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**Implementation of an Environmental, Social and Governance Rating
in Business Valuations**

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Betriebswirtschaft
Zweibrücken



Declaration:

Herewith I declare that this thesis is the result of my independent work. All sources and auxiliary materials used by me in this thesis are cited completely.

Homburg, 06/05/2020

Abstract

Nowadays, people tend more and more to care for the environment and to social justice in the world. Therefore, it is immensely important for a company to act sustainable, on the one hand to attract and hold employees and on the other hand to win investors. This is the reason why several rating agencies nowadays create so-called ESG scores (environmental, social and governance scores) for companies, to compare the value of sustainability that each one delivers. These scores help to show if a company acts more sustainable or less than others in their peer group. These factors are already very important for a mass of people for the question if they want to invest in a company or not.

But although, these scores are more and more important for investors, the common business valuation methods do not include any sustainability rating in their calculations. While calculations like the Net Present Value and the Discounted Cash Flow Methods just take historical financial indicators into account, the Venture Capital and Multiplier Method take a potential future earning into account. But nonetheless, all Methods concentrate on (potential) earnings.

That means, although people nowadays often follow sustainability ratings for the decision to invest e.g. in a company share and therefore many analysts in the stock market provide such information, still no sustainability rating is considered for the very important decision of whether a company would like to buy another company or merge with it.

To face this problem, this work deals with converting an ESG score into a financial indicator, which can be included in the common business valuation methods. This is intended to enable a sustainability rating to be included in the assessment of a company. In this way, future mergers and acquisitions should be facilitated, since the sustainable acting has already and will have a more and more important influence of a company's performance, which needs to be reflected financially.

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List of Abbreviations

CSP	Corporate Sustainability Performance
CSR	Corporate Social Responsibility
DCF	Discounted Cash Flow
EBIT	Earnings Before Interest and Taxes
ESG	Environmental, Social and Governance
E&S	Environmental and Social
EV	Enterprise Value
IPO	Initial Public Offering
M&A	Mergers and Acquisition
NOPLAT	Net Operating Profit Less Adjusted Taxes
NPV	Net Present Value
SDI	Supranational and Development Institutions
S&P	Standard and Poor's Financial Services LLC
VC	Venture Capital

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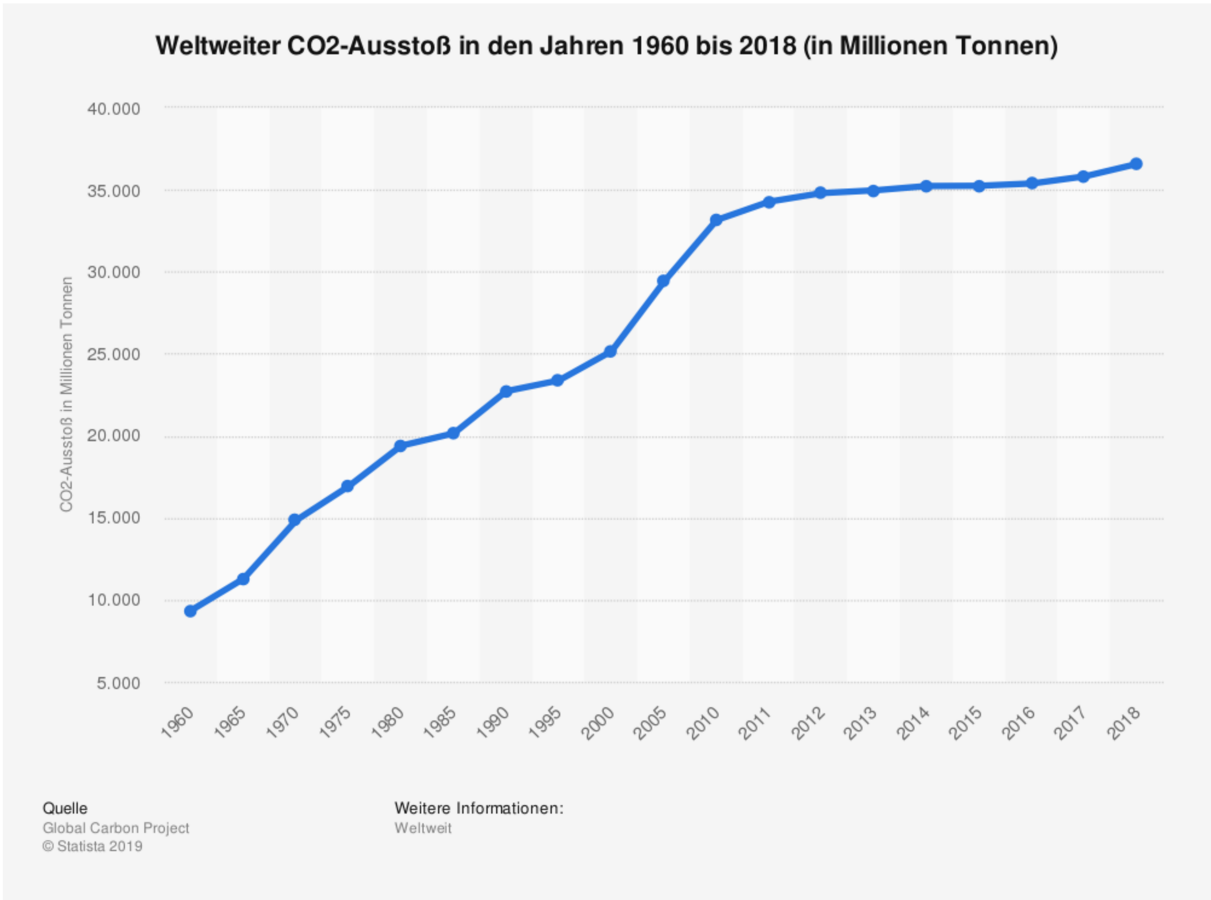


Figure 1: Worldwide Carbon Emissions Between the Years 1960 and 20182

ABC Corporation

ABC Corporation, together with its subsidiary, XYZ Limited, owns a 20% equity interest in Iron Mining Company that operates an iron mine in Canada.

REGION	LAST MEETING DATE
Canada	10 MAY 2016
COUNTRY	LAST DATA PROFILE UPDATE
Canada	20 JAN 2018
INDUSTRY GROUP	SCORES AS OF
Steel	24 JAN 2018

OVERVIEW OF SUSTAINABILITY DISCLOSURE PRACTICES			
Environment	10	Social	10
Management of Environmental Risks and Opportunities	9	Human Rights	8
Carbon and Climate	8	Labor, Health and Safety	10
Natural Resources	8	Stakeholders and Society	10
Waste and Toxicity	5	Product Safety, Quality and Brand	3

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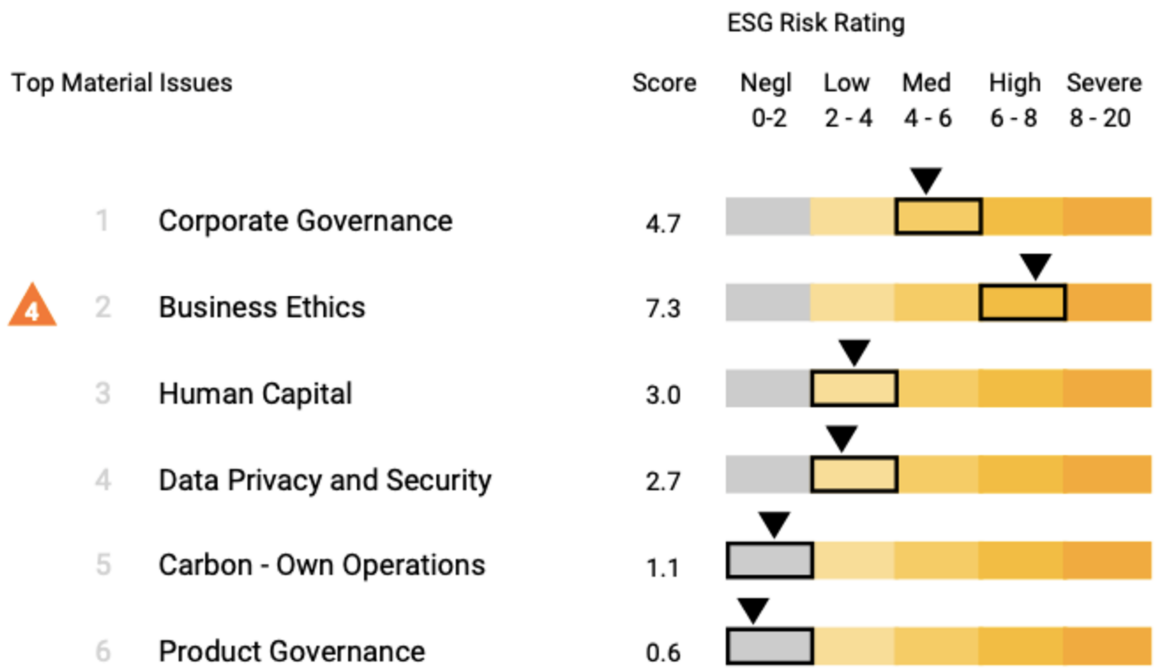


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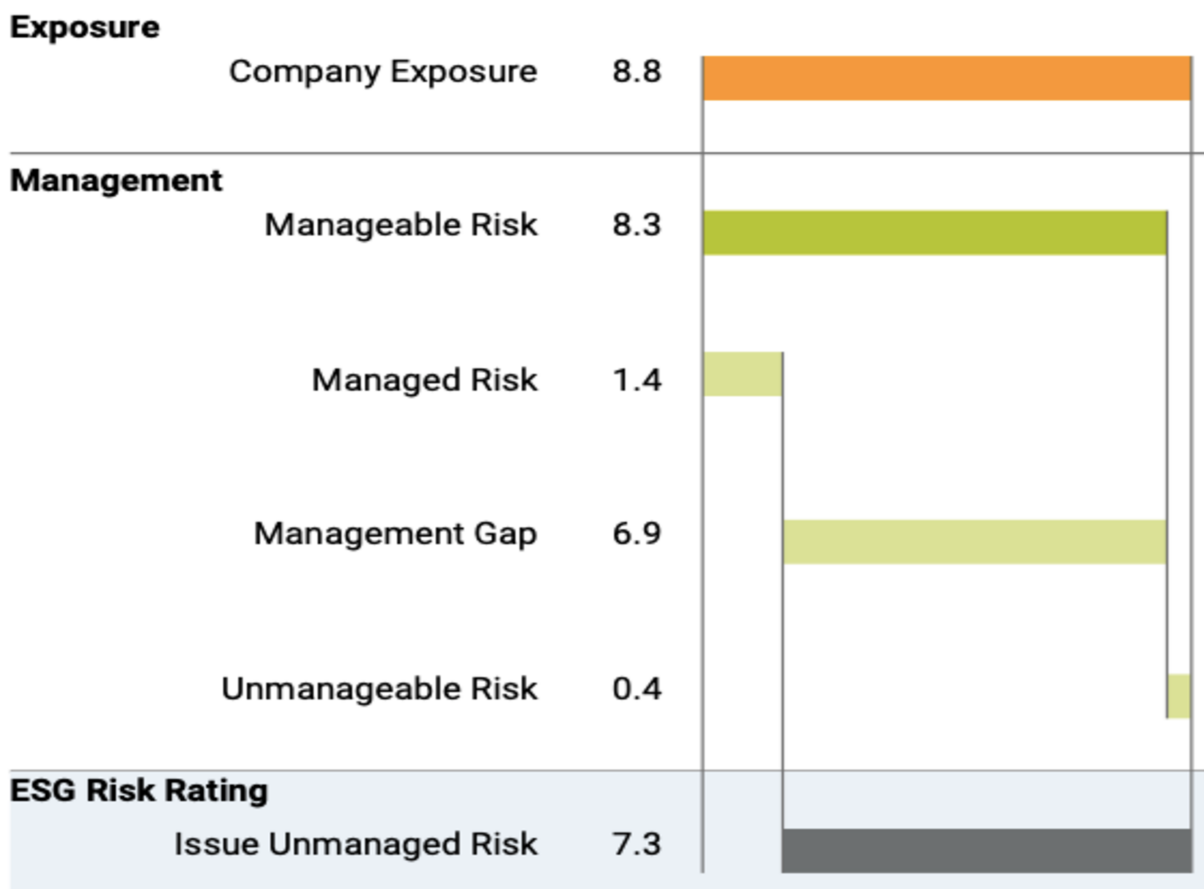


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Relative Performance




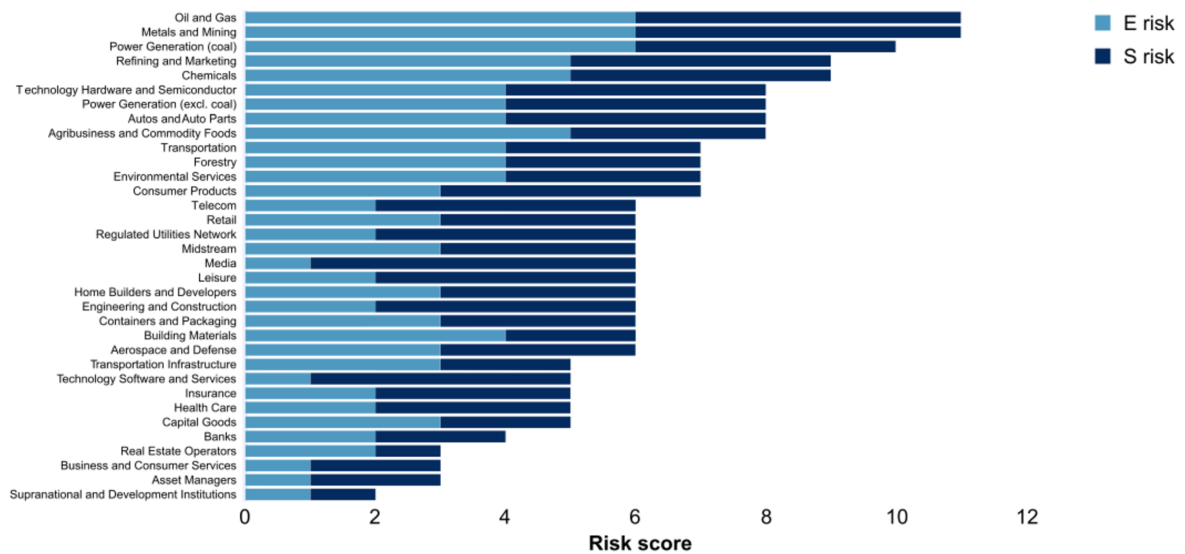
	Position (1st = lowest risk)	Percentile (1st = lowest risk)
 Global Universe	2021 out of 9376	22nd
 Technology Hardware (Industry)	187 out of 338	55th
 Communications Equipment (Subindustry)	9 out of 49	17th

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Source: S&P Global Ratings.
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1 Introduction

1.1 Relevance of Business Valuation

The need for business valuation services grew in the middle of the 18th century, as the first larger companies began to arise within the industrial revolution. The first attempts to value a company were mainly to calculate the difference between a company's assets and liabilities. But during the US prohibition in the 1920s developed another understanding of the value of a business. It was clear that the real value was much higher than just the net assets of the company. Therefore, new concepts were created which incorporate the benefit of future profit and goodwill. These ways to value a business did not change until the 1990s when the fast development of the internet and the beginning of the information age revolutionized it again. (Business Valuation Specialists LLC, 2016) Because of this circumstance and the fact that the number of mergers and acquisitions (M&A) grew dramatically during the past decades, the need for valuation companies rose remarkably. While the annual volume of M&A deals worldwide in the 1980s was under \$500 billion, the amount grew over \$1,000 billion in 1995 and to even far more than \$3,000 billion in the 2000s and 2010s. (Statista Research Department, 2019)

But it is not only the increasing number of M&A during the past two decades, which reflects the importance of business valuation companies nowadays. Also, the increased value of the companies which shall be complied, leading to the enormous importance of a correct and precise valuation, as a difference of only 3% can mean a value change of many million dollars.

