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Did Government Support During COVID-19 Reach the Right Companies?

An empirical analysis of the targeting of the compensation scheme for companies in Norway

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Abstract

This thesis investigates whether government support to companies during COVID-19 has reached the "right" companies. We analyse how well-targeted the compensation scheme for companies in Norway has been, in that it reached companies that were both viable and hard-hit by the pandemic. By using publicly available data on compensation payments to Norwegian companies in 2020 matched with the companies' respective company information and accounting data, we conduct a twofold empirical analysis. First, we estimate the effect of companies' bankruptcy probability, measured by Altman's Z-Scores in 2019, on received compensation by employing an OLS regression model. Second, we apply a logit regression model and a two-way fixed effects model to analyse the effect of received compensation on companies' dividend payments. Our results suggest that companies that had a moderate and high probability of going bankrupt received 18.9% and 7.1% more compensation than those that had a low bankruptcy probability, respectively. Further, our findings indicate that companies that received more compensation had a lower probability of paying out dividends in 2020 and also paid out less dividends that year. The obtained results imply that the scheme has not fully lived up to its purpose in terms of targeting otherwise viable companies, yet we find no evidence that it reached companies that were not in great need of support. These insights can be valuable when having to construct well-targeted and efficient policy responses to support companies in future crises.

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1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared the coronavirus disease (COVID-19) a global pandemic (World Health Organization, 2020). The virus has since spread rapidly across the world, threatening not only the public health, but also the economy. As a response to the pronounced increase in the number of infections in March, the Norwegian government ordered an extensive lockdown of the society, which involved strict infection control measures. These measures, along with an overall uncertainty surrounding the pandemic, consequently put a damper on economic activity across Norway and severely affected many businesses (Tjernshaugen et al., 2022).

As the virus outbreak was largely unexpected, the Norwegian government was forced to take prompt action to minimize the economic damage from the pandemic without any ex-ante evaluations. Like many other governments around the world, the Norwegian government thus introduced various economic policy measures aimed at businesses and industries. Of these, the compensation scheme for companies was of great significance in terms of increasing economic activity and helping many companies manage through the crisis without unnecessary layoffs and bankruptcies. This scheme was set specifically to help otherwise viable companies that experienced a large drop in turnover due to the pandemic by compensating them for their fixed, unavoidable costs. Although these economic policy responses to COVID-19 differ in terms of purpose, they are all of unprecedented magnitude. Budget allocations for economic measures to mitigate the economic effects of COVID-19 aimed at businesses and industries were estimated at NOK 98 billion in 2020. The compensation scheme for companies on its own was estimated to weaken the budget balance by NOK 30 billion (Ministry of Finance, 2020).

The compensation scheme for companies, along with the other economic policy responses to COVID-19, has certainly been essential for saving many companies and jobs during the pandemic. Nevertheless, it has been questioned whether the government support in Norway has reached the intended beneficiaries (e.g. Hjelseth et al., 2021; Alstadsæter et al., 2020). Considering the unprecedented magnitude of government support to companies during COVID-19, investigating whether it has reached the “right” companies is of great need and importance for assessing the trade-off between the policies’ effectiveness and economic cost.

To our knowledge, evidence on the targeting of the Norwegian support policies during COVID-19 remains scarce. The aim of this thesis is therefore to contribute to this limited research field by analysing whether the support has been efficient in the sense that it has been well-targeted. Based on this, we aim to answer the following research question:

Did government support during COVID-19 reach the right companies?

In line with what the scheme's purpose point to as the right companies, we believe there are two aspects of compensation scheme targeting of great relevance and importance for us to investigate. Thus, the aim of this thesis is twofold. We aim to analyse how well-targeted the Norwegian compensation scheme has been, in that it reached companies that were both viable and hard-hit by the pandemic. The importance of targeting support towards companies that were viable and that critically needed it to be able to cope with the crisis is mainly connected to potential issues of inefficient reallocation of resources (Barrero et al., 2020) and economic inefficiency creating a deadweight loss (Santarelli & Vivarelli, 2002). The former aspect has been studied by Hjelseth et al. (2021), who use logit estimates to analyse whether non-viable companies, defined by them as companies with credit rating C in 2019, had a higher probability of receiving compensation than viable companies had. This thesis aims to add to the research on this topic of study in Norway. In addition, the latter aspect of compensation scheme targeting has, to our knowledge, has not yet been studied in Norway, and this thesis seeks to fill this research gap.

To analyse the targeting of the compensation scheme for companies in Norway, we conduct an empirical analysis. We apply publicly available data on compensation payments to Norwegian companies for the periods March-August and March-December in 2020 to investigate the first and the second aspect of the compensation scheme targeting, respectively. Further, we match this data with the companies' respective company information and accounting data.

In the first part of our analysis, we employ an OLS regression model to estimate the effect of companies' bankruptcy probability, measured by Altman's Z-Scores in 2019, on received compensation. This is to investigate whether a disproportionate amount of compensation has been given to non-viable and that under normal circumstances would probably not do well. In the second part of our analysis, we aim to investigate whether compensation has been given

to some companies that were not relatively hard-hit by the pandemic and that could have survived without support. To do that, we find it relevant to investigate whether received compensation have had an effect on companies' dividend payments. Specifically, we apply a logit regression model to analyse whether companies that received more compensation had a higher probability of paying out dividends in 2020. We also apply a two-way fixed effects model and companies' dividend payments from 2015 to 2020 to analyse whether higher received compensation amounts led to companies paying out more dividends.

The rest of the thesis is structured as follows. Section 2 presents the background for the thesis. This includes the relevant aspects of the COVID-19 lockdown in Norway and the compensation scheme for companies. Section 3 provides a review of relevant existing literature on government support during COVID-19 and explains how our thesis contributes to this body of literature. Section 4 describes our research approach. The section introduces our hypotheses, describes our data, and presents the empirical models used to test our hypotheses. Section 5 display the empirical results of our analyses. In this section, the robustness of the analyses is also discussed. Section 6 discusses the empirical results, limitations of our study and relevant topics for future research. Section 7 presents our conclusion. Finally, we list our references and present supporting appendix.

2. Background

Understanding the context of the COVID-19 pandemic is essential for analysing the economic policy responses governments have taken to support companies financially during the crisis. This section first describes the situation and government restrictions on social and economic activity in Norway in the first phase of the pandemic, as this is the period of relevance to our analysis. Further, we address some issues according to welfare economics that may arise when introducing economic government interventions. Moreover, the section presents the compensation scheme for companies introduced by the Norwegian government following the lockdown. Lastly, we discuss some critical aspects of this scheme.

