

Differences in liquidity and credit risk reporting between German automotive companies

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ABSTRACT,

Managing liquidity and credit risks is of crucial importance for a company's further development and survival. The differences in corporate risk reporting between the 4 major companies are analysed in this research on the basis of a survey of the German automotive sector, and by doing a qualitative content analysis of the major players' risk and opportunity sections in their annual reports.

The automotive companies BMW, Mercedes-Benz, VW, and Porsche have been chosen for this analysis as they are from a sector that is subject to fast-moving developments and fierce competition and as they are all operating under the same regulatory framework and the same legislation. As the basis of the analysis the annual reports of 2019 to 2021 are used. The framework used to categorize the risk disclosures published is that provided by Svetlova (2021). The statements extracted from the reports are categorized as either substantial or symbolic. Based on this categorisation levels of coding from 1 to 3 are applied to each statement, to evaluate their content qualitatively.

The results show that statistically the companies had reported their liquidity and credit risks in a mostly substantial manner, nevertheless there were significant differences in reporting quality and quantity between the 4 companies chosen. However, even if statistically the companies had reported in a mostly substantial fashion, the information disclosed in their annual reports is still insufficient in providing users with enough information to base a decision upon. This is due to the lack of quantifications as well as the lack of yearly adaptations of substantial information.

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Keywords

Risk reporting, automotive sector, Germany, liquidity risk, credit risk, qualitative analysis

1. INTRODUCTION

Liquidity and credit risk management are critical components for an organization's competitiveness and survival chances. However, although an accurate understanding of these risks is of crucial importance for companies and thus also for their investors, many researchers who conducted studies in the field of qualitative content analysis of the firms' published annual reports and other relevant papers have concluded, that in order to increase the (perceived) usefulness of these disclosures, both their quality and specificity would have to be raised. Research on this subject was conducted by Abraham et al. (2014), Campbell & Slack (2008), Moxey & Berendt (2008), and Moxey & Welch (2010). All of these studies highlighted that the quality of the reports assessed had room for improvement regarding the usefulness of these risk disclosure statements for shareholders as well as for other stakeholders.

To achieve high quality in risk disclosure statements the risk disclosures should be 'substantial' rather than primarily of a 'symbolic' nature (Day & Woodward (2004)). 'Substantial' in this context means that the risk disclosure statements are company specific and can therefore not be applied interchangeably to other companies. Furthermore, the quality of a substantial risk disclosure statement can be evaluated by applying three different levels of coding (Svetlova, 2021). These levels will be explained in detail in the methodology section (see Figure 1).

As of now and in general, publicly listed and traded companies are required (by international and country-specific regulations) to disclose inherent risks to the public through annual public reports and statements informing investors and other stakeholders about current and potential future risks they are facing. It is also important to note that differences can be observed regarding the ways companies disclose their risk depending on the countries they are located in and the specific legislations under which they operate. However, based on first insights into the annual reports of Mercedes-Benz, BMW, VW, and Porsche, four major manufacturers in the German automotive industry, it appears that most companies choose to disclose risk in a mainly narrative manner, which leaves room for interpretation and even speculation. This room for interpretation and speculation decreases the (perceived) usefulness of the disclosures and furthermore it bears the risk that these reports are labelled as being opaque by their readers (investors and other stakeholders) (Abraham et al., 2014).

This research will focus on the credit and liquidity risk reporting within the automotive sector in Germany, more specifically it will analyse how Mercedes-Benz, BMW, VW, and Porsche, a subsidiary of the VW group, have disclosed their liquidity and credit risks in their annual reports over the last three years (2019-2021). These companies have been selected as they can be considered major players in the German automotive sector and as I believe that they are actually facing stern business challenges which will probably even increase due to the fast-moving developments and fierce competition that can be observed in the sector. I focus on the German automotive sector only as all these companies are firstly required by national law to disclose their risks and secondly as they are working under the same mandatory reporting standards.

The chosen period includes the peak of the Corona pandemic related measures, which should be assumed to have left traces in the credit and liquidity risk reporting.

Liquidity is one of the main foundations for the sustainment of a company over time. Liquidity is essential to pay off creditors

as well as it is required to fund research and development projects that will keep the company competitive and profitable over time.

Furthermore, most automotive companies sell cars on credit and invest in other closely related businesses. These credits that an automotive company gives out to other parties bear the risk that the credit receiving party might not be able to repay the amount they have been credited with.

Whenever companies grant credits in material amounts and the counterparty is not able to repay the money borrowed, the company can become - in a worst-case scenario - unable to survive. Any unpaid credit would develop into a sunk cost.

Therefore, the management of credit risk is important for the further - financially healthy - development of the company. Moreover, any investors' decisions should be expected to be influenced in a substantial way by the (perceived) credit risks a company is facing.

The purpose of this study is to analyse the credit and liquidity risk disclosures of the previously mentioned German automotive companies by their informational value. The outcome of this study will show whether the risk disclosure statements published contain enough substantial information to allow users to arrive at a meaningful assessment of the credit and liquidity risks situation of the reporting entity.

The results will be achieved by means of a manual qualitative content analysis of the reports in question, which will be explained in detail in the section on methodology.

In total 244 credit and liquidity related risk disclosures were identified as relevant within the annual reports.

2. LITERATURE REVIEW

This section provides an overview of relevant previous studies concerning the subject matter and a concluding summary of their findings and conclusions, in the context of what is relevant to the present work.

According to Ismail et al. (2016) risk disclosure is an important issue for companies because it provides information related to specific risks and their potential impacts on investors and shareholders. However, Ismail et al. (2016) also state that the participants involved have raised concerns about the insufficiency of the information provided on the risks disclosed by public companies in their reports, given the proven impact on business valuation as well as the companies' survival.

In addition, a study by Louhichi et al. (2015) shows that the communication of firms about their potential risks in annual reports influences firm reputation. Sufficient risk disclosure is reported to have a positive effect on the company's reputation, as it is seen as a part of the fulfilment of a "social contract" that the company has concluded with its stakeholders (Louhichi et al., 2015).

As a major paper in the relevant research field of corporate risk disclosure I have identified "Improving the relevance of risk factor disclosure in corporate annual reports" written by Abraham et al. (2014). The article describes different types of risk disclosure statements that companies use to make up their risk reporting, it differentiates between generic (symbolic) and specific (substantial) disclosures. According to Abraham et al. (2014) generic disclosures could apply to any company and tend to be of a routine nature, in consequence these disclosures are most likely not useful to users. Specific/substantial information is defined as "factors that are company specific". The terms symbolic or substantial are based on the definitions

provided by Day and Woodward in 2004. Their research focused on directors' disclosures regarding employees, but the term's definitions can be used far more broadly. A substantial disclosure is considered by them as an "an attempt to portray behaviour and events translucently (a critical realism approach)", while symbolic disclosures are seen as "attempts to deflect attention and one such strategy is 'espousing socially acceptable goals' which could be likened to compliance with regulations and as such is a structuralist approach to disclosure" (Day and Woodward, 2004). The research carried out by Abraham et al. (2014), builds upon prior research on the quality of risk disclosure by "using a longitudinal approach to assess the quality of risk reporting".

Moreover, Abraham et al. (2014) state that traditional studies on risk reporting are mostly focused on the disclosure quantity which is typically measured by counting words and sentences "or some form of disclosure checklist", yet they also note that prior research has shown that for risk reporting the quality of information is more important than the quantity.

Further research that stresses the importance of quality was done by Beck et al. (2010), who came to the conclusion that a narrative disclosure is the dominant form of statement used, but that such statements contain low levels of "(...) comparative or contextualised numerical information.". Beretta & Bozzolan (2004) also stress the importance of disclosure quality, when they argue that "(...) the quantity of disclosure is not a satisfactory proxy for the quality of disclosure." They propose a framework within which quality disclosure depends on the quantity of provided information in the disclosures as well as the "richness offered by additional information." Furthermore, Hasseldine et al. (2005) also stress the importance of disclosure quality in their article and conclude that managers who want to improve their company's reputation have to pay attention to the quality rather than the quantities they disclose. The statement by Abraham et al. (2014) is further supported by Hooks & van Staden (2011) in their article "Evaluating environmental disclosures: The relationship between quality and extent measures".