1.2 Relevance of Sustainability

Especially the ecological sustainability is more and more in discussion during the last decade. The following statistics from Statista shows the worldwide carbon emissions, measured in a million tons, between the years 1960 and 2018. (Global Carbon Project, 2019)

It can be seen that the carbon emissions rise continuously since 1960, even though the yearly increase is much smaller since 2011 compared to the years before.

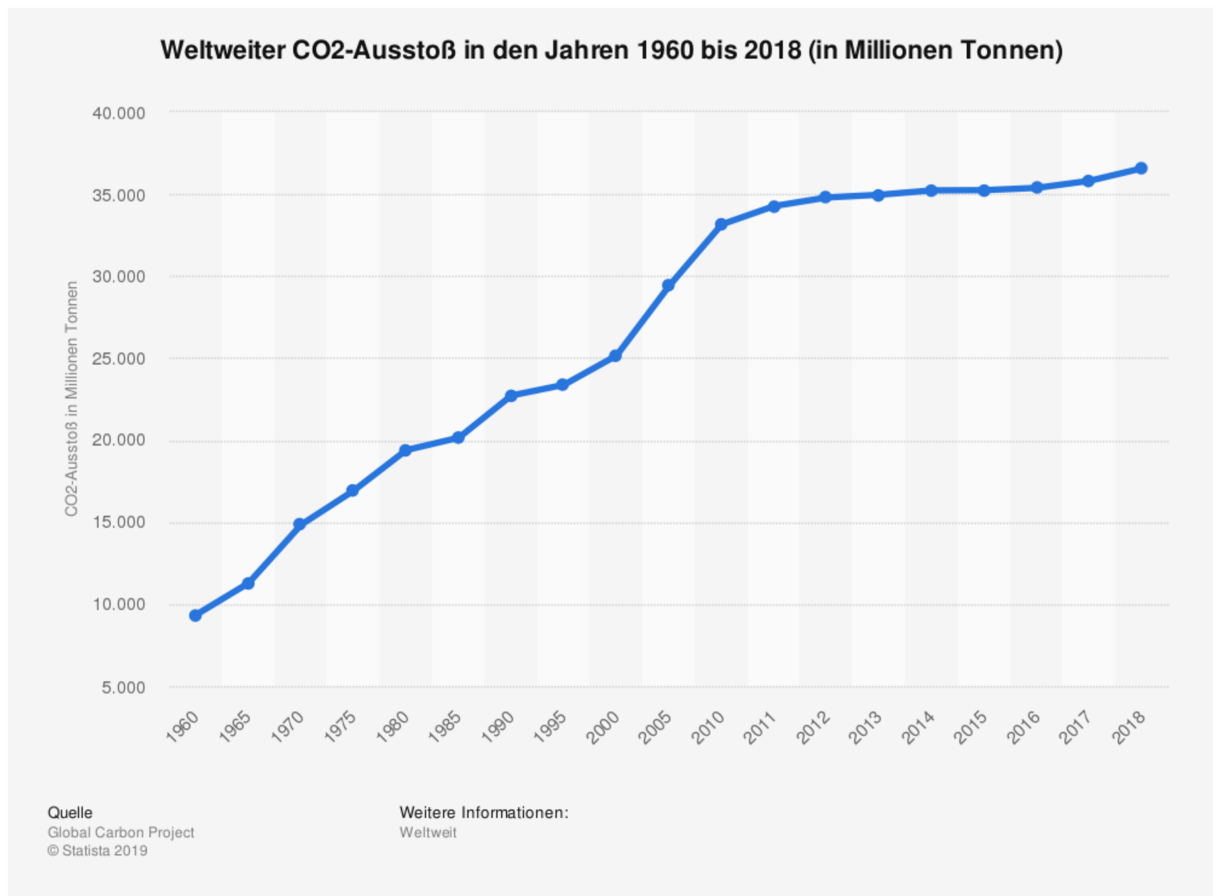


Figure 1: Worldwide Carbon Emissions Between the Years 1960 and 2018

The statistics especially provide information about two things. On the one hand, it demonstrates that the carbon emissions and the associated pollution get worse every year. But on the other hand, the lower emission increase during the last years, despite the significantly increasing globalization, which produces a lot of pollution, shows that many companies try to reduce their emissions nowadays.

Another statistic illustrates that the awareness of environmentally sustainable behavior nowadays is at a very high level. To measure the status which environmental sustainability has in German companies, the “IAB-Betriebspanel” asked in a survey in 2018 about 16,000 companies from all economic sectors what role sustainability plays in their company. Accordingly, about 43% of the companies said that ecological sustainability plays a crucial role in their firm.

Furthermore, over 36% stated that their customers ask specifically for sustainable goods. (Statista Research Department, 2019). The fact that over one-third of the customers nowadays want to have products that are demonstrably sustainable manufactured forces companies to rethink and gives them a market advantage, which produces already solely environmentally friendly products.

But not only environmental sustainability becomes more important during the past years. Nowadays, companies invest a lot of research, time, and money to improve their reputation and to make the workplace and working environment as positive as possible for their (future) employees. In order to that, many companies analyze the attractiveness of employers and evaluate them. The big firms need to have a good standing in these evaluations, as the factor of human work has a very high priority nowadays.

Furthermore, companies don't just need to deal with the topic sustainability because it is becoming common practice, especially for the big firms, but also because the law forces them to disclosure ESG (Environmental, Social, and Governance) figures.

1.3 Present Link Between Business Valuation and Sustainability

At the moment, the classic and most common methods to calculate the value of a business, do not contain scores which consider the fact whether a company acted sustainably or not. Nevertheless, today there is a tendency that investors are interested in the sustainable behavior of companies in which they want to invest and do care about this before deciding on investing. Especially in the stock market, this trend can be seen. While some decades before, no investor cared about the sustainable behavior of companies he was invested in, today this changed enormously. The mere fact that there are many agencies by now which create sustainability scores and rate companies which are listed in the stock market within their score system substantiates the global demand after this knowledge. Such rating agencies are, for example, MSCI or the Institutional Shareholder Services Group of Companies (ISS).

Not solely the connection between Business Valuation and Sustainability matters, but rather the question of whether sustainability behavior influences the performance of companies or not. Several analyses focus on this topic.

2 Business Valuation

2.1 Definition

Business Valuation is the whole process of determining the fair value of a business or of parts of it. There is a set of techniques to measure the price of a business. Which method to use depends on the company to be evaluated and the reasons why a company is valued. (Corporate Finance Institute, 2020)

There are three superordinate categories in which the different types of valuation methods can be subordinated. The first superordinate category is the net substantive value method. Here, the decisive factor in determining the value builds the present value of all assets which a company has. The most common valuation methods in this category are the liquidation value and reproduction value.

The liquidation value consists of the earnings which the investor would get if he or she sells all the fixed and current assets the company has. Therefore, the sales costs and debts of the company need to be subtracted.

On the contrary, the reproduction value does not measure the earnings if the goods would be sold at this time. It measures the money that an investor needs if he wants to buy on the market the same fixed and current assets which the company has. For this purchase, the costs for goods with the same age and condition must be considered. In other words, it can be said that the reproduction value indicates what an investor needs to pay to rebuild exactly this company. (Pintz, 2019)

Although the substantive value method is easy to determine, it has a significant disadvantage. It concentrates only on the balance of a company and on the assets that it has. Furthermore, it doesn't take the composition and the exploitation of the resources into account, but this interaction of the assets represents the actual value of a company. Hence, the net asset value method should be the first indicator of a company and should never be done as the only measurement. Most often, it gives a sign of the lower price limit of the company to be evaluated.

Consequently, measuring the value of a company by using just the liquidation and reproduction value is only then appropriate if the company is not profitable anymore. Therefore, the amount of its assets is the only value left of the company. The liquidation value forms now the lower limit, the reproduction value the higher limit of the cost. (Pintz, 2019)

For example:

Mr. Jon Doe wants to sell his small company. The company doesn't make a considerable gain. Therefore, he lists all the fixed assets and goods, as well as all receivables and liabilities, to determine an enterprise value. Intangible assets can be ignored, as they cannot be assigned a notable amount. All following prices are in US dollar.

Assets and debts	Original purchase price	Current carrying amount	Replacement costs	Realizable individual sale price
• Fixed Assets	100,000	33,000	70,000	20,000
• Goods	20,000	18,000	20,000	10,000
• Receivables		5,000	5,000	5,000
• Liabilities		- 15,000	- 15,000	- 15,000
Reproduction value			40,000	
Liquidation value				20,000

Table 1: Determining of the Reproduction and Liquidation Value

Following the calculation of this example, the liquidation value of Mr. Jon Does' company is \$20,000, and the reproduction value \$40,000. Therefore, this is also the range in which the selling price for the company has to be.

The second superordinate category is the net present value, which consists mainly of the eponymous net present value method (NPV) and the so-called discounted cash flow (DCF) method. These two methods are similar and provide the present value of future earnings and future cash flows that a company is likely to generate.

Accordingly, a company that is established in the market can be evaluated by using the Net Present Value (NPV) Method or the Discounted Cash Flow (DCF) Method, as it can be analyzed quite reliable by its market value and its financial statements. Therefore, future earnings can be predicted very accurately. However, if a company is new on the market, the just mentioned methods don't suit perfectly, because these companies have neither significant market value nor meaningful financial statements as they are not yet established.

On this occasion, there can be used the common methods of the third superordinate category, the market value. The most common subordinated methods of this category are the Venture Capital (VC) Method and the Multiplier Method. The key point of these methods is that the company gets compared to other companies within the same peer

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group, which have already been sold or are longer on the market to get a comparative value.

Reasons to evaluate a business are primarily the request for buying or selling the business; in other words, in cases of mergers and acquisitions. But reasons can also be litigation, strategic planning, or determining a share value. As business valuation is a critical financial analysis, it should be done by a valuation expert with adequate qualifications to ensure that a comprehensive analysis with all its aspects is done. (Corporate Finance Institute, 2020)

2.2 Standard Valuation Methods

2.2.1 Net Present Value Method

The NPV method calculates the present value of future earnings – all earnings subtracted by all costs – minus the planned investment made in period t=0. Therefore, it discounts the estimated future net profits, which a company is likely to generate, by the so-called discount factor. The discount factor represents the percental earnings an investor or firm could make by investing in another option. Mostly, the annual dividend of secure bonds is taken as a comparison, like e.g., the 10-year us treasury note. The period which is chosen for the future earnings depends on the branch in which the considered company is located and the time horizon in which an investor expects his money to amortize. The result of the future earnings in the reviewed period subtracted by the amount of investment, which an investor is willing to pay has to be positive. Therefore, the investment would yield a profit.

The following example calculation will clarify the procedure of this method. Company X is interested in buying company Y. The managing director of company Y wants \$10 million for his/her company. Company X wants its investment to be amortized in a maximum of five years. After studying the balance sheets and income statements of company Y, company X gets to the following expected net incomes of company Y during the next five years:

Year	1	2	3	4	5
Net Income in million \$	2	2.5	2.75	3	3.25

Table 2: Expected Earnings of Company Y from Years 1 to 5

Assumed that the interest rate which the company gets if it invests in a 10-year us treasury note is 2%. When the future earnings now will be divided by the discount factor

of 2%, it results in an NPV of \$12.67 million.¹ The company has a value of \$12.67 million. The following table shows the net earnings after the deduction of the discount factor.

Year	1	2	3	4	5
Net Income in million \$	1.96	2.4	2.59	2.77	2.95

Table 3: Net Present Values for Years 1-5 of Company Y

As the NPV is higher than the offer of \$10 million, the company X would make a profit by investing in company Y and hence should buy it.

But with this method, there must be considered a further factor than just the discount factor, which could be generated if the money is invested in a risk-free bond. This factor is the interest of a particular risk that is taken over by buying a company. Hence, future earnings cannot be predicted surely. Therefore, it is appropriate to increase the discount factor by this rate. The higher the expected risk, that the company could fail the predicted earnings, is, the higher is the premium on the scale. Generally, the premium is at 5% to 10%.

If the discount factor in the previous example would be 7.5%, the value changes like follows:

Year	1	2	3	4	5
Net Income in million \$	1.86	2.16	2.21	2.25	2.27

Table 4: Net Present Values of Company Y with a Discount Factor of 7.5%

The value of company Y would, therefore, be \$10.75 million, using a discount factor of 7.5%.

An advantage of the NPV method is that it can be calculated easily and very fast. A disadvantage is that the future net profit has to be estimated. The longer the period is, the harder it is to make precise estimations, especially for startups. Another negative factor is that the formula varies extremely by changing the discount factor. In economic cycles, where a treasury bond generates an attractive return, is the profit of future earnings, which companies can create, less worth compared to times when the interest rates are low. Accordingly, opportunity costs influence the estimated worth of a company a lot, although these costs are not directly related to the company.

¹ For the exact calculation see excel sheet "NPV Calculation"

2.2.2 Discounted Cash Flow Method

The DCF method determines the value of a company by discounting the expected future cash flows which the company is likely to generate. It can be applied for startups as it doesn't take cash flows of the past years into account, so no historical performance has to be documented. The difference between the NPV method and the DCF method is that the DCF considers all corporate financial processes. In contrast, the NPV solely takes the present value of future profits into account. The expected future cash flows have to be divided by the discount factor the same way it is done by the NPV method to subtract the opportunity costs. Accordingly, the investment should be perceived if the discounted cash flow in time zero ($t=0$) is positive.