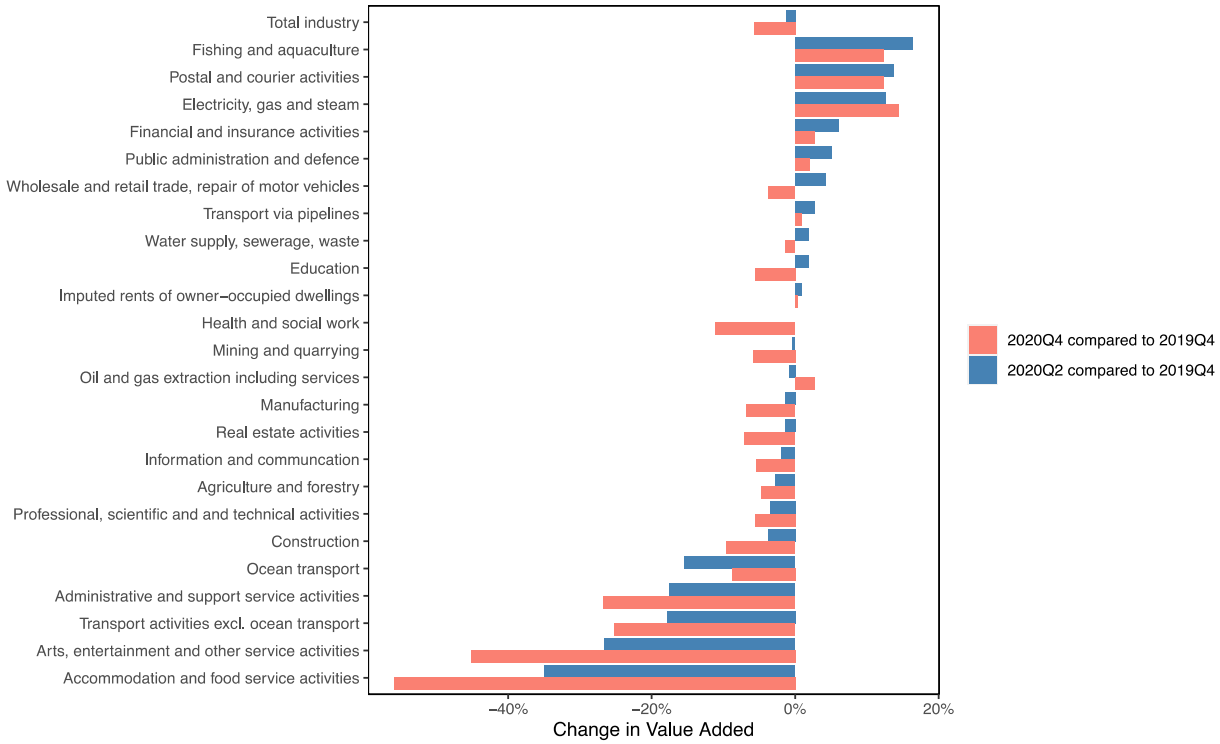
2.1 The COVID-19 Lockdown in Norway

The coronavirus was confirmed to have spread to Norway on February 26, 2020. In the following weeks, the number of COVID-19 cases and hospitalisations began to rise rapidly, and the first death was documented. In order to limit the spread of infection, it became necessary to implement infection control measures, and the Norwegian government therefore ordered an extensive lockdown of the society on March 12, 2020. These measures were described by former Prime Minister Erna Solberg as “the strongest and most intrusive measures we have had in Norway in peacetime”. Among other things, all childcare and educational institutions were closed. Several types of businesses where close physical contact is unavoidable, including hairdressers, were also required to stay closed. All cultural and sports events were cancelled. Workers who were able to, were generally encouraged to work from home. Severe travel restrictions were also imposed, both domestically and internationally, and all leisure trips were strongly discouraged (Tjernshaugen et al., 2022).

The outbreak of the coronavirus and the government-imposed measures during the lockdown, along with an overall uncertainty surrounding the pandemic, quickly led to a steep decline in economic activity and weakened the economic situation for many businesses. Several businesses had to close down temporarily and companies in most industries experienced loss of revenue. The decline in economic activity was particularly pronounced in several service sectors, and the infection control measures were especially hurting businesses in areas such as culture and entertainment, and in the hotel and restaurant sector. In addition, there were

difficulties for several businesses operating across national borders (Statistics Norway, 2020). The change in value added from 2019 to 2020 in different sectors in Norway is given by Figure 1. Oslo was particularly hard-hit by the pandemic compared to other municipalities in Norway. The municipality of Oslo experienced relatively higher infection rates and therefore had many measures that were stricter than the national restrictions (Statsforvalteren i Oslo og Viken, 2020). Similarly, Table 1 shows that Oslo, followed by Bergen and Trondheim, are the municipalities that experienced the highest numbers of reported COVID-19 cases.

Figure 1: Change in Value Added by Sectors in Norway



Note: Figure is based on value added at basic prices. Constant 2019-prices, seasonally adjusted (NOK million). Source: Statistics Norway (2022a).

Table 1: Number of Reported Cases by Municipalities in Norway

Municipality no.	Municipality	Number of reported cases
301	Oslo	257,962
4601	Bergen	77,405
5001	Trondheim	53,010
3024	Bærum	42,208
1103	Stavanger	39,367
4204	Kristiansand	36,321
3005	Drammen	35,141
3030	Lillestrøm	30,948
3025	Asker	30,614
3004	Fredrikstad	25,149

Source: Norwegian Institute of Public Health (2020).

There was also a pronounced increase in unemployment during the first phase of the pandemic. Juranek, Paetzold, Winner and Zoutman (2020) study the labour market effects of non-pharmaceutical interventions (NPIs) during COVID-19 in Norway, Denmark, Finland and Sweden. The descriptive statistics of their weekly regional unemployment and furlough spells data for weeks 11 to 21 show that the average weekly number of new unemployment spells in Norway was approximately 2.4 times higher in 2020 than in 2019. Even more drastically, their statistics indicate that the new weekly furlough spells in Norway were almost 69 times higher in 2020 than in 2019. Lastly, the results of their empirical analysis indicate that labour markets were affected by NPIs in all the four countries, but the negative effects were the greatest for Norway and Denmark.

The extensive measures imposed during the lockdown succeeded in containing COVID-19 in the upcoming months. During the spring and summer of 2020, the infection rates decreased and several of the measures were then gradually eased. In the course of the summer, many service industries could therefore resume business, and employees could return to work. However, some industries were still subject to restrictions that severely limited business. This applied, for instance, to the cultural sector, where it was impossible to carry out large audience events. Even though the decline in economic activity came to a halt that summer, there has since then been several waves of infection and reintroductions of a number of infection control measures, something which has further restrained businesses financially (Tjernshaugen et al., 2022).

The effectiveness of such strict lockdown measures has been analysed by several authors. For instance, Juranek and Zoutman (2020) investigate the effectiveness of the costly lockdown measures focusing on Norway, Denmark, and Sweden. Since the measures imposed in Norway and Denmark were stricter than the approach that Sweden followed, they analyse the measures' impact on the demand for intensive care by comparing these countries. They find that stricter measures strongly decrease the stress on the health care system. Further, Sheridan, Andersen, Hansen and Johannesen (2020) study the effect of social distancing laws on consumer spending during COVID-19. They find that the lockdown restrictions are only responsible for a small proportion of the decrease in consumer spending during the pandemic and suggest that the coronavirus itself is responsible for the economic contraction. These studies illustrate the importance of evaluating the effectiveness of the government interventions during COVID-19 in order to justify the economic cost that came along.

2.2 Welfare Economics and Government Support to Companies

Following the lockdown, the Norwegian government introduced a range of extensive economic policy measures to support companies that were severely affected by the coronavirus outbreak and the related infection control measures. The aim of these measures was to increase economic activity and help unemployed return to work. Some of the measures were deferral of tax payments and reduced fees, guarantee and loan schemes, and direct subsidies in the form of various compensation schemes (Ministry of Finance, 2020). Such economic government interventions are, in accordance with welfare economics (Harberger, 1971), legitimized when it would be worse for the economy without them. However, introducing such policy interventions can often come with some issues.

One well-known potential issue with economic government interventions is that they may induce resource misallocation. This issue arises when resources are not distributed to its best or most efficient use, something which reduces economic productivity (Barrero et al., 2020; Herrera et al., 2021). In the matter of COVID-19 government support to companies, such an issue will arise if non-viable companies receive support and continue to live at the expense of otherwise viable ones. This also relates to the term "zombification", which can be defined as a situation where public support programmes and bank lending actions provide relief to and

keep non-viable companies alive (Laeven et al., 2020). There is a widespread fear that government support during COVID-19 has led to an increased share of these so-called "zombie companies". An accelerated zombification of the economy is of great concern as keeping non-viable companies alive will undermine the aggregate productivity and output through misallocation, thereby slowing down the economic recovery in the post-pandemic period. It may also distort market competition (Laeven et al., 2020) and can impede the Schumpeterian process of creative destruction, where new production units replace outdated ones (Schumpeter, 1942).

Another issue that can potentially arise as a result of government interventions is the creation of a deadweight loss, which primarily is caused by inefficient allocation of resources. Deadweight loss refers to a loss in economic efficiency when supply and demand are out of equilibrium (Harberger, 1964). With regard to policy responses to COVID-19, such a loss will arise if taxpayer-financed support has been given to companies that would have anyway survived the crisis without it. This would happen at the expense of those that genuinely needed it, and thereby hinder an optimal level of supply and demand. Thus, deadweight loss can, in this case, be seen as a measure for support wastage.

2.3 Compensation Scheme for Companies in Norway

Part of the government's measures to mitigate the economic consequences of COVID-19 was the compensation scheme for companies, which was announced by the government on March 27, 2020. The scheme was set with the purpose of compensating parts of the fixed, unavoidable costs of otherwise viable companies that experienced a substantial decline in turnover as a result of the virus outbreak and the infection control measures, to avoid unnecessary bankruptcies and preserve jobs throughout the crisis (Finansdepartementet, 2020a). Initially, the scheme was intended to apply for the months March to August 2020[1] but has eventually applied for four periods. Several other European countries also implemented such compensation schemes for fixed costs, where the Norwegian scheme share the most similarities with the ones in Sweden, Denmark, and the UK (Bennedsen et al., 2020).

[1] The scheme applying to this compensation period is commonly known as Compensation Scheme 1.