Although all this research highlights the importance of the qualitative aspects of risk disclosures, Abraham et al. (2014) found out that risk disclosure statements made by companies tend to be "quite general and routine". This generality and the lack of adjustments of the statements on a year-to-year basis make it unlikely that the disclosures published can provide users with adequate information. The point of view that risk reporting is most likely unhelpful for users that Abraham et al. (2014) have represented is further supported by multiple other researchers. Slack & Campbell conducted an analysis in 2008 of analysts' views on narrative risk reporting and came to the conclusion that risk disclosure was seen as too general to provide useful information to the public. Further verification comes from Moxey & Welch (2010), who analysed the banking sector and the information banks provided in their financial statements. They found that these reports were long and detailed, but still "sometimes criticised" for not being specific enough. Moreover, they state that stakeholders would welcome more disclosed information on a broader range of matters the reporting companies are dealing with and which are not necessarily of a financial nature. In relation with the "credit crunch" of 2008 and according to the "Financial Reporting Council in 2005 of the UK Turnbull report on internal control" Moxey & Berendt (2008) have described several insufficiencies in risk management, that help to explain why risk reporting was seen as not sufficient and had room for improvement.

Furthermore, according to Abraham et al. (2014) the existing quality levels in risk reporting require the user to "read between the lines" of published risk disclosures to identify potential risks the reporting company is facing. Despite the thoughts and expectations behind risk reporting, research has suggested that generic risk reporting is the type of risk reporting occurring in practice (Abraham et al., 2014). Their research also shows that disclosures which tend to be of generic/symbolic nature are changed only little over time and bear limited or no relation to the risks the examined companies were actually facing at the time.

Insufficient risk reporting by companies can be a missed opportunity as Mazumder et al. (2018) found out: "Risk disclosure can help enhancing company reputation", thus implying that if a company discloses accurately about risks they are facing this transparency "will be rewarded with more reputation". Regardless of the increasing reputation a company can earn by disclosing risks in a substantial fashion, Mazumder et al. (2018) conclude that "Companies, in general, are reluctant to quantify the risk related information." The research by Mazumder et al. (2018) also focused on the relation of company size and their level of risk disclosure and found out that the company size was positively related to risk disclosure in Malaysia, but it seems that there is a positive correlation between company size and risk disclosure in other countries and under different legislations as well, because it is stated that there were "several similar studies that came to the same conclusion".

This leads Mazumder et al. (2018) to the general conclusion that company size is "one of the main factors influencing risk disclosure", as, in general, larger companies were found to report more extensively about the risks they are facing. This is supported by research by Linsley et al. (2006), in which was shown - in a sample of 79 UK based companies and by means of a content analysis - that company size was positively associated with the number of risk disclosures. In this study the positive effects were identifiable in financial risk disclosures as well as in non-financial risk disclosures. However, their research stresses the importance of not only looking at how much and what was disclosed by companies, but also of integrating "how" these risks were disclosed. This point of view is shared by Mazumder et al. (2018) who conclude: "A more meaning-oriented analysis is needed".

2.1 Liquidity and credit risk related literature

Prior research on the subject of how companies report liquidity and credit risks has shown that these two types of risks, liquidity and credit risks, gained particular attention during the financial crisis of 2008 (Cole et al., 2012).

In their article "Corporate liquidity disclosures: A review" Cole et al. (2012) also share the SEC's definition of a company's liquidity namely, "ability of an enterprise to generate adequate amounts of cash to meet the enterprise's needs for cash", and a statement by the SEC made in 2003 which implies that information about liquidity is essential to assess a company's future prospect and survival chances. This once again underlines the importance of a content analysis of the liquidity risks that are reported to see whether this critical information is actually helpful for the reader.

Since liquidity is essential for a company's survival, and liquidity and credit risks have become more important since the financial crisis in 2008 and again during the Corona pandemic, it should be fair to state that it is currently even more relevant to analyse the risks companies report to the public.

2.2 Literature concerning German specificities

Several prior studies have dealt with risk reporting by German companies.

Extensive research was carried out by Dobler et al. (2011) with an analysis of 160 annual reports, in which “detailed content analysis” was conducted to analyse the quantitative aspects as well as the attributes which were used to describe the reported risks. Moreover, they researched the correlation of quantity and used attributes associated to firm risk, for four different geographies: the U.S., U.K., Canada, and Germany. They found out that risk disclosure is most common in management reports, but that it offers little “quantitative and forward-looking disclosure” in the sampled countries. Another finding was a negative association between risk disclosure quantity and leverage for German companies (Dobler et al., 2011).

Doupnik & Tsakumis (2004) state that Germany is expected to have low levels of risk disclosure since it is a country of high uncertainty avoidance. In contrast to this statement German firms tend to provide high levels of risk reporting as it was described by Elshandidy et al. (2016). The expected low levels of risk disclosure could imply insufficient information intake from investors wanting to invest in German companies.

Germany has adopted the IFRS accounting standard and also relies on GAS 5, a specific German accounting standard. GAS 5 requires German firms to disclose risks which can affect the decisions made by users. The information provided has to focus on a company's specific risk which could arise from the company's business environment and its respective business activities.

The GAS 5 defines risk as “the possibility of a future negative impact on the economic position of a group” (Elshandidy et al., 2016).

Furthermore, GAS 5 also implies that the company's risk disclosure statements have to be made in the firm's annual report either in the section “Risks and opportunities” or in the section “Outlook”.

The usefulness of the risk reporting provided is examined by aggregate levels of risk disclosure and the impact the reporting tone has.

2.3 Automotive sector literature

Research on risk reporting within the automotive sector has shown that the question of corporate transparency is evaluated on disclosing risks in annual reports. The financial crisis of 2008 increased the pressure on companies in the automotive sector to increase their transparency through improved public risk reporting towards stakeholders. One study found that the automotive sector provides a lot of risk disclosures based on past measurement but does not reveal many “forward looking and bad-news risk disclosures” (Vychytilova et al., 2020). Moreover, their findings indicate that bigger automotive companies that face more risks do not automatically reveal larger amounts of information about these risks. This is contrary to the findings by both Mazumder et al. (2018) and Linsley et al. (2006).

According to Vychytilova et al. (2020) previous studies on risk disclosure also lack specifications towards particular industries. They analysed 34 annual reports of the biggest car manufacturers from 10 countries and applied a content analysis approach. Their content analysis also aimed at defining the type of measurement used, at answering the question whether a reporting statement is based on the past or forward-looking, and

at determining whether the outlook of the risk reported was rather positive, negative, or neutral.

The research conducted by Vychytilova et al. (2020) categorised the risks into six risk types (financial risk, empowerment, operations risk, integrity risk, strategic risk, technology and information processing risk), in total 986 sentences that included information about these risk categories were identified.

Their research also pointed out that financial risk disclosure should also allow credit investors to analyse and understand credit risks of a given company. This conclusion is based on a prior study conducted by Chiu et al. (2018), which looked specifically into “the effects of risk factor disclosure on the pricing of credit default swaps”.

In general, it can be concluded that the quality and usefulness of risk reporting is dependent on quantified estimates, the “monetary value” of the company's disclosed risk. This means that the risk the company expects in the projected period of time is expressed in ranges of numbers. Therefore, these quantified estimates are key in increasing the quality of a company's risk reporting (Vychytilova et al., 2020).

The automotive sector is of particular relevance in this context, as it is - in addition to the general economically driving factors - in a transition phase, switching away from combustion engines towards other means of actuation. Therefore, we need to assume increasing risks in this economically impactful sector of the German industry with regards to their likelihood of occurrence as well as to their potential severity.

2.4 Literature summary and conclusions

The discussion about risk reporting and its usefulness for investors does not provide one single correct conclusion due to many firms' specific variables, but general concerns about the sufficiency of information provided to investors and other stakeholders remain (Ismail et al., 2016).

The information provided becomes useful for investors if a risk and its potential impact are quantified in the published reports. The reports' substance can be determined by looking at the degree of firm specificity and the existence of quantified estimates provided or avoided (Vychytilova et al., 2020).