To reach the free cash flow amount, which is needed to calculate the DCF, the following scheme has to be followed:

The basis of the calculation presents the earnings before interest and taxes (EBIT). This amount has to be deducted by the adjusted taxes whereby the net operating profit less adjusted taxes arise (NOPLAT). This amount must be adapted by

- Amortizations and appreciations
- Change in long-term provisions
- Change in special reserves
- Gain/ loss on disposal of non-current assets

After these adjustments, the cash flow of the firm is reached. But this is not the final cash flow, which should be considered in the DCF method. The cash flow has to be adjusted by the change in net working capital, cash inflow/ outflow, and investments/ divestments in non-current assets. This leads to the free cash flow. With this result, the calculation can be done the same way as in the NPV method. Accordingly, the estimated values of the future free cash flows need to be deducted by the discount factor.

Future cash flows of company X can look like that:

	2021	2022	2023
EBIT	3,000,000	3,000,000	5,000,000
- adjusted Taxes	900,000	900,000	1,500,000
NOPLAT	2,100,000	2,100,000	3,500,000
+/- amortizations and appreciations	- 950,000	- 870,000	-1,530,000
+/- change in long-term provisions	- 120,000	150,000	110,000
+/- change in special reserves	- 100,000	80,000	140,000
+/- on disposal of non-current assets	50,000	250,000	170,000
Cash Flow	980,000	1,710,000	2,300,000
+/- net working capital	- 60,000	- 120,000	-120,000
+/- cash	90,000	60,000	150,000
+/- investments in non-current assets	- 560,000	- 290,000	-780,000
Free Cash Flow	450,000	1,360,000	1,550,000

Table 5: Free Cash Flow Example of Company X

Now, the interest of the opportunity costs of the company which wants to invest must be deducted from the future cash flows. Assumed that the interest rate is 5%, the following results arise²:

Year	2021	2022	2023
Net Free Cash Flow	428,571	1,233,560	1,338,948

Table 6: Net Free Cash Flows for Company X

Adding these net free cash flows leads to a total amount of **3,001,080**. Therefore, company X has a worth of about 3 million, using the DCF method.

An advantage of the DCF method is that it can be applied for all businesses, even for startups, because it relies on estimated future cash flows. Furthermore, this method

² See the calculation in excel sheet "DCF Calculation"

gives a much better impression of the whole financial activities of the company, which should be bought, as the complete cash flow has to be revealed. Finally, these adjustments lead to the free cash flow, which is needed for the calculation. (Deutsches Institut für Unternehmensnachfolge, 2020)

The longer a company is on the market, and the more stable the cash flows are, the less is the volatility of the financial projections. Additionally, the weighted average costs of capital (WACC) must be deducted from the free cash flows, which result from the weighted interest of equity and debt capital. (Deutsches Institut für Unternehmensnachfolge, 2020)

However, the DCF Method contains disadvantages as well. On the one hand, the DCF Method is a mathematical operation which bases on the input variables that are used. This means that the result can vary significantly if just one or two input variables differ from the real future amount. That is problematic, especially for startups. Thus, without any historical performance data, some variables can be challenging to estimate for startups.

2.2.3 Multiplier Method

As seen in the two chapters, 2.2.1 and 2.2.2, the NPV and DCF methods have a specific disadvantage. Especially for startups, which are yet in an early phase, these methods are not sufficient, as the startups have significant potential indeed, but simultaneously a considerable uncertainty, whereby a precise prediction of cash flows and revenue is impossible to do. To analyze in which phase another valuation method should be consulted, initially, it is of significant importance to categorize the different stages which startups usually run through. Generally, startups run through four major phases.

The first one is the seed phase. This is the phase in which the first ideas about the product and or service grow. An existing problem is analyzed, and a possible solution is discovered. The most money invested yet is from the founders, and there is no finished product, just a prototype, and there is also no production, but only a business plan yet. Furthermore, cash flows are generally negative.

The second stage is the startup phase. In this phase, a concept of the product and/or service is done, and the first income is generated. But the company is still not established on the market and has no considerable earnings. Often, the cash flows are negative as well.

The third phase is the growth phase. In this stage, the startup is already established in the market, and its sales and earnings start to grow significantly. It is not questionable anymore if the product and/or service appeal to the customers and the market. Therefore, the uncertainty of the company's success starts to decrease within this phase, and the cash flows get positive.

In the last stage, the maturing phase, the company is thriving and has a sustainable revenue. This is the first phase, in which the company can finance itself by bank funds or by an initial public offering (IPO) of its company shares. This is because the cash flow is very stable and confident in this phase.

The categorization of the different stages of a startup illustrates why the NPV and DCF methods can't apply. In the first two stages, the seed and startup phase, the uncertainty of a company is too significant, and the cash flows are, as mentioned, mostly negative. Therefore, it would make no sense to use one of the previously mentioned methods, as the results would not reflect the potential the startup has. For these companies, two other ways suit much better. One of these is the multiplier method. (Jasch, 2020)

It calculates the market value of a company by looking at different ratio indicators of similar companies.

The multiplier method can focus on a variety of indicators that can be used as the multipliers. These can be categorized into three different groups.

- The first one is the "equity multiplier." In this category are the price-earnings ratio, the price/book value ratio, and the price-cash flow ratio.
- The second one is the "entity multiplier." It relates the enterprise value to revenue, EBIT, EBITDA, or free cash flow.
- The third category is "special multiplier." It takes other operative figures into account or a variation of classic multipliers, like a combination of sales and EBIT multiples, in relation to the company growth. (Jasch, 2020)

The calculation itself bases on three steps. Firstly, the company must be analyzed. Part of this analysis is typically key financial figures, which are partly historical and partly forecasted, like the number of customers or cash flows of the next years. Then, one must do a risk analysis to measure the potential success or loss of the company. Subsequently, it must be selected which parameters should be used to determine the value of the company. The second step is to choose one of the multipliers which were named right before. As there are different key figures more important in specific industries like in others, there should be chosen one, which fits best to the respective

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industry. In the last step, there must be selected which reference group should be used. Therefore, it must be analyzed which companies are comparable to the firm to be evaluated in different categories like size and industry, and these must be used to compare. But it must not be forgotten to adjust the results by specific strengths and weaknesses which occur particularly in this company. (Jasch, 2020)

The following example will illustrate this:

A company in the advertising sector generated a revenue of \$5 million in 2019. The entity multiplier “enterprise value” (EV) in relation to the sales prices of comparable advertising companies is used for the calculation in order to determine the company’s value. The EV/Sales multiples for companies in this sector are determined at 1.94 as of January 2020. (Damodaran, 2020) This leads to the following formula:

Revenue x EV/Sales multiplier = company value

→ \$5 million x 1.94 = \$9.7 million

Therefore, the value of the company is \$9.7 million.

The advantage of the multiplier method is the easiness of the calculation. If there is access to the present data which is needed, it is just one formula required to determine the result. Furthermore, this circumstance makes the multiplier method very easy and quick to implement. Besides, as already mentioned, it can be used mainly for early-stage startups as revenue figures are not necessarily needed, and a negative profit is not reflected in the result. Moreover, specific balance sheet policies, which could influence the outcome of the balance sheet, only have a minor impact on the result using this method.

But this method also has some disadvantages. On the one hand, factors which make the company unique are not considered. Therefore, measures like growth potential, specific manufacturing processes, patents, or profitability are ignored. This can blur the real value of the company. Besides, the circumstance that early-stage startups don’t need to disclose their business figures. Therefore, it can be challenging to determine meaningful multipliers for the evaluation. (Jasch, 2020)

2.2.4 Venture Capital Method

According to the auditing company “Ernst and Young,” the VC method is the most used calculation to determine the value of a company. Therefore, more than 50% of all VC companies use this method. The VC method is a combination of the just mentioned

multiplier method and the DCF method. Three influencing factors need to be determined to calculate the VC method. The first factor is the liquidity which the startup needs to expand. The second factor is the risk, which the investor has by investing in the startup. The last influencing factor is the duration in which the investor wants to have his/her money back. Therefore, a so-called exit strategy is simulated, which means that it is suggested that the investor plans to sell his shares after a specific time. The key figures of the business plan, as well as empirical values of comparable companies are needed to calculate a sales price in period t . (Jasch, 2020)

The following example will illustrate the approach: A startup in the general insurance sector needs liquidity amounting to \$1.5 million. Its estimated revenue after five years is \$7 million, and the suggested EBIT sums up to \$1.25 million. An important role now presents the industry-standard multiplier. This is the average multiplier of all companies in this sector, which an investor wants to have to warrant his/her risk. The industry-standard multiplier in 2020 for the general insurance sector is 2.5 times the sales and 15.9 times the EBIT. (Damodaran, 2020)

The investor anticipates an exit after five years and expects a yearly return of 20% of his/her investment. This leads to the following calculation in order to determine the targeted exit proceeds:

Revenue x revenue multiplier = exit proceeds

→ \$7 million x 2.5 = **\$17.5 million**

These \$17.5 million reflect the expected worth of the company after five years. To calculate the future value of the investment, the following formula is needed:

Liquidity need x expected return = future investment value

→ \$1.5 million x 1.20^5 = **\$3.73 million**

Therefore, the investor expects his investment of \$1.5 million to be worth \$3.73 million after five years. In the next step, it is important to know how the value of the investment changes in relation to the exit proceeds. This relation is called the participation rate.

The associated formula looks like that:

(Future investment value x 100)/exit proceeds = participation rate

→ $(\$3.73 \text{ million} \times 100) / \$17.5 \text{ million} = \mathbf{21.3\%}$

Thus, the future value of the investment amounts to 21.3% of the future company value of \$17.5 million. Now, the post-money valuation, which means the value of the company after the \$1.5 million investment, needs to be determined. The following formula results:

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(Liquidity need/participation rate) x 100 = post-money valuation

$$\rightarrow (\$1.5 \text{ million}/21.3\%) \times 100 = \mathbf{\$7.04 \text{ million}}$$

Therefore, the company valuation on the day of reporting sums up to \$7.04 million after the investment, which makes an amount of \$5.54 million before the investment of \$1.5 million. Thus, at the time of valuation, the company to be evaluated has a worth of **\$5.54 million**. (Jasch, 2020)

The example could also be calculated with the EBIT multiplier, as all needed data is available. The final result would differ then, because the exit proceeds change.

Using the EBIT, the exit proceeds lead to the following calculation:

EBIT x EBIT multiplier = exit proceeds

$$\rightarrow \$1.25 \text{ million} \times 15.9 = \mathbf{\$19.88 \text{ million}}$$

The future investment value stays at the same level:

Liquidity need x expected return = future investment value

$$\rightarrow \$1.5 \text{ million} \times 1.20^5 = \mathbf{\$3.73 \text{ million}}$$

But the further calculation changes, because of the different amount for exit proceeds:

(Future investment value x 100)/exit proceeds = participation rate

$$\rightarrow (\$3.73 \text{ million} \times 100)/\$19.88 \text{ million} = \mathbf{18.76\%}$$

This leads to a post money valuation of:

$$\rightarrow (\$1.5 \text{ million}/18.76\%) \times 100 = \mathbf{\$8 \text{ million}}$$

Accordingly, the company has a pre-money valuation of **\$6.5 million**, so nearly \$1 million higher than by using the sales multiplier.

This example demonstrates that the VC method can differ significantly, when various multipliers are used. This is an essential problem of this method. An investor should always consider, to use as many multipliers as possible, to reach a reliable average value. But this method also has significant advantages.

One advantage of the VC method is that it is fast and easy to calculate. Furthermore, it needs no specific details about the company and forecasts of future development, because it takes a scale from other companies of its peer group. But this advantage brings disadvantages simultaneously. As all company-specific data is neglected, its result is relatively vague. Moreover, the fact that the calculation should be applied for exits in the future, but refers to multiplier data from exits of the past can distort the result, especially, if it must be assumed that the structure and the importance of an industry change within the near future. (Jasch, 2020)

2.3 Criticism of the Methods

This chapter will deal with the pros and cons of the mentioned business valuation methods and will compare them to each other. All these business valuation methods have in common that they are easy to implement and to calculate. Furthermore, they are all quickly executed. The **NPV method** is the only one, which should not be used for startups, as using this method only makes sense if the company to be evaluated has stable earnings as well as a consistent and predictable growth rate, such as mature and established businesses. Because, in the beginning, startups have often a negative income and a hard to predict growth rate, this method is not appropriate to measure them. Besides, it is the only method which concentrates just on one financial figure. The net profit is indeed a very important figure to measure the value of a company, as it reflects best the earning potential. Still, it can also be misleading, e.g., for businesses that invest a lot of their earnings in the growth of the company again, like in the technology sector.

The **DCF method**, however, has some advantages in comparison to the NPV method. It can be used better for companies with an unsteady growth in the future or a lack of earnings in the history, as they do not just display the earnings of the business but also rather the whole cash flow which a company generates. As the cash flow is revealed in this method, an investor also has a better overview of the use of a business's funds. But this can also pose a problem, especially for early-stage startups, as the future cash flows can be very hard to predict for them. Thus, this method is more extensive than the NPV method and also more suitable for companies that have not yet stable earnings and/or growth. Therefore, it can also be used for businesses which are only a few years on the market. But it should also not be used solely for very new businesses, because the inaccuracy of the prediction of the cash flows, can mean a huge erroneous assessment of the value of the business. Furthermore, it must not be forgotten that this inaccuracy does not necessarily occur only in early-stage businesses. External circumstances or the beginning of a recession can change future the factual situation drastically in contrast to the predictions.

The **multiplier method** has one major advantage over the NPV and DCF methods. As the multiplier method compares the value which similar businesses obtained in the past, it shows real numbers that the market was willing to pay for such companies like the one to be evaluated. Inaccuracies in the prediction for future cash flows of the company itself cannot arise using this method. But this advantage can also mean a

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disadvantage as possible differentiating features which this specific company can have in contrast to the similar businesses are not considered. Thus, the multiplier method gives a useful impression of the market values of comparable companies. Still, it may not be forgotten that the specific business to be evaluated has most often completely individual characteristics. Furthermore, it can be difficult to get the data from similar businesses or to find reliable data from the sources which are available. Thus, the data can be corrupted or incomplete and can, therefore, distort the calculations.

As the **VC method** combines the DCF method and the multiplier method, it unites the advantages of both methods. But it also has the named disadvantages. But the supplement of the two methods gives one of the most precise value analyses of a business and is accordingly the most used method. Especially for companies that are located in industries in which suitable information exists, the VC method can provide the most reasonable value estimation. (Bilby, 2018)

Nonetheless, it must be mentioned that using different multipliers can often lead to different results. Accordingly, it is nearly impossible to find the one perfect fitting valuation. The problem here can be that the investor wants to choose the multiplier, which leads to the lowest company value, and the owner of the company wants to choose the one which leads to the highest value. To reach an arrangement is, therefore, always making compromises.

