Effect of COVID-19 on Managerial Sentiment within US Industries

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ABSTRACT,

This paper examines the effect of COVID-19 on managerial sentiment within US industries. Managerial sentiment refers to the level of optimism or pessimism of a company's management regarding the present and future outlooks. The recent COVID-19 pandemic, an unforeseeable event, has a large impact on economies worldwide, impacting managerial sentiment in a variety of different industries. The research question for this paper is: To what degree has managerial sentiment deteriorated or improved in multiple US industries throughout different phases of COVID? This study investigates the degree to which multiple industries are impacted by COVID by analyzing changes in managerial sentiment throughout all quartiles of the years 2019, 2020, and 2021 using companies' earnings call transcripts. This study conducts a sentiment analysis and presents visual representations to show the different effects. The main finding is that COVID has a negative impact on industries, as it was a shock for all industries. However, the degree of severity in which the pandemic has an impact on these industries varies significantly.

Keywords
Managerial Sentiment
US Industries
COVID-19
Textual Analysis
Earnings Conference

1. INTRODUCTION

Managerial sentiment is a term used to describe the attitude of managers towards their organisation and its environment (Salhin, 2017, p. 48). It refers to managers' current feelings, which is dependent on the organisation's current performance and current market conditions. Managers' feeling can either indicate a degree of optimism or pessimism about the company's future.

Managerial sentiment is a factor which can impact a variety of business decisions and outcomes. For example, management sentiment has an effect on the stock price of a company, because how managers express themselves affects the feelings of investors and their willingness to buy shares at a specific price i.e., investor sentiment (Haritha & Rishad, 2020). It can also strongly influence the decisions that managers make. For example, if managers feel immensely optimistic about the future, they are much more likely to take some risks and make some more high-risk high-return investments. If a company is also performing well and managers are thoroughly satisfied, then they may give out some extra benefits to employees, such as pay raises.

Managerial sentiment depends on the organisation's internal and external environment. Therefore, a variety of factors and circumstances can influence managerial sentiment. A huge event that influences managerial sentiment is the recent pandemic known as COVID-19. This pandemic, which broke out at the end of 2019, created many challenges for managers of companies all over the world, since it was an unexpected shock for local and global economies (David J. Sencer CDC Museum, 2023). These challenges refer to the different ways in which COVID has affected companies' managers, and thus managerial sentiment. The degree to which each of the following influences managerial sentiment positively or negatively is not precisely known, as it can vary between industries. However, factors resulting from COVID that may have impacted managerial sentiment to a degree are the home office and long-distance communication as a result of lockdowns, the number of financial gains or losses as a result of the pandemical consequences. More specifically, companies "saw their supply chains interrupted, demand for their products and services decline, shortages in supplies and inputs, and government-mandated closures" (Stang, 2021). Employee morale and personal challenges also are factors to be considered. In all cases, managerial sentiment can be measured through careful analysis of quarterly earnings conference call transcripts.

Considering the challenges of COVID on the economy and on managers in different sectors of the economy, it is of huge importance to study managerial sentiment. It provides useful insights into the mind of managers, how they make and justify decisions, and how they react to certain events, such as in this case the recent pandemic, COVID-19. The need to investigate whether companies affected heavily by COVID also have a decreased managerial sentiment provides further relevance. Furthermore, a sentiment analysis gives the opportunity to quantify this highly qualitative and information-rich data. However, the mentioned reaction may vary across industries due to differences in terms of the type of product/service, dependence on technology, production style and much. Every industry is unique. Therefore, it can only be reiterated that studying managerial sentiment is of a huge importance, and more importantly, to study this in multiple industries that are different in nature with a sufficient sample size.

For those reasons, the research question is phrased in the following way: To what degree has managerial sentiment deteriorated or improved in multiple US industries throughout different phases of COVID? This question will be answered by conducting a sentiment analysis to find differences in the sentiment of managers throughout the different moments in time throughout different industries.

2. LITERATURE REVIEW

This paper investigates the effect of COVID on managerial sentiment through textual analysis. A number of studies and research papers have been conducted and written on this topic, though it is still quite recent.