It seems that there is a research gap regarding industry specific analysis conducted, which includes the automotive sector (Vychytilova et al., 2020). This is where my research question (see 3) has its origin. Prior research activities concerning German companies had a cross industry focus or focused on regulatory forces related to the company's risk disclosure statements, like the research conducted by Elshandidy et al. (2016) with the title “Environmental Incentives for and Usefulness of Textual Risks Reporting: Evidence from Germany”.

Furthermore, many of the studies compare reports from companies which are operating under different legislative frameworks, which creates some difficulties in comparing those directly, as similar standards of reporting cannot be taken as given under different legislations.

Moreover, there are only few papers that focus on specific risk types. Most research analyses risk disclosures as such and without being risk type specific.

3. RESEARCH QUESTION

How are liquidity and credit risks in the German automotive sector reported according to the framework provided by Svetlova (2021)? Have liquidity and credit risks been reported in a substantial or a symbolic manner over the last three years,

have they been quantified and are there substantial differences in the reporting quality that can be derived between the chosen companies?

3.1 Hypothesis

The hypothesis is formulated based on prior research done in the field. As of now multiple studies on the quality of risk disclosure suggest that the risk disclosure statements provided by companies in their annual reports and other statements published do not provide the needed transparency for investors and other stakeholders (Abraham et al., 2014), Campbell & Slack (2008), Moxey & Berendt (2008), and Moxey & Welch (2010).

Therefore, I put forward the following hypothesis:

Liquidity and credit risk disclosures of German automotive companies regarding the risk and opportunity report sections of their annual reports are insufficient in providing users with enough information to make well-informed decisions.

This would verify the findings by Abraham et al. (2014), who proposed that risk disclosure statements of companies seem to have a high level of generality and be of a routine nature, which makes these risk disclosure statements unlikely to be helpful for users. In addition, their findings of an absence of annual adjustments in risk disclosure statements could be verified for credit and liquidity risk disclosures in annual reports provided by important players within the German automotive industry. Svetlova (2021) considers annual reporting adjustments in her descriptive framework (see Figure 1) where they are labelled as ‘substantial information’ with a coding level three, whose definition includes that “The disclosed information changes over years” (Svetlova, 2021).

The hypothesis will have proven right when the data that was extracted from the annual reports published by the four major German automotive companies cannot be considered to be helpful to users, based on the descriptive coding framework as it has been provided by Svetlova (2021). Either because there are too many symbolic statements in the respective disclosures, thus not providing company specific information to the reader, or because of insufficient levels of quantification in the disclosed substantial information.

Information is considered as useful if it is company specific (substantial), quantified and adjusted over the years to keep up with latest developments. Substantial but unquantified information is often of limited use as it frequently describes what a company is doing in terms of risk management but does not inform the reader or user of the potential impact the managed risk could have for the company in case a risk materializes nevertheless, in parts or even fully.

4. METHODOLOGY & DATA

My research is based on the textual risk reporting section in the annual reports of four major players in the German automotive industry: BMW, Mercedes-Benz, VW, and its subsidiary company Porsche over a time span of three years (2019 to 2021). My study first lays the groundwork by looking at whether German automotive firms have - over the last three years - reported their credit and liquidity risks in a primarily symbolic or substantial fashion, and then goes on to analyse if there are significant differences in reporting styles and in the informational value provided between these companies which are all from one industry and thus operating under the same regulatory framework.

The focus is on qualitative content analysis of the risk disclosure statements that have been published based on the framework that has been provided by Svetlova (2021), in order to identify differences in the reporting quality and substance between the four companies with regard to their liquidity and credit risk reporting. The content analysis is crucial to evaluate the usefulness of a risk disclosure statement for investors and other users.

For the purpose of this analysis the risk disclosure statements are categorized as symbolic or substantial. A risk is disclosed symbolically when the information the statement discloses is “general in nature” (Svetlova, 2021). Substantial risk disclosure statements on the other hand disclose company specific information (see Table 1).

The analysis of the risk disclosures made by BMW, Mercedes, VW, and Porsche is conducted using the “three level coding scheme” by Svetlova (2021) (see Figure 1).

Table 1: Example disclosures per category

Type of disclosure	Example disclosure	Source
Symbolic level 2 coded	Credit risk describes the risk of financial loss resulting from a counterparty failing to meet its contractual payment obligations.	Mercedes-Benz 2019
Symbolic level 3 coded	2019: By means of refinancing coordinated with the terms of the financing agreements, the risk of maturity mismatch is minimized from both an interest-rate and a liquidity perspective.	Mercedes-Benz 2019 and 2020
	2020: By means of refinancing coordinated with the terms of the financing agreements, the risk of maturity mismatch is minimized from both an interest-rate and a liquidity perspective.	
Substantial level 1 coded	The BMW Group’s financial resources are stable, with liquidity requirements currently covered by existing liquidity and available financing instruments.	BMW 2020
Substantial level 2 coded	If unexpected credit and counterparty default risks were to materialise, they could have a medium earnings impact over the two-year assessment period. The risk amount is classified as medium.	BMW 2020
Substantial level 3 coded	2019: If liquidity risks were to materialise, they would be likely to have a low earnings impact over the two-year assessment period	BMW 2019 and 2020
	2020: If liquidity risks were to materialise, they would be likely to have a medium earnings impact over the two-year assessment period	

In this scheme the first level is defined as the “idiosyncrasy of reporting”, this level focuses on the distinction between general information and company specific information (Svetlova, 2021).

The second level deals with the “quantification of information” in the risk disclosure statements. Here the analysis focuses on the question whether the impact of the risk is quantified in financial terms or not (Svetlova, 2021).

The third level deals with the “changes of the published risk statements over time”. If a disclosed information is only repeated year by year, it is categorized as symbolic. Substantial information on the third level of coding therefore changes over time (Svetlova, 2021).

covering the years 2019 to 2021 included a total of 120 liquidity risk and 124 credit risk related disclosures (see Table 2).

After the identification of the units of analysis, all identified units were analysed and categorized either as symbolic or substantial, based on their content. This served as the starting point for the further categorization of these statements according to the provided framework. According to the previous categorization the units of analysis were then allocated to the various levels of coding (see Figure 1), which reach from one to three, as defined by Svetlova (2021).

To evaluate the size of the companies in question I refer to their market capacities of 2021, which I took from the webpage <https://companiesmarketcap.com/>. The largest company given

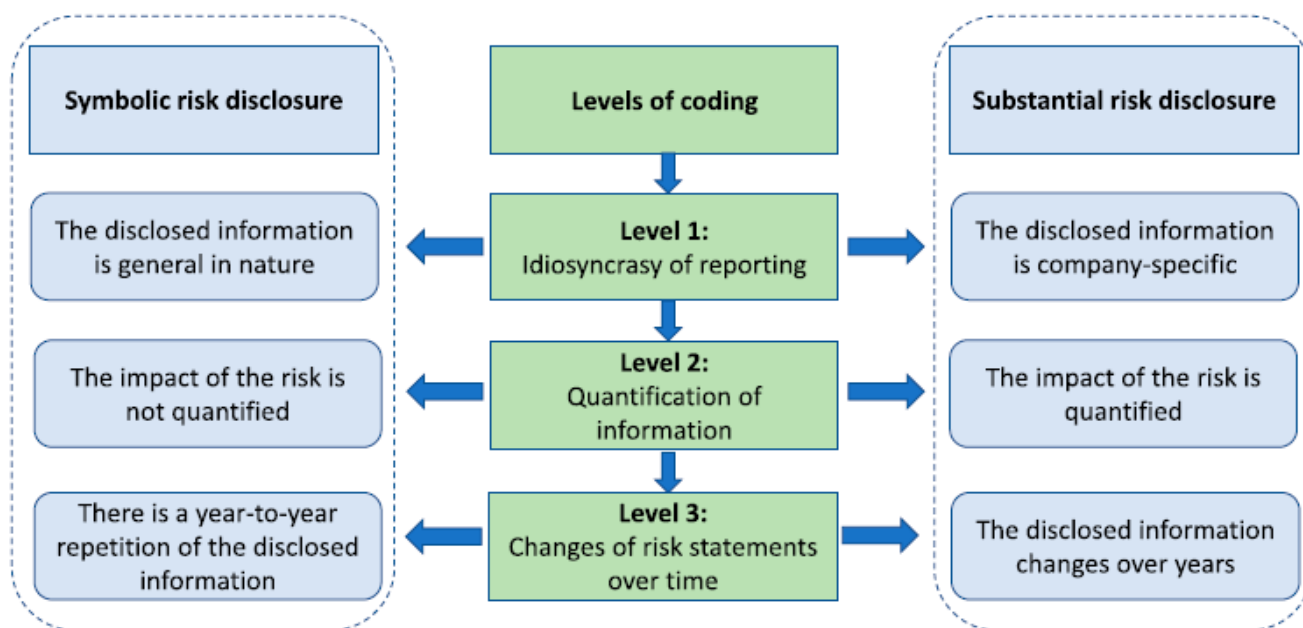


Figure 1 : “Symbolic versus substantial disclosure: levels of coding.” (Svetlova, 2021)

Note: Reprinted from “Corporate risk reporting about Brexit as political communication,” by E. Svetlova, 2021, Review of Social Economy, p. 10.