3 Sustainability

3.1 Definition

In earlier times, when a businessman was asked what sustainability means, there was often the answer that it indicates how stable a company can generate its profits throughout a specific time. The more stable the profits are, the higher was the sustainability of a company assessed. In this relation, sustainability was just seen as an economic factor. According to that, sustainability was synonymous with a reliable profit and the commercial success of a company; in other words, its financial viability. But this kind of definition has changed within the past years. It can instead be said that the word sustainability became ambiguous because nowadays, it does not mean just this economic factor. Primarily, the term “environmental sustainability” has become very popular during the past years. But furthermore, sustainability can also be involved in the social area, where it gains in importance. To achieve environmental and social sustainability, a company must develop sustainable governance, which builds the third meaning of the new sustainability understanding. These three modern views of sustainability are often compared under the so-called “ESG” factors. Together, they define the overall sustainable performance of a company.

The company MSCI names 37 ESG key issues, which a company can influence its sustainability. Therefore, it subdivides the umbrella terms environmental, social, and governance in further topics.

For environmental, these subtopics are:

- Climate Change
- Natural Resources
- Pollution and Waste
- Environmental Opportunities

The social topics are as follows:

- Human Capital
- Product Liability
- Stakeholder Opposition
- Social Opportunities

Finally, the governance subtopics are:

- Corporate Governance
- Corporate Behavior

These topics are further divided into a total of 37 ESG issues. (MSCI ESG Research LLC, 2020) These issues will be explained more detailed in chapter 3.2.

3.2 Types of Sustainability

3.2.1 Environmental

The environmental sustainability measures the degree of diligence with which a company avoids environmentally unfriendly results throughout the wholistic value chain process. To proof the ecological impacts, a company must disclose specific data. As mentioned in chapter 3.1, the four main categories in which environmental sustainability can be divided are “climate change,” “natural resources,” “pollution and waste,” and “environmental opportunities.”

The most critical issues concerning **climate change** are *carbon emissions*, *product carbon footprint*, *financing environmental impact*, and *climate change vulnerability*.

Carbon emissions are bad for the environment in many ways, but especially as they lead to global warming. The topic “carbon emissions” shows how much carbon and also greenhouse gas emissions a company produces. The more it produces, the worse for the environment. The “product carbon footprint” is directly connected to the carbon emissions and demonstrates the amount of carbon that is needed to produce a product. The “financing environmental impact” indicates the use of financial instruments like land trusts and emissions trading to make an active contribution to environmental protection. The climate change vulnerability measures the degree of a company’s proneness to climate change. Continuing and more extended periods of dryness can, e.g., influence the output of a company that needs a lot of water for its production.

The category “**natural resources**” demonstrates how many finite resources a company consumes within a specific period. These resources can be subdivided into three major parts: The *water stress*, so the quantity of water required, the *biodiversity and land use*, so the degree of animal and plant species which are threatened by a business, and the *raw material sourcing*, thus the degree of finite raw materials which are consumed by a company.

Pollution and waste can be subdivided into the types of dangerous waste materials, which can harm the environment. The main categories for that are *toxic emissions and waste*, *packaging material and waste*, and *electronic waste* as all these types of waste burden the environment.

The last category, **environmental opportunities**, however, illustrates the ways of how a company can profit from environmental precautions. Therefore, companies that invest in *clean techs* like solar energy, *green buildings* with a minimum degree of the environment polluting cement, or *renewable energy* like wind energy, can profit from their environmental friendliness and achieve a competitive advantage over its rivals. (MSCI ESG Research LLC, 2020)

A company that can prove that just one single criterion is fulfilled acts already environmentally sustainable in a certain kind of way and can, therefore, get a certificate, although other vital issues are not appropriately managed. (Silda Wall Spitzer, 2019)

Environmental sustainability is especially nowadays very popular. In particular, the Fridays for Future movement took this topic to the broader public. According to the “Statistisches Bundesamt” (Statistisches Bundesamt, 2019) of the Republic of Germany, in 2017, there were spent slightly over €70 billion for environment protection. These expenses rose steadily from 2010, where approximately €52 billion were spent. Interesting, however, is the distribution of the money spent. In 2017, €45.5 billion were issued by companies, €13.5 billion by private households, and just over €11 billion by the government. Therefore, 65%³ of the expenses for environmental protection are issued by the companies in Germany and only 35% by the government and private households. This shows that the expenses for and investment in the environment are, most of all, the concern of companies. A comparison to the year 2010 clarifies that. Here, the expenses of companies were at €30 billion, the ones of the private households at €13.5 billion and of the government at about €8.5 billion. This illustrates not only the significant increase within these seven years from €52 billion to €70 billion, which is an increase of nearly 35%, but also the distribution of it. Whereas the percental share of the companies was about 58% in 2010,⁴ this share rose to 65% in 2017. The topic of environmental protection is consequently especially for companies of very high importance. A subdivision of the expenses in the categories “investments in environment protection” and “running costs for environmental protection” provides more detailed information. As private households do not make investments in environmental protection, in this category are only companies and the government listed. In 2017, the expenses of companies were about €9 billion and the ones of the

³ €45 billion expenses of the companies in relation to €70 billion expenses in total

⁴ €30 billion expenses of companies in relation to €52 billion expenses in total

government about €4.5. Accordingly, the companies make twice as many investments to support environment protection as the government. But it must also be said that in 2010 the difference was higher. Here, companies invested about €7.5 billion and the government about €2.7 billion. Thus, in 2010 the German companies spent approximately 2.8 times the amount of the government. Although the investments of companies increased throughout the years, the expenditures of the government exceeded the ones of the companies.

Furthermore, it must be mentioned that the yearly inflation rate deducts the increase in the investments of companies during these seven years. An increase of 20% from 2010 to 2017 comply with an annual rise of about 3%. But as the average yearly inflation rate in Germany during this period was about 1.3% (Rudnicka, 2020), the real annual increase in investments is about 1.7%.

Nevertheless, also the statistic about greenhouse gas emissions, supports the view, that climate protection has a not to neglectable importance nowadays. Accordingly, the produced emission decreased from 1,251 million tons in 1990 to 805 million tons in 2019. The aim is to reduce this emission in the future years drastically and to have a nearly greenhouse gas neutrality in 2050. (Umweltbundesamt, 2020) To realize this aim, the pressure on companies in Germany will be very high. Therefore, companies which invest already in an environmentally sustainable culture, have a competitive advantage in the nearer future, which needs to be reflected in the valuation.

There are different ways to prove an environmentally sustainable company culture. A company can, for example, get a certificate from various institutions like the “Benefit Corporation” or the “TÜV.” Another way would be to prove the environmentally sustainable production of the company’s products, which can be confirmed by a seal of quality like a bio label or the “Blauer Engel.” Blauer Engel is a seal that was introduced in 1978 in Germany from the then Minister of the Interior Gerhart Baum and the ministers of the federal states who are responsible for environment protection. It appreciates particularly environmentally friendly products and services. Today, more than 12,000 products and services of about 1,600 companies in Germany are honored. (RAL gGmbH und Umweltbundesamt, 2020).

But while these certificates or seals can prove specific environmentally sustainable processes of a company, it is not necessarily a proof that every part of the value chain of a company is environment-friendly. Such a certificate or seal does only consider a particular part of the company. On the other hand, it must not necessarily mean that a

company does not act sustainably if it has no certificates or seals, as it is just not possible to award all companies which operate (partly) sustainable. Nevertheless, a certificate/seal is always a good indication that a company cares about the environment and tries to act appropriately to protect it. (Silda Wall Spitzer, 2019)

3.2.2 Social

The social sustainability score describes the working conditions for the entirety of the employees. Relevant categories hereby include the diversity of the employees, the labor relations, arrangements to ensure the health and safety of the employees, and more. In this regard, a company acts socially sustainable if it employs people, no matter which religion, race, or sexual orientation they belong to. But also, the working conditions play a crucial role.

Human capital represents the most critical component of social issues. The human capital category can be subdivided into the topics of *labor-management*, *human capital development*, *health and safety*, and *supply chain labor standards*. Accordingly, a company is measured by the treatment of the employees. Influencing factors are, therefore, e.g., the working conditions, training possibilities, safety standards, or employee participation for important decisions. But as the category “supply chain labor standard” shows, to perform well in this sustainability category, there is not only the treatment of the own employees of importance; it must be instead ensured that the employees of associated companies are treated well too.

The category “**product liability**” is often forgotten but plays a significant role in the degree of social sustainability nonetheless. Product liability means hereby that a product or service is measured by its responsibility, accountability, reliability, and durability, which it needs to have for the consumer. It can be divided into six parts.

The first three categories deal with the topics of *product safety and quality*. As the category name indicates already, here is measured of how quality a product is, so how functional, durable, and safe its usage is. This is applicable to companies in the cleaning industry. Here can be measured how dangerous, corrosive, or environmentally friendly the products are. But it can also be applied for companies in the financial market, as products within this market can also be more dangerous – in the meaning of volatile – than others. In this category, a company can best prove its social sustainability by certificates or seals on the company’s products. The next subcategory of product liability is *privacy and data security*. This category has caused

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a lot of stir, especially in the last few years. The topic of cybersecurity was vigorously discussed, and it ended with a strict privacy policy in Germany. Companies that did not care a lot about cyber privacy or security had thereupon to invest a lot to satisfy the new requirements. This illustrates the actuality of this topic.

Furthermore, *responsible investments* are assumed for companies which want to show up a socially sustainable behavior. This means that companies should analyze and rethink possible investment options carefully before they start to invest to ensure a safe and sustainable investment. The last point is a *health and demographic risk*, which every company should be aware of. Therefore, health and demographic changes throughout the years should always be considered when creating a product and analyzing the market. A sustainable product should serve to improve a customer's health and well-being. Accordingly, tobacco companies would get a bad score in this subcategory, as smoking is verifiably unhealthy.

The next major category in the social sustainability segment is the **stakeholder opposition**. This means that a company should be sure about the aims and ethical procedures of its stakeholders to ensure smooth cooperation. Companies that act against their stakeholders will get serious moral conflicts when making decisions.

The last category covers the **opportunities** which a company can achieve by acting socially sustainable. A socially sustainable company can create better *access to communication, finance, and healthcare* and can, therefore, improve the well-being of its customers. A positive example would be a company that produces *healthy nutrition*. (MSCI ESG Research LLC, 2020)

Nowadays, social sustainability is also essential in the labor market. There is not just a competitive market for the employees anymore, but also a very competitive market for employers. Companies must invest in social sustainability, to gain a competitive advantage in hiring the most skilled employees. A descriptive example of a socially sustainable work environment is Google. It is known that Google has, for several years, the highest amount of job applications worldwide. In 2019, it was about 2 million applications, although just about 7,000 jobs were offered. This enormous amount of people who were interested in working for Google was not only a reflection of the high wages which Google pays. Rather, it was the fact that Google invests in good working conditions and social sustainability like nearly no other company. Accordingly, the mentality of Google is to create a working place that is more than the standard office. The employees should be allowed to develop freely and should draw their creativity

through the surroundings of the workplace. Therefore, Google provides its employees with a large number of benefits free of cost. Some of these benefits are, for example:

- Health and dental checkups
- Cafeteria
- Massages from professional masseurs
- Gym, swimming pool, and further sport activities
- Professional hairdressers
- In-house sleeping possibilities
- Video game stations and so on

All these services, which Google offers, help to ensure a working atmosphere, which makes the employees happy, more creative and efficient. This is made evident by the fact that Google is nowadays one of the most successful and lucrative companies in the world. This illustrates yet again the enormous value of social sustainability for a business that wants to gain success. (Li, 2020)

3.2.3 Governance

The Governance sustainability score relies most of all on the actions of the board of a company. Inherent are, for example, company ethics, board diversity and composition, shareholder rights, supply chain engagement, and others. (Silda Wall Spitzer, 2019) Thus, governance sustainability deals with the behavior, interaction, communication, and execution of all topics, which are determined by the management level of a company. These actions generally affect all parts of a business. Therefore, a sustainably working governance is essential in order to achieve a sustainable behavior in the other two parts as well, namely the environmental and social sustainability. Accordingly, it is, to an equal extent, essential for all kinds of businesses and all types of industries and no matter where a company is located.

Achieving an efficient working sustainable corporate governance starts with the structure of the governance. Responsibilities within the management level need to be assigned, and the strategic direction of the company must be formulated explicitly. It is also essential that the aims, the strategic direction, and the general company mentality are conveyed to all levels of the company.

The first major category in which governance can be divided is **corporate governance**. It can be parted in four further categories. The first one is the *board diversity*. As the topic already reveals, hereby is examined how diversified a board is.

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The more people from different races, ages, sexes, and ethnic origins it has, the better is the score for board diversity.

The second subcategory is *executive pay*. It says that the payments and bonuses for the management board should always be in proportion to the turnover and profit of the company.

The third classification is *ownership and control*. A company would get a bad score in this category if it is partly owned by another company which has opposing goals in specific areas. But the degree of control and monitoring of the government can pose a problem as well for a company and therefore lead to a bad score.

The last category is *accounting*. Every more prominent company needs to make accounting and show its financial figures with its balance sheet and income statement. If a company would conceal specific data, e.g., in its cash flow, or even modify some data, this would lead to a massive reputation loss, if the matter became known to the public, and a sinking sustainability score.

The second major category for governance sustainability is **corporate behavior**. This part can be subdivided into five categories. The first one is *business ethics*. Here are the (un-)ethical practices of employees considered, especially of the company's board, as their decisions and behaviors can affect the whole company. E.g., a company that produces in countries in which child labor is encouraged, acts unethically in its business decisions.

Furthermore, *anti-competitive practices* of a company can harm its ESG score. As it is not allowed in a country with a free market system to make price agreements, bid-rigging, or boycotts, a company that does so, acts unethical and also unsustainable in this area.

Apart from that, a company's governance sustainability is also measured according to the points of how high its *tax transparency* is and how *stable the financial system* is.

The last relevant category is the *corruption and instability* of the board. A sustainable working board may not accept a bribe or prefer a supplier because of personal reasons, as this can damage the outcome for the company itself and also for the competition of the market. (MSCI ESG Research LLC, 2020)

According to BSR's sustainability management work (Eapen, 2017), four main principles should always be considered when a sustainable governance structure should work.

1. **Commitment begins at the top** (Eapen, 2017):

This means that a company can only act sustainably if the top-level management is committed to this idea, and everybody cooperates accordingly. Furthermore, it is also crucial that processes, changes, or interactions at all levels within a company, which can influence sustainability, are reported to the CEO or another manager at the top level. This demonstrates a serious commitment in terms of sustainability.