2.1 Importance of Managerial Sentiment

Managerial sentiment is "managers' unjustified beliefs about future firm outcomes" (Hribar et al., 2016). It refers to the degree to which managers are currently confident whether the company will be successful in the future.

Numerous studies have been conducted explaining the relevance and importance of managers, and why research analysts are consistently interested in participating in earnings conference calls to interact with managers and capture their sentiment. For example, Zeng and colleagues (2022) write how managerial sentiment influences analyst following and their earnings forecast accuracy for the firm, which in turn can influence investor attention and interest to the firm, as mentioned in section 1. However, the study is limited by its geographical coverage, as it only includes Chinese firms in the Chinese market. Nevertheless, the general importance of managerial sentiment is for all economies.

There are many stakeholders involved who are interested in the (financial) success of a company, such as company executives, consumers and shareholders. For example, shareholders invest in the company in the hopes of their shares gaining values. As Chen (2021) and colleagues write, managerial sentiment has an effect on stock returns in the future. Therefore, a higher managerial sentiment is profitable for both investors and the companies.

2.2 Effect of COVID on Managerial Sentiment

Buchheim and colleagues (2022) conducted a study covering approximately 5000 German firms with the aim to find out how managerial sentiment as a response to COVID impacted managerial decision making. The sentiment of managers is a strong factor in determining the decisions managers make. Buchheim writes that "firms' sentiment about the shutdown duration explains their choices of forward-looking business strategies to mitigate the consequences of COVID-19" (Buchheim et al., 2022). Once the final results from this investigation are analyzed, an attempt is made to say which industry requires the most mitigation strategies, as that industry suffered the most consequences as a result of COVID.

2.3 Effect of COVID on specific Industries

Multiple pieces have been written about the effect of COVID on a single specific industry. For example, Gursoy (2020) explains the impact of COVID on the hospitality industry, which was hit exceptionally hard during the pandemic. This study was published early on in the pandemic, and therefore it mainly focuses on the initial challenges that COVID presented to the industry. It also explains that customers are somewhat reluctant to come back into restaurants and stay in hotels, as they still feel uncomfortable with the safety and health situation overall. This paper and the study summarized in it have the limitation of time, as the time frame is covering only a limited amount of time in terms of the duration of COVID. It cannot include any studying methods of the hospitality industry after July 2020, which does to an extent present a limitation to this study. This paper will fill that gap by investigating a wider time frame.

Another study by Gabbiadini (2020) and colleagues published in October 2020 focused on the online communication and streaming sector during the initial lockdown of the pandemic. Through surveying methods, it is found that participants streamed more movies and played more online games compared to pre-lockdown times. Although the results after surveying 899 participants might show a trend and seem accurate, it is questionable if this small sample size, especially compared to the total population in this case, is representative enough. Nevertheless, this literature gives many insights into the potential effect of COVID on the streaming and digital communication sector. However, it does not go too deep into the sentiment of managers within the industry.

COVID has caused numerous lockdowns, in which many employees from different industries had to work from home. Social isolation is also new, and it requires many adjustments to daily life such as getting used to online communication. A study by Yu and colleagues (2022) has been undertaken to investigate how these effects of COVID have impacted managerial sentiment. The study considered 2478 public firms in the US, in the two industries. The main outcome of the study is that the effects of COVID, such as social distancing, vary across different industries. This means that there is a difference, and this thesis can theoretically use data to support these found results. However, the study differentiates only between critical and non-critical industries, and not for more specific industries. Another study by Jamil and Hashim (2021) considers more industries, 14 to be exact, however it focuses on industries within Malaysia. Although there may be similarities with the US, one surely cannot assume that the results of this study may be used to make assumptions for other countries.