In order to receive compensation, companies had to meet some requirements[2]. The scheme applied to registered taxable companies in Norway, with some exceptions, such as companies with no employees and companies that are undergoing bankruptcy proceedings (Lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 4). As mentioned, the scheme also only applied to companies that have experienced a substantial decline in turnover due to COVID-19, which is defined as a decline in turnover of 30 percent or more in the month for which compensation is applied for. For March 2020, a decline in turnover of 20 percent or more is considered a substantial decline in turnover (Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 2-3).

The fixed, unavoidable costs that companies were compensated for are costs that cannot be reduced in the short term in line with the business activity, such as rent, insurance costs, utilities, and net interest rate costs[3] (Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 3-2). Further, the compensation was scaled by the size of the decline in turnover for the given month and an adjustment factor of 0.8 for March, April, and May. For June and July, the adjustment factor was 0.7 and for August 0.5. The scheme distinguished between companies that were closed down by the authorities and those that were not, where those that were closed down received a somewhat higher compensation in March, April, and May as they were then compensated at a higher rate of 0.9. For companies that were not closed down, the fixed, unavoidable costs were also adjusted by a standard deductible. The deductible was NOK 10,000 for March, NOK 5,000 for April, and NOK 0 for May-August (Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 3-1). This can be summarized in two different equations; one for companies that were closed down and one for those that were not, as given by Equation 2.1 and 2.2, respectively.

[2] All requirements to receive compensation is given by Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, §§ 2-1 – 2-6.

[3] Fixed, unavoidable costs are costs that can be attributed to the specified items given by Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 3-2 (2).

$$Decline\ in\ turnover\ (\%) * fixed, unavoidable\ costs * adjustment\ factor \quad (2.1)$$

$$Decline\ in\ turnover\ (\%) * (fixed, unavoidable\ costs - deductible) * adjustment\ factor \quad (2.2)$$

Further, the minimum payable compensation was NOK 5,000 (Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 3-1). Compensation up to NOK 30 million per month was paid in full, but for any calculated compensation above NOK 30 million, the amount exceeding this threshold would be reduced by a factor of 0.5. For March, April, and May, the maximum payable compensation per month was NOK 80 million. The maximum limit was lowered to NOK 70 million for June and July and to NOK 50 million for August (Forskrift til lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall, 2020, § 3-3).

Eventually, a second compensation scheme for companies, known as Compensation Scheme 2, was introduced. This scheme applied to the period from September 2020 to February 2021 and was to a great extent a continuation of Compensation Scheme 1. There are nevertheless some differences between these two schemes, such as that compensation was henceforth to be calculated for two months at a time (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020 for tilskuddsperioder til og med februar 2021, 2020, § 1-1). Unlike the previous scheme, Compensation Scheme 2 did also not incorporate more compensation for companies that were closed down by the authorities and the deductible for any of the months (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020 for tilskuddsperioder til og med februar 2021, 2020, § 3-1).

Further, Compensation Scheme 3 applied to the period March-October 2021 (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020, tilskuddsperioder etter februar 2021, 2021, § 1-1). The greatest change from the two previous schemes is that, under Compensation Scheme 3, compensation was only given to companies that could refer to a calculated loss in the operating profit during the compensation period (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020, tilskuddsperioder etter februar 2021, 2021, § 3-1). Another requirement that was introduced

merely for medium- and large-sized companies is that these companies could not be given compensation if the company experienced financial difficulties prior to the COVID-19 pandemic[4] (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020, tilskuddsperioder etter februar 2021, 2021, § 2-5).

The last adopted compensation scheme for companies is Compensation Scheme 4, which applied to the period from November 2021 to February 2022. This scheme went back to compensating month by month, and not two months at a time (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020 for tilskuddsperioder etter oktober 2021, 2022, § 1-1). In order to be able to apply for compensation under this scheme, it was taken into account that the company applying could not have decided to or gone through with any dividend payments (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020 for tilskuddsperioder etter oktober 2021, 2022, § 2-6). Perhaps the greatest change from the previous schemes is that, under Compensation Scheme 4, a company that received compensation will be obligated to pay back the received compensation if it pays out dividends or makes a profit of more than NOK 50,000 in the accounting year to which the compensation period belongs (Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020 for tilskuddsperioder etter oktober 2021, 2022, §§ 3a-2 – 3a-3).

As illustrated above, the scheme continuously became more complicated and different compared to how it was initially designed over the course of time. Eventually, in the time of Compensation Schemes 3 and 4, the government wanted to downgrade the scheme, which made the requirements for receiving compensation even stricter than it had been before. Consequently, there were far fewer companies that met the requirements to receive compensation under these schemes. Following Compensation Scheme 4, the government decided that the compensation scheme for companies is under no circumstances relevant to continue beyond February 2022 (Solheimsnes et al., 2022).

[4] Whether a company had financial difficulties prior to the COVID-19 pandemic is defined by Forskrift til utfylling og gjennomføring av lov om midlertidig tilskuddsordning for foretak med stort omsetningsfall etter august 2020, tilskuddsperioder etter februar 2021, § 2-5 (3).

2.3.1 Critical Aspects of the Scheme

The initial compensation scheme for companies has its flaws for which it has been subject to criticism. This is probably a consequence of the scheme being put in place under enormous time pressure to prevent bankruptcies and save jobs in a time of very high uncertainty, which in turn led to less stringent requirements for receiving compensation for the first compensation periods, as illustrated in the previous section. In the following, we will elaborate on some of the critical aspects of the scheme, which is also what initially inspired us to investigate this topic and serves as the foundation for our hypotheses.

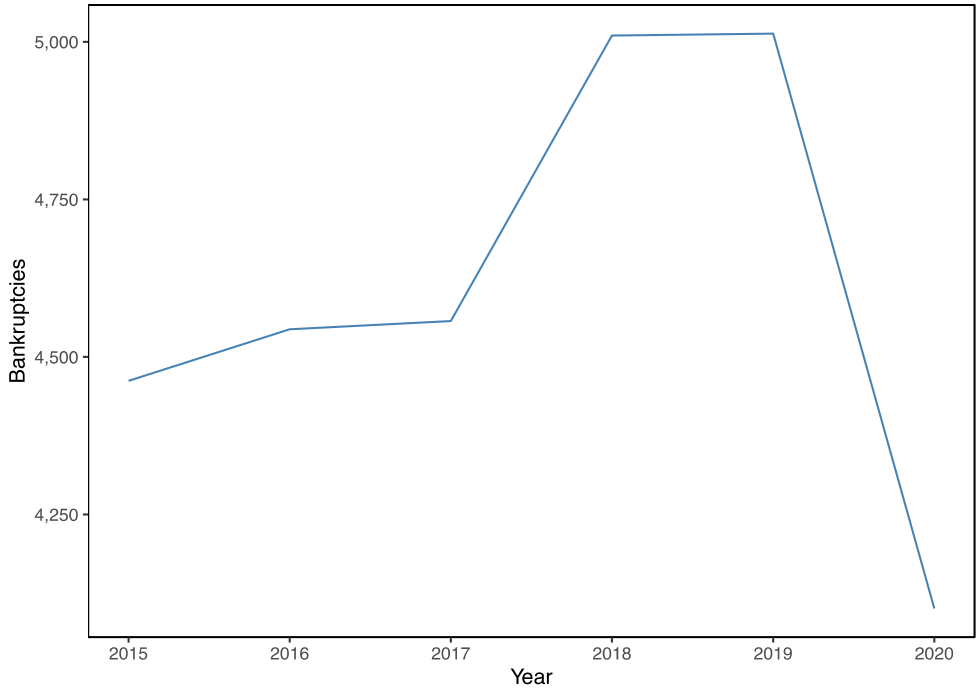
First, one potential critical aspect of the scheme concerns the process of applying for compensation. To ensure efficient and fast payment of compensation to the many expected applicants, the application process of the scheme has taken place in a digital application form processed by the Norwegian Tax Administration and eventually the Brønnøysund Register Centre[5]. When applying for compensation, the companies provided requested information on financial figures and other relevant information themselves. In the process, there were built-in control systems against various register data and cross-checks. All approved applications also went through a digital seriousness assessment before payment, where those that did not pass this test went to manual case processing (Skatteetaten, n.d.-b). Thus, the application process of the scheme has to a large extent been automated, which is something that may have made it possible for some non-viable companies and unaffected companies to receive compensation. Section manager in the Norwegian Tax Administration, Hanne Kjørholt, points out that such an automated application process harmonizes poorly with making more thorough assessments of companies' viability (Kampevoll & Seibt, 2020).

