the economical difference¹⁰ prevail, to segment our rational - if among location or product. Indeed, the four types of products sold by the company are used in the same context, to construct residential or non-residential buildings, so they are complementary. The discrepancy arises regarding the location they are sold, as revenues are dependent on economic growth, population growth the type of product. That said, we believe the best way to treat revenues is to divide them by location.

The split includes the five Heidelberg Materials regions and a sixth additional division, Group Services a support segment of the other five regions, stimulating high Utilization Rates.

The Logic

At our view, the best way to express revenues is by performing the equation: *Quantities Sold x Price*. Making this split is crucial in the current economical context, a period where the prices in general, including building materials, are fluctuating dramatically (*Figure18 and Figure 19*). The revenue forecast would lose a tremendous amount of value if we would consider steady prices for all years and ignore the massive effect of inflation. Additionally, refer that we treat both variables aggregately, as the company's portfolio is economically homogeneous and subjected to the same future trends, so dividing quantity and price depending on the product would bring no additional value.

Price

We took the historical data from 2004 to 2022¹¹ (*Figure 19*), regressed it, and forecasted values until 2035 (*Figure 20*). We assume that those price variations in United States of America (US) can be worldwide extrapolated, as US is still the world economical leader and its economy tend to mirror the global macroeconomic *status quo*.

By critically evaluating the results, we take them as reliable, verifying a decrease in prices in 2023 of 17,9% reasoned by smoothing of the inflation trends coming from the war in Ukraine and the recent pandemic and a normalization of the data in the end of the period, stabilizing the values between 1,5% and 2%, the common thresholds defined by central authorities.

¹⁰ Koller, T., Goedhart, M.H. and Wessels, D. (2020) Valuation: Measuring and managing the value of companies. Hoboken, No-info: John Wiley & Sons, Inc.

¹¹ Contributors, M. (2022) Producer price index by industry: Building material and supplies dealers, FRED. Available at: <https://fred.stlouisfed.org/series/PCU44414441> (Accessed: December 16, 2022).

Years	Price Index	Growth Rate
2036	233,1	1,6%
2037	236,8	1,6%
2038	240,6	1,6%
2039	244,5	1,6%
2040	248,4	1,6%
2041	252,3	1,6%
2042	256,4	1,6%
2043	260,5	1,6%
2044	264,6	1,6%
2045	268,9	1,6%

Figure 21 - Assumed price Index Building Material and Supplies Dealers Industry between 2036-2045

Tropical zone	4,5
Extreme temperatures	3
Percipitation	6
Subtropical Zone	6,5
Extreme temperatures	6
Percipitation	7
Temperate	6
Extreme temperatures	8
Percipitation	4
Cold Zone	3,5
Extreme temperatures	2
Percipitation	5

Figure 22 - Weather scores for each climate zone; Source: Metoblue.com

Tropical zone	
Extreme temperatures	20°C to 30°C
Percipitation	Low tendance
Subtropical Zone	
Extreme temperatures	20°C to 35°C
Percipitation	Dry
Temperate	
Extreme temperatures	*0°C to 27°C
Percipitation	800ml Average
Cold Zone	
Extreme temperatures	-47°C to 0°C
Percipitation	Medium tendance

Figure 25 - Weather conditions for each climate zone; Source: Metoblue.com

Segment	Score
Western and Southern Europe	6,25
Northern and Eastern Europe-Central Asia	6
North America	4,75
Asia-Pacific	4,5
Africa-Eastern Mediterranean Basin	4,5

Figure 23 - Weather scores for each region; Source: Metoblue.com

Segment	Variance
Western and Southern Europe	-0,036
Northern and Eastern Europe-Central Asia	-0,042
North America	-0,024
Asia-Pacific	-0,012
Africa-Eastern Mediterranean Basin	-0,012

Figure 24 - YOY changes in Extreme temperatures score for each region: Metoblue.com

Concluding, we consider prices need an adjustment between 2036 and 2045, introducing a decrease in 3 Basis Points to 1,6%, comparing to the last regressed value, 1,9% in 2035. The practiced prices do not depend only on inflation, as this element constitutes a powerful tool for companies to impose their strategy. Company will decrease the product prices and assume part of the inflation by losing margin, due to the dilution of competitive advantage from the investment in green capital, as CEMEX, Holcim and CRH will set green transformation as a priority too. Along this period, we expect a decrease in market share growth of c.1,6x reason that justifies that price policy (Figure 21).

Quantity

We believe the best option is to regress quantity in function of the three most relevant factors it depends on, variables that will be further detailed on the next sections. Moreover, we refined the quantity model with two changes to introduce the Q32022 results and the Utilization Rate variances.

Climate Conditions

Weather affects deeply construction levels, because, when the climate is not favourable, construction activity deaccelerates - by not favourable we mean the existence of precipitation or/and extreme temperatures. Based on those two factors we created a weather index. The world is divided into four climate zones – tropical zone, subtropical zone, temperate and cold zone, the four of them with different climatological characteristics. Geographically, Western and Southern Europe is mixture between Subtropical and Temperate zone; Northern and Eastern Europe-Central Asia temperate zone, North America a mixture between temperate zone, Asia-Pacific Tropical zone, and Africa-Eastern Mediterranean Basin as Tropical Zone. Each climate zone is ranked from 1 to 10 for the two factors mentioned, being 1 the worst level, and through averaging it, we arrive climate zone score (Figure 22). We believe those are accurate in the sense they result from each climatological characteristic. Based on that score and on the geographical distribution of each region among the climatological zone, we came up with the score for each region. The ranks for each region are exposed on Figure 23, assumed as for 2011, the base year of our regression.

The goal of this index was to integrate the climate changes that will happen in future. The variation of precipitation levels is residual, however for extreme temperatures the reality is different, and, along last years, there was a considerable increase of extreme temperatures. We assume that, by decade, temperatures will rise by 0,18°C¹². The average worst-case scenario stated by

¹² Dahlman, R.L.A.N.D.L.A. (2022) Climate change: Global temperature, NOAA Climate.gov. Available at: <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature> (Accessed: December 16, 2022).

scientists is an increase in 3°C ¹³ so we assumed that a variation of this level turns the extreme temperatures benchmark to level 1. The logic applied was the three simple rule. So, if the temperature rise 3°C , the score for Extreme Temperatures fall to 1, so if it increases $0,18^{\circ}\text{C}$, the index reduces x times. Lower the score, lower the impact considering the amplitude is already high, so the changes will lead to smother results (*Figure 25*). This outcome is acceptable as we believe that is reasonable to assume that, in regions with high thermal amplitudes the changes are less noticeable and vice-versa, this variance covers the period between 2011 and 2022.

We recognize that those results go in line with reality. Europe resulted as the geography with the best geography for construction due to its stable and controlled climate, whereas the rest of the world turns to be less favourable for construction activities. Note that for North America the disparity with Europe is influence by regions as Alaska, that significantly decreases their score. On the other hand, we expect that Europe is the continent that will suffer the highest with the climate changes.

Economic and Population Growth

We extract the historical information about the GDP development and the historical population growth for the countries, to then perform the regression.

Regression

The dependent variable is *Quantity of Materials*, and the independent ones are *Weather Index*, *Economic Growth*, and *Population Growth*. We assume, as there is not information about the previous values for UR, that past number of quantities stated on annual statements consider a UR of 100%, justified by our belief that, during those years, HCT segment was extremely efficient in optimizing the combination between demand and supply, turning the *Actual Level of Output* equal to the *Maximized level of Output*¹⁴.