In this thesis, four major industries within the US are in the focus (n = 4). The intention is to choose industries that are different in nature, and from which different responses to COVID are expected. For example, the travel and tourism industry is chosen because it is one of the industries that suffered the most during the pandemic (Behsudi, 2020). The major reason for that is due to the high amounts of travel and other restrictions as well as due to safety and health concerns. The digital and home entertainment industry, on the other hand, is chosen because people spent much more time at home e.g., due to lockdowns, and thus spent a lot more time and money on things they do and enjoy at home. Then, the food and drinks industry is chosen because meals and beverages are necessity goods, meaning they are essential. Nevertheless, labor shortages and closures of restaurants on the other hand might indicate another decrease in managerial sentiment, although a recovery is expected. Fourthly, the healthcare industry is chosen because it is very relevant and connected to COVID and the importance of the healthcare system. In the results section, the industries will have the following abbreviations: The digital and home entertainment is referred to as D&H E, the food and drinks industry as F&D, health care as HC, and the travel and tourism industry is noted as TT.

3. HYPOTHESES

Two different hypotheses are developed for this investigation. The first hypothesis focuses on the overall impact of the pandemic on managerial sentiment, whereas the second hypothesis considers the impact of COVID across industries.

Hypothesis 1: It is predicted that if a sentiment analysis is conducted for companies in different US industries using quarterly earnings conference call transcripts, then, in general, there will be a negative effect of COVID on managerial sentiment.

Hypothesis 2: It is predicted that if a sentiment analysis is conducted for US companies in the travel, health, entertainment and food industries using quarterly earnings conference call transcripts, then there will be a negative effect of COVID on managerial sentiment in the travel industry, and a positive effect in the digital and home entertainment industry, because those industries suffered and benefited from people spending much more time at home due to restrictions and concerns, respectively.

This investigation conducted by combining all relevant aspects, such as years, quarters, industries, and others are combined to make this study meaningful. It aims to combine the named factors together, and with data, provide numerical evidence for the made assumptions as to which industries are hit the hardest and recovered the fastest from COVID.

4. METHODOLOGY AND DATA

This investigation analyzes the effect of COVID on different US industries. The US is chosen due to the fact that it has one of the largest economies worldwide and the largest stock market in the world (Statista, 2023). In addition, the earnings transcripts of the public companies in the US are in English. The aim is to use data to support the claim that the variable industry impacts managerial sentiment. This investigation requires having the numbers to support the hypotheses (section 3), but nevertheless it can be generalized that certain industries have been affected differently compared to others, in response to the pandemic. To be able to attempt to summarize changes in managerial sentiment per quartile per year per industry, twenty firms are chosen per industry so that averages can be calculated later on (n=20). In total the number of firms used in this investigation add up to eighty (n=80). The firms can be viewed in Table 1.

Table 1
List of Companies used per Industry

Digital and Home Entertainment	Food and Drinks	Health Care	Travel and Tourism
Adobe	Campbell	AbbottLabs	AlaskaAir
ATT	Coca Cola	AbbVie	AmericanAirlines
Autodesk	Conagra	AlignTech	Boeing
Disney	GeneralMills	Baxter	Booking
EA	Heinz	BectonDickinson	CarnivalCorporation
Fortinet	Hersheys	CVS	CHRobinson
Fox	Hormel	DaVita	CSXCorporation
HomeDepot	JMSmucker	ElevanceHealth	DeltaAirlines
Meta	Kroger	GileadSciences	Expedia
Microsoft	LambWeston	Idexx	Hilton
Netflix	McCormick	Johnson	HostHotels
Newell	McDonalds	LabCorp	JBHuntTransport
Oracle	MolsonCoors	McKesson	Marriott
Paramount	Mondelez	Pfizer	NorfolkSouthern
PayPal	Monster	Quest	NorwegianCruise
TakeTwo	Pepsi	Regeneron	RoyalCaribbean
TMobileUS	Starbucks	Stryker	SouthwestAirlines
Verisign	Sysco	UnitedHealth	UnitedAirlines
Verizon	Tyson	WatersCorp	VFCorporation
Whirlpool	YumBrands	ZimmerBiomet	WynnResorts