Furthermore, the only mechanism set under the initial scheme for screening out non-viable companies was that those who were in bankruptcy proceedings were not entitled to compensation. As some time has passed since the scheme was put in place, there has been investigations revealing that several companies that received compensation under the scheme were already doing poorly financially prior to the crisis (e.g., Kampevoll & Seibt, 2020). Statistics Norway have also shown that, despite an ongoing economic crisis, there was a

[5] The scheme was managed by the Brønnøysund Register Centre as of September 2020 (Nærings- og fiskeridepartementet, 2020).

decline in the number of bankruptcies of approximately 20 percent from 2019 to 2020 (see Figure 2). According to the section manager in Statistics Norway, Erik Fjærli, such a sharp reduction in the number of bankruptcies may indicate that various forms of public support during COVID-19 to a certain extent have helped to keep several non-viable companies afloat, considering that both the national and international economy has been weakened (Fredriksen, 2021). This relates to the fear that government support during COVID-19 has led to a rise of zombie companies, as mentioned in Section 2.2.

Figure 2: Bankruptcies in Norway Over the Period 2015-2020



Source: Statistics Norway (2022b).

Moreover, a lot of the criticism of the scheme has been about that not enough was done in the beginning to prevent compensation from going to companies that would do well without support. An investigation done by the Norwegian newspaper E24 show that half of the companies that received compensation in 2020 in fact did better financially that year than the year before, and that over half of the companies could have paid back the entire compensation amount and still avoided losses (Fraser et al., 2021a). Another investigation done by E24 also show that the companies that received compensation overall paid more dividends in the first year of the pandemic than in 2019 (Fraser et al., 2021b). Although companies that received compensation under the scheme were encouraged to show moderation with respect to paying

dividends and bonuses (Finansdepartementet, 2020b), there were nevertheless no claim for repayment of compensation if a company made a profit or paid dividends for the ones that received compensation for the first compensation periods, as demonstrated in the previous section.

Lastly, despite the fact that many companies have received compensation under the scheme, the compensation amounts are highly concentrated. As displayed in Table A1 in the appendix, the ten companies that have received the highest compensation amounts have alone received approximately 22% of the total compensation paid out in 2020. This is consistent with calculations done by SNF researcher at NHH, Ole-Andreas Elvik Næss, showing that five companies have received a total of NOK 1 billion in compensation, which is as much as what 27,000 small companies have received combined. Næss has therefore questioned whether the scheme was particularly advantageous for rich business owners in the way it was set up initially, and he believe this could have been avoided if the scheme was set up differently (Næss, 2020). He also points out that the companies that have received high compensation amounts are relatively large and should therefore have had good access to capital and the loan market (Næss et al., 2021).

Based on these mentioned critical aspects of the scheme, one can discuss whether the control systems have been sufficient and why no adjustments were made to the scheme earlier, as it became clear that the compensation seemingly went to more companies than solely those that were viable and that really needed it. As we will convey in the following section, the targeting of government support during COVID-19 has also been the topic for investigation in various research papers.

3. Literature Review

In this section, we present relevant existing literature about the targeting of government support to companies during COVID-19. To our knowledge, the literature on this topic of study in Norway is still very limited, as COVID-19 is still an ongoing event. There is, nevertheless, a wider range of existing literature addressing the targeting of different COVID-19 government support policies in other countries. The focus of the literature review will therefore be on the latter. This section first presents existing literature on the targeting of the compensation scheme to companies in Norway. Second, we introduce the research on different COVID-19 government support policies and their targeting in other countries. Lastly, we explain how our thesis will contribute to the still limited body of literature on this topic.

3.1 Compensation Scheme for Companies in Norway

Hjelseth, Solheim and Vatne (2021) study the targeting of some of the government support policies during COVID-19 in Norway, including the compensation scheme for companies. To analyse the compensation scheme, they conduct a simple logistic regression model to examine the relationship between the received amount of compensation and companies' viability. By using the lowest credit rating, C, at the end of 2019 as an indicator for a company being non-viable, they find that 4% of the compensation was given to non-viable companies. Nevertheless, their regression results primarily show that companies that were non-viable were not more likely to receive compensation compared to viable companies. Further, their results indicate some heterogeneity across sectors. Particularly, they find that non-viable companies in the food service activities sector had significantly and clearly lower probability of receiving government support, followed by the transportation and wholesale and the retail trade sectors. To sum up, the paper of Hjelseth et al. (2021) suggests that companies that were financially weak at the end of 2019 have received less support than those that were financially healthy.

Furthermore, Alstadsæter, Bjørkheim, Kopczuk and Økland (2020) review government support policies implemented in Norway during the COVID-19 pandemic and compare them to the Pay Protection Program (PPP) scheme in the United States. They conduct a simulation study to evaluate the effectiveness of the government support policies on mitigating negative effects of the crisis. Their results show that the impact of the crisis on profits, liquidity and

insolvency risk falls by over a half when they model full packages of policies in both Norway and the United States. They find, however, that the Norwegian compensation did not make an enormous quantitative difference, for which they claim can be primarily explained by the scheme not being well-targeted to the more financially distressed companies.

3.2 Government Support Policies in Other Countries

Literature on COVID-19 government support policies in other countries and their targeting is, as mentioned, more extensive and covers a wider range of topics. While one branch of this literature draws attention to COVID-19 government support policies possibly keeping non-viable companies afloat (Groenewegen et al., 2021; Dörr et al., 2021; Hoshi et al., 2022; Cros et al., 2021), the other one addresses how the support went to companies that did not experience any shocks due to the pandemic and that could have survived without the support (Cirera et al., 2021; Kluzek & Schmidt-Jessa, 2022; Granja et al., 2020; Gourinchas et al., 2022). Some studies also draw attention to the heterogeneity across companies in terms of how much they were negatively affected by COVID-19 and thereby how much government support they were given (Janzen & Radulescu, 2021; Kozeniauskas et al., 2020).

Groenewegen, Hardeman and Stam (2021) bring attention to government support during COVID-19 possibly rescuing non-viable companies and analyse how well-targeted government support policies have been in the Netherlands. They study the characteristics and long-term viability of 1,151 companies that received government support during the pandemic. By using logistic regression analyses, the authors find that the support went to companies with lower turnover expectations, greater uncertainty about future turnover, and better management practices. The authors state that these findings suggest that the government support reached companies that are long-term viable and that are in perceived need, indicating that the Dutch COVID-19 support policy is effective and efficient.

The issue of COVID-19 government support keeping non-viable companies afloat is also addressed by Dörr, Licht and Murmann (2021), which they refer to as the “insolvency gap” phenomenon. They study German government support policies during COVID-19, which consists of liquidity subsidies and temporary suspension of the duty to file for insolvency for financially distressed companies. According to the authors, such government support policies hamper the “cleansing effect” in times of economic crises, where capital and employees should

be reallocated to more efficient companies. By investigating the pre-crisis financial standing of approximately 1.5 million German companies, Dörr et al. (2021) estimate the COVID-19 insolvency gap to affect around 25,000 companies. They emphasise that this gap is substantial when comparing it to around 16,300 actual insolvencies in 2020. They also state that the estimated insolvency gap is driven by small companies that were financially weak prior to the pandemic.

Further, Hoshi, Kawaguchi, and Ueda (2022) link the rescuing of non-viable companies by government support during COVID-19 to the concept of "zombification" of the economy. They study characteristics of listed and unlisted companies in Japan to examine to what extent government support went to zombie companies, which they refer to as "firms that are non-viable but kept alive by assistance from creditors and/or government". They find that companies with low credit scores prior to COVID-19 were more likely to apply for and receive subsidies and grants, as well as concessional loans offered by the government. Specifically, their regression analysis estimates that a company having a credit score one standard deviation below the mean average was 7.7% more likely to get the Business Continuity Grant and 28.1% more likely to receive the concessional loan. They point out, however, that companies with low credit scores prior to the pandemic are not necessarily zombie companies.

Cros, Epaulard and Martin (2021) investigate the impact of policy measures to support companies during the pandemic on the selection process of company bankruptcies but refer to it as "hibernation" rather than zombification of the economy. By analysing bankruptcy filings in France from 2009 to 2020, they find that 36% less companies filed for bankruptcy in 2020 than in 2019. In addition, they estimate factors predicting companies' failures during the COVID-19 crisis. They state that the selection process of bankruptcies has not been distorted in 2020 because the main predictors of bankruptcy are at work in 2020 as in 2019 and 2018. Therefore, they conclude that partial hibernation of the destructive creation process rather than a zombification of the French economy has been generated by the policy measures during COVID-19. However, they emphasise that their analysis is conducted in an early stage and state that catch-up failures in 2021 and 2022 will be large.