The qualitative risk disclosure approach also includes finding out how risk issues are disclosed by companies, this involves the rhetorical style of the risk disclosure (Svetlova, 2021).

The data gathering method for this analysis is a manual content analysis approach as defined by Smith & Taffler (2000). The analysed information is taken from the textual risk reporting statements in the risks and opportunity sections of the respective annual reports.

Smith & Taffler defined two typical approaches to content analysis. First a “form-oriented” one, which essentially means an “(objective) analysis”. This approach includes a quantitative analysis as well as “concrete references” and a “meaning-orientated analysis”. Both approaches are considered in this study.

First the relevant data was extracted from twelve annual reports, which accumulated to 244 credit and liquidity risk disclosure statements in total (see Table 2). Here a ‘statement’ is not necessarily a sentence, but the smallest unit that establishes a factual connection.

In the second step the statements were separated into liquidity risk disclosures and credit risk disclosures. The annual reports

the market capacities is VW with 128 billion, followed by Mercedes-Benz with 81,88 billion, BMW with 65,11 billion, and the smallest company in this selection is Porsche with a market capacity of 28,93 billion.

The results of this analysis will show whether the statements about liquidity and credit risks which VW, BMW, Mercedes, and Porsche provided over the timespan from 2019 to 2021 were mostly of a symbolic or of a substantial nature. Furthermore, this research shows if they have been quantified and adapted over time.

Finally, my research will answer the research question and with that help to come to an informed opinion regarding the informational value of the provided credit and liquidity risk related disclosures.

5. RESULTS

In 2019 a total of 69 disclosures concerning liquidity and credit related risks were published by BMW, Mercedes-Benz, VW, and Porsche as presented in Table 2. Of the 69 disclosures published in 2019 24 were extracted from the annual report of BMW, 17 from Mercedes Benz, 17 from VW, and 11 from the annual report of Porsche.

The number of liquidity and credit related risk disclosures increased by 22 to a total of 91 in 2020. Of those 91 disclosures published by the 4 companies in 2020, BMW again had the largest number of risk disclosure statements, with a total of 29 disclosures (+5), which is almost one third of disclosures in 2020 published by all 4 companies in scope. The second most disclosures in 2020 were published by Mercedes-Benz (24; +7). VW disclosed 23 statements concerning liquidity and credit risk in their annual report (+6). The smallest number of statements concerning liquidity and credit risk was published by Porsche in 2020, they disclosed 15 statements, which represents an increase of 4 compared to 2019.

5.1 Liquidity related statements

Table 2 shows that in total 120 liquidity related risk disclosure statements were published by the four automotive companies featured in this research. Since the research included 12 annual reports in total, there are on average ten liquidity related risk disclosure statements in each annual report. In 2019 the 4 companies all together published 36 statements concerning liquidity related risk disclosures. In the year 2020 the total number of liquidity related disclosures rose to 45 as shown in Table 2. In 2021 the number of total liquidity related risk disclosure statements decreased by six statements to a total of 39.

Table 2: Number of liquidity and credit risk disclosures per year and category

	Liquidity Risk Related Disclosures									Credit Risk Related Disclosures									Sum of All Disclosures
	Symbolic				Substantial				Total	Symbolic				Substantial				Total	
	Level 1 Coded	Level 2 Coded	Level 3 Coded	Total Coded Disclosures	Level 1 Coded	Level 2 Coded	Level 3 Coded	Total Coded Disclosures		Level 1 Coded	Level 2 Coded	Level 3 Coded	Total Coded Disclosures	Level 1 Coded	Level 2 Coded	Level 3 Coded	Total Coded Disclosures		
BMW 2019		3		3	8	2		10	13		3		3	6	2		8	11	24
BMW 2020			3	3	9		2	11	14		2	2	4	8	3		11	15	29
BMW 2021			2	2	6		1	7	9		1	4	5	6	2		8	13	22
BMW Total		3	5	8	23	2	3	28	36		6	6	12	20	7		27	39	75
Mercedes 2019		3		3	3			3	6		5		5	6			6	11	17
Mercedes 2020			3	3	7			7	10		1	5	6	8			8	14	24
Mercedes 2021			2	2	8			8	10			5	5	9			9	14	24
Mercedes Total		3	5	8	18			18	26		6	10	16	23			23	39	65
VW 2019					9			9	9		5		5	3			3	8	17
VW 2020		1		1	9	1		10	11			4	4	7	1		8	12	23
VW 2021			1	1	9			9	10			4	4	9			9	13	23
VW Total		1	1	2	27	1		28	30		5	8	13	19	1		20	33	63
Porsche 2019		1		1	7			7	8		1		1	2			2	3	11
Porsche 2020		1	1	2	8			8	10		1	1	2	3			3	5	15
Porsche 2021			1	1	9			9	10			1	1	4			4	5	15
Porsche Total		2	2	4	24			24	28		2	2	4	9			9	13	41
Total		9	13	22	92	3	3	98	120		19	26	45	71	8		79	124	244

2021 saw a slight decline in risk disclosures concerning liquidity and credit risks of the aforementioned companies to a total of 84 disclosures (-7). In the year 2021 BMW was no longer the company that disclosed the most liquidity and credit risk concerning statements (22; -7). Their place was taken by Mercedes-Benz, who disclosed a total of 24 statements about the liquidity and credit risks they faced (+/-0). The second most disclosures in 2021 were published by the Volkswagen Group (23) as Table 2 illustrates (+/-0). As in 2019 and in 2020 Porsche remained the company that disclosed the smallest number of liquidity and credit risks concerning statements in 2021, with a total of 15 disclosed statements, which is the same level as the previous year (+/- 0).

Out of the 4 German automotive companies analysed BMW disclosed the most liquidity and credit related risks of all with a total disclosure of 75 statements. Second in the number of total statements disclosed was Mercedes-Benz with 65 statements, followed closely by VW with 63 statements. The company which published the smallest number of liquidity and credit risk related statements was Porsche. Over the timespan of three years Porsche disclosed 41 statements, more than 20 fewer than the VW Group which was in third place.

Of all 175 liquidity and credit risk disclosure statements that the companies published in 2020 and 2021 and which allowed for level 3 coding only three units of analysis could be identified as substantial level three coded. All of these three substantial level three coded disclosures were published by BMW. None of the other three automotive companies provided a disclosure which can be coded as substantial level three.

Of the 120 liquidity related risk disclosures extracted, 22 are disclosed in a symbolic way, and 98 are disclosed in a substantial way as displayed in Table 2.

Even though coding level three was only attained by BMW, Mercedes-Benz, VW, and Porsche in the years 2020 and 2021, of the total 22 liquidity risk statements labelled as symbolic, 13 were level three coded.

Since the year 2019 serves as a basis for my research, it has not yet been determined whether the 2019 statements were repeated or adjusted compared to the annual reports published the year before.

The remaining nine liquidity related symbolic disclosure statements are all level 2 coded. None of the statements that were liquidity related and symbolic are level one coded.

Of the 98 substantial liquidity related disclosures over 90% (92) are level one coded, implying that the statements disclosed are company specific but not quantified.