All companies used in the study have been categorized within one of the four categories listed in Table 1. These are major players in the representative industries, and they are all listed on the S&P 500, a major stock index in the US (S&P Dow Jones Indices, 2023). The scope of firms in the food and drinks and health care industries is narrow, since all firms are either suppliers of food or sellers of food, as well as suppliers of health care products and services. The variety of firms in the other two industries is somewhat broader. For example, the travel and tourism industry includes airlines, hotels, cruise operators, all which still fit into the category of travel and tourism, and thus all

are heavily impacted by COVID. The same is for the digital and home entertainment industry. It includes firms which sell products and services which are exclusively for digital usage and entertainment purposes (mostly at home) such as Netflix, EA and Disney.

The data that is required for this investigation are the transcripts of companies' quarterly earnings conference calls, from 2019, 2020, and 2021. Therefore, the initial (raw) data used in this investigation is qualitative, and the final data is quantitative. Earnings conference calls are calls that are typically held once a quarter, where representatives of a public company hold a presentation and answer questions from analysts about the firm's performance of the recent quarter. All of these transcripts are gathered from the Refinitive Eikon database, by searching for the companies' names under the advanced events search page. There, the relevant Q1, Q2, Q3, and Q4 transcripts are downloaded as text files. Each transcript is named using the industry name and the time it was released, for categorization purposes.

The first step in preparing for the sentiment analysis is to install and load the necessary packages in the program RStudio, such as the tidytext and stringr packages. Secondly, all transcripts are imported into Rstudio, with all of its content (all the words), and they are stored as a list. Following this, the text had to be reduced down to the initial presentation part of the transcripts, where the company executives make their statements, comments, and discuss the latest performance and other relevant news and information. This is done by using the str_extract function which basically told the program to extract the text between the titles 'Presentation' and 'Questions and Answers', for all transcripts. Also, the stop words are loaded into the Rstudio environment and the anti_join function is used to remove stopwords from that text. At the same time, punctuation is also removed as it is not needed.

Thirdly, the list which contained the file_names and all the separate words extracted from the transcripts are converted into a data frame. Since every transcript had a different word length, it is needed to tell the program that there is a maximum length of words a transcript can have, and that there are empty spaces in the shorter transcripts. A column heading named 'file_name' is also added. Afterwards, the tidyverse and tidytext packages are loaded which are needed to conduct a sentiment analysis. The program counts the occurrence of positive and negative words. It does this by making use of the 'sentiments' dictionary/lexicon, which classifies certain words as either positive or negative. The code to load this data set containing all these words and their classification is data("sentiments"). Subsequently, the program is told a calculation which calculates a sentiment score for each transcript, which represents the average positive words in relation to negative words per quartile of each year for all industries. The calculation is as follows:

Sentiment Score =
  Positive words / (Positive words + negative words)   *(1)*

This calculation will be referred to as calculation 1, or method 1. In addition, another method is used to calculate the sentiment scores as follows:

*Sentiment Score 2 = {(Positive words - negative words) / Total words of extracted transcript part} *100.*   *(2)*
This calculation will be referred to as calculation 2, or method 2, and will guide as a robustness check to ensure that the results of the calculations follow the same trend.

Both methods will be used to create summary statistics, average sentiment scores, and a regression analysis model. The calculations within methods 1 and 2 will be used to create the regression model, which will show the effects of Covid and industry type on managerial sentiment. The effect of COVID will be a dummy variable (Covid_Period) which equals 1 when the year is 2020 and 1 if the year is either 2019 or 2021. The effect of industry on managerial sentiment will be a dummy variable (Covid_Exposed_Industry) which equals 1 if the industry is travel and tourism and 0 if it is any of the other 3 industries. Furthermore, the combined effect (Covid_Period*Covid_Exposed_Industry) will be calculated, as well as the total effect, which adds the combined effect to the individual effect of COVID. Each effect is represented by a coefficient. A negative coefficient would indicate that the named factor(s) would have a negative effect on managerial sentiment, which would support both hypotheses.