For each segment, except for group services, we compute a logarithmic regression: $Quantities = a + b \ln(Weather\ Index) + c \ln(Economic\ Growth) + d \ln(Population\ Growth)$. We choose that type of statistical regression in the sense that, it is perfect to normalize data sets were there is highly dispersed data, strengthening the output and turning it more reasonable. On the other hand, that is also a tool that is commonly used when the forecast, in future, tend to reach

R Square	84%
Intercept Coefficient	-104302,1
Weather Conditions Coefficient	69270,6
Economic Growth Coefficient	84,8
Population Growth Coefficient	4099,1

Figure 26 - Key regression metrics for Africa – Eastern Mediterranean Basin

R Square	93%
Intercept Coefficient	-3354,3
Weather Conditions Coefficient	1857,5
Economic Growth Coefficient	181,6
Population Growth Coefficient	4068,0

Figure 27 - Key regression metrics for Western and Southern Europe

R Square	56%
Intercept Coefficient	-761,4
Weather Conditions Coefficient	448,2
Economic Growth Coefficient	288,5
Population Growth Coefficient	56,0

Figure 28 - Key regression metrics for Northern and Eastern Europe – Central Asia

R Square	99%
Intercept Coefficient	-4845,4
Weather Conditions Coefficient	3188,3
Economic Growth Coefficient	109,5
Population Growth Coefficient	1106,6

Figure 29- Key regression metrics for North America

R Square	89%
Intercept Coefficient	-13068,7
Weather Conditions Coefficient	8718,7
Economic Growth Coefficient	294,7
Population Growth Coefficient	420,8

Figure 30 - Key regression metrics for Asia Pacific

¹³ Contributors, M. (2022) <https://corporatefinanceinstitute.com/resources/economics/capacity-utilization/>, CompaniesMarketCap.com - companies ranked by market capitalization. Available at: <https://companiesmarketcap.com/building-materials/largest-companies-by-market-cap/> (Accessed: December 16, 2022).

¹⁴ Cumulative Market Value of Equity for the Sector/Cumulative Market Value of Debt for the Sector (Market Value of Debt = Book Value of Debt), Damodaran Source

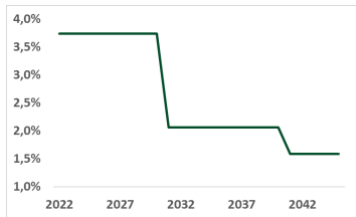


Figure 31 - Forecasted GDP Growth between 2022-2045

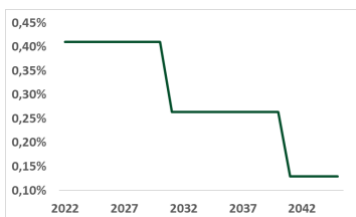


Figure 32 – Forecasted Population Growth between 2022-2045



Figure 33: Forecasted weather score for each region between 2022-2045

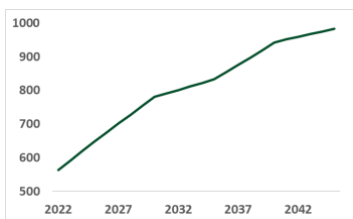


Figure 34 - Forecasted quantities between 2022-2045

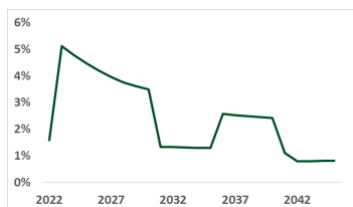


Figure 35 - Forecasted YOY growth of quantities between 2022-2045

states near to steady, a reality that fits perfectly with our perspective about the low long-term growth, comparing with the short term one.

The regression was between 2015 and 2021, once we believe that is a period long enough to extract a tendency, but not excessively long that could “intoxicate” the results.

We found the output highly credible considering the high R Square ratios (*Figure 26, 27, 28, 29, 30*) and since all regressions resulted in positive coefficients for the three variables, were higher population and economic growth results in higher quantities and lower weather score impact negatively estimated quantities.

Forecast

We predict quantities using the forecasted values of economic growth, population growth and weather index. The first two are extracted from World Bank data (*Figure 31 and 32*). For weather index, we assumed it varied until 2045 in a lower rate as we did for the historical period, as we believe in the future practices against CO2 emissions will slow down the tendency for the climate to change and deepening of extreme temperatures. It would be misleading to not consider that decrease and, indeed our logic was using one sixth of the variation calculated between 2015 and 2021 until 2035, half of that value between 2036 and 2040, which inputs an increase of the temperature variations and consequent decrease in conditions for construction but in a lower scale that was computed for the previous years. We estimate the weather index will stabilize in 2040, as the constant pro-environment policies will promote a stabilization of the weather conditions in the future, more precisely in the year mentioned¹⁵. The result of the forecast is the one in left.

The final aggregated growth level for quantities is assumed to be constant from 2042, in 0,8%, a reasonable value bearing in mind that this represents just one part of the growth, as the other is imposed by the price growth.

To conclude, that regression resulted on the trend exposed on the *Figure 34*, and the subliminal message is clear – the negative performance expected until 2027 (Appendix 2, Income Statement), is reasoned by a huge decrease in margins as, indeed, the quantities sold will not decrease. On the other hand, by analysing the YOY quantity growth (*Figure 35*), we see that, after the most impacted year, 2023, the quantities sold grew intensely, common phenomenon after big drops, and specifically for 2029 and 2030 the expressive growth values are also positively impacted by the first investments in green capital. Then there will be a drop in 2031 reasoned by the entering of competitors in the sustainability market.

¹⁵ , According to United States Environmental Protection Agency

Western and Southern Europe	15%	2%
Northern and Eastern Europe - Central Asia	15%	3%
North America	15%	-1%
Asia-Pacific	15%	4%
Africa-Eastern Mediterranean Basin	15%	3%
Group Services	15%	-64%

Figure 36 - Underlying Growth to Q3 2022 results; Source: Heidelberg Materials Q3 2022



Figure 37: Forecasted weather score for each region between 2022-2045

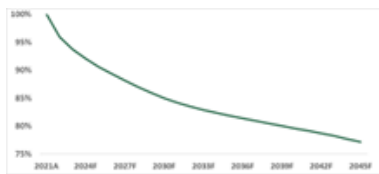


Figure 38: Comprehensive UR

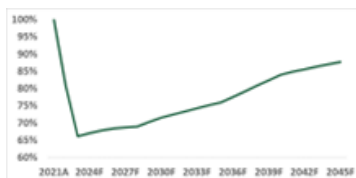


Figure 39 - Underlying Growth to Q3 2022 results; Source: Heidelberg Materials Q3 2022

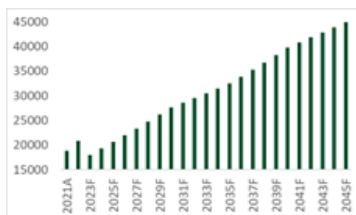


Figure 40 - Underlying Growth to Q3 2022 results; Source: Heidelberg Materials Q3 2022

However, the persistence on net zero CO2 CAPEX investments, with bigger incidence until 2035, will result in a rise of growth in 2036 that will remain until 2040, the year the main Heidelberg Cement competitors will fully recover from its competitive disadvantage and the company will decelerate with market share growth.

Model Refining

The first action was to update the revenue growth for 2022. In Q3 2022, the firm discloses its projections for 2022 revenues for each segment, from which elapse the projected annual growths. To keep up with the model's logic, from that given annual growth, we took our implied price growth off, reaching to the projected quantity growth by the company (Figure 37). When comparing to our original quantity growth level we realize we were over optimistic assuming c.10,2% growth when, in fact, this value is 1,6%, meaning that, this year, the demand decreased drastically comparing with initial projections.

To conclude, the regression assumes 100% of UR. Our belief is that HCT will break in terms of efficiency in the next years, firstly due to the rise in energy prices that do not compensate for the company to redirect some country products to other regions, as typically those are far from the origin country and made through boat, which results in high costs. On the other hand, the social and political context of the world is getting more divided than ever, and this circumstance is deeply affecting the international trading. Indeed, this expectation was right on point with Q3 2022 projections of 64% decrease in revenues in 2022 for group services.

This decrease of Group Services revenues on 2022 impacts negatively the results for the remaining segments, as part of their production is not drained to other regions, causing a decrease on the Utilization Rate. In the forecast, the estimated quantity increase refers to the maximum the company can produce and sell additionally, but due to HCT inefficiencies solely part will be considered. To calculate the UR rate for each year additional quantity we considered that 72,5% of the quantities sold are in the proper country and the remaining 27,5% were in the hands of HCT. That later percentage is then multiplied by the activity level of the trading harm which is 31% for 2022, and constant for the rest of the period as we believe that, before this fall on this year, it is fair to believe that its activities will grow at the same rate as the company globally. To conclude, assuming a constant UR for the rest of time is not reliable, so we assume it varies along the years with the market share variation, as this impacts the demand in the proper country.