Attention has also been drawn to the concern that government support has flowed to companies that did not actually suffer from the COVID-19 crisis. Cirera, Cruz, Davies, Grover, Iacovone, Cordova, Medvedev, Maduko, Nayyar, Ortega, and Torres (2021) study

government support policy measures in 60 countries during the months April-September in 2020. Their paper provides indicative evidence of mistargeting, which they define as support that is going to companies that are not experiencing the pandemic shock. By analysing data on 120,000 companies, they find that a significant number of companies that declared not having experienced any shock as a result of the pandemic did benefit from receiving support. Furthermore, their results show that companies which did not experience any change or increase in sales had a probability of 19% to receive government support, compared to a probability of 27% for companies that had a reduction in sales.

Further, Kluzek and Schmidt-Jessa (2022) investigate the relationship between government support and dividend payments by companies in Poland. By employing a sample of 457 Polish companies listed on the main trading floor, they apply a logit regression model to analyse the impact of received compensation on the probability of a company paying out dividends. The results of their model show that received government support had a significant negative effect on the probability of a company paying out dividends in 2020. In addition, they investigate the characteristics of companies in the sample that both received support and paid out dividends. They find that these companies are of average size and age, but that they have the lowest level of debt and the highest level of cash ratio.

Granja, Makridis, Yannelis, and Zwick (2020) study the targeting of the Paycheck Protection Program (PPP) in the United States. By performing several different regression analyses, they investigate whether funds flowed to where the economic shock was greatest and also analyse the role of banks in the policy targeting. Among other findings, they document that funds flowed to geographic areas that were less hard-hit by COVID-19. On the contrary, they find no evidence that funds flowed to areas that were more negatively affected by the economic effects of the pandemic. Further, regions with better performing banks are found to have gotten higher levels of the PPP loan lending. The authors also point out that there is low correlation between regional program's funding and shock severity due to COVID-19. In addition, they document that many inframarginal companies received funds due to limited targeting of the program.

Moreover, Gourinchas, Kalemli-Ozcan, Penciakova and Sander (2022) develop a framework to track business failures during economic downturns, which they apply to the COVID-19 crisis in 11 European countries. In addition, they examine whether the government support

was adequately targeted and reached the vulnerable companies. Their results show that, without the government support, the failures among small- and medium-sized companies would have increased by 6.15 percentage points. Furthermore, they find that both cash grants and pandemic loans provided substantial funding to companies that could survive the crisis without the support, which they define as "strong firms". Specifically, they find that, out of a total of 2.37% of funds disbursed as cash grant measured as a percentage of GDP, 2.02% went to "strong firms". Simultaneously, only 0.17% is distributed to companies that would only fail in the presence of COVID-19, and 0.18% is channelled to companies that would go bankrupt even in the absence of COVID-19.

Janzen and Radulescu (2021) investigate around 10,000 Southern and Eastern European companies to study the effects of the COVID-19 lockdown on the companies' financial health and how government support was distributed. Their results reveal effect heterogeneity across size and sector and conduct a descriptive analysis of policy targeting effectiveness. First, they find that small-sized companies, exporting companies and companies in the facility sector experienced the largest declines in sales due to the pandemic. Furthermore, they find a strong and significant correlation of -0.59 between a company operating in a specific division that was impacted by containment and closure policies and receiving government support. The descriptive analysis reveals that the most affected sector division in their sample is the air transport business, and that 75% of companies in this division received government support. Nevertheless, their results also show that some sectors may have been overcompensated. Specifically, the authors point out that 56% of manufacturers of motor vehicles, trailers and semi-trailers received government support, whereas the average sales decline for companies in this sector was only 20.1%.

Similarly, Kozeniauskas, Moreira and Santos (2020) analyse the pandemic's impact on the financial health of companies in Portugal and find that the shock was heterogeneous across companies. By matching pre-COVID administrative data with a panel survey of 6,952 Portuguese companies conducted during the pandemic, they find that 31% of companies experienced a decline in sales of more than 75%, while 14% of them had flat or increasing sales. Furthermore, the results reveal that 36% of the companies benefited from government support policies. They also point out that, among companies that did not experience any change in sales, up to 9% of them made use of the COVID-19 support policies. Furthermore, the authors highlight the importance of companies' productivity when it comes to the impact

of COVID-19. By performing a regression analysis, they find that companies with high productivity were more likely to remain open, made less use of government support policies and were less likely to reduce their employment.

3.3 Our Contribution to the Literature

Existing literature presented above give us an essential understanding of how well-targeted government support in other countries during COVID-19 has been. Nevertheless, to our knowledge, only Hjelseth et al. (2021) investigate the topic of non-viable companies potentially having been kept alive by government support in Norway. Further, to the best of our knowledge, there are no studies investigating whether the compensation has been given to companies which were not hard-hit by the pandemic in Norway. Thus, our thesis will contribute by filling this gap in the current research.

Our analysis of the relationship between companies' bankruptcy probability and received compensation contribute to the worldwide field of studies analysing whether government support during COVID-19 is keeping non-viable companies afloat. Since we employ companies' Altman's Z-Scores as a measure for bankruptcy probability, our methodology for analysing this topic differs from the method of Hjelseth et al. (2021). Further, there are, to our knowledge, no studies conducted in other countries neither which employ Altman Z-score as a measure for companies' probability of going bankrupt for analysing this subject. Thus, we provide this field of research with a different approach for analysing this topic.

As mentioned, the compensation's impact on companies' dividend payments has not, as far as we know, been studied in Norway. Although there is a range of studies conducted in other countries that have analysed whether the government support has gone to companies which did not actually suffer due to the pandemic, only Kluzek and Schmidt-Jessa (2022), to our best knowledge, analyse the relationship between government support and dividends. Thus, there is a research gap in this field of literature which our analysis aims to fill. Our thesis provides early insights into the relationship between government support and companies' dividend payments during COVID-19 in Norway and contributes to the limited literature about this topic of study.

4. Research Approach

This section first motivates and specifies our three different hypotheses. Second, a detailed description of how we collect and prepare the data for our empirical analyses is provided. Lastly, we present the empirical models we use to test our hypotheses and provide a description and explanation of variables included in the models.

4.1 Research Hypotheses

The compensation scheme was, as mentioned, set with the purpose of providing support to otherwise viable companies that suffered financial distress due to the COVID-19 pandemic to prevent them from going bankrupt. Nevertheless, it has eventually, as mentioned, been questioned whether the scheme has lived up to this purpose in terms of reaching the intended beneficiaries. Thus, in the same way as Juranek and Zoutman (2020), Sheridan et al. (2020) and Alstadsæter et al. (2020) investigate the effectiveness of different government measures implemented during the pandemic, we believe it is important to assess the effectiveness of the compensation scheme in terms of targeting. By doing this, one can evaluate the trade-off between saving companies during the pandemic and the several billion kroners dedicated to this purpose. We will therefore do an evaluation of how well-targeted the scheme has been, in that it reached companies that were both viable and hard-hit by the pandemic. In that sense, we believe there are particularly two aspects of compensation scheme targeting that are important to investigate. It is on the basis of these two aspects that we formulate our three hypotheses.

4.1.1 Compensation to Non-Viable Companies

First, concerns have emerged that the scheme has been too generous, keeping non-viable companies alive and thereby increasing the threat of a zombification of the economy. This would, as mentioned in Section 2.2, be problematic, as such zombie companies will not contribute to the productivity of the economy in the longer run. As conveyed in Section 3, there has been conducted several empirical studies of whether government support in other countries during COVID-19 has gone to non-viable companies, of which some find evidence that this is the case. However, research on this topic in Norway is, as mentioned, still limited. In addition, statistics from Norway have shown that there were far fewer bankruptcies in 2020

compared to the last years, despite 2020 being a year hit by a global pandemic and an economic crisis (see Section 2.3.1). We therefore believe it is important to analyse whether a disproportionate amount of compensation has been given to Norwegian companies that had moderate or high probability of going bankrupt and that under normal circumstances would probably not do well. Thus, our first hypothesis can be constructed as follows:

H1: *Companies with high bankruptcy probability received more compensation than companies with lower bankruptcy probability.*

To investigate this hypothesis, we choose to merely analyse companies that received compensation for the period March-August 2020, which constitutes Compensation Scheme 1. The authorities introduced this scheme quite quickly in a situation of very high uncertainty, which is probably why this scheme had relatively less stringent requirements for receiving compensation, as illustrated in Section 2.2. As pointed out in Section 2.2.1, most criticism has also been directed at this first scheme in terms of targeting. For these reasons, we believe this scheme is of greatest relevance for us to look at.