5. RESULTS
Following a clear methodology and retrieving the necessary data, summary statistics are calculated for each industry for every year. Sentiment scores are calculated using two different formulas. A regression analysis is conducted using precisely those formulas. Differences in managerial sentiment between industries at various points in time are discovered. The found results are then used to support the hypotheses.

Table 2 shows summary statistics for sentiment score (method 1). Table 2 shows the mean sentiment score for each industry during 2019, 2020, and 2021. In addition, Table 2 also shows the median, the range, which is the difference between the highest and lowest sentiment score, the variance and standard deviation.

Table 2
Summary Statistics for Sentiment Scores calculated using Method 1

	D&H E 2019	F&D 2019	HC 2019	TT 2019	D&H E 2020	F&D 2020	HC 2020	TT 2020	D&H E 2021	F&D 2021	HC 2021	TT 2021
MEAN	0.7718	0.7935	0.7935	0.7832	0.7384	0.7200	0.7289	0.6853	0.8001	0.7703	0.7895	0.7863
MEDIAN	0.7782	0.8164	0.7939	0.7881	0.7507	0.7433	0.7330	0.6918	0.8243	0.8223	0.8115	0.7800
RANGE	0.3174	0.6349	0.2967	0.4089	0.4563	0.6995	0.3674	0.3220	0.7823	0.7351	0.3154	0.2659
VARIANCE	0.0061	0.0149	0.0046	0.0060	0.0089	0.0175	0.0063	0.0046	0.0131	0.0246	0.0066	0.0032
ST.DEV	0.0781	0.1222	0.0676	0.0773	0.0942	0.1322	0.0796	0.0679	0.1144	0.1570	0.0811	0.0569

As Table 2 shows, there a significant change in managerial sentiment in the industries, for example between 2019 and 2020. Table 2 shows that in the travel and tourism industry, which is hypothesized that it would experience a large decrease in managerial sentiment, has a decrease from 0.7832 in 2019 to 0.6853 in 2020. Looking at the digital and home entertainment industry, it also experienced a slight decrease in managerial sentiment, from 0.7718 in 2019 to 0.7384 in 2020.

This process is repeated using method 2. This method is utilized to check the robustness of the results i.e., to ensure the results show the same trends. Table 3 shows the summary statistics of sentiment score 2 (method 2).

Table 3
Summary Statistics for Sentiment Scores calculated using Method 2

|	D&H E 2019	F&D 2019	HC 2019	TT 2019	D&H E 2020	F&D 2020	HC 2020	TT 2020	D&H E 2021	F&D 2021	HC 2021	TT 2021
MEAN	4.207	5.205	4.846	4.734	3.993	4.190	3.832	3.346	4.583	5.060	4.739	5.118
MEDIAN	4.198	5.461	4.534	4.610	3.911	4.394	3.668	3.528	4.707	5.701	4.745	4.845
RANGE	7.197	1.167	6.771	8.142	9.672	1.097	8.039	5.629	1.331	1.245	7.074	7.098
VARIANCE	2.399	5.023	2.908	2.921	3.478	5.521	2.558	1.499	4.767	7.445	2.646	1.802
ST.DEV	1.549	2.241	1.705	1.709	1.865	2.350	1.599	1.224	2.183	2.728	1.627	1.342

Table 3 shows that using another method to calculate sentiment scores gives similar results. The sentiment scores using method 1 ranged between 0 and 1, whilst the scores in this method range between 1 and 11. Nevertheless, comparing the summary statistics of both methods, the trends are similar. For example, there are drops in managerial sentiment in all industries in 2020 compared to the scores of 2019. Table 2 and Table 3 show that all industries, even the digital and home entertainment industry, are not immune to the shock that COVID presented. This evidence supports hypothesis 1, as there is a general negative effect of COVID on US industries.

In the following, two sets of averages are calculated, for both methods as described in section 3. Table 4 illustrates the average sentiment scores calculate as per method 1, on an industry-quarter basis.