Out of the six remaining substantial liquidity related statements half (3) were level two coded, and half were level three coded as presented in Table 2.

The distribution of all liquidity related statements of the four companies is as follows: BMW had the largest share with a total of 36 statements over the analysed period of three years. The second largest share was disclosed by VW with 30 statements disclosed over the three-year time period (see Figure 2).

VW is closely followed by Porsche who disclosed 28 statements concerning liquidity related risks (see Figure 2).

The smallest number of liquidity risk related disclosures was published by Mercedes-Benz (26) as Table 2 and Figure 2 show.

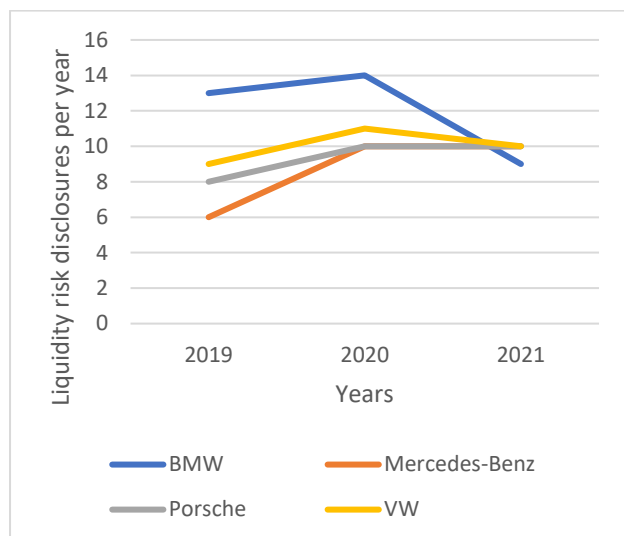


Figure 2: Liquidity risk disclosures per company per year

Note : Figure 2 shows the annual liquidity risk disclosures per company, the three years combined add up to the number of total disclosures per company.

5.2 Credit related statements

Concerning credit risk related disclosures Table 2 displays that in 2019 a total of 33 statements were published by the 4 companies in question. In the annual reports for the year 2020 the 4 companies published a total of 46 credit risk related disclosures. In the following year (2021) the total number of credit risk related disclosures published stayed almost the same with 45 statements published in total as presented in Table 2 and in Figure 3.

Of the total of 124 credit risk related disclosures published in the twelve reports analysed, BMW's 39 statements and Mercedes-Benz' 39 statements together made up 62,9% of the total 124 credit risk related disclosures. Over the same time-span VW disclosed 33 credit risk related statements. This would make up an average of eleven credit risk related disclosures per year. But looking at the details one can see that VW disclosed 8 statements concerning credit risk in 2019, 12 in 2020, and 13 in 2021 (see Table 2), which shows an increase in disclosures over the years. Porsche disclosed significantly less about credit risk than the other three companies, over the course of the three years analysed, their total share of credit risk related disclosures was around 10,5% (see Figure 3).

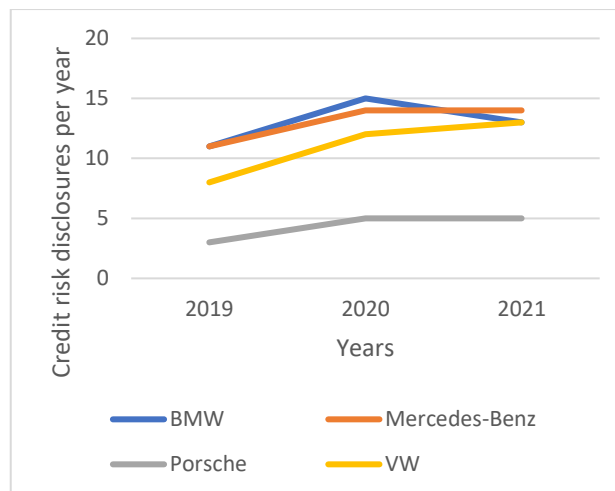


Figure 3: Credit risk disclosures per company per year

Note : Figure 3 shows the annual credit risk disclosures per company, the three years combined add up to the number of total disclosures per company.

Out of the total 124 credit risk related disclosures, 45 were written in symbolic fashion, as with the liquidity related risk disclosures, there are no symbolic disclosures that are level one coded here.

Of the statements which have been identified as symbolic, 19 are level two coded. The majority (26) of the symbolic statements are level three coded, which implies their repetition on a year-to-year basis as shown in Figure 1 (Svetlova, 2021). As with the liquidity related disclosures the level three coding in general was only applicable in 2020 and 2021.

45 credit related risk disclosures are expressed in a symbolic fashion and 79 credit related risk disclosures are expressed in a substantial fashion (see Table 2). Of these 79 substantial units of analysis, none is level three coded. 71 of the 79 units of analysis are level one coded, which represents 89,9% of the total. This leaves roughly 10% for level two coded credit risk related disclosure statements, in total these are then 8 quantified substantial statements that the 4 companies published from 2019 to 2021.

5.3 Rhetorical style

With regard to the rhetorical style that is used by the companies analysed, it can be said that they seem to be very confident about healthiness regarding the credit related risks their companies are exposed to. One example illustrating this comes from VW (2019, 2020, 2021): "Taking into account all the information known to us at present, no risks exist which could pose a threat to the continued existence of significant Group companies or the Volkswagen Group."

There are no statements in the extracted units of analysis stating that one of the companies is in serious trouble.

Furthermore, many of the units of analysis that were identified as substantial were identified as such because the company name or a particular segment of the reporting company was referred to. Otherwise, these disclosed statements should have been classified as being of a symbolic nature as well. The sentence "The use of the 'matched funding principle' to finance the Financial Services segment's operations ensures that liquidity risks are generally avoided.", is an example of this from the BMW Group's annual report of 2020.

6. DISCUSSION

This part serves to discuss the findings previously presented, and to relate them to results and conclusions provided by preceding research.

6.1 Intra-sector differences in reporting

The findings show that there are differences in the reporting between the four analysed German automotive companies (see Figure 4). These differences are not only related to the amount of risk disclosures each company provided, but also and more importantly to the quality of the risk disclosures provided.

The highest number of total risk disclosures in the annual reports analysed were published by BMW with a total of 75 liquidity and credit risk related disclosures, in contrast to that Porsche provided the lowest number of credit and liquidity risk related disclosures with a total of 41 over the three-year period in question (-34) (see Figure 4).

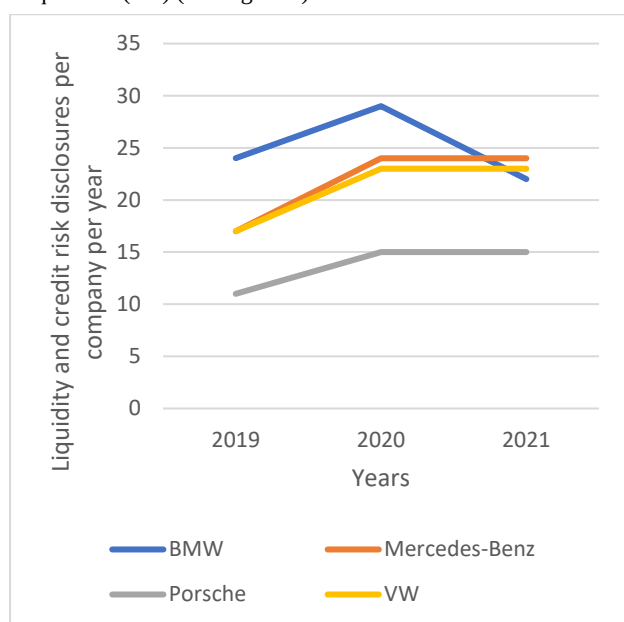


Figure 4: Liquidity and credit risk disclosures per company per year

Note : Figure 4 shows the annual liquidity and credit risk disclosures per company, the three years combined add up to the number of total disclosures per company.

One assumption could be that this large gap in the total liquidity and credit risk related disclosures between the two companies operating in the same regulatory environment might be due to the fact that for Porsche it is less important than for the other manufacturers to provide their environment with risk related information, as their reputation comes to a great extent from motor racing and their brand image. Thus, they might not have to rely on risk communication in annual reports (Louhichi et al., 2015).