Measure of Companies' Bankruptcy Probability

As a measure of financial distress, we employ bankruptcy scores calculated using Altman's Z-Score model, which is a bankruptcy prediction model published by Edward Altman in 1968. The model calculates a Z-Score by weighting different financial ratios obtained from a company's accounting data. The Z-Score is an indication of a company's probability of going bankrupt within the next two years. Based on the calculated Z-Score, a company can be classified as either being in the "safe zone", the "grey zone", or the "distress zone". These zones represent a company having either low, moderate, or high bankruptcy probability, respectively (Altman, 1968).

The original mode includes five different financial ratios: working capital to total assets, retained earnings to total assets, earnings before interest and taxes (EBIT) to total assets, market value of equity to book value of total debt, and sales to total assets (Altman, 1968). Due to the inclusion of market value of equity in one of the ratios, the original model is limited to publicly traded companies (Altman & Hotchkiss, 2010). In addition, this model is based on a sample of companies in the manufacturing industry. In order to make the model applicable also for private companies, Altman (2013) introduces a revised version of the model, where

market value of equity is replaced by book value of equity. For further revision, the model is adapted for non-manufacturing companies as well (Altman, 2013). Due to the total assets ratio being an industry-sensitive variable, it is excluded from this revised model in order to minimize the potential industry effect. Thus, the revised Altman's Z-Score model that we use in our analysis is given by:

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \tag{4.1}$$

where

$$X_1 = \frac{Current\ Assets\ -\ Current\ Liabilities}{Total\ Assets} \tag{4.2}$$

$$X_2 = \frac{Retained\ Earnings}{Total\ Assets} \tag{4.3}$$

$$X_3 = \frac{Earnings\ before\ Interest\ and\ Taxes}{Total\ Assets} \tag{4.4}$$

$$X_4 = \frac{Book\ Value\ of\ Equity}{Total\ Liabilities} \tag{4.5}$$

Our choice of using the revised Altman's Z-score as our measure for companies' bankruptcy probability is based on four different reasons. First, our data set consists of companies belonging to many different sectors, making the revised version of the model the most appropriate for our analysis. Second, despite the model's "old age", it is still the most commonly used bankruptcy prediction model by financial market practitioners and for academic purposes (Altman, 2018). Third, research in recent years shows that the model still works reasonably well for companies in most countries and has a prediction accuracy of approximately 0.75 (Altman et al., 2017). When applying the model in Norway specifically, the results show a prediction accuracy of 0.694. Lastly, the model's classification of the three zones of bankruptcy probability allows us to create a categorical variable for companies' probability of going bankrupt within the next two years.

In order to make it easier to interpret the regression results, we categorize the Z-Score outcomes into the three zones described above and employ it as the independent variable. We use the Z-Score cut offs in accordance with the zone classification by Altman and Hotchkiss

(1993) for the revised version of the model. Companies with a Z-Score below 1.10 fall under the category distress zone. Having a Z-Score between 1.10 and 2.60 classifies a company as being in the grey zone. When the Z-Score exceeds 2.60, a company is classified as being in the safe zone. We use this classification to investigate what effect having either moderate or high bankruptcy probability has on received compensation amount compared to having low probability. In the same way as Hjelseth et al. (2021) base their analysis on credit scores in 2019, we choose to base our calculation of Altman's Z-scores on accounting figures in 2019, as 2019 is the most recent "normal year" prior to COVID-19.

4.1.2 Compensation to Companies Not Hard-Hit by the Pandemic

Second, it has been questioned whether the scheme has lived up to its purpose of providing support to companies that genuinely suffered financial distress due to the pandemic. If companies that were not in great need of support received it on the expense of the ones that did, the scheme would, as described in Section 2.2, constitute an inefficient use of taxpayers' money. As conveyed in Section 2.3.1, it may seem as if compensation has been given to more companies than solely those that were in great need of it in order to be able to cope with the crisis. What is particularly interesting is that the companies that received compensation in 2020 overall paid out more dividends in that year than in 2019, as mentioned in Section 2.3.1. Paying out dividends may serve as a symbol of a company being financially healthy. We therefore find it relevant to investigate the relationship between compensation and dividends, as we believe this may give us some indication as to whether the government support reached the "right" companies.

We look at this aspect from two different angles; one where we investigate the relationship between the size of received compensation and the probability of paying out dividends in 2020 and one where we investigate whether the dividend payments of companies that received compensation changed in accordance with how much compensation they received. In this way, we are able to compare extensive and intensive responses, respectively. Based on this, we formulate our second and third hypotheses:

H2: *Companies that received more compensation had a higher probability of paying out dividends than those that received less.*

H3: *Companies that received more compensation paid out more dividends after receiving it than they did before.*

To investigate these two hypotheses, we use annual dividend payments retrieved from companies' income statements, although it would be ideal to use monthly dividend payments. In order for the annual dividend payments to be somewhat matchable to the received compensation in terms of period of time, it is of greatest relevance for us to analyse companies that received compensation for the period March-December 2020. Taking into consideration the differences between the schemes mentioned in Section 2.2, we note that it is not ideal to study Compensation Scheme 1 and parts of Compensation Scheme 2 combined. For the second hypothesis, we base our analysis on dividends paid out in 2020, as accounting figures for 2021 were not accessible at the time of our data collection. For the third hypothesis, we want to look at dividends paid out both prior to and during the pandemic. To potentially identify a change in dividend payments prior to and during COVID-19, we base our analysis on dividends paid out in the period 2015-2020.

4.2 Data Management

Collecting and preparing the data for our analyses was a significant part of the thesis work. This section first describes the process of collecting our data. Further, a detailed description of the steps of our data management process is given. Lastly, the descriptive statistics of our data sets are presented.

4.2.1 Data Collection

As a basis for our analysis, we use publicly available data on compensation payments to Norwegian companies during the first phase of the COVID-19 pandemic. We retrieve compensation data for the periods March-August 2020 and September-December 2020 from the Norwegian Tax Administration[6] and the Brønnøysund Register Centre[7], respectively. To analyse our first hypothesis, we use the data set for the period March-August 2020. With

[6] See Skatteetaten (n.d.-a).

[7] See Brønnøysundregisteret (n.d.).

regard to the second and third hypotheses, we want to use the available compensation data for the period March-December in 2020, as we are only able to retrieve annual dividend data. We therefore merge the compensation data for the two compensation periods and create a second data set.

The retrieved compensation data consists of 92,258 observations in total, of which 78,110 and 14,148 observations are obtained for the periods March-August 2020 and September-December 2020, respectively. This amounts to a total of NOK 9,517,036,157 in paid out compensation, of which NOK 6,581,186,442 was paid out for March-August 2020 and NOK 2,935,849,715 was paid out for September-December 2020. In order to derive company-specific compensation amounts, we remove duplicates due to multiple companies having received compensation for several months. This leaves us with two compensation data sets containing 33,928 and 36,690 companies to analyse the first and second and third hypothesis, respectively.

By using the organisation numbers of these companies, we are able to retrieve these companies' respective company information and accounting data from the Bisnode SmartCheck database[8]. From this database, we extract company form, incorporation date, number of employees in 2022, 5-digit sector code, and municipality number, which we need to modify the data sets and create control variables for our analyses. In order to calculate companies' Altman's Z-scores for the analysis of the first hypothesis, we also extract total assets, current assets, current liabilities, retained earnings, earnings before interest and taxes (EBIT), total equity, and total liabilities for 2019. To analyse the second and third hypotheses, we extract total assets and dividend payments in the period 2015-2020. As SmartCheck did not have data for all of the companies, the number of observations was reduced to 32,354 and 34,987 for the first and second data set, respectively. Lastly, these data sets were matched with the existing compensation data sets by the organisation numbers.

4.2.2 Data Management Process

To modify our data sets, we start by removing companies that do not have the company form AS or ASA. Since limited companies (AS) and public limited companies (ASA) in Norway

[8] See Bisnode SmartCheck (n.d.).

are primarily those that are required to provide accounting figures, these companies will be of the greatest relevance for our analyses. Thus, 8,219 observations are removed from the cross-sectional data on compensation and Z-Scores, whereas 9,165 observations are removed from the data set on dividend payments and compensation. Further, as companies with no employees do not in principle satisfy the requirement to receive compensation, we also remove these companies from the data sets. This counts for 1,095 observations in the first data set and 1,249 observations in the second data set. Including only stock-based companies and companies that have at least one employee is in line with what Hjelseth et al. (2021) do in their study.