Table 4
Average Sentiment Scores using Method 1, per Quarter, Year, and Industry

	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
D&H E	0.7561	0.7712	0.7597	0.7977	0.7212	0.7285	0.7329	0.7711	0.7945	0.8173	0.7795	0.8090
F&D	0.8020	0.7769	0.7887	0.8067	0.7046	0.7368	0.7361	0.7042	0.7656	0.7768	0.7592	0.7803
HC	0.7877	0.7883	0.8010	0.7969	0.6833	0.7197	0.7487	0.7638	0.7791	0.8157	0.7807	0.7825
TT	0.8081	0.7803	0.7824	0.7621	0.6520	0.6555	0.7111	0.7207	0.7811	0.8063	0.7823	0.7754

Table 4 shows that all industries experienced a decrease in managerial sentiment in the first quartile of 2020, when COVID started to spread around the world. All industries experienced a drop in managerial sentiment, although the degree is different per industry. For example, the difference in the travel and tourism industry is 0.1101, whilst the difference in the digital and home entertainment industry is only 0.0765. To further visualize this argumentation, Figure 1 illustrates the trend of these results.
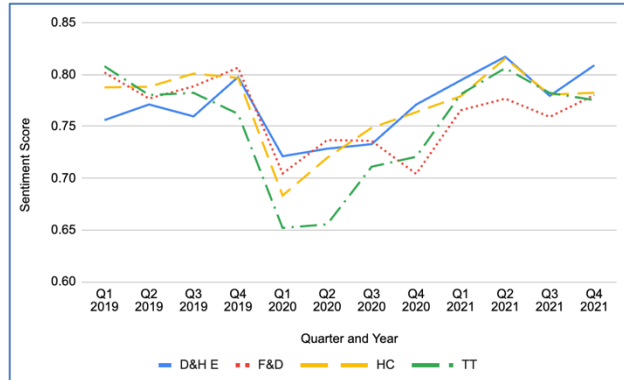
Figure 1. Method 2 Average Sentiment by Time and by Industries.

As both the Table 4 and Figure 1 show, the largest drop in managerial sentiment is in the travel and tourism industry. The severity of the managerial sentiment drop supports hypothesis 2, which states the impact of COVID on the industry is the strongest. Figure 1 shows how the industry went from having the largest managerial sentiment score in Q1 2019, to the industry with the lowest managerial sentiment score in Q1 2020. On another note, the healthcare industry also appears to have had many concerns about COVID at the beginning of 2020. Nevertheless, after the initial shock of COVID, all industries have recovered by 2021. The second method provides very similar results.

As mentioned in the methodology and data section, what is also calculated are average sentiment scores using method 2, which will act as a reliability check. These scores are calculated as

positive words minus negative words, divided by the total words per transcript, as written in equation (2). The mentioned average sentiment scores using method 2 are presented in Table 5.

Table 5
Average Sentiment Scores using Method 2, per Quarter, Year, and Industry

	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021
D&H E	3,928	4,226	4,160	4,482	3,629	3,784	3,967	4,590	4,496	4,937	4,261	4,638
F&D	5,193	4,978	5,202	5,444	3,730	4,444	4,417	4,181	5,019	5,332	4,699	5,199
HC	4,790	4,732	4,951	4,911	3,081	3,799	4,208	4,239	4,475	5,202	4,627	4,651
TT	5,290	4,740	4,558	4,347	2,647	2,964	3,706	4,033	4,965	5,431	5,084	4,991

Table 5 shows that there are similar trends in terms of managerial sentiment drops and recoveries in the four industries. Similar to the first method, the travel and tourism industry had the largest average managerial sentiment in Q1 2019, and the lowest in Q1 2020, as well as in the following quartiles, until it recovered like the other industries. This trend is further visualized using Figure 2, which highlights the similarities of Figure 1, implying the two calculations produced similar trends.
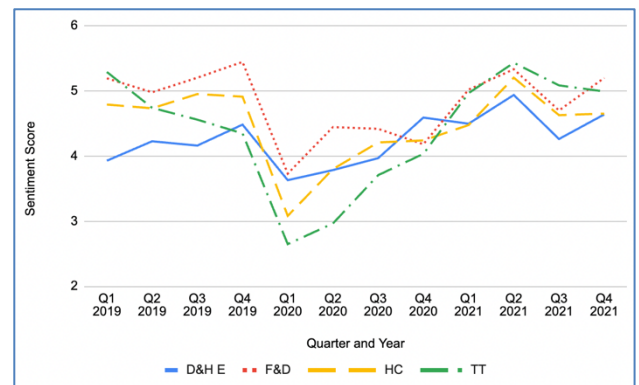
Figure 2. Method 2 Average Sentiment by Time and by Industries.