2. **Accountability must be established and communicated clearly** (Eapen, 2017):

Accountability is necessary to integrate sustainability into other business goals. A useful measure would be to include sustainability goals in the company's annual goals and to include a sustainability performance measure in the employee performance review.

3. **Alignment between the structure and the business is imperative** (Eapen, 2017):

It will be impeded if the company tries to implement sustainability governance structures if they do not fit in the existing business model and organizational structures. If the introduced governance structures would compete with existing structures or would complicate the current business model, the business would fail. Therefore, sustainability governance structures must complement and support existing structures.

4. **Flexibility to adapt and build upon the sustainability program across business units and regions can advance the sustainability agenda** (Eapen, 2017):

As different local areas can have varying given conditions, it is required to have a flexible sustainability program so that it can be adapted to these locations without the need for a new program or significant changes, that would compete with the first program. The same is also true for different business units, as given conditions can vary significantly from unit to group. To adapt the sustainability program to the respective business unit, does not only make the implementation more realistic but also can encourage the engagement of the employees.

These principles must always be in mind to create a sustainable governance structure, as they form the basis on which this structure can be built. To ensure that sustainability strategies are correctly implemented, one should establish a committee, which has the

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task to oversee the company's activities and to intervene if anything could oppose to the named sustainability goals. Furthermore, sustainability leaders should be appointed with varying levels and titles, led by the so-called Chief Sustainability leader, who controls and manages the sustainability issues. The implementation of sustainability teams and high-level manager positions for that task can be very costly and time-consuming. Still, however, it helps a company, in the long run, to structure and execute its sustainability tasks efficiently and successfully as soon as the committee is well-rehearsed. Grievances and problems can be counteracted hereby, and a sustainable acting value chain can be created.

4 Determination of an ESG Score for a Business

4.1 Standard Methods to Determine an ESG Score

4.1.1 MSCI ESG-Rating Methodology

MSCI is one of the leading providers of tools and services, which help the investment community in decision making. Therefore, the team of MSCI researches and collects essential data whereby the clients get the knowledge to understand key drivers of risk and return and to build a more effective portfolio. Therefore, MSCI tries to make the complex investment world more transparent and the investment process more verifiable for its clients. Furthermore, MSCI issues several funds, composed of the data and knowledge which they have, to create a stable and sustainable portfolio for its clients. One important niche of MSCI is funds that are composed of companies that act in accordance with ESG requirements. Therefore, MSCI has established an ESG-Rating Methodology to evaluate the sustainability concept of several funds. This should give investors the knowledge to understand how ESG can influence the long-term risk of a portfolio and the return profile by providing critical insights for them. (MSCI, 2019)

The MSCI ESG fund ratings include at the moment about 36,000 funds from all over the world. The rating ranges from AAA to CCC, whereby the scores of AAA and AA mean, that the issuer has a leading or improving management skill to avoid key ESG risks. These funds are seen as leaders in ESG aspects and consist, therefore, on companies which are very resilient to disruptions concerning ESG events. The scores A, BBB, and BB stand for an averagely ESG risk management of the companies on which this fund is based. This can mean that all contained companies are on an average ESG risk management level, but also that it consists of companies that are above and below average but which result around the average ESG risk management when added together. The scores B and CCC mean that the fund does not integrate companies with a high level of ESG risk management but consists of companies with low or worsening management. These companies are more vulnerable to several disruptions. Those funds are called laggards. (MSCI, 2019)

Furthermore, MSCI provides an overall “Fund ESG Quality Score” and further general Environmental, Social, Governance scores, which range both from 0 to 10. Hereby, the number of the ESG Quality Score can be converted to the Fund ESG Rating. The conversion table looks like that:

Determination of an ESG Score for a Business

Fund ESG Quality Score	Fund ESG Rating
8.6 - 10	AAA
7.1 - 8.6	AA
5.7 - 7.1	A
4.3 - 5.7	BBB
2.9 - 4.3	BB
1.4 - 2.9	B
0.0 - 1.4	CCC

Table 7: Relationship of Fund ESG Quality Score and Fund ESG Rating (MSCI, 2019)

It conveys an ESG value based upon the underlying holdings on which the fund consists of.

The MSCI ESG-Rating system bases mainly on three different influencing factors. The first factor is the **sustainable impact**. Here, it is measured to what extent a fund contains companies whose main tasks it is to address core environmental and social challenges. Funds that are composed of companies that have a sustainable impact are directed to investors who want to invest, especially in firms that have measurable social returns per dollar like a clean technology exposure.

The second factor is the **Values Alignment**. Funds, which align with specific values like, e.g., ethical, religious, or political, are taken into consideration here. Especially for investors with a particular attitude to morality, these funds are of importance. These funds avoid companies that are located in sectors that may be morally questionable, like tobacco, alcohol, or weapon manufacturing, or which violate human rights, e.g., by employing child labor.

The third one is the **risk** factor. Hereby, metrics help the investors to understand specific ESG-related risks, which can occur in companies, which neglect measures to encourage sustainability factors in the company. Especially for investors with a long-term horizon, this factor is of great importance, as an unsustainable behavior of a company can have dramatically adverse effects in the future. A new law in the future that aims to reduce carbon consumption could, for example, force the company to invest much money to change their production processes in order to meet these targets. But natural incidents can influence these companies as well. Future scarcity of oil could mean, for example, the end of a business model of a company that is strongly dependent on oil, as soon as the oil reserves go down. (MSCI ESG Research LLC, 2019)

Determination of an ESG Score for a Business

To be included in the MSCI ESG Fund Ratings, the following three criteria must be satisfied:

1. 65% of the fund's gross weight must come from securities that are covered by the MSCI ESG Ratings. Hereby, cash positions, and other specific asset types like Currency, Foreign Exchange and Interest Rate Swap are removed so that the calculation only considers securities which are relevant for ESG measures. The values of short positions, however, are included in a fund's gross weight calculation but are treated as uncovered for ESG data. (MSCI, 2019)
2. Fund holdings date must be less than one year old (MSCI, 2019)
3. The fund must have at least ten securities (MSCI, 2019)

The following table gives an example of the Fund ESG coverage calculation:

	Market Value	Fund Weight	Absolute Market Value	Gross Weight	ESG Rated	Contributes towards Fund Metrics Coverage	Covered Weight
Security A	400	50%	400	40%	YES	YES	40%
Security B	400	50%	400	40%	YES	YES	40%
Security C	100	13%	100	10%	NO	NO. Security not covered by ESG Ratings	0%
Security D	-100	-13%	100	10%	YES	NO. Security held as a short position	0%
Total	800	100%	1,000	100%			80%

Table 8: Fund ESG Coverage Calculation Example (MSCI, 2019)

Determination of an ESG Score for a Business

With 80% coverage, this fund meets the criteria of 65% covered and would, therefore, be listed in the MSCI ESG Fund Rating. Of course, the fund needs to include at least ten securities as well, for simplification purposes, here were just four securities mentioned.

Now, the actual calculation of a Fund ESG Quality Score can be done. The example fund will consist of five securities, again for simplifications. The first step is to calculate the “Fund Weighted Average ESG Score.” To figure this, the so-called “Overall ESG Score” of the underlying holding is needed. The Overall ESG Score can be found either as the result of the “ESG Ratings Final Industry-Adjusted Score” or of the “Government Adjusted ESG Score” of the issuer depending on its asset classification. The following table offers an overview of the Weighted Average ESG Score of the hypothetical Fund X:

	Weight	ESG Score	ESG Rating	ESG Rating Trend	Normalized Weight	Normalized Weight x Score
Security A	40%	7.0	A	0	50%	3.5
Security B	20%	2.5	B	0	25%	0.6
Security C	20%	N/A	N/A	N/A	0%	N/A
Security D	12%	6.0	A	1	15%	0.9
Security E	8%	8.0	AA	-1	10%	0.8
Total	100%				100%	5.8

Table 9: Example Calculation of the Fund Weighted Average ESG Score of Fund X (MSCI, 2019)

As security C has no ESG score, it was taken out in this calculation, and the percental weights of the remaining securities were adjusted to get the normalized weight of 100%. The ESG scores of the securities were now multiplied by their normalized weight. The resulting scores of each security were finally added up to get to the weighted average rating of 5.8.

In step 2, the result of the calculation needs to be adjusted by positive and negative ESG trend changes of the fund, as well as by the ESG laggards of the fund.

As seen in table 7, security D had a positive ESG rating trend and security E had a negative ESG rating trend. As security B has only an ESG score of 2.5 and accordingly a B ESG rating, it represents the laggard security of table 7. Thus, the calculation needs to be adjusted by the weight of these three securities. Positive trends are added hereby, and negative patterns, as well as laggards, are subtracted. Hence, the following adjustments result:

Change	Fund Factors	Fund Values
Plus	Fund ESG Trend Positive	12%
Minus	Fund ESG Trend Negative	8%
Minus	Fund ESG Laggards	20%
= Adjustment %		-16%

Table 10: ESG Score Adjustments

As seen in table 8, the Fund Weighted Average ESG Score of fund x must be deducted by the -16% adjustment.

$$\rightarrow 5.825 \times 16\% = 0.932$$

$$\rightarrow 5.825 - 0.932 = 4.893$$

For the fund X results an **ESG Quality Score of 4.983** and the **ESG Fund Rating BBB**. Accordingly, the fund is located in the ESG middle range. (MSCI, 2019)

As already mentioned, MSCI does not only provide ESG scores for whole funds; they collect and also develop data for single companies, as this data is needed for the calculation of the fund's ESG Quality Score. Therefore, MSCI analyzes ESG risks, which a company can have. These risks normally do not show up in the financial statements of a company and must, therefore, be analyzed separately. Specific industries usually have special risks, which are most important for this industry. Especially environmental and social risks (E&S) can differ significantly from industry to industry. Governance risks, however, are mostly the same, as they concern all companies within all sectors the same. But for the analysis of E&S risks, it is important to consider the industry-specific risks for a company and compare the management of a company with these to other companies in its peer group.

Furthermore, it is necessary to analyze these industry-specific risks of a company, particularly in the light of business activities, size of the operation, and operating location of a company, as these factors can make quite a difference. Thus, the score calculation is based on two influencing factors. Firstly, the specific risk exposure of the

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company within its industry is analyzed. The more risks are possible in this industry, the higher is the risk exposure score of the company. Secondly, the risk management score of a company is determined. This means that it is analyzed, how well a company handles their specific risks, and what actions it does to prevent or reduce them. Therefore, the final ESG score is calculated from the company's risk exposure itself on the one hand, and the company's risk management on the other hand.

To get the data that is needed, MSCI collects information of thousands of sources that are publicly available and also considers controversies that may indicate performance failures. This information builds the basis of MSCI's ESG risk score rating. It assigns a percental weight for each determined ESG risk of a company according to the impact it can have and the time horizon of the risk. These percental weights are then combined and normalized relative to industry peers. Consequently, an overall value results, which compares the company to its peer group.

For example: A mining company that **mismanages water resources, waste, and emissions**, that **demonstrates severe lapses in safety** and that consists of a **board with evidence of corruption** would get the worst ESG score of CCC, as it fails to manage **environmental**, **social** and **governance** risks all the same.

4.1.2 E&S Disclosure Quality Score

The E&S Disclosure Quality Score, which was launched in 2018 from the proxy advisory firm Institutional Shareholders Services, Inc. (ISS), rose to a further important sustainability rating. Like the ESG Rating Methodology of MSCI, it provides an evaluation of E&S disclosures for investors to understand risks, which individual companies in their portfolio can have. ISS uses a specially created metric. Therefore, the exposure on environmental and social issues of a company is being analyzed, and critical disclosure omissions are being identified. (Zabihollah Rezaee, 2020)

In mid-2019, the E&S Quality Score covered about 4,700 companies and 24 industries. To evaluate the disclosure score of a company, the ISS data is based on the information which is published by the companies themselves and analyzes upon this data the quality of the disclosure and takes this into account for the final evaluation. For the assessment, ISS divided the environmental category into 12 subcategories like "management of environmental risks and opportunities," "carbon and climate," or "natural resources." The social categories are grouped in 25 subcategories, like "human rights," "labor health and safety," or "stakeholder and society." This approach

shows broad similarities to the one of MSCI, as both companies, create subcategories for the E&S issues and evaluate a company by every single one.

In contrast to MSCI, however, the E&S Disclosure Quality Score solely analyzes single companies and scores them, it does not create an ESG classification based on the companies' separate ESG scores, like MSCI does. Also, ISS focusses more on the disclosures themselves than on the sustainable value which the company delivers. Furthermore, to reach the scores of the single subcategories and, therefore, to the final score, ISS has developed a questionnaire with over 380 questions. Mostly all questions can apply for every industry, and the questionnaire is compiled from formulated sustainability goals of organizations like the United Nations. (David Bixby, 2019)

The following figure from ISS demonstrates their methodology:

ABC Corporation

ABC Corporation, together with its subsidiary, XYZ Limited, owns a 20% equity interest in Iron Mining Company that operates an iron mine in Canada.	REGION	LAST MEETING DATE
	Canada	10 MAY 2016
	COUNTRY	LAST DATA PROFILE UPDATE
	Canada	20 JAN 2018
	INDUSTRY GROUP	SCORES AS OF
	Steel	24 JAN 2018

OVERVIEW OF SUSTAINABILITY DISCLOSURE PRACTICES			
 Environment	10	 Social	10
Management of Environmental Risks and Opportunities	9	Human Rights	8
Carbon and Climate	8	Labor, Health and Safety	10
Natural Resources	8	Stakeholders and Society	10
Waste and Toxicity	5	Product Safety, Quality and Brand	3

Figure 2: Example of ISS Methodology (Institutional Shareholder Services, Inc., 2019)

The scenario is that ABC Corporation owns a 20% equity on a Canadian Iron Mining company. As can be seen, numbers from 3 to 10 were allocated to the previously mentioned categories. These scores indicate decile rank relative to the company's peer group. Figure 1 shows hereby a high level of the disclosure; the number 10 means that nearly nothing is disclosed. Therefore, the example shows a company that reveals very little in most of the sustainability issues. Only in the category product safety, quality, and brand, the company reached a high score of three. The overall scores both for the environment and social sustainability disclosures have a valuation of 10. Therefore, the company performs badly concerning its sustainability disclosures within its industry. An investment in this company is accordingly riskier. (Institutional Shareholder Services, Inc., 2019)

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The E&S Disclosure Quality Score is a prominent figure, as news about ESG sustainability issues is often solely disclosed by the companies, and it is hard to get the information otherwise. With this score rating, an investor can at least assess how valuable and meaningful the statements of the companies are. It is, therefore, an excellent supplement to other classifications.