Figure 41: Actual Output vs potential for HCT

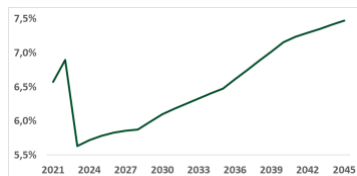


Figure 42: Market Share between 2022 - 2045

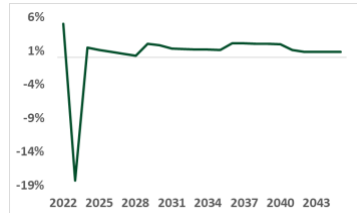


Figure 43: Market Share growth between 2022-2045

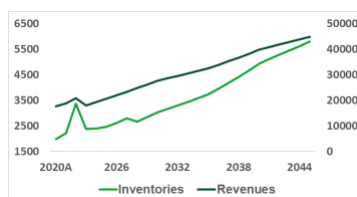


Figure 44 - Inventories evolution in comparison with revenues evolution between 2022 - 2045

That calculus resulted on the revenues exposed on Figure 34. We find them plausible, noting that, in 2022 the drop in demand exposed on the quantity growth, resulted in a revenue peak, due to the great price increases, and in 2023, the price drop will generate a big drop in revenues, despite the quantity growth. Then, for the rest of the period, the tendency will be similar when comparing with quantities, but price variation contributed for these variations to be smother. On the other hand, its long-term tendency, 2,4%, very similar to the 2,8% median CAGR for all companies¹⁶. It will be also higher than the forecasted long-term GDP, in 0,8%, a fair difference bearing on mind the traditional premium that building materials industry have over overall economy.

Market Share

We consider that market value of building materials industry grows at a constant rate of 5,66% until 2027 according to ReportLinker¹⁷. Then, after that period we believe it is fair to assume that the growth of this segment will converge to the World GDP growth, 3,7% until 2030, 2% between 2030 and 2040, and from 2040 onwards 1,6%. The consequent values for Market Share go in line with our rational in the sense that there is a big spike in 2022 followed by a big drop in 2023, mirroring the revenues' trend for those couple years. Then there is an increase until 2029, the moment when, until 2040, the market growth will not suffer relevant variations. Indeed, between that period there are small variations, as competitors will penetrate too on the "green market", however it will be just on 2040 that share growth values will clearly demonstrate the erosion of the competitive advantage coming from the early adoption of the ecological strategy.

Working Capital and PPE

Working Capital

The most prominent elements correspond to inventories, receivables, and payables. The logic assumed was assume it varies according to market share variations.

Inventories

Starting with inventories, our base was to calculate the Holding Period, assuming it develops in the same line as market share. In fact, considering the inventory policy we expect the company will adopt, the higher the demand for products, the higher the "safety stock levels", the higher the inventory level (Figure 44). The

¹⁶ Bradley, C. et al. (2022) The ten rules of Growth, McKinsey & Company. McKinsey & Company. Available at: <https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/the-ten-rules-of-growth> (Accessed: December 16, 2022).

¹⁷ ReportLinker, M. (2022) The Global Building Materials Market grew USD 398.47 billion by 2027, at a CAGR of 5.66%, GlobeNewswire News Room. ReportLinker. Available at: <https://www.globenewswire.com/news-release/2022/07/27/2487042/0/en/The-Global-Building-Materials-Market-grew-USD-398-47-billion-by-2027-at-a-CAGR-of-5-66.html> (Accessed: December 16, 2022).

output is reasonable as we believe that, with the increase of demand, companies tend to rise their inventory levels, to sustain higher potential sales, and we expect that the current inventory policy of the company need to be adjusted along the time to support the forecasted sales growth, as its “safety stock” must increase¹⁸.

Receivables

Then we investigate receivables, which our theory was based on bargaining power. The number of days the company allows to pay the purchases is a fundamental competitive tool, and it gains a bigger importance when the company is losing market share. On the other end, the proper power for the company to impose a lower collection period becomes weaker when it loses power in market position. That way, the lower the market share, the higher the collection period, a strategy followed by the company to fight the loss on market share. When the company gains market power, it is in the position to ask the payments in lower time and reduce the collection period. That way, we assume the value of receivables grows inversely to the market share growth.

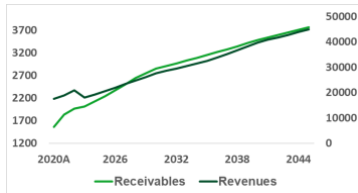


Figure 45 - Receivables evolution in comparison with revenues evolution between 2022 - 2045

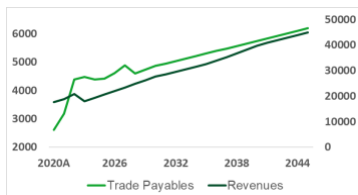


Figure 46 - Payables evolution in comparison with revenues evolution between 2022 - 2045

Payables

Finally, we investigate payables (Figure 46). We consider the payable period grows in inverse proportion as market share grows. The idea behind this decision is the fact that, with higher market share results, Heidelberg Materials gain an additional financial capacity, and power to rapidly repay them, improving that way its working capital position. Higher demand leads to the purchase of higher levels of raw materials to produce their products, which compels the Heidelberg Materials to improve the payments times, otherwise the suppliers could impose restrictions to the firm which would lead to a scarcity of resources. The other perspective is the idea that, the company is getting in a better strategical position, so suppliers are in the position require faster payments, believing Heidelberg Materials is in good financial position to meet with its obligations, contributing for the shortening of the payment periods.

PPE

Abstract

In a nutshell, we expect a significant increase on the investment in green CAPEX along the forecasted period, starting in 2026. The first reason directs to taxes, as cement industry is responsible for huge CO2 emissions, inducing a great amount of environmental taxes to pay. Additionally, the company headquarters are in Germany, cleaand the European continent is particularly worried with climate

¹⁸ Mecalux, M. (2022) Minimum stock levels: Definition and strategies, Interlake Mecalux, Warehouse solutions. Available at: <https://www.mecalux.com/blog/minimum-stock-levels-definition> (Accessed: December 16, 2022).

changes where the sanctions against those emissions are highly significant, amounting in 2020 to €300,5b¹⁹, existing the risk of those taxes to rise in the long term. On the other hand, we believe the consumer is changing and increasing its environmental awareness so the sustainability level of the product, in future, will turn crucial and impacting deeply the demand levels. Finally, Heidelberg Materials is in a particular weak position since the Russian invasion to Ukraine, so it is fundamental for the firm to bet in future opportunities to give confidence to investors, retain market value and keep competitive in the long term. The underperformance of Heidelberg described in the competitor overview, must be tackled so we believe that the firm will bet on being the market leader on the CO2 free products and, with that, retain the investments.

Financing

That strategical option presupposes a capital-intensive action. In this sector, the main players are in stable financial positions, Heidelberg Materials included, however, between 2023 and 2027 the company's goal of investing in neutral CO2 facilities is not reasonable at our opinion due to the problematic macroeconomic conditions that lead to abnormal low operating CFs or even negative. That said, losing cash position by using the excess cash to fund this option would not make sense because it could push the company to a fragile financial position. Other financing options would be not convenient too, like debt, considering the tight space on company's CFs to pay the extra amount of interest, or even issuing equity, not a clever idea as this would be issued in a great discount considering the economic context and uncertainty of the market. Assuming the company is managed with responsibility, investing the previously mentioned time frame is something that will not happen, and will be delayed for future periods.