Table 1, Table 2, Figure 1, and Figure 2 support hypothesis 1, as there is an overall trend showing that all industries are to a degree influenced by the outbreak and spread of the pandemic.

Hypothesis 2 is also supported by the data, although during Q1 of 2020, when COVID became a topic of discussion, managerial sentiment in the digital and home entertainment did not increase. This can be explained by the fact that COVID was new for all industries, and that there was a lot of uncertainty regarding the entire topic. Nevertheless, the decrease in managerial sentiment is the smallest in both calculations, indicating that the industry was the least impacted during the initial shock. On the other hand, the travel and tourism was impacted the most, as explained.

In addition to these visual representations of the data, a regression analysis is conducted. The model includes all companies in all industries. The variable Covid_Exposed_Industry is representative of the industries, where the travel and tourism industry will be coded as 1 (since the variable is a dummy variable, see section 4). This is mainly due to that industry being hit the hardest by Covid, as previous literature and results suggest. The other industries (digital and home entertainment, food and drinks, and health care) will be coded as 0. The regression analysis will calculate coefficients for the effect of Covid_Period and Covid_Exposed_Industry, as well as for the combined effect (Covid_Period*Covid_Exposed_Industry), on managerial sentiment. The formula for the regression analysis is as follows:

Managerial Sentiment_score $_{it}$

$$= \beta_0 + \beta_1\,Covid\_Period_{it} + \beta_2\,Covid\_Exposed\_Industry_{it} +$$

$$\beta_3\,Covid\_Period*Covid\_Exposed\_Industry_{it} + \varepsilon_{it} \qquad (3)$$

In equation 3, in the subscript, I represents a firm and t the specific year-quarter time period. The year 2020 was the year when COVID hit most of the world and was most present. Therefore, a variable called Covid_Period will also be used, and 2020 will be assigned a value of 1, all other years a value of 0. ε is the error term. A regression model is created for both methods, where each dependent variable represents a method of calculating managerial sentiment i.e., sentiment_score represents method 1 and sentiment_score2 represents method 2. However, the regression equation stays the same.

As for the general assumptions as well as the assumptions for the regression model, it is assumed that there is a linear relationship between the independent variables and dependent variable. In addition, the observations are independent of each other. However, homoskedasticity is not assumed. That is, it is assumed that there are different variances of managerial sentiment within the different industries and years.

Table 6 shows the results of the regression analysis.

Table 6
Regression Model Analysis Results using Methods 1 and 2

	Dependent Variable	
	Sentiment_score (1)	Sentiment_score
Covid_Period	-0.058 ***	-0.780 ***
	(0.008)	(0.152)
Covid_Exposed_Industry	-0.002	0.144
	(0.009)	(0.174)
Covid_Period:Covid_Exposed_Industry	-0.042 ***	-0.800 ***
	(0.016)	(0.303)
Constant	0.787 ***	4.781 ***
	(0.005)	(0.088)
Observations	941	941
R2	0.107	0.063
Adjusted R2	0.104	0.060
Residual Std. Error (df = 937)	0.098	1.900
F Statistic (df = 3; 937)	37.286 ***	21.131 ***