4.1.3 Governance Quality Score

The governance quality score is also developed by ISS. As the name says, it monitors company governance based on data-driven screening. The scoring for governance attributes is parted in four topical categories: Board Structure, Shareholder Rights and Takeover Defenses, Compensation/Remuneration, and Audit and Risk Oversight. Over 230 governance factors are considered for the evaluation, of which up to 127 can be applied for one single company. Thereof are 30 core factors, which refer to a broad range of companies in at least 29 different countries. This makes the governance scores more comprehensive and comparable within the specific market in which the company is located.

What kind of factors are used depends on the index and region in which the company is located. Therefore, every single region also has a specific type of questionnaire, which is only applicable to them. E.g., the question: “What is the outside director composition of the board?” is only relevant to Japan. The reason is that company insiders often dominate Japanese boards. Outside directors, however, could enhance the board’s monitoring and oversight abilities. Therefore, the external director composition is an essential issue for Japanese governance. As other markets usually employ a broader range of outside directors, this question however is not suitable for those markets and therefore not in their questionnaire.

The annual filing of a company mainly collects the information on which the data set is based. This includes annual reports, the company’s proxies, meeting notices, circulars, and other publicly disclosed materials. All this data is analyzed in a second step by professional ISS analysts, who utilize all information and edit it. Companies are given a chance to submit changes in one of the governance factors to ISS regularly. ISS updates, therefore, once per day, the Governance Quality Score, as far as anything has to be changed. So far, the ISS Governance Quality Score covers about 6,000 publicly traded companies in 30 markets. (Institutional Shareholder Services, Inc., 2020)

The approach corresponds in the main features with the E&S Disclosure Quality Score, meaning that the rating scale also goes from 1 to 10, whereby one means that the company has a relatively high quality of governance and accordingly a rather low governance risk compared to its peer group. A score of 10 means the opposite equivalently.

The final governance quality score, however, bases on so-called raw score calculations. These raw calculations are made for different topical categories that are selected depending on the industry or region in which the company is located. These raw points are then transferred into the 1 to 10 score scale for every topical category. Less raw points mean hereby a higher governance score. Finally, the single scores of the category are summed, and an average is built, which results in the final Governance Quality Score. The following table gives an example of how a Governance Quality Score is calculated for an S&P 500 U.S. company:

Rating Category	Raw Points	Governance Quality Score
Board	23.3	8
Audit	56.9	7
Shareholder Rights	28.3	5
Compensation	19.2	10
Total	127.7	8

Table 11: Governance Quality Score Example (Institutional Shareholder Services, Inc., 2020)

As can be seen in the table, a governance score can differ significantly from rating category to category for a single company, but as well in relation to the raw points, which were assigned to the company. This is because the governance quality score is a measure that must be seen in relation to the company's peer group. Therefore, it can be that the raw point score for the category "Shareholder Rights" of 28.3 points can lead to a lower governance quality score (5) than for the group "Audit" (7), although the raw points for Audit have a score of 56.9. This is because other companies within the same market are used as a comparison base. Thus, if the general raw point score is higher for companies within this market, the Governance Quality Score can be relatively low, although the raw point score would indicate otherwise. The final Governance Quality Score is then determined by summing the scores of the four topical groups up and building an average rating for these. In the given example, this

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leads to a score of 8, which indicated that the governance quality of the example company is rather inadequate compared to its market.

4.1.4 Corporate Sustainability Performance

The Corporate Sustainability Performance is, similar to the Governance Quality Score, a measure to determine the implementation and execution of company-specific factors against the background of environmental, social, and governance sustainability. Therefore, it measures the strategic activities of a company and analyzes to what extent these activities can contribute to sustainability. A well-known company that has collected a big database and created a CSP index based on this data is the company Sustainalytics. (IGI Global, 2020)

Sustainalytics is one of the global leaders in ESG and Corporate Governance research and ratings. The company created and developed different ESG and Corporate Governance Ratings. The basis of these ratings builds a two-dimensional materiality framework. On the one hand, the company's exposure to industry-specific material risks is measured, and on the other hand, it is determined how well a company manages those risks. Therefore, nearly 40 industry-specific indicators were consulted. The basic structure is accordingly similar to the MSCI methodology. However, Sustainalytics has a different rating scale, which ranges from 0 to 100, whereby 100 is the worst rating. With this rating, Sustainalytics categorizes the firms across five risk levels: negligible, low, medium, high, and severe.

Furthermore, Sustainalytics distinguishes between three categories of risk exposure. In the first category are the risks which the company successfully manages, in the second category are the dangers which are manageable, but are not managed by the company by now. This is the so called management gap. In the last category are all risks that cannot be controlled because they are industry-specific and not influenceable by a single company. E.g., a company in the oil industry cannot eliminate its risks related to carbon emissions. (Sustainalytics, 2020)

Based on these three categories, the CSP is analyzed in six steps:

1. **Risk Exposure:** Determining the ESG risks which can occur in this industry.
2. **Risk Mitigation:** How well can the company mitigate its specific industry-related risks.
3. **Removal of the Unmanageable Risks:** Risks that cannot be influenced, reduced, or prevented by the company are taken out of the calculations.

4. **Performance Analysis:** It is reflected how well a company manages all manageable risks it has based on its policies, programs, practices, and quantitative performance measures.
5. **Subtraction of the Controversies:** Controversies in the company's programs and policies show that they have not been as effective as planned. Therefore, they could increase management risk. Accordingly, they reduce the company's management score.
6. **Overall Rating:** The final risk rating is calculated by adding up the amount of unmanaged risk for each ESG issue.

The ESG ratings from Sustainalytics find acceptance in the financial sector. This shows the fact that the company Morningstar uses the ESG ratings from Sustainalytics for its portfolio sustainability rating. Morningstar is founded in 1984 and analyses, like MSCI, shares, funds, and indices, and gives appropriate advice to its clients. By doing so, Morningstar has risen to one of the biggest financial advisory companies. To reach its sustainability rating, Morningstar takes the ESG scores of Sustainalytics for the companies which underlie in the specific fund to measure. At least 67% of the fund's underlying companies need to have an ESG score. Otherwise, the fund cannot be given a score. The measurement of Morningstar corresponds with the one of Sustainalytics, meaning that the rating scale runs from 0 to 100 as well, 0 being the best score and 100 the worst. As the most scores vary from 0 to 50 in practice, Morningstar spreads the five risk levels of Sustainalytics as follows:

- 0 – 9.99: Negligible ESG Risk
- 10 – 19.99: Low ESG Risk
- 20 – 29.99: Medium ESG Risk
- 30 – 39.99: High ESG Risk
- 40+: Severe ESG Risk

Thus, a score of already 40% of the maximum leads to the worst risk level. The weighting of the assets basically complies with the one of MSCI, which can be seen in table 8. Accordingly, the uncovered securities are removed, and the covered securities are weighted according to their shares in the portfolio. An innovation of the Morningstar rating, however, is the implementation of historical portfolio sustainability scores. Therefore, it builds a weighted average of the last twelve months of a portfolio. Hereby, newer portfolios are weighted more heavily than older portfolios. Through this twelve-month historical rating, the score of the portfolio is given more consistency. However,

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the current decisions are taken into greater account, as this information is more important for the investors. Nonetheless, historical ratings influence insofar the scoring significantly, as portfolios that have a bad historical score cannot improve on a specific level. Therefore, if any past score was higher than 40, the portfolio stays at a severe risk level. If a score was 35 to 39.99, the portfolio could not be better evaluated than in the high ESG risk level. And when a historical score was at 30 to 34.99, the evaluation may not be better than the medium ESG risk level, although the current value would allow this. (Morningstar Research, 2019)

The following example shows how an ESG rating score methodology of Sustainalytics looks like:

The example analysis is made for the company “Qualcomm Incorporated” and is dated September 20, 2018. Qualcomm is a U.S. company that is settled in the technology hardware industry. The final ESG score of Qualcomm is **20.2**. According to the risk level distribution, which is shown before, it is located in the medium ESG risk level, though it is at the lower scale of the level. A subdivision of the rating in six major ESG issues shows how the final score occurs. The addition of these six subdivisions, namely, builds it.

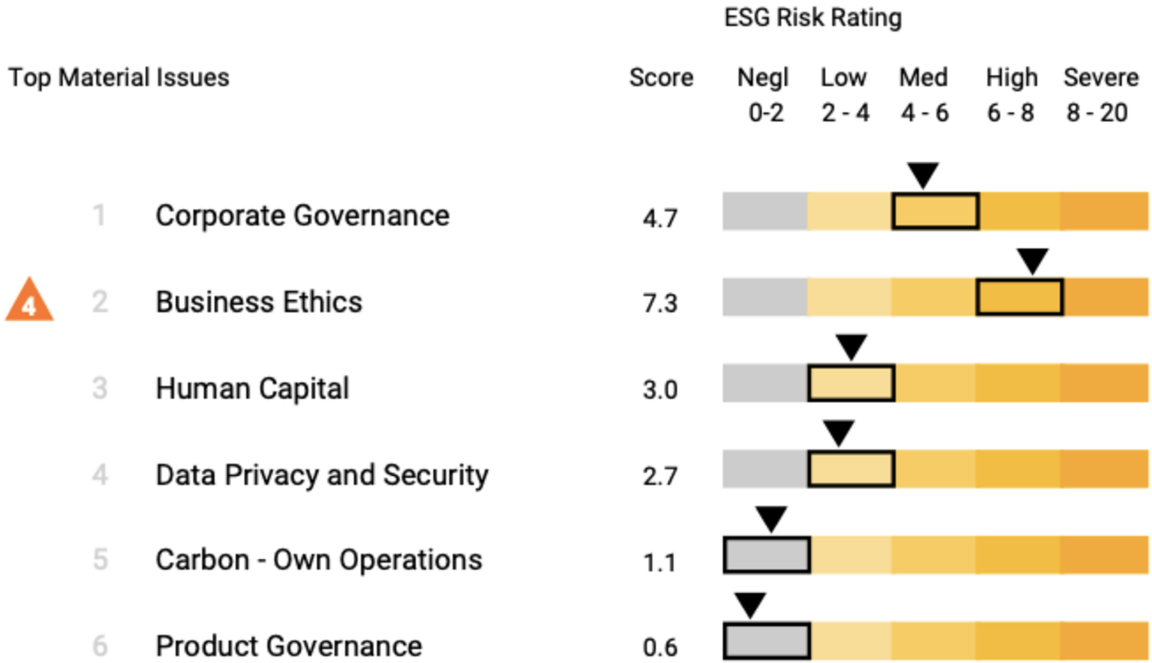


Figure 3: ESG Risk Rating for Critical ESG Issues (Sustainalytics, 2018)

As can be seen in the figure, the issues Carbon emissions and product governance are managed extraordinarily well, and the scores are accordingly at the best level. The

business ethics issues, however, are not managed appropriately. In this segment, the score is 7.3, which is rather high and subsequently located in the high ESG risk level. The ESG management performance table, which assesses the risk management of Qualcomm in comparison to its risk exposure, shows how the score of 7.3 occurs:



Figure 4: Risk Management in Comparison to the Risk Exposure for Qualcomm in the Category Business Ethics (Sustainalytics, 2018)

The figure demonstrates that the risk exposure to business ethics issues is at 8.8, which is, relatively high. The company has, therefore, in the category of business ethics a high amount of possible negative issues that could occur. But the company is solely able to achieve a score of 1.4 for the number of risks it manages currently. Thus, it remains a score of 7.3 for all the other risks which are unmanaged presently by Qualcomm. This leads to a rather bad final score.

Furthermore, Sustainalytics also provides rankings to compare the company's performance to the other assessed companies.

Relative Performance




	Position (1st = lowest risk)	Percentile (1st = lowest risk)
 Global Universe	2021 out of 9376	22nd
 Technology Hardware (Industry)	187 out of 338	55th
 Communications Equipment (Subindustry)	9 out of 49	17th

Figure 5: Relative Performance Measure of Qualcomm (Sustainalytics, 2018)

The comparison is classified into three parts. Firstly, the company is compared to all global firms, which are assessed as well by Sustainalytics. Secondly, Qualcomm is compared to all companies within the same industry. And lastly, Qualcomm is evaluated in comparison to all firms being assessed within the same subindustry. As can be seen, both globally and within the subindustry, Qualcomm is listed under the best 25%, according to its ESG score. Solely, within the industry, Qualcomm does poorly and is not under the best 50%. This comparison is essential, as it puts the ESG performance in different relations. When, e.g., a company is located in a subindustry in which the firms are generally more prone to ESG issues, a mid-range ESG risk can be relativized and mean that the performance is not that bad like the original score could indicate.

A critical component of the CSP plays the Corporate Social Responsibility (CSR). CSR is part of corporate policy and aims to develop a sustainably committed corporate culture. The underlying assumption is that a company benefits from the resources it gets out of its environment. Therefore, it also gets a certain degree of responsibility toward the environment and society. A key indicator of CSR is that the company overtakes these responsibilities voluntarily and goes accordingly beyond the legal requirements. Therefore, environmental precautions, which are only done by a company because the law stipulates that, cannot be considered in the ratings. It must be seen as a substantial added sustainability value which the company contributes. (Heribert Meffert, 2005)

4.2 Impact of ESG on Business Performances

ESG can have a high impact on the performance of businesses. As already shortly mentioned in chapter 4.1.1, ESG can bring many risks with it, as far as it is not handled appropriately. These risks can impact the performance of a company even though they

cannot be seen in its conventional financial analysis. Such risks can especially mean higher costs for companies, like additional operational costs because of the necessary restructuring of business processes or costs for litigation because of, e.g., not legitimate waste disposal. (MSCI, 2019)

Different ESG risks can impact various industries. Therefore, not all risks mean the same threat to every company. Especially the environmental and social risks can be parted in regional and industrial specific risks. Just the governance risks are typically not divided by industries or the location, as these risks have universal importance throughout all sectors and countries. The company Standard and Poor's Financial Services LLC (S&P) has structured and categorized the risk potential of environmental and social risks for major industries and different regions with a short explanation of how the score is justified. (S&P Global Ratings, 2019)

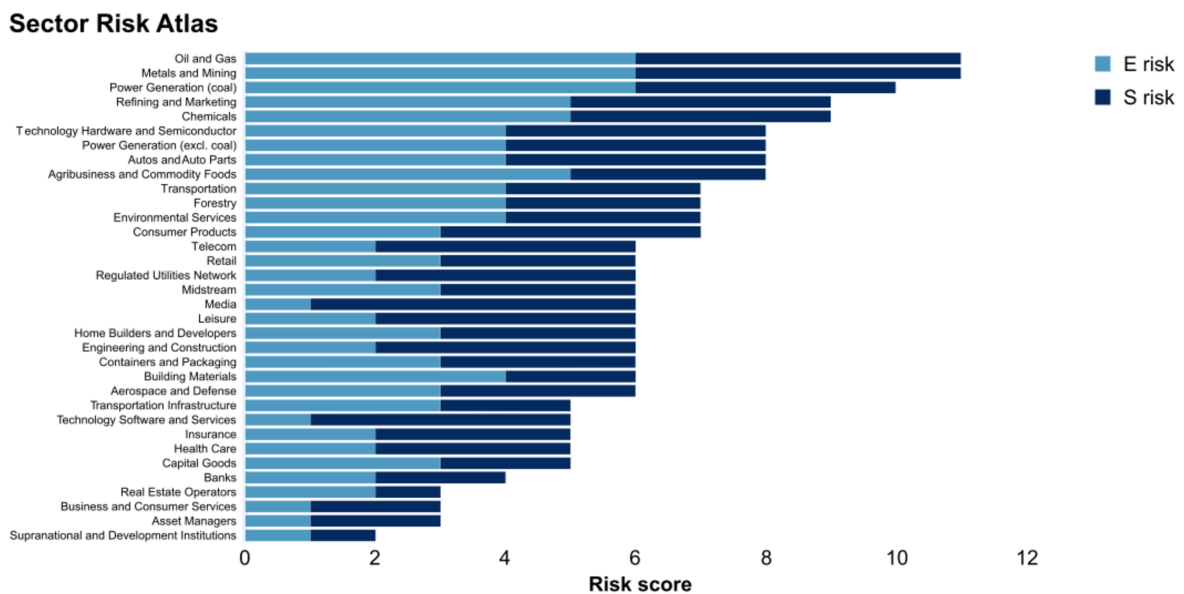


Figure 6: S&P's Sector Risk Atlas

The figure above shows the environmental and social risks for different industries. Every industry is assigned a risk score that runs from one to six. One means hereby that the risk in that sector is nearly not existing, and six means the risk potential is exceptional high. The light blue bar shows the environmental risks; the dark blue demonstrates the social risks.