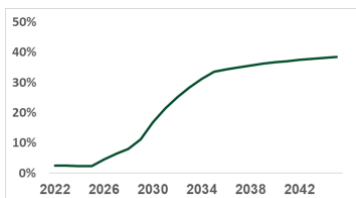


Figure 47 - Evolution of Green Capital proportion in comparison with total PPE

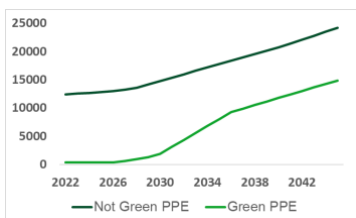


Figure 48 - Evolution of "Non-Green Capital" and Green Capital, in absolute values, between 2022 - 2045

Considering the intention of the firm to reduce considerably the emissions, we believe the period of the most significant investment will be between 2030 and 2035, a timeframe where the economic context is more favourable, reality mirrored in the CFs. The investment is absorbed by the excess cash of the company, so it would not need to require any financial support from equity holders or creditors. We assume the PPE value for 2021 already includes 2,5% of green investment, a value used to calculate the total "Not Green CAPEX" for each segment. Then, those capital investments for the individual segments were computed in proportion of that value, to pair up with its size. Those proportions are represented on the Figure 47, expecting an initial investment in 2026, value

¹⁹ ontributers, M. (2022) Statistics explained, Statistics Explained. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_tax_statistics (Accessed: December 16, 2022).

that will considerably increase between 2030 and 2035, and after that period stabilize, a fair assumption since, when creating a project from scratch, those initial investments have always higher dimensions (higher burn rate) to settle the basis and foundations for it to be successful, typically followed by a slow down when it enters in “cruise mode”.

Additionally, to that investment in green CAPEX, we consider fundamental to include expenditures on maintenance CAPEX in the sense that, indeed, the “old” infrastructures will not be substituted but reappropriated with the investment in CCUS. That investment will be lower until 2025 but will gradually grow over time considering that the CAPEX will rise, so those must raise too and from 2035, with the decrease in investment of green capex there will be a higher capacity to invest on maintenance CAPEX.

The output is the one exposed in figure 48 and makes sense going in line with our described logic. Green Capex investments starts in 2026, which reflects on 2029 and 2030 quantity growth. This quantity growth will slow down between 2030 and 2036 with competitors entering in this market too, but with the intense investment between 2030 and 2035, the sales will boost in 2036, which will slow down from 2040 with the gradual dilution of competitive advantage.

Capital Structure and Dividend policy

Capital Structure

According to our logic, decreasing the Debt/Equity Ratio in the next couple years is unreasonable due to the macroeconomic circumstances, but from 2024 onwards we believe it will happen and converge to 25%, an implied Debt/Enterprise Value of 20%, c.27% higher than the industry target of 15,79%²⁰. This decrease in debt funding will be offset by the available excess cash reserves generated by the firm activities, which, according to our forecast are enough do that transaction, even for 2024, a period when company is not still completely recovered from the war in Ukraine turmoil, but after all necessary spendings, it keeps €311,4m in excess cash. Indeed, we believe the company will generate large excess cash values, a value interpreted as reliable due to its importance for potential future acquisitions, if Heidelberg Materials decide to add an inorganic growth premium to its total growth, view totally compatible with the Capital Structure exchange proposed and the reason why it is higher when comparing with the industry target.

²⁰ Cumulative Market Value of Equity for the Sector/Cumulative Market Value of Debt for the Sector (Market Value of Debt = Book Value of Debt), Damodaran Source

Dividend Policy

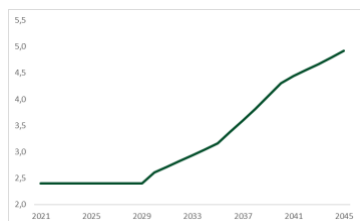


Figure 49 - Dividend evolution between 2022 - 2045

We believe the company will keep the same dividend of 2021 until the moment it has capacity to increase it, in 2030, the first year where the transactions per share levels reach the levels it has in 2021. Between 2023 and 2026, the company will use excess cash to pay dividends once its activities will not be enough for the company to keep the level of dividend, an acceptable position due to the powerful signalling effect of dividends. From 2029, the first year the transactions per share reach to 2021 values, we expect dividends rise in function of transaction to shareholders, in the same proportion of 2021. Finally important to mention that besides dividend value, there is another amount directed to transaction to shareholders, a value that will be partially discarded during the bad economic years but since 2030 will recover but will not be compensated using excess cash as they are not so relevant as dividends, would “burn” cash diverging with the goal of accumulating for potential M&A activities.

Costs and Gross Margin

The cost of sales for the building materials segment includes mostly the materials costs, energy cost, supplies, repair materials and packaging. On the other hand, Heidelberg Materials incurs also in the employee and personal costs considering the fifty-one thousand employees around the world. The majority of the remaining costs come from other operating expenses, which includes the selling and administrative expenses, the freight, and the expenses for third party repair and services. This last expense we decided to keep it growing as the percentage of sales from each country.

Material costs

The cost of materials has been increasing in the last 4 years, with an average cost of materials representing about 40% of revenues. This rise is driven due to the increase in commodity prices, mainly regarding to energy costs. The war in Ukraine, the lockdown in China due to the Zero-covid policy, and the problems in the distribution channels still coming from the pandemic are the three big reason impacting dramatically the material costs. As a result, cost of sales of Heidelberg Materials is expecting to increase substantially along the next years.

The reasoning behind our assumptions were the fact that Heidelberg even though is not influenced by it the inflation trends associated to raw materials, bearing in mind that it is the proper company that extracts them, it is deeply

Year	Variation %
2021	55%
2020	-21%
2019	35%
2018	-25%
2017	12%
Average	11%

Figure 50: Historical Variation of the Oil Barrel
 Source: MacroTrends

Year	Index Prices	Variation%
2021	51,5	
2022	81,9	55%
2023	75,9	47%
2024	69,5	35%
2025	65,8	28%
2026	65,6	27%
2027	66,7	30%
2028	57,4	11%

Figure 51: Predicted prices of the Oil Barrel
 Source: Own Estimates

affected by the fluctuations of energy prices included in the transportation and the manufacturing phase.

To forecast them we used the price of the barrel in UK as reference²¹, (Fig 50) with the historical variations. The first reason was the fact that UK is the country which performance is highly correlated with the global markets, so the fluctuation of its energy prices tends to be very similar to the global fluctuations, besides the fact that it was highly covered by credible pricing forecasts. Those two reasons lead us to assume and consider it as a benchmark for the market and extrapolate its values for the rest of the world (Fig 51). Having those values, the final inflation level available was for 2027, with an inflation premium comparing with the 2021 prices of c.30%, an extremely high value in our perspective. We believe that the values along the forecasted period still contain a deep effect of the economic turmoil generated by those three major factors. That said we consider that, for 2028 onwards, the historical average of changes in energy prices capture in a better way the “natural” variance of that commodity, without being intoxicated as, indeed, before the War, the inflationary tendency existed but still in reasonable terms – indeed, it was the combo of that three main factors that made the hyperinflation phenomenon to emerge. To conclude we used the average of the last 5 years variance to calculate the long-term inflation, c.11%, a reasonable value from our point of view, since it does not constitute an extreme number.

With this we then reach the value for the materials costs by grabbing the previous value as the extra inflation and by combining it with the regions dependence on oil and the 2021 material costs, and as we can see on the figure xx, we have a decreasing value for the material costs starting in 2023, because for 2022 we expect to have the biggest impact, material costs to be around 60,05% of the revenues and it will then decrease and finally stabilized in 2028 as a cost of 44% of the revenues.

Other Expenses

In terms of Heidelberg Materials operating expenses, we have been seeing the increase in the freight rates, that since the Covid hit and as well as from the Evergreen ship to run aground, the prices have been sky rocking and now with the addition of the war they do not seem to be lowering down. Despite this representing the major of operating expenses, we decide to keep it at a steady growth of 2,5% despite last year growth of almost 15% we believe that was just caused due to covid and the Evergreen ship.

Another important input is the CO2 emissions costs, where here we did what from our point of view would be the costs predictions regarding the future reasoned

²¹ “Crude Oil Prices - 70 Year Historical Chart.” MacroTrends. Accessed December 15, 2022. <https://www.macrotrends.net/1369/crude-oil-price-history-chart>.

with Heidelberg expected reduction of 30% of their emission by 2030 and by 2050 be net zero.