Hasseldine et al. (2005) concluded that managers focused on gaining reputation for their company should pay attention to quality rather than quantities disclosed. Porsche does not seem to pay much attention to either quality or quantity. They had the smallest number of credit and liquidity related risk disclosures, as well as neither level two nor level three coded substantial disclosures, which - by the definitions in the framework used - excludes any quantified disclosures and therefore does not enable Porsche to adapt these non-existent quantified risk disclosures in any meaningful way.

Almost the same applies for Mercedes. One attempt at explaining this could be the assumption that the brand image for Mercedes is strong enough, so they do not have to rely on annual reports and the corresponding risk disclosures. It could also very well be that the differences are of historic origin without there being a recognisable reason that can be identified in the annual reports. These factors can also be assumed to explain the difference between BMW and Mercedes-Benz.

Mercedes-Benz did not provide any level two or level three coded substantial information in the annual reports used here, but they still managed to provide the second highest number (65) of credit and liquidity related risk disclosures in total, which still gives the reader the perception that these risks were recognized and treated with a certain degree of importance even if the information provided is not actually on a higher level and thus helpful for the reader (see Table 2).

Regarding the coding levels that were applied to the company's risk disclosure statements in their annual reports the results showed that only BMW published any statements that could be categorized as substantial coding level three in the time frame analysed, and even BMW only provided 3 statements that could be classified as level three coded risk disclosures in the total of 51 risk disclosures which they published in 2020 and 2021 (see Table 2).

6.2 Room for improvement

This shows that there is still a lot of room for improvement for all four companies analysed, as yearly adaptations are almost completely absent and the quantifications the companies provided were expressed as rather large ranges instead of actual numbers. One example of this is BMW's 2020 report in which the medium potential earnings impact referred to ranges from 500 million to 2 billion. An investor could argue that there is quite a big difference between these figures and that they are hardly specific enough. Moreover, from a potential earnings impact of above 2 billion the classification is high, here the reader is not able to find out whether it can possibly be a potential earnings impact of 2.1 billion or a potential earnings impact of 20 billion, which then might force the company into a temporary insolvency or even bankruptcy in a worst case scenario.

The room for improvement described above is supported by many preceding studies. In 2016 Ismail et al. stated that participants in their study raised concerns about the insufficiency of the information provided in the reports published. Abraham et al. stated in 2014 that the statements provided by the companies were lacking specificity and seemed to be of a routine nature. Beck et al. (2010) concluded that the narrative disclosures, which are the dominant form of disclosure, contained low levels of "(...) comparative or contextualised numerical information". With that Beck et al. are already drawing attention to how companies can improve their narrative risk disclosures, namely through providing quantifications. Furthermore, the companies can improve by making yearly adjustments based on recent developments, which would then make the information disclosed more likely to be useful for the reader according to Abraham et al. (2014).

The room for improvement also becomes evident through the high share of substantial level one coded risk disclosure statements the companies provide the reader with which means that a lot of statements were considered to be company specific, because the company name or the name of a particular company segment was referred to. Without these references the statements would also have been considered to be of symbolic nature only. According to the statistics (see Table 2) this makes the quality of the statements appear to be of a higher level

(substantial instead of symbolic), but they do not necessarily provide the reader with more useful information than would be the case if these statements were of a symbolic nature.

6.3 Similarities in reporting

One thing that all companies have in common is that they are able to convey the impression that they are at all times in command of the liquidity and credit risks they have to manage. One example of this comes from VW in 2019, 2020, and 2021, here they state at the end of their risk and opportunity report that all risks have been taken into consideration and that there is no risk existent that could potentially “(...) pose a threat to the continued existence of significant Group companies or the Volkswagen Group.”, This example illustrates that the general impression that all four companies give their readers in the risk and opportunities section is that everything is well under control.

This further confirms the result by Abraham et al. (2014) who conclude that the risk reporting statements published require readers/users to “read between the lines” to identify the potential risks the reporting company is actually facing. In this case it might also be difficult to handle the reporting differently as an individual company or perhaps as one of the few companies that do not follow the same reporting patterns, since due to the politics of expectations investors might refrain from investing into this company, because the company could be perceived as more exposed to risks than others providing less specific risk related information.

6.4 Substance of the annual reports

The question why the analysed companies disclose their risks the way they do - in this case whether in a more symbolic or more substantial way - is difficult to answer in a meaningful way. The results show that the majority of the risk disclosures published were coded as substantial level one (see Table 2), so according to the statistics the majority of the statements made by the companies must be regarded as substantial while from the point of view of their usefulness they can as well be classified as symbolic.

On the one hand this finding can imply that the companies are in fact concerned with their reputation and the expected fulfilment of their ‘social contract’ with the stakeholders as Louhichi et al. proposed in 2015. On the other hand, this also confirms Mazumder et al. (2018), who stated that companies generally are hesitant when it comes to quantifying risk related information, which then according to Vychytilova et al. (2020) implies that these reports continue to be of relatively low quality and not very useful as the estimates are not quantified.

I would support the view held by Vychytilova et al. (2020) here as of the 244 made statements in total only 14 were company specific and quantified, and that therefore, the overall amount of useful information provided, was perceived as low (see Table 2). Moreover, Vychytilova et al. (2020) stated that in order to increase the quality of the published reports the key is to focus on integrating more “monetary value (quantified estimates)”, which this research can confirm. In principle the total number of statements is sufficient to provide the reader with useful (quantified) information, but it seems that the reporting entities are trying to avoid publishing quantified information. This further confirms the findings by Mazumder et al. (2018).

For Vychytilova et al. (2020) a report’s substance is based on the degree of firm specificity and the existence of quantified estimates provided or avoided. In this case these two requirements must both be met in order for a report to be of substance, the conclusion would be that the reports that have been dealt with in this research are of low substance. This lack

of substance is defined by Day and Woodward (2004) as “attempts to deflect attention and one such strategy is ‘espousing socially acceptable goals’ which could be likened to compliance with regulations and as such is a structuralist approach to disclosure.” In the context of this research this suggests that all of the companies analysed mainly focused on complying with the given regulations and are not trying to transparently inform the reader about their behaviour and the events that occur. These findings are contrary to the findings of Louhichi et al. (2015) that the companies are fulfilling their “social contract”. Therefore, I argue that within the framework used here (see Figure 1) the majority of the reporting done by BMW, VW, Mercedes-Benz and Porsche is substantial in nature, while in reality the reporting is more of a symbolic fashion. This is justified by the very high percentage of substantial level one coded statements that mostly do not provide the user with meaningful information, as they are perceived to be of quite general nature nonetheless, due to the lack of quantifications and the fact that they are not necessarily adjusted on a yearly basis. In a subsequent study I would therefore suggest labelling all statements that are lacking in quantifications as symbolic in various degrees in order to align the evaluation even closer to the perceived usefulness for the reader. In this way only information which enables a reader to meaningfully base a decision upon it would be labelled as substantial. In this regard I support the statements made by Vychytilova et al. (2020) which stress that the key to quality in reporting is quantification.

6.5 Comparison to previous research

My research confirms the findings by Beretta & Bozzolan (2004) that disclosure quality is important, but that the disclosure quantity is not a sufficient indicator for the quality of the information disclosed. This can be seen on the basis of the number of total liquidity and credit risk related statements disclosed in comparison to the number of quantified disclosures published by the German car manufacturers. The research conducted by Beretta & Bozzolan (2004) is further supported by Moxey & Welch who analysed the banking sector in 2010 and came to the conclusion that the reports analysed were long and detailed but could still be criticised for not being specific enough. This conclusion is perfectly in line with the observations resulting from this research.