Furthermore, our data sets had some missing values, which can be due to some companies having been incorporated recently or simply that SmartCheck does not have all data for the companies we searched for. We therefore remove all companies for which we do not have data for the years of interest to our analyses. In the data set on compensation and companies' Z-Scores, that means removing companies that do not have data for 2019. This counts for 138 observations. As we use the data set on compensation and companies' dividend payments for two different analyses, we have to split it into two different data sets; one cross-sectional data set with data for 2020 and one panel data set with data for 2015-2020, respectively. We thus remove 74 observations in the cross-sectional data set and 5,712 observations in the panel data set. In addition to removing missing values for the years 2015-2020 in the panel data set for the analysis of the third hypothesis, we also drop companies that did not pay out dividends in at least one of the years during the time period. This constitutes 10,998 observations. Moreover, we remove companies with a negative value or a value of zero in received compensation in all three data sets, as we consider these to be error values. This counts for 143 observations in the first data set and 123 and 17 observations in the data sets for the analyses of the second and third hypotheses, respectively.

In the data set on compensation and companies' Z-Scores, we also remove companies with negative values in total assets, current assets, total liabilities, and current liabilities, as we also consider these to be error values. In addition, we have to remove companies with zero-values in total assets and total liabilities, as we use these figures in the denominators when calculating Altman's Z-Scores. After having made all these amendments, we are left with 22,665 observations in the data set on compensation and companies' Z-Scores, which we use for the OLS regression model given by Equation 4.6 in Section 4.4.1.

In the data sets for the analyses of the second and third hypotheses, we have to remove companies with negative values and zero-values in total assets, as we use total assets in the denominators of our dependent and independent variables. In addition, we remove negative values in dividends in both data sets. We are then left with 24,300 and 7,294 observations in the data sets for the analyses of the second and third hypotheses, respectively. The panel data set combines 7,294 cross-sectional companies and 6 time periods, which amounts to a balanced panel of 43,764 observations. We use the cross-sectional and the panel data set on compensation and companies' dividend payments for the logit regression model given by Equation 4.10 and the two-way fixed effects regression model given by Equation 4.11, in Section 4.4.2 and Section 4.4.3, respectively.

4.3 Descriptive Statistics

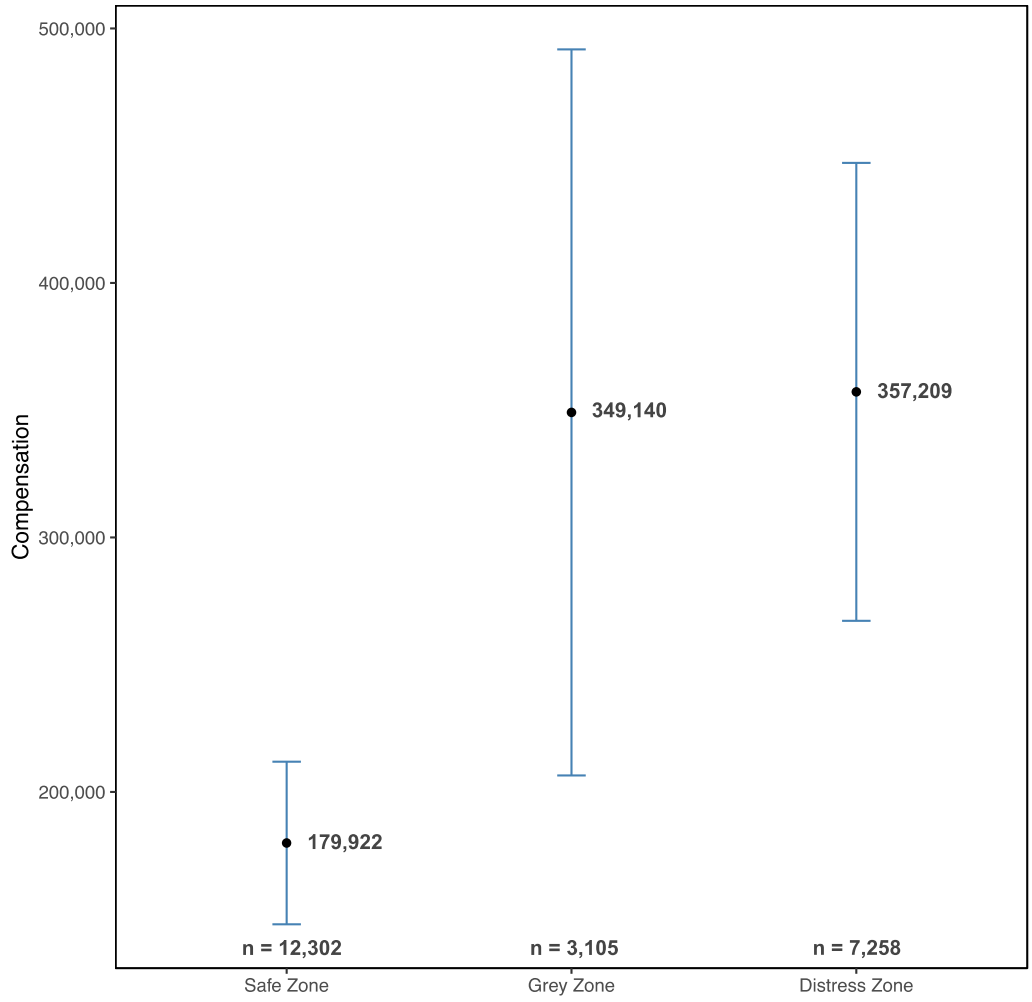
This section displays the underlying structure of our three data sets individually by providing different graphic illustration and descriptive statistics.

4.3.1 Descriptive Statistics of Cross-Sectional Data on Compensation and Altman's Z-Scores

Figure 3 presents a 95% confidence interval plot for the mean of compensation given to companies in each zone of bankruptcy probability. The interval plot reveals that 12,302 companies in the sample are in the safe zone, 3,105 fall under the grey zone and 7,258 are classified as being in the distress zone. Moreover, the figure shows that companies in the safe zone received an average compensation amount of NOK 179,922, while the compensation that companies in the grey and distress zones received on average is NOK 349,140 and NOK 357,209, respectively. Thus, companies in these two zones seem to have received significantly higher compensation on average than companies in the safe zone did. In addition, companies in the distress zone seem to have received a marginally higher average compensation amount than those in the grey zone. Further, we notice that the variation in compensation is substantially lower for the companies in the safe zone than for the companies in the grey and distress zones. Lastly, the figure shows that the confidence intervals of companies in the grey and distress zones, and in the safe and grey zones overlap, which indicates that there may not be any statistical differences in received compensation between these zones. The confidence

intervals between safe and distress zones, on the contrary, do not overlap, which suggests that the difference in the compensation means of the two groups may be statistically significant.