The way we incorporated this decrease in the CO₂ emission was in proportion of the investments in Green Technology. Assuming the company has nowadays emission amounting to 565Kg/ToneCO₂ with €317m invested, through a three simple rule, we can forecast our expectations for future savings. This investment as Heidelberg is doing, will be able to capture their CO₂ emissions resulted from their production. With this capturing of CO₂ it will imply that their CO₂ emissions to reduce, meaning that they will be able to reduce their expenditure in CO₂ permits, that for instance as we can see on the table xx, Heidelberg is in a situation where it emits more CO₂ then its cap allowed, so to be able to produce above that it has to go to the market and by excess permits from its competitors so it would entail in more costs.

To sum up, we can see that this reduction will not only be an environmental gain as well as a financial gain, since by reducing and having this technology it can then also sell their excess permits to competitors meaning that it would be reducing their costs and probably increasing their profitability.

Still in the category of other operating expenses and with the information we had, we decided to keep the selling and administration expenses as well as the expenses for third party repairs and service to grow with the revenues grow because it was what it made more sense since they are related with our revenue growth.

Personal Costs

In terms of the personal costs, from the data set that was available, we could see that despite in the last 4 years we reduce from 59 thousand employees to 51 thousand, nevertheless the employee and personal costs has been increasing, and due to this we decided to include in our model this same increase. To do so we collected the average salary growth from the last 10 years around the world, even though that for 2022 we are not including a big value increase due to the big inflation this years is providing us, we decided to stick with this value as an average, since this last 10 years have included not only covid as well as the results from the last crisis, and since this value has always kept the same we found it right to stick with the average of the last 10 years that has been these 2% increase every year, so we did the same for Heidelberg Materials incorporating this increase throughout our valuation model.

Nevertheless, despite the hit we anticipate for the next two years, we predict that it will come around in the third year, with the reduction on the material costs,

Company Name	EBITDA Margin - %
Cemex SAB de CV	19,7%
Holcim AG	24,2%
Heidelberg Materials	18,3%
CRH PLC	17,4%
Average Industry	19,9%
Heidelberg Forecast	25,0%

Figure 52: EBITDA Margin from the Heidelberg' peers
Source: Refinitiv

Company Name	EBIT Margin - %
Heidelberg Materials	10,3%
Holcim AG	15,5%
CRH PLC	11,4%
Cemex SAB de CV	11,9%
Average Industry	12,3%
Heidelberg Forecast	17,0%

Figure 53: EBIT Margin from Heidelberg' peers
Source: Refinitiv

mainly due to the reduction of the fossil fuels as well as the reduction on the CO2 permit taxes also the gain from the efficiency in the raw material use as well as the recycling of materials to produce, all of this will start to have a major impact in our most higher costs and with this reduction as well as the revenues already coming back up after two years mainly due to the effects that this war will have as well as the crisis we are starting to feel and the confidence of people going down, we believe that after these two upcoming years, Heidelberg Materials will start to have an upcoming year and become to have again profitable results.

Final results

Heidelberg is a company that initially has a lower EBITDA Margin compared to its peers in the industry (Fig 52). However, with investments in reducing CO2 emissions and improving operational efficiency, the company is expected to improve its EBITDA Margin and surpass the industry average. This improvement is also expected to be reflected in the company's EBIT Margin, (Fig 53), where it will have a higher margin than its peers. The reduction in CO2 emissions and operational improvements are expected to lead to improved profitability for Heidelberg, a "green premium". These findings suggest that investments in sustainability and operational efficiency can lead to improved financial performance for companies.

WACC

In order to discount the operating free cash flow from our company, the cost of capital has been computed. Despite our company being operating with 4 different types of materials, they all belong to the same family and even the fact that it has several business units around the world with diversified markets, only one WACC was computed because we have our statement in euros as well as every country reports to German, where it is the headquarters.

Firstly, the CAPM was applied in order to compute the cost of equity. Since we are placed in Germany and our stock is in the DAX, the German 10 Year Treasury Bond Yield was firstly used as the risk free rate in which we obtained a value of 0,45% as it is globally used as the indicator of investor confidence, protected by the German government. Since this was such a low value when compared to the latest values, we decided to assume a larger one, so we did the average of the last 5 months and we came up with a value of 1,79%, which goes in accordance with the latest situation of the increase on rates and to the economic situation we living.

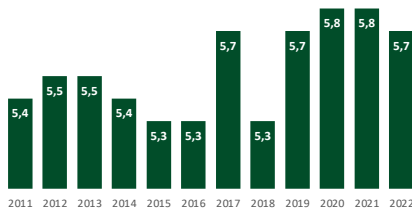


Figure 54 German Market Risk Premium from 2011 to 2022
Source: Statista

In terms of the Market Risk Premium, the Damodaran recommendation for 2022 was used, yielding a value of 4,24%²², where he uses a conventional approach, meaning that he uses the historical returns on equity and government securities and then evaluates their weakness²³. We also compared this value to the average of the last 10 years 5,37%²⁴ as we can see on the (Fig 54), despite this difference we decided to go with Damodaran point of view since this would be a more conservative approach to our model that would go with the economic situation that we are facing, we do not expect this year and the following to have the same average return it has have in the past.

To find our beta, we collected the past returns from Heidelberg Materials stock, 2 years, and we then regress it against the market portfolio. In terms of the market portfolio we decided to used as a base the MSCI World Index mainly because of two major factors, being the first since our company has several business units around the world as well as our competitors it would make sense to have used a portfolio that would aggregate the overall movements of the world market and since we are present as how competitors all around the the global market, this brings us to the second major factor to have chosen the MSCI World Index that is the diversified variety of investors we have in not only our company as well as how peers. For instance, Heidelberg Materials investors is composed of 30% from Germany, 30% from North America, 21% from around the world with unknown locations and the remaining in Europe, and the same thing happen to our peers, for instance CRH has 29,7% of their investors in UK, the same amount in North America, 20% across Europe and 3% in Ireland, so in order to aggregate a well diversified variety of investors, we decided that for this purpose this would be the best portfolio that we could compare.

Regarding the β_e was obtained, for a wide range, median (0,88), the 10th (-1,73) and the 80th percentile (2,24). Since Heidelberg Materials is planning to maintain their capital structure constant for the near future, the beta obtained was not unlevered. We then repeated the previous steps to the companies we already talked about previous as our industry peers and that we found the most suitable to used as comparables.

With this we were able to reach the industry β unlevered by doing the average of all four companies reaching in the same intervals, meaning the median of the unlevered beta a value of (0,67), the 10th percentile (-0,50) and the 80th percentile (1,51). To get a better confidence of our value we then calculated a

²² Damodaran, Aswath. "Country Default Spreads and Risk Premiums." Welcome to Pages at the Stern School of Business, New York University, 2022. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html.

²³ Damodaran, Aswath. "Risk and Return Models." Ch3, 2022. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/valquestions/RiskPrem.htm.

²⁴ Published by Statista Research Department, and Nov 16. "Average Market Risk Premium Germany 2022." Statista, November 16, 2022. <https://www.statista.com/statistics/664825/average-market-risk-premium-germany-europe/>.

	Lower Bound	Median	Upper Bound
β_u Heidelberg	-1,01	0,67	1,54
β_e Heidelberg	-1,73	0,88	2,24
β_u Industry Average	-0,46	0,70	1,55
β_e Industry Average	-0,64	0,98	2,15

Figure 55: Final Results on Heidelberg and its peers β_u and β_e
 Source: Own Estimates

Method 1		Heidelberg
Return on Debt (Rd)		3,04%
β_d		0,29
Return on Debt (Rd)		3,09%
YTM Corporate Bond		3,44%
Loss given Default		0,6
Probability of Default		0,59%
Implied β_d		0,29

Method 2		Heidelberg
Return on Debt (Rd) - Method 2		2,99%
risk free rate		1,79%
Credit spread		1,20%
credit rating		BBB
Implied β_d		0,28

Figure 56: Information on Rd and β_d inputs
 Source: Own Estimates

confidence interval for our betas unlevered obtained, and with a 95% confidence interval we reached between 1,16 and 1,93. With this we can see that both our beta as well as the industry beta are within the range of the confident interval (1,54 and 1,55), and when we levered to our company debt to equity ratio 55,41% we obtained the Heidelberg and the Industry average as follow (2,24 and 2,15). We can see on the (Figure 55) that we also obtained negative values as well as some values lower than one, in which we decided to discard. Thus we decided to go with Heidelberg beta as it would be the best to continue with the calculations. We could have done an average of both or even include more companies, but in our point of view, these were the ones that could best mimic our company in all aspects from market presence to their structure as well as their core business, leading us to choose the be derived from Heidelberg Materials rolling beta regression.