Another prior study my research is in line with was conducted by Slack & Campbell (2008). They discovered that analysts also see narrative risk disclosure as too general to provide useful information to the public. Their findings also fit in with the research conducted by Abraham et al. (2014), whose research suggested that generic/symbolic risk reporting was the sort actually used by companies, and that this type of reporting has only limited or even no correlation with the risks the company is actually facing. In this case this means that more than a quarter (67 of 244) of the statements analysed here had limited or no relation to the risks the German automotive companies were actually facing (see Table 2). It also illustrates why the analysts in the study by Slack & Campbell (2008) see narrative risk disclosures as too general to provide useful information to the public. In 2011 Dobler et al. published an article concerning risk disclosures made by companies also located in Germany. They came to the conclusion that the risk disclosures are most common in management reports and that they offer only a small amount of “quantitative and forward-looking disclosure”. Their study, that was conducted 11 years ago, can be confirmed by the analysis undertaken here, especially because Dobler’s study (2011) concerned companies in the same geographical area. It is also noticeable that in the

last 10 years the risk reporting does not seem to have changed drastically, since my study comes to confirmatory results.

During the financial crisis of 2008 both liquidity related as well as credit related risk disclosures gained particular attention, as pointed out by Cole et al. (2012). The research conducted here seems to confirm that both liquidity and credit related risk disclosures significantly gain attention in tough economic situations. This is shown in the increase of liquidity and credit related risk disclosures published by the automotive companies in question when Covid-19 emerged and started to have an impact on economies worldwide. In their 2019 annual reports all four companies together published a total of 69 disclosures while after the outbreak of Covid-19 in 2020 their annual reports provided 91 disclosures, which is an increase of almost one third (31,9%) (see Table 2). This leads me to the assumption that in times of a worsening economic environment the companies report more about the fundamental needs of a company to which liquidity and credit risks are of great importance. However, this finding needs to be confirmed further and it is purely related to the quantity of information disclosed, not to its quality in terms of quantification.

Moreover, there are two contrary findings presented in the literature review. The first was made by Doupnik & Tsakumis (2004), who expected German companies to have low levels of risk disclosure as Germany was a country of high uncertainty avoidance according to them. Contrary to this are the findings of Elshandidy et al. (2016) who described German companies as tending to provide high levels of risk reporting. Here both are partly right to some extent. Doupnik & Tsakumis (2004) are right when the quality of the disclosures is assessed, while they are wrong when the quantity is looked at. Elshandidy et al. (2016) are right when quantity is looked at, and wrong when the quality is assessed. Therefore, the middle between the two seems to be the way the German companies went, but for both of them it is possible to argue they are right or wrong depending on what is in question at the moment, the quality or the quantity.

Another point in which preceding studies have come to different results was regarding the question whether larger companies report more about risks than smaller ones. The view that larger companies reveal more risk related information is supported by Linsley et al. (2006) and Mazumder et al. (2018). Contrary to their research and tailored to the automotive sector are the findings by Vychytilova et al. (2020) who state that their findings indicate that larger automotive companies do not necessarily reveal more risk related information. In this research I can confirm the findings by Vychytilova et al. (2020), as the company who revealed the largest number of statements was BMW even though they are coming third in the size ranking, and VW who was first in the size ranking finished only third with regard to the number of statements published (see Table 2). Yet, it has to be said that Linsley et al. (2006) and Mazumder et al. (2018) can also be confirmed to some extent since Porsche - the company with the smallest market size - also has the smallest number of published risk disclosures. Mercedes-Benz as the second largest company, measured by their market capitalisation also has the second highest amount of risk related disclosures (65), but they are almost on par with VW who have published 63 disclosures while having a significantly higher market capitalization. According to both studies VW should have a significantly larger amount of published information. In general, one cannot say that either of them is wrong or right as my study focuses on liquidity and credit risks only, but assuming that the risk disclosure statements are reflective of the overall risk reporting behaviour,

my study is more confirmatory of the results provided by Vychytilova et al. (2020).

During their research Vychytilova et al. (2020) also found out that the companies which belong to the automotive sector provided many of their risk disclosures in a retrospective manner, these do not reveal a lot of forward-looking information and do not reveal many statements concerning bad news. The small number of bad news disclosures supports my observation that the companies assessed here aim to give the impression that they are always on top of the challenges they are faced with.

6.6 Limitations

One main limitation in this research is the limited total amount of companies investigated. Nevertheless, they represent all German automotive companies listed in the German share index (DAX 40), which features the 40 largest publicly listed companies based in Germany.

Moreover, the time span used here only allows to categorize the risk disclosures as substantial or symbolic level 3 in the years 2020 and 2021, as the year 2019 serves as a basis for this research, and therefore it cannot be determined if the 2019 statements were repeated or adjusted in comparison to those in the annual report published in 2018.

7. CONCLUSION

The research question aimed at finding out how liquidity and credit risks were reported in the German automotive sector, whether they were reported in a more symbolic or substantial manner, if they have been quantified, and whether there are substantial differences in the reporting quality between the chosen companies.

From a rhetorical perspective the annual reports of BMW, Mercedes-Benz, VW, and Porsche, all convey the impression to the reader that they are at all times in command of the challenges they are facing.

According to the statistics (see Table 2) based on the framework provided by Svetlova (2021) (see Figure 1) the reports published by the companies in the German automotive sector have to be regarded as mostly substantial. Of the total of 244 units of analysis extracted 177 were categorized as substantial (see Table 2).

Yet, when taking into account their usefulness I would conclude that the reporting was rather done in symbolic fashion, since there are not many quantified and adjusted statements (14) (see Table 2), which supports the findings by Vychytilova et al. (2020) that substance and thus the quality of a report is based both on firm specificity and on the existence of quantified estimates.

Table 2 clearly shows that most of the statements provided by the 4 companies in question are not considered to be substantial coding level 2 or 3 (see Figure 1) according to the framework provided by Svetlova (2021). In total 14 of the 244 extracted statements were company specific and quantified. Here again I support the view held by Vychytilova et al. (2020) and therefore have to conclude that the overall amount of useful information provided in these risk disclosures was (perceived) as small.

Focussing on the question of substantial differences in reporting between these 4 companies the findings show that there are in fact substantial differences between the companies in question.

These substantial differences in reporting are not only related to the quantity of information each of these companies provided (see Table 2), but also and more importantly to the quality of the risk disclosures published. BMW, the second smallest

company of the four, published the most liquidity and credit related risk disclosures from 2019 to 2021 (75). Mercedes-Benz and VW were almost on par with 65 to 63 disclosures. Porsche published the smallest number of liquidity and credit risk related disclosures (41). Over the three-year period analysed they provided 34 risk disclosure statements fewer than BMW provided. As regards quality BMW is the leader as well, since they are the only company of all four in question that provides statements which can be categorized as substantial level 3 (see Figure 1) at all. From a quality point of view VW comes in second because they provided at least 2 risk disclosures that were coded substantial level 2. In contrast to that Mercedes-Benz and Porsche have not included any quantification in their narrative risk reporting at all.

This proves my hypothesis right that the liquidity and credit risk disclosures made by German automotive companies in the risk and opportunity sections of their annual reports are insufficient in providing users with enough information to make well-informed decisions. This confirms the findings by Abraham et al. (2014) that the disclosures are generally of routine nature and that the information provided seems to be of a high level of generality for all included companies, although significant differences were found in between the companies.

In order for the companies in question to provide the readers of their annual reports with sufficient information for them to base decisions upon them, they need not increase the quantity of their disclosures but can improve considerably by making increases in the areas of quantification and yearly adjustments. They would thus significantly improve the usefulness of their reports.

7.1 Recommendations for further research

The findings of this research paper suggest that it could be worthwhile to further look into the reporting of risks of companies that have undergone significant capital increases, received a significant credit downgrading or gone bankrupt in order to see whether these events could have been expected by users of their annual reports based on the information the companies provided in them. Such research could further determine whether companies are willing to declare risks they are facing in a transparent and accurate way.