As can be seen in the figure, the oil and gas industries, as well as the metals and mining industries are most prone to environmental and social risks. For both, the environmental risk score is at six, and the social risk score at five. The oil and gas industry is inherently exposed to greenhouse gas emissions, pollution, water use and

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contamination risks and also the plastic waste which derives from petrochemicals is not neglectable, because it accounts for about 14% of crude oil production. Mining is also very polluting. It needs a lot of water and electricity and can release toxic elements in the air, water, or soil.

Furthermore, alloy production like steel or aluminum are heavily air-polluting and need extremely much energy. These are the reasons why both the oil and gas industry and the metal and mining industry are very environmentally risky industries and have, therefore, the worst score. But the social risk does not look much better for these industries. For both sectors, safety management is a critical risk, as the working conditions are harsh and dangerous equipment is used. Although the companies try hard to avoid severe accidents by specific programs and workforce education, they occur from time to time. These are the reasons why the social risk is very significant for those industries as well.

The industry “power generation by coal” also has a maximum risk potential for environmental incidents. Still, its social risk score is slightly lower than the one of the just mentioned industries with a score of four. Nonetheless, energy production by using coal is very power-intensive too, it creates a lot of carbon and greenhouse gas emissions, pollutes the air through gases and air particles, and consumes a lot of water. Therefore, it is also very vulnerable to environmental protection laws from the government and the fact that resources are finite. The safety risks are not that high than in the two industries before but are also not neglectable. Furthermore, this industry is prone to harmful political interventions or social criticism, which could lead to arbitrary taxation. Based on these reasons, social risks are relatively high as well for this business.

The Supranational and Development Institutions (SDI) sector, however, is least prone to environmental and social risks and has a score of one in both categories. This is because the SDI sector has a deficient use of physical infrastructures and facilities. Furthermore, this sector produces nearly no greenhouse gas emissions and the pollution, and water usage are very low as well. This is due to the fact that SDI’s are primarily service providers, which do not produce on their own and have, therefore, a minimum resource consumption. As SDI’s work closely together with local governments and are directed towards topics like developing health, environment, education, and infrastructure, which is underlined by strict internal guidelines, the social risk is as well shallow for this sector.

The media industry, however, is an example for a sector that is very prone to one risk, but not for the other one. The media industry can be influenced very strongly by risks like IP theft, social media activism, or content regulations. Negative remarks of a vital employee of the company can, for example, lead to significant reputation damages and could, therefore, hurt the competitiveness of the company extremely. Thus, the media industry is very prone to social risks and has a score of five accordingly. On the contrary, the environmental risk for the media industry is negligible. Companies in this sector could be influenced by the indirect use of raw materials or the waste output. But these factors would change the competitiveness of those companies at a low level. Therefore, the environmental score is at one in this sector.

A contrary example represents the building materials industry. As the building materials industry is very exposed to greenhouse gas emissions and waste risks, the environmental risks are very high for this sector. Especially the cement industry is very prone to these risks, as it produces one of the most CO₂ emissions of all industries. Many cement companies in Europe had already to invest in alternative fuels and raw materials in order to meet the regulations of the Paris Climate Agreement, which committed them to reduce carbon emissions. But also, climate-related risks like storms or dryness could influence this industry a lot. Therefore, the environmental score for this industry is four. The social risks for this industry, however, are at a rather low level. Specific programs to educate their employees, and incident tracking and management systems lead to a rather low safety management risk. Furthermore, population growth and rising living standards can mean opportunities for this business in the medium- and long-term. This results in a score of two. (S&P Global Ratings, 2019)

As already mentioned, environmental and social risks do not just depend on the industry; it can also depend on the region in which a company is located. S&P has also analyzed and developed the influencing score for the regional risks, classified in the different countries, which a company has when it is settled within this specific country. Here counts most of all, the social and governance risk of a region. Countries with high social disparity and corruption like Venezuela and Turkey have a higher score. Accordingly, countries with strong institutional and governance effectiveness combined with transparency and accountability have vice versa a low regional risk score. (S&P Global Ratings, 2019)

This rating shows that there are industry- and regional-specific risks that companies usually have. The threats themselves, as well as the management of these risks, affect

the performance of every company. It is historically experienced that a company which fails to manage its ESG risks has higher costs of capital, is more volatile, and records more accounting irregularities. (MSCI ESG Research LLC, 2020)

Therefore, ESG management does have a significant influence on the performance of a company and can lead to a competitive disadvantage in the future of a company, although it can be, that it is as successful at the moment as its competitors – measured by the financial statements. Accordingly, ESG management and risks must be considered as well in business valuations, as it is evident, that it affects the future value.

4.3 Controversies and Criticism of the ESG Score Methodologies

A significant problem of all standard ESG score methodologies is that most database includes only big companies, mostly ones which are listed on a stock market. This has a simple reason. The bigger the company is, the more information is disclosed publicly. However, a startup that is still in the very early phase does not need to reveal any data of its company. Therefore, the database which is required to determine a reliable ESG score is missing.

Nonetheless, the environmental and social sustainability score determined by S&P, which rates the different major industries can apply as a starting basis for the determination.

Furthermore, in Germany, companies that have 500 employees or more need to disclose the environmental and social impacts which their business causes. So, at least these firms have to disclose their data. But conclusively, not only the data from big companies is shown that way, as these companies need to communicate every activity in their value chain. Therefore, also, the data of suppliers need to be inquired. Thus, there is also data collected from smaller companies, as long they are in the supply chain of bigger ones, although this does not cover all companies by far, like already mentioned. (Lin-Hi, 2019)

The second problem can be the data itself, which is disclosed. Most of the ESG information of a company is published itself. Thus, the scoring methodologies are very depending on the seriousness and efforts with which the respective firm collects and distributes its data. Especially for the social sustainability category, performance reporting can be limited, and it lacks quantitative metrics. Nonetheless, rating agencies

try to solve this type of problem. Therefore, there are assessed thousands of news sources daily to achieve a complete and high-quality ESG rating.

Furthermore, the rating agencies try to work in close cooperation with the companies and to create a qualitative dialogue with them to extract the most viable data. Finally, the lack of disclosure on ESG topics often accompanies with weak company management. This is why the rating agency ISS also assesses the quality of the ESG disclosures. Thus, ineffective ESG management leads inevitable to a higher cost of capital and, therefore, can impair the company performance. A mixture of an ESG rating and an ESG disclosure rating can accordingly solve the problem. (David, 2019)

A further problem can be that the ESG scores for a single company vary from rating firm to rating firm. This can be due to two reasons. The first reason can be that different rating companies concentrate on measuring various ESG aspects. Thus, it can be that some company considers data which the other does not. The second reason can be, this specific ESG criterion is more important for one rating agency than for the other and therefore influences the calculation at varied intensity. However, both companies take the same influencing data into account. The rating firms must show clearly how they came to a final ESG score, which data they included and how they assessed specific data. A company that wants to have analyzed another company's ESG score can, therefore, follow the argumentation of different rating firms seamlessly and take the evaluation score into account, which corresponds most with its own ethical views. But this is only possible if the rating firms disclose all aspects of how they reached the final evaluation. (David, 2019)

5 Implementation of an ESG Score in Standard Business Valuations

5.1 Creation of a Suitable ESG Rating for Business Valuations

As the chapters before showed, every standard rating methodology has its advantages and disadvantages. The specific problem is that a single method does not cover all environmental, social, and governance aspects. To cover all ESG factors within the business valuation, it is necessary to connect the methodologies to gain a wholistic score model, which includes all aspects. Therefore, it is required to adapt the ESG score of a company by the disclosure score. The ESG score must build the basis, as this is, after all the, the score which is the most important one to measure. But as already mentioned, the quality of which the ESG data is disclosed has its relevance as well, as it indicates weak management and, therefore, can lead to higher costs. Accordingly, this plays a vital role in business valuations, too, as this can directly affect future performance.

The basis for a suitable ESG rating to implement in the business valuation methods builds the system of Sustainalytics, as this company is one of the most appreciated firms which basis its knowledge on a complex analyzation. Furthermore, it subcategorizes its ESG rating in the most critical ESG issues, which allows the possible investor to divide the score in the information which is most relevant to him/her, which makes this method most suitable. But as seen in chapter 4.1.2, it is also important to analyze how precise and accurate the information is which a company discloses, as it cannot just change the outcome but rather be a supplementary indicator that the company manages specific ESG risks improperly. Therefore, the ESG rating to evaluate a business should include the E&S Disclosure Score as well.

However, the ESG rating from Sustainalytics must be weighted more, so it influences the calculation stronger. This is justified by the fact that, although the disclosure constitutes an essential influencing factor, the primary input is nonetheless the ESG risks themselves, which a company has due to its activity. Therefore, the disclosure score should maximally change the ESG rating by one risk level, meaning that it should solely influence the 100-point scale from Sustainalytic's ESG score by 10 points, whether positive or negative. As the Disclosure Score ranges from 1 to 10, this factor

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needs to be adapted to fit appropriately in the calculation of the ESG score. This assumption leads to the following consideration:

As mentioned, a change of the ESG score by more than 10 points would not be reasonable, so the best disclosure score of 1 improves the ESG rating by -10 points, the worst score of 10 by +10 points, as a lower score indicates a better performance. To reach to more precise adjustment, the disclosure scores must be illustrated in scale values with two decimal places. Therefore, the sum of the influencing factors for the E&S Disclosure Score must be calculated more precisely than in the example, which ISS delivered in chapter 4.1.3. The mean score should accordingly be 5.5 as it represents the medium of the scale. With the same distribution of the weighting of the different scores, for every difference of 1 in the E&S disclosure score, the ESG score must be modified by 2.22. Hereby, the following table occurs:

E&S Disclosure Score	ESG Score Adjustment
1	- 10
2	- 7.78
3	- 5.56
4	- 3.34
5	- 1.12
5.5	0
6	1.12
7	3.34
8	5.56
9	7.78
10	10

Here can the change be seen, which the ESG score makes, when the different E&S disclosure scores change by 1 or, as seen for the medium by 0.5. The changes are applicable for every 0.1 deviation of the E&S disclosure score. Accordingly, every + 0.1 change indicates a - 0.22 change of the ESG score and inversely the same. E.g., an E&S Disclosure score of 3.3 would lead to the necessity to adapt the ESG score by - 4.9.

So much for the theory. The following example will demonstrate this more clearly.

Table 12: Conversion of an E&S Disclosure Score to an ESG Adjustment Score

For example, company Qualcomm will be considered again.

As chapter 4.1.4 showed, Qualcomm was assessed in 2018 by Sustainalytics with an ESG score of 20.2. Qualcomm released a Corporate Responsibility Report in 2019. It included 53 pages, was clearly structured, and took many vital issues into account.⁵ Therefore, Qualcomm's disclosure on ESG issues and risks is on a reasonable level.

⁵ The report is released as a PDF and can be read under the following link: <https://www.qualcomm.com/media/documents/files/2019-qualcomm-sustainability-report.pdf>

Nonetheless, the declaration does not take all the needed data into account, and some smaller aspects could have had explained more detailed. Accordingly, this work assumes a disclosure score of 2.7 for Qualcomm. The conversion of the E&S disclosure score to the ESG score rating adjustment gives a value of - 6.22. Is the ESG rating now deducted by this score, a disclosure adjusted ESG score of **14** results.⁶ To simplify the calculation, it is necessary to round the result at one decimal place. Therefore, a final score of 13.98 is adjusted to the outcome of 14.

Just assumed now that Qualcomm would perform badly concerning its ESG disclosure. Accordingly, the disclosure score would be at 8.7. This can be transferred to an ESG adjustment score of 7.1. This would change the ESG risk score of Qualcomm like that:
 $20.2 + 7.1 = 27.3$

As expected, the new score for Qualcomm is now significantly higher, but, Qualcomm is still located in the medium ESG risk area.

This new score must now be transferred in a value-based indicator so that the ESG risk can flow in the calculation and influence the result of the valuation. This conversion will be analyzed in the next chapter.

5.2 Transferring the ESG Score in a Value-Based Indicator

To transfer the ESG score in a suitable indicator, which assesses a company's ESG risk and management accurately, the first consideration must be which type of factor can be best used in the calculations for business valuation.

As seen in chapters 2.2.3 and 2.2.4, newer types of business valuations consider so-called multipliers to adjust the calculations. Though these multipliers solely based on financial factors that are industry-specific, this approach is very suitable too for the implementation of an ESG score in the valuations. This is because of two factors. Firstly, multipliers are very easy to implement in the calculations, and secondly, this system keeps the calculations on a simple base, and it can be made quickly.

However, the ESG score must initially be transferred in a multiplier. Therefore, several steps are required. The first one is to assign a percental value on the different ESG scores. Hereby, it is essential to note that a smaller ESG score must indicate a higher multiplier, as a low score is defined as proper risk management. So, the lower the ESG score, the more does the sustainable well-doing impact the success of the company.