The cost of equity was obtained with the beta calculated previously and with the value of the 10Y German Bonds adapted as well as with the Damodaran MRP, reaching a value of 11,27%. In terms of the cost of debt, we decided to use the average of the two approaches as we can see in figure 56, in the first approach we obtained the 10 Year bond issued by the company 3,44%, the probability of default, and in addition the loss given default, bloomberg values we then throughout the formula ($rd = YTM - PD * LGD$) reached the value of 3,09%.

In order to better fortify our value obtained, we went with another logic that was to compute the cost of debt by using the Heidelberg Materials credit spread obtained of Bloomberg and then to add the risk-free rate, we reached a 2,99% cost of debt. The German country risk premium is 0%, due to its safety, so this value was not added to the formula. To obtain the final cost of debt we did an average of both, reaching the final cost of debt of 3,01%.

Thus, the WACC was then obtained by using the formula with the previous values obtained, Heidelberg Materials capital structure and their tax rate 29,72%, bridging it into a final value of 8,01% like we can see in the Figure 57.

Multiples Valuation

In terms of the peer group, companies in the construction materials industry, with sales around the world, very similar percentage of sells by product, similar capital structures and also a similar market capitalization are considered. Companies that fulfill this requiremets were selected and have already been analyzed throughout our "file", being Holcim, Cemex and CRH. All these have around a market cap of 8 to 30 billion of dollars.

Equity	9 820,00
Net Debt	5 440,86
EV	15 260,86
E/EV	64,35%
D/EV	35,65%

Risk Free Rate	1,79%
Market Risk Premium	4,24%
Re	11,27%
Rd	3,04%
β_d	0,29
β_e	2,24
WACC	8,01%

Figure 57: WACC
 Source: Own Estimations

In terms of the release of the annual reports, all the peers have a similar release date as ours, around March. Cemex normally releases in the end of March, CRH is a little sooner being on the beginning of March and finally Holcim at the end of February. In addition to the annual reports, we also used information about the quarterly reports/ trading updates in order to obtain the most accurate information of the impact that not only the war is making well as the inflation is starting to influence companies and the way they operate in the market. To sum up this the information was obtained from not only the annual reports as well as the quarterly reports/ trading updates and we consider a full year for the purpose of this valuation the 4Q of 2021 to the 3Q of 2022.

Hereupon, for our competitor analysis we decided to use the following metrics, EV/EBITDA and EV/Revenue and as we can see the final results on the Figure 58. The main reasons to go with the EV/EBITDA instead of the EBIT is the fact that our industry is categorized for having a lot of capital intensity, for instance Heidelberg Materials has around 1470 ready-mixed concrete production sites worldwide plus another couple hundred facilities, which in numbers would mean a lot of cumulated depreciations, it would take a lot of value of the company and since it can be used as an overall financial performance we find it more relevant, since it is more common on these companies to use EBITDA instead of EBIT.

	Price	Shares (M)	EV/EBITDA	EV/Revenue
Heidelberg Materials	52,50	198,42	7,10	0,76
CRH	38,07	747,48	8,50	1,31
Cemex	0,42	14 004,89	3,50	0,97
Holcim	48,71	615,93	10,23	1,66
Minimum			3,50	0,76
Median			7,80	1,14
Average			7,33	1,18
Maximum			10,23	1,66

Figure 58: Heidelberg and peers Multiples
Source: Own Estimates

EV/EBITDA

As we can see also from the Figure 58, Holcim as well as CRH have higher multiple values when compared to Heidelberg Materials and Cemex, mainly occurring due to the higher presence they both have in the market, as well as bigger results coming from this, making their multiple values higher but in the contrast there is Cemex, which has a lower presence than the remaining as well as Heidelberg Materials and with this we can almost have a small sample of what the market is by having similar but diversified companies in terms of ranges.

Regarding the actual values obtained from the EV/EBITDA, we can see in Figure 59, that we obtain a larger variation in the final share price ranging from €11,99 to €87,73 and an average of all 4 companies of €55,11, which is very close to what we are obtaining in our DCF analysis which is €53,30.

EV/EBITDA	Minimum	Median	Average	Maximum
EBITDA 2022	2 232,99	2 232,99	2 232,99	2 232,99
EV Estimated	7 820,16	17 417,90	16 375,93	22 847,74
Net Debt	5 440,86	5 440,86	5 440,86	5 440,86
Equity	2 379,30	11 977,04	10 935,07	17 406,88
Number of Shares	198,42	198,42	198,42	198,42
Price Estimated	11,99	60,36	55,11	87,73

EV/Revenue	Minimum	Median	Average	Maximum
Earnings 2022	20 825,34	20 825,34	20 825,34	20 825,34
EV Estimated	15 857,75	23 764,36	24 471,93	34 501,24
Net Debt	5 440,86	5 440,86	5 440,86	5 440,86
Equity	10 416,89	18 323,50	19 031,07	29 060,38
Number of shares	198,42	198,42	198,42	198,42
Price Estimated	52,50	92,35	95,91	146,46

Figure 59: Heidelberg Share Price on Multiples values
Source: Own Estimates

EV/Revenue

As for the EV/Revenue multiple we are seeing the impact of the stock and their performance in a way that most investors used this multiple to determine whether the stock is priced fairly or not, other important factor to have in mind is normally that the lower the value of the multiple the better, because it can mean that the stock price is undervalued. So as we can see from the Figure 58, Heidelberg

Materials was the one actually that obtained the lower value for this multiple with 0,74 and the highest going to Holcim with a 1,67. From this number we can take some conclusions, being the first that our stock price might be indeed lower than the actual value should be, mainly because just from this last year has lost 15% of their value even though it has still been more profitable than the previous year, nevertheless one other conclusion can be that we are having more revenues for the EV of our company, in contrary, for instance the amount of revenue Holcim is having.

To sum up, we can see in the *Figure 59* the price per share value that we would obtain in case we used the minimum, the median, the average or the maximum of the combination of the values and as expected we have a very diversified range of numbers going from €11,99 to €146,46 that even though is a big range, the average on both gives us a very similar value to the one obtained in our DCF valuation.

Sensitivity

In our sensitivity analysis we decided to firstly perform it against the weighted average cost of capital in order to see which values we could achieve if we had different returns on equity as well as different returns on debt and to do so, a delta of 0,5 percentual points was used in both of the returns. With this we were able to reach a variation of 6,68% to 9,37% and where our value of the weighted average cost of capital was placed on the middle with 8,02% as we can see on the *Figure 60*. In terms of analysis, as expected, the variations of both returns have an impact on the value of WACC, as we can see, as both go up, our WACC value also go up, and as they go down, they also go down.

WACC	Return on Equity							
	8,02%	9,77%	10,27%	10,77%	11,27%	11,77%	12,27%	12,77%
Return on Debt	1,54%	6,68%	7,00%	7,32%	7,64%	7,97%	8,29%	8,61%
	2,04%	6,81%	7,13%	7,45%	7,77%	8,09%	8,41%	8,74%
	2,54%	6,93%	7,25%	7,58%	7,90%	8,22%	8,54%	8,86%
	3,04%	7,06%	7,38%	7,70%	8,02%	8,35%	8,67%	8,99%
	3,54%	7,19%	7,51%	7,83%	8,15%	8,47%	8,79%	9,12%
	4,04%	7,31%	7,63%	7,95%	8,28%	8,60%	8,92%	9,24%
	4,54%	7,44%	7,76%	8,08%	8,41%	8,73%	9,05%	9,37%

Figure 60: WACC Target
Source: Own Estimates

Price	55,30	Growth						
		1,62%	2,12%	2,62%	3,12%	3,62%	4,12%	4,62%
WACC	6,68%	77,91	82,64	88,27	95,95	105,18	118,50	136,21
	7,02%	68,63	72,20	76,55	81,97	88,93	98,24	111,36
	7,52%	57,65	60,13	63,08	66,67	71,15	76,90	84,50
	8,02%	48,91	50,64	52,68	55,10	58,04	61,70	66,41
	8,52%	41,87	43,09	44,50	46,15	48,12	50,50	53,47
	9,02%	36,15	37,01	37,99	39,13	40,45	42,02	43,83
	9,37%	32,80	33,48	34,25	35,12	36,13	37,31	38,72