$*p<0.1; **p<0.05; ***p<0.01$

Table 6 shows that during the quartiles of the COVID year, 2020, managerial sentiment tends to be lower than in the other years. This is explained by the -0.058 coefficient of Covid_Period for method 1, and the -0.780 coefficient for the variable in method 2. This supports hypothesis 1, as both methods show a negative coefficient for Covid_Period, significant at a 1% level, which means that during the year when COVID arrived (2020), managerial sentiment generally decreased across the economy. In other words, the model suggests that during 2020, a company from any industry will have a lower managerial sentiment compared to 2019 and 2021. This numerical evidence also supports Figure 1 and Figure 2, which show a drop in managerial sentiment for all industries in Q1 2020. In addition, the results show that managerial sentiment tends to be lower on average throughout all years in the travel and tourism industry, when compared to other industries. This is explained by the -0.002 coefficient for Covid_Exposed_Industry. Even though research and past results have shown this industry was heavily impacted by COVID, more evidence is needed to say that COVID had a major effect on that industry.

Considering method 2, the combined effect, also known as the interaction term of Covid_Period*Covid_Exposed_Industry, is higher than the individual effects. The coefficients of the interaction variable are also significant at the 1% level, therefore it is highly unlikely that the found relationship between the variables is in fact not a relationship. Importantly, the effect of

Covid_Exposed_Industry is actually positive in method 2, meaning that in general, the travel and tourism industry has a higher managerial sentiment than the other industries. However, when COVID is taken into consideration, managerial sentiment drops significantly as that industry relies on free travel and other factors. This means that a firm from an industry (in this case from the travel and tourism industry) during the time where it is also a COVID year (2020) is, according to this model, more likely to experience a lower managerial sentiment. Nevertheless, to find out the total effect of COVID on the COVID exposed industry (travel and tourism), the interaction term needs to be added to the coefficient of Covid_Period. Therefore, for model 1, the total effect is -0.058-0.042, which equals -0.100. For model 2, the combined effect is -0.780-0.800, which equals -1.580.

Considering the results of method 1 and method 2, the regression results also support hypothesis 2, to a degree. The regression results support hypothesis 2 in that the total effect of COVID on managerial sentiment within the especially exposed industry, travel and tourism, is more severe and statistically stronger than for the less/non exposed industries (in this model). As mentioned, this shows that the during 2020, the travel and tourism industry experienced a significantly larger decrease in managerial sentiment. This means there is a significant impact of COVID on managerial sentiment within the industry.

6. DISCUSSION AND CONCLUSION

In conclusion, all industries in this investigation experienced a decrease in managerial sentiment as a result of the COVID outbreak and the initial countermeasures taken. Despite that, the severity is different. Industries such as the travel and tourism industry, had a significantly larger decrease in managerial sentiment.

This thesis holds key insights for multiple managers, from a variety of different industries, not just the ones used in this study. The most important insight for managers of companies included in this investigation is to compare the sentiment of their industry to that of the other industries. It allows them to find out when exactly the sentiment was lower and when it was higher. Managers of companies in other industries can use this thesis to observe changes in managerial sentiment in the studied industries and possibly use similar methods to investigate managerial sentiment in their industry and other industries of their choice.

Although the thesis is thorough, well planned and executed, there can be some further studies done to expand the topic. For example, the investigation can be expanded by using an even larger number of transcripts, by e.g., considering more years such as 2018 and 2022, or by adding in more firms to increase the sample size per industry. In addition, the study can be expanded by using not just the presentation parts by management as an indicator of managerial sentiment, but also the executives' answers to questions asked by analysts during the Q&A part of the earnings calls.

The results part could also be enriched in future investigations by further deepening the formula used in the regression analysis. Adding in (a) control variable(s) and other further factors could improve the meaningfulness of the coefficients by bringing them closer to their 'true' value. That is why there is also an error term included in the equation, since the included independent variables are not a 'perfect' predictor of the result for the dependent variable. For example, the size of the firm in terms of turnover or number of employees can also have an effect of managerial sentiment, to a degree. Also, economic and

political events can also influence the sentiment of managers. Those could include elections, new regulations, changes in inflation rates, interest rate rises, and many more. In addition, further firm specific factors could further have an impact on managerial sentiment, such as working climate in the company, personal characteristics of managers, and the current financial success of the company.

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