⁶ Rounded from the following calculation: $20.2 + (- 6.22) = 13.98$

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As the disclosure score adjustment can change the ESG score from -10 to 10, the new scale goes from 0⁷ to 110. Now, the question arises how much a score should be able to change a calculation based on standard business valuation.

Firstly, it can be said that a low scoring should indicate an increase in a company's value, and a high ESG score should indicate a decrease in a company's value. This is due to the fact that, like already mentioned, it is proved that a sustainably acting company that manages appropriate ESG risks is likely to increase its revenues in the future more, than a company that neglects this issue. Simultaneously, a company that does not care about sustainability issues at all is verifiable prone to higher operating costs, which can decrease expected future earnings.

As an ESG score of 40 in the Sustainalytic's Rating already indicates the worst risk level, the created ESG rating follows this view and sets the worst score level at the score of 50, so the ESG risk score adjusted by the maximum variation of the disclosure score. Therefore, all companies with a score of 50 or higher get the worst multiplier.

But to what extent does sustainable acting influence the future value of a company? This is discussed harshly, as there is no consistently change to see for every single company, even though a trend can be seen.

However, as the impacts of ESG issues on the business valuation are still in the early phase, a more conservative approach is expedient. Therefore, the multiple should not exceed a factor of two. This means that the suggested business valuation should not more than be doubled, or in contrast halved. For the scores, which are between 0 and 25, every 2.5 change in the ESG Risk Rating indicates a 0.1 difference in the multiple. So, when the ESG rating increases within the range of 0 and 25, for every increase of 2.5, the multiplier decreases at 0.1. Within the range between 25 and 50, the multiple reduces at 0.1 for every rise of 5. With this assumption a conversion table can be made, like in the chapter before.

⁷ to start from -10 is not logical, as a negative ESG score would be unfeasible. Therefore, 0 is the best score to reach

ESG Risk Rating	Resulting Multiple
0	x 2
5	x 1.8
6.25	x 1.75
10	x 1.6
12.5	x 1.5
15	x 1.4
20	x 1.2
25	x 1
30	x 0.9
35	x 0.8
37.5	x 0.75
40	x 0.7
43.75	x 0.625
45	x 0.6
50	x 0.5

An ESG score of 25 would lead to a multiple of 1, meaning that there should be no adjustment, as the company is then located precisely in the medium ESG risk level. Consequently, the more the score differs from the risk score of 25, the higher is the adjustment that needs to be made.

To make an example, both hypothetical scores of Qualcomm are used.

The first ESG risk score, which was calculated, was 14. This results in a multiplier of **1.44**, as an ESG risk change of solely 1 indicates an increase/decrease of 0.04 within this range.

Now, the second example is analyzed. Here, Qualcomm reached a score of 27.3. Accordingly, this leads to a multiple of **0.954**.

Table 13: Conversion of the ESG Risk Rating in a Business Valuation Multiplier

Every increase of 1 within the range between 25 and 50 indicates multiplier decrease of 0.02. Accordingly, 27 leads to a score of 0.96. But, as the result is 27.3, the 0.3 more must be adjusted as well. As a change of 1 leads to multiplier changes of 0.02, a change of 0.1 results in an adjustment of 0.002. Are the 0.3 points deducted too, results in the final score which was mentioned before, the 0.954.

These multipliers can now be implemented in the business valuations. The next chapter will show how these multiples will be applied in the different common business valuations.

5.3 Implementing the Value-Based ESG Score in the Standard Business Valuations

5.3.1 Net Present Value Method

For the implementation of the ESG multiplier, the example from table 4 in chapter 2.2.1 is used. The NPV, in this example, was \$10.75 million. If the owner from company Y wants to sell it for \$10 million, according to the NPV calculation, the owner of company

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X would make a good deal. But now, it will be assumed that company Y has an ESG risk score of 37.5. Then, the value of company Y changes as follows:

$$\$10.75 \text{ million} \times 0.75 = \$8.06 \text{ million}$$

The relatively bad ESG score would accordingly lead to a worse company value. The owner of company X should not buy company Y anymore, as its value decreased under \$10 million.

In a further step can now be calculated at which ESG score the critical value of \$10 million is reached.

$$\$10.75 \text{ million} \times X = 10 \text{ million}$$

$$\rightarrow X = 0.93$$

→ Company X will solely invest in company Y if it has a minimum multiplier of 0.93.

This corresponds with an ESG score of **28.5**. Thus, the critical point is reached, if company Y has an ESG score of 28.5. A lower score would indicate a buy; a higher score would lead to a non-buy recommendation.

5.3.2 Discounted Cash Flow Method

For the implementation of an ESG score, the example from chapter 2.2.2 is examined again. Like in the NPV method, here, the multiplier is also used after the DCF is calculated. Giving a reminder: The investor wanted to have his/her investment back in three years. Applying the DCF method, the value of company x was 3,001,080, using a 5% discount rate.

Now it will be assumed that the company is exemplary in its ESG risk management. Accordingly, it is assessed with an ESG score of 7 and a disclosure score of 1, which leads to a final ESG risk score of 0. As this represents the maximum multiplier of 2, company x's real worth is **6,002,160**, considering its sustainability management.

5.3.3 Multiplier Method

As this method already says, it already uses a multiplier. Giving a reminder: Hereby, it is cast a glance on other businesses within the same industry and their historical performance. This is possible for different factors. The most common is to look at earnings like the EBIT or EBITDA.

The following example will give an insight into the methodology of the multiplier method, considering ESG risk management:

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Company X is in the Auto industry. The multiplier, which is most interesting for the investor, is the EV/Sales multiplier. According to Damodaran (Damodaran, 2020), the EV/Sales multiplier for the Auto and Truck sector is **1.26**. As company X is an average enterprise within its industry, the specific ESG risk rating from S&P can be used as the first indicator to analyze its ESG risk rating. According to S&P (S&P Global Ratings, 2019), the industry gets both an environmental score and a social score of four points, being one the best and six the worst. The governance risk management, as well as the ESG disclosure quality of the company, are expected to be on an average level. Therefore, the E&S risk management of company X is assumed to be slightly below-average. Accordingly, for company X is considered an ESG risk score of **32.5**. This leads to an ESG multiplier of **0.85**.

The industry-specific multiplier and the ESG multiplier are now combined:

$$1.26 \times 0.85 = \mathbf{1.071}$$

Supposed, the earnings of company X in 2019 were \$10 million.

The enterprise value, using the multiplier method and including the ESG management look like follows:

$$\text{\$10 million} \times 1.071 = \text{\$10.71 million}$$

The adjusted value of company X, which is based in the auto industry is, **\\$10.71 million**.

A change of the multiplier would also influence the outcome of this method, using additionally the ESG risk multiplier. It can even enhance this effect, as the new multiplier is raised or decrease further. This problem is analyzed mote detailed in chapter 5.4.

5.3.4 Venture Capital Method

Finally, the VC Method is analyzed again under the ESG aspect. For the VC method, the ESG risk multiplier should be considered in the very beginning; in this way, the ESG issues affect the calculation. Therefore, it will be cleared with the industry-specific multiplier, which is used in the VC method. The following example will illustrate this:

A company is based in the aerospace and defense sector. It is likely to generate a revenue of \$10 million in five years and needs financing of \$2 million to realize its expansion. The possible investor expects a yearly 20% return on the investment and an exit after five years.

The industry-specific sales multiplier is **2.27**. (Damodaran, 2020)

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The industry-specific E&S score for the aerospace and defense sector is both at three, so in the average risk rating. It is assumed that the company has a proper governance risk management and a very conclusive and comprehensive ESG risk disclosure. Therefore, the original ESG risk score would accordingly be at 22, and the disclosure quality score deducts it by four points. The final ESG risk score is then at **18**, which leads to an ESG risk multiplier of **1.28**. With this knowledge, the calculation can be done.

The first step is to combine the multipliers:

$$2.27 \times 1.28 = \mathbf{2.9056}$$

Now, the multiplier is used to calculate the exit proceeds:

Revenue x ESG risk-adjusted sales multiplier = exit proceeds

$$\rightarrow \$10 \text{ million} \times 2.9056 = \mathbf{\$29,056,000}$$

Therefore, the expected future value of the company after five years is **\$29,056,000**.

Now, the future value of the investment is calculated, using the following formula:

Liquidity need x expected return = future investment value

$$\$2 \text{ million} \times 1.20^5 = \mathbf{\$4,976,640}$$

The value of the investment should, therefore, be worth **\$4,976,640** after five years.

Now, the changes in the investment value need to be related to the exit proceeds. This leads to the so-called participation rate, so the future percental share of the investment value. The associated formula looks like that:

(Future investment value x 100)/exit proceeds = participation rate

$$(4,976,640 \times 100) / 29,056,000 = \mathbf{17.13\%}$$

Thus, the future value of the investment amounts to **17.13%** of the future company value. Now, the post-money valuation, which means the value of the company after the \$2 million investment, needs to be determined. The following formula results:

(Liquidity need/participation rate) x 100 = post-money valuation

$$(\$2 \text{ million} / 17.13\%) \times 100 = \mathbf{\$11,675,423}$$

Therefore, the company valuation on the day of reporting sums up to \$11,675,423 after the investment. Is the \$2 million investment deducted, it occurs an amount of \$9,675,423 before the investment of \$2 million. Thus, at the time of valuation, the company has a net worth of **\$9,675,423**.

5.4 Criticism of the ESG Score Implementation

A positive impact of the created ESG score is that it can be easily implemented in the standard business valuation methods, as seen in the examples before. The calculations are not complicated by implementing the ESG score and can be done still easily and quickly.

Furthermore, the implementation of the ESG score meets the current change to globally sustainable thinking. The sustainability acting of a company is appreciated that way, and further incentives are created for companies to care about sustainability in all three expressions. The implementation of an ESG score in business valuations can, therefore, lead to more sustainable companies, which would create a win-win solution for investors, customers, and companies all the same.

The first point of criticism is that the risk exists that sustainability is assigned a too critical role. An investor may not forget that the basis of all success constitutes the company's performance itself, the type of problem-solving it addresses, and the prospects which the industry implies. The ESG score is then an appropriate way to adjust the score, but it should not be the other way around.

Another problem is that the change towards a sustainable corporate responsibility is still in the early phase. Ten years ago, most companies generally did not care about such factors, but were nonetheless successful. Some investors are skeptical about sustainably acting companies until this very day because this is often associated with costs. E.g., avoiding countries for the production with child labor and low wages is accompanied by higher costs. But the last few years showed that this behavior encourages customer interest, which can lead to much higher profits, whereby this argument is attenuated.

A further criticism can be that there are industries, which are specially prone to ESG risks. A company, which reaches an average risk score, could, therefore, even outperform its competitors in the ESG risk management. But, companies in such industries, like the oil and gas industry, are nevertheless very exposed to such risks. Even though a company performs better than its competitors concerning these issues, the vulnerability to ESG risks, which occur operating costs, is still given. Therefore, it must be considered solely for the company, not in the light of its industry.

The last point, which could also be mentioned, is that the ESG score can exacerbate inaccuracies of business valuations, as it multiplies these assessments. Accordingly,

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is the business valuation not sufficiently precise, then the implementation of the ESG multiplier intensifies this inaccuracy. Specific business valuation methods can always be imprecise to a certain extent. Therefore, it is essential to measure the value of a company with more than just one method anyway. This reduces mistakes and compensates inaccuracies, whereby this problem is solved reasonably as well.

6 Conclusion

Business valuation is a crucial topic. Especially these days, when the trend to merge with other companies or to acquire them is higher than ever, one must be able to calculate the value of a company accurately. The standard valuation methods have all long been known and have proved themselves. The first step of this work was to analyze them and give examples, so the readers can understand the composition of the business valuation methods.

On the other side, the factor of sustainability got more and more during the last years. Analyses came to the decision that a company which manages its ESG related risks and issues appropriately, can increase the enterprise value. However, the implementation of effective ESG management takes its time and is costly at the beginning. But despite these findings, the ESG management of a company is not considered by the standard business valuation methods.

A look at the different sustainability analyses in this work, it was ascertained, that the ESG risk management influences the overall performance of a company, be it in a positive way or in a negative one. For example, it turned out that a company that mismanages its ESG risks has traceably a higher cost of capital. E.g., a company that pollutes the environment must count on penalties or punishment in the future, especially in times when the environmental protection requirements get stricter.

On the other side, a company that invests in ESG management can improve its value. E.g., a socially sustainable company can be able to hire the most suitable employees as it increases their awareness and interest by doing so. A famous example, therefore, is Google, which invests a lot about its ESG management and that with great success. After analyzing the most common business valuation methods and its calculations, as well as analyzing the sustainability issues and finding the evidence that sustainability influences a company's performance, this work dealt with the question how an ESG score must look like, so it can be easily implemented in the business valuation methods.

Firstly, it is of great importance to have a look at the standard ESG ratings and to analyze how they are created and how a final score is reached. The most famous ESG rating firms provide the basis for this. It turned out that, especially for stock market investors, there are a variety of ESG analysts. The ESG risk rating turned hereby out to be the most suitable method. But to reach a decent ESG score, the quality of the ESG information disclosure must not be neglected, as all ratings based on data and

information of the companies, which shall be evaluated. Accordingly, the E&S disclosure quality score from ISS should also influence the final ESG score used in business valuations. Therefore, this work adjusted the ESG risk score from Sustainalytics by the E&S disclosure score, in order to reach to a new score methodology.

In a final step, this score was adjusted, so it can be used in the valuations. It turned out that it would be best to transfer the point system of the ESG rating in a multiplier, like the ones which are already used in specific business valuation methods. This is the easiest way to implement the value, as it can be included without the need to change the original calculation by much.

Finally, this work gave examples for the implementation of the created ESG scores in the four most common and the already analyzed business valuation methods. Despite the knowledge that criticism can be made upon this method, it delivers a way to value sustainability and integrate it in the business valuation to make the calculations, according to today's view, fairer, and more accurate.

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Appendix

Net Present Value Method Calculations:

Chapter 2.2.1: Net Present Value Method					
Example 1:					
Year	1	2	3	4	5
Earnings (in million \$)	2	2,5	2,75	3	3,25
discount factor	2%				
NPV (in million \$)	12,67 €				
yearly NPV's	1,96 €	2,40 €	2,59 €	2,77 €	2,94 €
Example 2:					
Year	1	2	3	4	5
Earnings(in million \$)	2	2,5	2,75	3	3,25
discount factor	7,5%				
NPV (in million \$)	10,75 €				
yearly NPV's	1,86 €	2,16 €	2,21 €	2,25 €	2,26 €

Discounted Cash Flow Calculation:

Chapter 2.2.1: Net Present Value Method			
Example 1:			
Year	1	2	3
Earnings (in million \$)	2	2,5	2,75
discount factor	2%		
NPV (in million \$)	12,67 €		