Figure 61: Price Target
Source: Own Estimates

Price	55,30	RONIC						
		11,00%	11,50%	12,00%	12,50%	13,00%	13,50%	14,00%
WACC	6,68%	92,01	93,52	94,91	96,19	97,37	98,46	99,48
	7,02%	78,88	80,17	81,34	82,43	83,43	84,36	85,22
	7,52%	64,14	65,16	66,11	66,97	67,77	68,51	69,20
	8,02%	53,00	53,83	54,60	55,30	55,95	56,55	57,10
	8,52%	44,41	45,09	45,71	46,29	46,82	47,31	47,77
	9,02%	37,66	38,23	38,74	39,22	39,66	40,06	40,44
	9,37%	33,82	34,32	34,77	35,19	35,59	35,94	36,27

Figure 62: Price Target
Source: Own Estimates

A sensitivity analysis was performed then to the weighted average cost of capital and also the respective terminal growth rate derived from the model. In the performance of the analysis, the range for the WACC was the one obtained in the previous analysis, and in terms of the growth rate delta of 0,5 percentual points was used as we can see in the *Figure 61*. We then did the same procedure but this time we decided to see how sensitive our price to the changes in RONIC was, and as before, the variation on WACC was the results obtained in the previous analysis of the return on equity as well as debt and for the RONIC, a delta of 0,5 percentual points was used, and we can see the result in the *Figure 62*.

Analysing now both figures, we can see that if we do an average of both the outcomes from our sensitivity (61,83€ vs 60,11€) we will obtain a larger value variation with the changes on the growth rate, nevertheless with the variation on

RONIC, we are able to obtain an average much closer to what we obtain in our DCF valuation.

Scenario Analysis

For this analysis, three variables were used, the ones we consider that are more subjected to fluctuations depending on the macroeconomic scenario: material costs, utilization rates, and economical growth. We created two scenarios for each variable beyond the base case: the bull and the bear.

Material Costs

Core element, highly sensitive to economic conditions. We strongly feel that in next years **operating margins will decrease**, an expectation **confirmed on Q3 22**. To estimate we considered the price of oil barrel in UK, to then extrapolate for the world, a fair assumption since UK prices are highly correlated with the global market, and are deeply covered. In that sense, we used a forecast of prices until 2027²⁵. There we noted that, besides peaks and falls, after the tumult, prices between 2025 and 2027 fixed at c.30% premium in comparison with 2021 prices.

We strongly believe that there will be a premium, even considering the decrease of its supply levels due to the fact its is a natural ressource, **but in a lower level**. That said, we used historical values average of the barrel price to capture the natural increase of the prices, with no effect of extraordinary moments. For the period 2028 onwards the **base case** the average between the 5 last years **c.11%**, the **bear** the average of the last 15 years, **c.9%** and the **bull** the average of last 20 years, **c.13%**.

Utilization Rate

Expected to be **96% in 2022**, and **77% in 2045**, a **-24% difference**. This contraction is originated due to a decrease in HTC efficiency, a line of thinking proof by the Q32022 results for group sevicees, that reveal a fall of **64%** in returns for that segment. This technique was applied to the yearly additional quantity UR, not to the comprehensive UR, which is expected to vary in the same direction as market share: when the potential demand increases, it compensates the loss coming from HCT underperformance. That said for the original values of **yearly additional quantity UR**, in the **bull case**, they vary by the **average upwings of market share variations** along 2022-2045, **1%**, and in the bear case by the simetric of that value, as the average of the downwings is non-meaningful. Results are exposed in the left figure.

Economic Growth

Bear 1	47,2	-15%
Base	55,3	-
Bull 1	66,8	21%

Figure 63 - Scenario analysis for material costs

Bear 2	50,5	-9%
Base	55,3	-
Bull 2	60,6	10%

Figure 64 - Scenario analysis for Utilization Rate

²⁵ Published by D. Clark, S.S. and 18, N. (2022) Oil prices forecast UK 2022, Statista. Available at: <https://www.statista.com/statistics/374961/united-kingdom-uk-oil-price-forecast-in-gbp/> (Accessed: December 16, 2022).

Bear 3	46,8	-15%
Base	55,3	-
Bull 3	61,6	11%

Figure 65 - Scenario analysis for Economic Growth

The most unpredictable factor. The values we considered for economic growth are based on World Bank forecasts, but the economy is subjected to periods of booms and recessions that affect the development line of GDP in future. That said the aggregated GDP growth until 2045 can be perceived more positively or negatively, depending if the economy during those years will be more stimulated with recessions or benefited with booms. These two possibilities are introduced through a yearly stimulus. This "hit" comes from the **average historical upsides and downsides**, assuming **2% as the standard benchmark** to define those variances. The implied variance in bull **-1,32%**, and in bear **0,96%**, resulting in the Figure 65 results.

Final Recommendations

For the following years, a stable, slight decreasing market performance for building materials companies, a decrease in the profit margins that is being driven by the spike in prices of not only the main materials used, but as well as in the energy sector with the most recent crisis to embrace Europe and where with the most recent predictions the worse is yet to come with the beginning of Winter. One other aspect to highlight is the CO₂ costs that are expected to account up to 14% of total cement costs, and in addition the sanctions that are being imposed on Russia that is also having an effect on the energy crisis in Europe due to the power that Russia has. Nevertheless, we are already seeing Heidelberg Materials implementing new technology in order to capture the CO₂ release from the production facilities and with this capture up to 95%. This will be important since with the phase IV regulation for carbon credits, the CO₂ allowances are being reduced meaning the prices of metric ton of CO₂ will increase, as just in 2022 increased 12%.

We strongly believe that if Heidelberg keeps their overall strategy and situates itself and the brand that is building in the more sustainable production of materials as well as be able to expand their geographic position to other regions where it is not so strong, it would be able to increase their market share despite of the decrease in the profit margins.

According to our DCF valuation as we strongly believe to be the most accurate method in order to evaluate the company, otherwise we would have considered a premium to reflect any outstanding market performance, we believe that Heidelberg Materials will be traded at €55,30 as of December 31st of 2023. This would indicate a shareholder return of 5,0%, that includes a constant pay-out ratio of 28% considering a dividend per share of €2,4. All in all, given, we recommend the shareholders to Hold when comparing our analysis to the current price, as there is a return in the range of 0% to 10%.