8. REFERENCES

Abraham, S., & Shrivess, P. J. (2014). Improving the relevance of risk factor disclosure in corporate annual reports [Article]. *British Accounting Review*, 46(1), 91-107. <https://doi.org/10.1016/j.bar.2013.10.002>

Beck, A. C., Campbell, D., & Shrivess, P. J. (2010). Content analysis in environmental reporting research: Enrichment and rehearsal of the method in a British-German context [Article]. *British Accounting Review*, 42(3), 207-222. <https://doi.org/10.1016/j.bar.2010.05.002>

Beretta, S., & Bozzolan, S. (2004). A framework for the analysis of firm risk communication [Article]. *International Journal of Accounting*, 39(3), 265-288. <https://doi.org/10.1016/j.intacc.2004.06.006>

Chiu, T. T., Guan, Y., & Kim, J. B. (2018). The Effect of Risk Factor Disclosures on the Pricing of Credit Default Swaps [Article]. *Contemporary Accounting Research*, 35(4), 2191-2224. <https://doi.org/10.1111/1911-3846.12362>

Cole, C. J. (2012). Corporate liquidity disclosures: A review [Article]. *Journal of Corporate Accounting and Finance*, 24(1), 65-77. <https://doi.org/10.1002/jcaf.21814>

Day, R., & Woodward, T. (2004). Disclosure of information about employees in the Directors' report of UK published financial statements: Substantive or symbolic? [Article]. *Accounting Forum*, 28(1), 43-59. <https://doi.org/10.1016/j.accfor.2004.04.003>

Davies, J., Moxey, P., & Welch, I. (2010, June). *Risk and reward: tempering the pursuit of profit* | ACCA Global. ACCA. Retrieved May 22, 2022, from <https://www.accaglobal.com/ca/en/technical-activities/technical-resources-search/2010/june/risk-and-reward-tempering-the-pursuit-of-profit.html#:~:text=ACCA%2C%20June%202010.,the%20risks%20that%20confront%20it>

Dobler, M., Lajili, K., & Zéghal, D. (2011). Attributes of corporate risk disclosure: An international investigation in the manufacturing sector [Article]. *Journal of International Accounting Research*, 10(2), 1-22. <https://doi.org/10.2308/jiar-10081>

Doupnik, T. S., & Tsakumis, G. T., (2004). A critical review of the tests of Gray's theory of cultural relevance and suggestions for future research. *Journal of Accounting Literature*, 23, 1-30.

Elshandidy, T., & Shrivess, P. J. (2016). Environmental Incentives for and Usefulness of Textual Risk Reporting: Evidence from Germany [Article]. *International Journal of Accounting*, 51(4), 464-486. <https://doi.org/10.1016/j.intacc.2016.10.001>

Hasseldine, J., Salama, A. I., & Toms, J. S. (2005). Quantity versus quality: The impact of environmental disclosures on the reputations of UK Plcs [Article]. *British Accounting Review*, 37(2), 231-248. <https://doi.org/10.1016/j.bar.2004.10.003>

Ismail, R. F., Arshad, R., Ahmad, E. M., Shaffee, N. S., & Mohd Pauzi, N. F. (2016). Risk reporting practices and organisational survivability. Proceedings of the 27th International Business Information Management Association Conference - Innovation Management and Education Excellence Vision 2020: From Regional Development Sustainability to Global Economic Growth, IBIMA 2016,

Linsley, P., & Shrivess, P. (2006). Risk reporting: A study of risk disclosures in the annual reports of UK companies. *The British Accounting Review*, 38(4), 387-404. <https://doi.org/10.1016/j.bar.2006.05.002>

Louhichi, W., & Zreik, O. (2015). Corporate Risk Reporting: A study of The Impact of Risk Disclosure on Firms Reputation [Article]. *Economics Bulletin*, 35(4), 2395-2408. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85053386236&partnerID=40&md5=b7c1e3d2a34c01a0e5ea63f41fd04e20>

Mazumder, M., & Hossain, D. (2018). Research on corporate risk reporting: Current trends and future avenues. *Journal of Asian Finance, Economics and Business*, 5(1), 29-41. <https://doi.org/10.13106/jafeb.2018.vol5.no1.29>

Moxey, P., & Berendt, A. (2008, November). Corporate governance and the credit crunch | ACCA Global. ACCA. Retrieved May 22, 2022, from

<https://www.accaglobal.com/ca/en/technical-activities/technical-resources-search/2008/november/corporate-governance-and-the-credit-crunch.html>

Slack, R., & Campbell, D. (2013, June 25). *Narrative reporting : analysts' perceptions of its value and relevance*. St Andrews Research Repository. Retrieved May 22, 2022, from <https://research-repository.st-andrews.ac.uk/handle/10023/3804>

Smith, M., & Taffler, R. J. (2000). The chairman's statement: A content analysis of discretionary narrative disclosure. *Accounting, Auditing and Accountability*, 13(5), 624–647. <https://doi.org/10.1108/09513570010353738>

Svetlova, E. (2021). Corporate risk reporting about Brexit as political communication [Article]. *Review of Social Economy*. <https://doi.org/10.1080/00346764.2021.1975807>

Vychytilova, J., Nadirov, O., Pavelkova, D., & Mikeska, M. (2020). Risk reporting practices of listed companies: Cross-country empirical evidence from the auto industry [Review]. *Journal of Competitiveness*, 12(4), 161-179. <https://doi.org/10.7441/joc.2020.04.10>

8.1 Additional sources

BMW Group Annual Report 2019. (2020). Bayerische Motoren Werke. https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2020/hauptversammlung/BMW-Group-Annual-Report-2019.pdf

Mercedes-Benz Group. (2020, February). *Daimler Annual Report 2019*. Daimler AG. <https://group.mercedes-benz.com/documents/investors/reports/annual-report/daimler/daimler-ir-annual-report-2019-incl-combined-management-report-daimler-ag.pdf>

Annual Report 2019. (2020, March). Volkswagen AG. https://www.volkswagenag.com/presence/investorrelation/publications/annual-reports/2020/volkswagen/Y_2019_e.pdf

Annual report 2019. (2020a). Porsche Automobil Holding SE. https://www.porsche-se.com/fileadmin/downloads/investorrelations/mandatorypublications/annualreport-19/PSE_GB2019_English_web.pdf

Annual Report 2020. (2021, March). Volkswagen AG. https://www.volkswagenag.com/presence/investorrelation/publications/annual-reports/2021/volkswagen/Y_2020_e.pdf

Annual Report 2020. (2021a). Porsche Automobil Holding SE. https://www.porsche-se.com/fileadmin/downloads/investorrelations/mandatorypublications/annualreport-20/PSE2020_Annual_Report_en.pdf

BMW Group Report 2020. (2021). Bayerische Motoren Werke. https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2021/bericht/BMW-Group-Bericht-2020-EN.pdf

Daimler Annual Report 2020. (2021, February). Daimler AG. <https://group.mercedes-benz.com/documents/investors/reports/annual-report/daimler/daimler-ir-annual-report-2020-incl-combined-management-report-daimler-ag.pdf>

Mercedes-Benz Group Annual Report 2021. (2022, March). Mercedes-Benz Group AG. <https://group.mercedes-benz.com/documents/investors/reports/annual-report/mercedes-benz/mercedes-benz-ir-annual-report-2021-incl-combined-management-report-mbg-ag.pdf>

BMW Group Report 2021. (2022). Bayerische Motoren Werke. https://www.bmwgroup.com/content/dam/grpw/websites/bmwgroup_com/ir/downloads/en/2022/bericht/BMW-Group-Report-2021-en.pdf

Annual Report 2021. (2022). Volkswagen AG. https://www.volkswagenag.com/presence/investorrelation/publications/annual-reports/2022/volkswagen/Y_2021_e.pdf

Annual Report 2021. (2022b). Porsche Automobil Holding SE. https://www.porsche-se.com/fileadmin/downloads/investorrelations/mandatorypublications/annualreport-21/PSE2021_Annual_Report_en.pdf

BMW (BMW.DE) - Market capitalization. (n.d.). Companiesmarketcap.Com. Retrieved June 7, 2022, from <https://companiesmarketcap.com/bmw/marketcap/>

Volkswagen (VOW3.DE) - Market capitalization. (n.d.). Companiesmarketcap.Com. Retrieved June 7, 2022, from <https://companiesmarketcap.com/volkswagen/marketcap/>

Porsche SE (PAH3.DE) - Market capitalization. (n.d.). Companiesmarketcap.Com. Retrieved June 7, 2022, from <https://companiesmarketcap.com/porsche-se/marketcap/>

Mercedes-Benz (MBG.DE) - Market capitalization. (n.d.). Companiesmarketcap.Com. Retrieved June 7, 2022, from <https://companiesmarketcap.com/mercedes-benz-group/marketcap/>