Financial Statements

Free Cash Flow Map		2020A		2021E		2022F		2023F		2024F		2025F		2026F		2027F		2028F		2029F		2030F		2031F		2032F		2033F		2034F		2035F		2036F		2037F		2038F		2039F		2040F		2041F		2042F		2043F		2044F		2045F																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
Free Cash Flow Available to Western and Southern Europe IC		84424	3777	-4105	-4710	-2949	-1639	-1292	-1284	1921	2467	2986	3088	3313	3548	3784	4029	4314	4655	4829	5107	5399	5431	5499	5569	5640	5714	5784	5854	5924	5994	6064	6134	6204	6274	6344	6414	6484	6554	6624	6694	6764	6834	6904	6974	7044	7114	7184	7254	7324	7394	7464	7534	7604	7674	7744	7814	7884	7954	8024	8094	8164	8234	8304	8374	8444	8514	8584	8654	8724	8794	8864	8934	9004	9074	9144	9214	9284	9354	9424	9494	9564	9634	9704	9774	9844	9914	9984	10054	10124	10194	10264	10334	10404	10474	10544	10614	10684	10754	10824	10894	10964	11034	11104	11174	11244	11314	11384	11454	11524	11594	11664	11734	11804	11874	11944	12014	12084	12154	12224	12294	12364	12434	12504	12574	12644	12714	12784	12854	12924	12994	13064	13134	13204	13274	13344	13414	13484	13554	13624	13694	13764	13834	13904	13974	14044	14114	14184	14254	14324	14394	14464	14534	14604	14674	14744	14814	14884	14954	15024	15094	15164	15234	15304	15374	15444	15514	15584	15654	15724	15794	15864	15934	16004	16074	16144	16214	16284	16354	16424	16494	16564	16634	16704	16774	16844	16914	16984	17054	17124	17194	17264	17334	17404	17474	17544	17614	17684	17754	17824	17894	17964	18034	18104	18174	18244	18314	18384	18454	18524	18594	18664	18734	18804	18874	18944	19014	19084	19154	19224	19294	19364	19434	19504	19574	19644	19714	19784	19854	19924	19994	20064	20134	20204	20274	20344	20414	20484	20554	20624	20694	20764	20834	20904	20974	21044	21114	21184	21254	21324	21394	21464	21534	21604	21674	21744	21814	21884	21954	22024	22094	22164	22234	22304	22374	22444	22514	22584	22654	22724	22794	22864	22934	23004	23074	23144	23214	23284	23354	23424	23494	23564	23634	23704	23774	23844	23914	23984	24054	24124	24194	24264	24334	24404	24474	24544	24614	24684	24754	24824	24894	24964	25034	25104	25174	25244	25314	25384	25454	25524	25594	25664	25734	25804	25874	25944	26014	26084	26154	26224	26294	26364	26434	26504	26574	26644	26714	26784	26854	26924	26994	27064	27134	27204	27274	27344	27414	27484	27554	27624	27694	27764	27834	27904	27974	28044	28114	28184	28254	28324	28394	28464	28534	28604	28674	28744	28814	28884	28954	29024	29094	29164	29234	29304	29374	29444	29514	29584	29654	29724	29794	29864	29934	30004	30074	30144	30214	30284	30354	30424	30494	3056																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Free Cash Flow Available to Western and Southern Europe IC		4265	415	-294	90	819	1782	1879	2834	3309	5283	5324	5311	5338	5144	5151	5336	5465	5478	5501	5526	5571	3748	3761	3774	3787	3800	3813	3826	3839	3852	3865	3878	3891	3904	3917	3930	3943	3956	3969	3982	3995	4008	4021	4034	4047	4060	4073	4086	4099	4112	4125	4138	4151	4164	4177	4190	4203	4216	4229	4242	4255	4268	4281	4294	4307	4320	4333	4346	4359	4372	4385	4398	4411	4424	4437	4450	4463	4476	4489	4502	4515	4528	4541	4554	4567	4580	4593	4606	4619	4632	4645	4658	4671	4684	4697	4710	4723	4736	4749	4762	4775	4788	4801	4814	4827	4840	4853	4866	4879	4892	4905	4918	4931	4944	4957	4970	4983	4996	5009	5022	5035	5048	5061	5074	5087	5100	5113	5126	5139	5152	5165	5178	5191	5204	5217	5230	5243	5256	5269	5282	5295	5308	5321	5334	5347	5360	5373	5386	5399	5412	5425	5438	5451	5464	5477	5490	5503	5516	5529	5542	5555	5568	5581	5594	5607	5620	5633	5646	5659	5672	5685	5698	5711	5724	5737	5750	5763	5776	5789	5802	5815	5828	5841	5854	5867	5880	5893	5906	5919	5932	5945	5958	5971	5984	5997	6010	6023	6036	6049	6062	6075	6088	6101	6114	6127	6140	6153	6166	6179	6192	6205	6218	6231	6244	6257	6270	6283	6296	6309	6322	6335	6348	6361	6374	6387	6400	6413	6426	6439	6452	6465	6478	6491	6504	6517	6530	6543	6556	6569	6582	6595	6608	6621	6634	6647	6660	6673	6686	6699	6712	6725	6738	6751	6764	6777	6790	6803	6816	6829	6842	6855	6868	6881	6894	6907	6920	6933	6946	6959	6972	6985	6998	7011	7024	7037	7050	7063	7076	7089	7102	7115	7128	7141	7154	7167	7180	7193	7206	7219	7232	7245	7258	7271	7284	7297	7310	7323	7336	7349	7362	7375	7388	7401	7414	7427	7440	7453	7466	7479	7492	7505	7518	7531	7544	7557	7570	7583	7596	7609	7622	7635	7648	7661	7674	7687	7700	7713	7726	7739	7752	7765	7778	7791	7804	7817	7830	7843	7856	7869	7882	7895	7908	7921	7934	7947	7960	7973	7986	7999	8012	8025	8038	8051	8064	8077	8090	8103	8116	8129	8142	8155	8168	8181	8194	8207	8220	8233	8246	8259	8272	8285	8298	8311	8324	8337	8350	8363	8376	8389	8402	8415	8428	8441	8454	8467	8480	8493	8506	8519	8532	8545	8558	8571	8584	8597	8610	8623	8636	8649	8662	8675	8688	8701	8714	8727	8740	8753	8766	8779	8792	8805	8818	8831	8844	8857	8870	8883	8896	8909	8922	8935	8948	8961	8974	8987	9000	9013	9026	9039	9052	9065	9078	9091	9104	9117	9130	9143	9156	9169	9182	9195	9208	9221	9234	9247	9260	9273	9286	9299	9312	9325	9338	9351	9364	9377	9390	9403	9416	9429	9442	9455	9468	9481	9494	9507	9520	9533	9546	9559	9572	9585	9598	9611	9624	9637	9650	9663	9676	9689	9702	9715	9728	9741	9754	9767	9780	9793	9806	9819	9832	9845	9858	9871	9884	9897	9910	9923	9936	9949	9962	9975	9988	10001	10014	10027	10040	10053	10066	10079	10092	10105	10118	10131	10144	10157	10170	10183	10196	10209	10222	10235	10248	10261	10274	10287	10300	10313	10326	10339	10352	10365	10378	10391	10404	10417	10430	10443	10456	10469	10482	10495	10508	10521	10534	10547	10560	10573	10586	10599	10612	10625	10638	10651	10664	10677	10690	10703	10716	10729	10742	10755	10768	10781	10794	10807	10820	10833	10846	10859	10872	10885	10898	10911	10924	10937	10950	10963	10976	10989	11002	11015	11028	11041	11054	11067	11080	11093	11106	11119	11132	11145	11158	11171	11184	11197	11210	11223	11236	11249	11262	11275	11288	11301	11314	11327	11340	11353	11366	11379	11392	11405	11418	11431	11444	11457	11470	11483	11496	11509	11522	11535	11548	11561	11574	11587	11600	11613	11626	11639	11652	11665	11678	11691	11704	11717	11730	11743	11756	11769	11782	11795	11808	11821	11834	11847	11860	11873	11886	11899	11912	11925	11938	11951	11964	11977	11990	12003	12016	12029	12042	12055	12068	12081	12094	12107	12120	12133	12146	12159	12172	12185	12198	12211	12224	12237	12250	12263	12276	12289	12302	12315	12328	12341	12354	12367	12380	12393	12406	12419	12432	12445	12458	12471	12484	12497	12510	12523	12536	12549	12562	12575	12588	12601	12614	12627	12640	12653	12666	12679	12692	12705	12718	12731	12744	12757	12770	12783	12796	12809	12822	12835	12848	12861	12874	12887	12900	12913	12926	12939	12952	12965	12978	12991	13004	13017	13030	13043	13056	13069	13082	13095	13108	13121	13134	13147	13160	13173	13186	13199	13212	13225	13238	13251	13264	13277	13290	13303	13316	13329	13342	13355	13368	13381	13394	13407	13420	13433	13446	13459	13472	13485	13498	13511	13524	13537	13550	13563	13576	13589	13602	13615	13628	13641	13654	13667	13680	13693	13706	13719	13732	13745	13758	13771	13784	13797	13810	13823	13836	13849	13862	13875	13888	13901	13914	13927	13940	13953	13966	13979	13992	14005	14018	14031	14044	14057	14070	14083	14096	14109	14122	14135	14148	14161	14174	14187	14200	14213	14226	14239	14252	14265	14278	14291	14304	14317	14330	14343	14356	14369	14382	14395	14408	14421	14434	14447	14460	14473	14486	14499	14512	14525	14538	14551	14564	14577	14590	14603	14616	14629	14642	14655	14668	14681	14694	14707	14720	14733	14746	14759	14772	14785	14798	14811	14824	14837	14850	14863

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Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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