Figure 3: Compensation Means and Confidence Intervals for Z-Score Zones

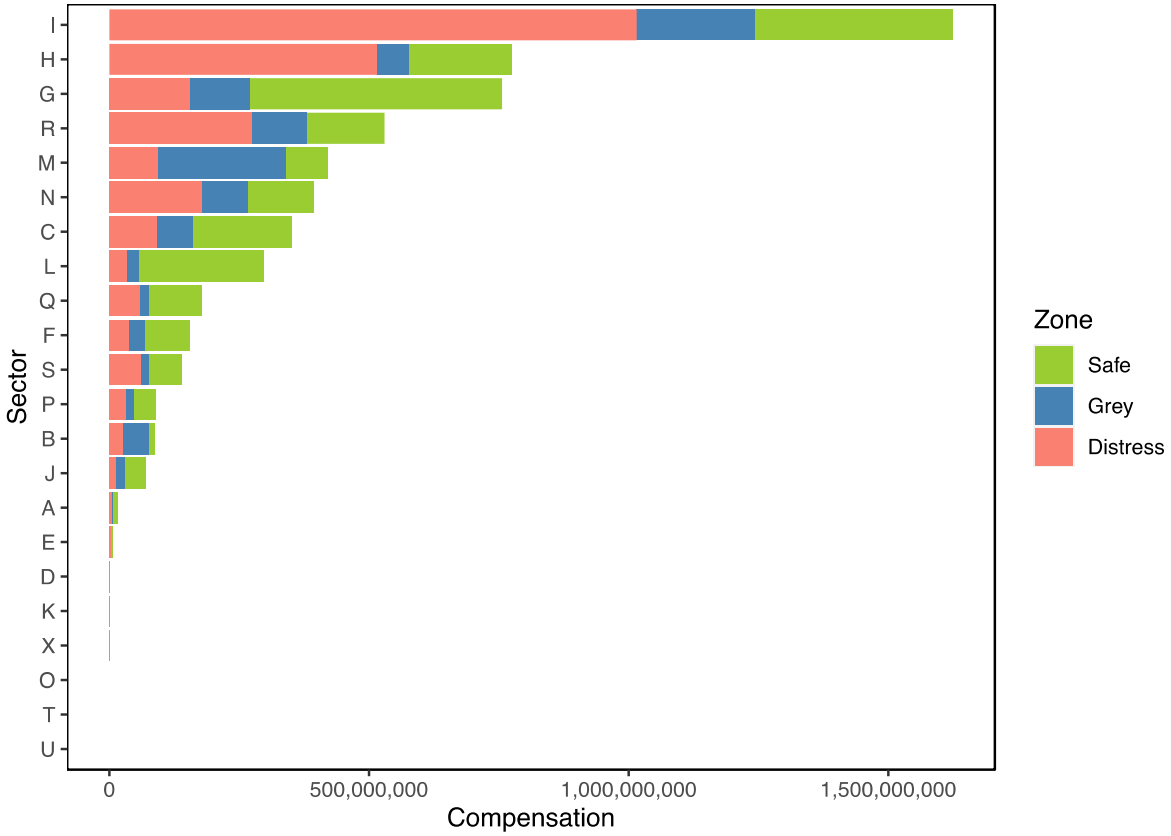


Further, a stacked bar chart illustrating total compensation received by companies in different sectors divided by the three Z-Score zones is given in Figure 4. The figure reveals heterogeneity in received compensation across sectors. We see that sector I appears to have gotten the highest compensation, followed by sectors H, G, and R[9]. At the same time, sectors like E, D, O and T, to name some, have been given a fairly small amount of compensation or have not received compensation at all. We also notice that some of the highest compensated

[9] NACE classification codes with respective section and division names are given in Table A2 in the appendix.

sectors correspond to the sectors that were the most negatively affected by COVID-19 (see Figure 1). Further, the figure shows that, in the majority of sectors, companies in the safe and grey zones seem to have received the highest proportion of the compensation. We observe, however, that companies in the distress zone have gotten more than half of the compensation in some of the highest compensated sectors, being sectors I, H and R. Lastly, an observation worth emphasising is that the two sectors which received the most compensation are also the two sectors where companies in the distress zone appear to have gotten the highest proportion of the compensation compared to the two other zones.

Figure 4: Compensation Given to Different Sectors Divided by Z-Score Zones



The descriptive statistics of the continuous variables of the data set on Z-Scores and compensation are presented in Table 2. First, we notice that the standard deviation of the compensation variable is substantially higher than the mean, implying a considerably widely spread compensation data. In addition, the mean being substantially higher than the median of the compensation indicates an asymmetric and positively skewed distribution in the

compensation data[10]. Such a relationship suggests that the compensation data has outliers as they affect the median less than they affect the mean. Consequently, we apply the natural logarithm to compensation when applying it in the regression model. Similar tendencies can be seen in the Z-Score data, where the standard deviation is considerably higher than the mean. However, the median is higher than the mean of the Z-Score data, indicating a negatively skewed distribution[11]. Due to this, the Z-Score values are also not employed directly in our analyses. Instead, they are, as described in Section 4.1.1, used to create a categorical variable which divides companies into three zones according to their bankruptcy probability. Lastly, we see that the average company age in the data set is 12 years and companies' average number of employees is 17. The standard deviations of these two variables show that the data on number of employees is more widely spread than the company age data.

Table 2: Descriptive Statistics of Cross-Sectional Data on Compensation and Altman's Z-Scores

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Compensation	22,665	259,876.80	2,988,602.00	4	23,660	53,071	132,820	214,462,911
log(compensation)	22,665	11.02	1.34	1.39	10.07	10.88	11.80	19.18
Company Age	22,665	12.65	11.89	0	4	9	19	119
Number of Employees	22,665	17.00	92.73	1	3	7	14	7,387
Z-Score	22,665	1.59	25.52	-2,153.78	0.18	3.03	5.90	240.44

4.3.2 Descriptive Statistics of the Cross-Sectional Data on Compensation and Dividends in 2020

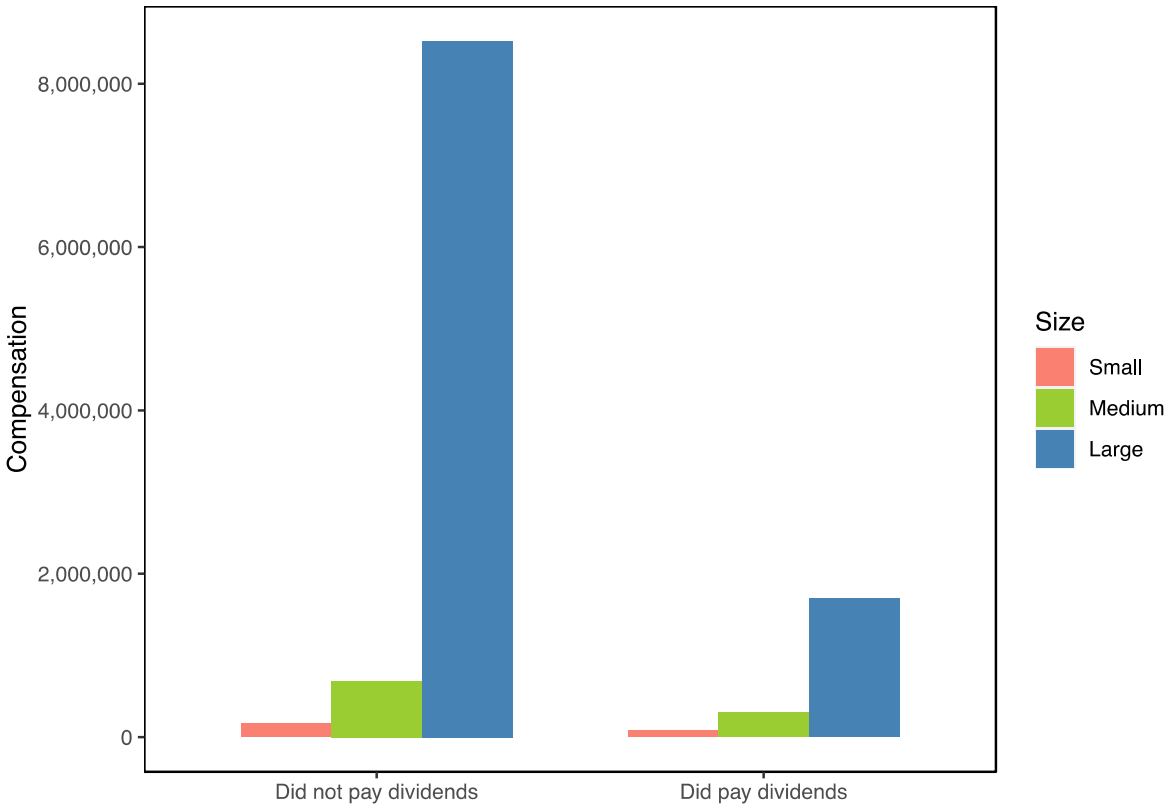
Figure 5 displays a grouped bar chart which compares the average of compensation received by companies that paid out dividends in 2020 and those that did not, divided by company size. The chart shows that companies that did not pay out dividends in 2020 received the most compensation on average, and this applies to companies of all three sizes. Further, while the difference between those that paid out dividends and those that did not, does not seem to be great among small- and medium-sized companies, there is a substantial difference between the two groups among companies of large size. While large-sized companies that did not pay

[10] The histogram of the compensation data is given in Figure A1 in the appendix.

[11] The histogram of the Z-Score data is given in Figure A2 in the appendix.

out dividends on average received compensation of NOK 8,522,571, the large-sized companies that did pay out dividends received NOK 1,700,810. Moreover, we observe that large-sized companies on average received a considerably higher amount of compensation than small- and medium-sized companies did in both groups.

Figure 5: Compensation to Companies That Did and That Did Not Pay Out Dividends in 2020 Divided by Company Size



The descriptive statistics of the variables in the data set on compensation and companies' dividend payments in 2020 are presented in Table 3. In the same way as for the data set on Z-Scores and compensation, the compensation has a high standard deviation and a mean that is substantially higher than the median, implying widely spread data and a positively skewed distribution. By adjusting the compensation for total assets, we achieve a narrower spread and less skewness. Further, we observe that the variables company age and number of employees have quite similar statistics as those in the data set on compensation and companies' Z-Scores. Lastly, the mean of the dividend dummy implies that only 14% of companies that received compensation paid out dividends in 2020, whereas 86% of them did not.

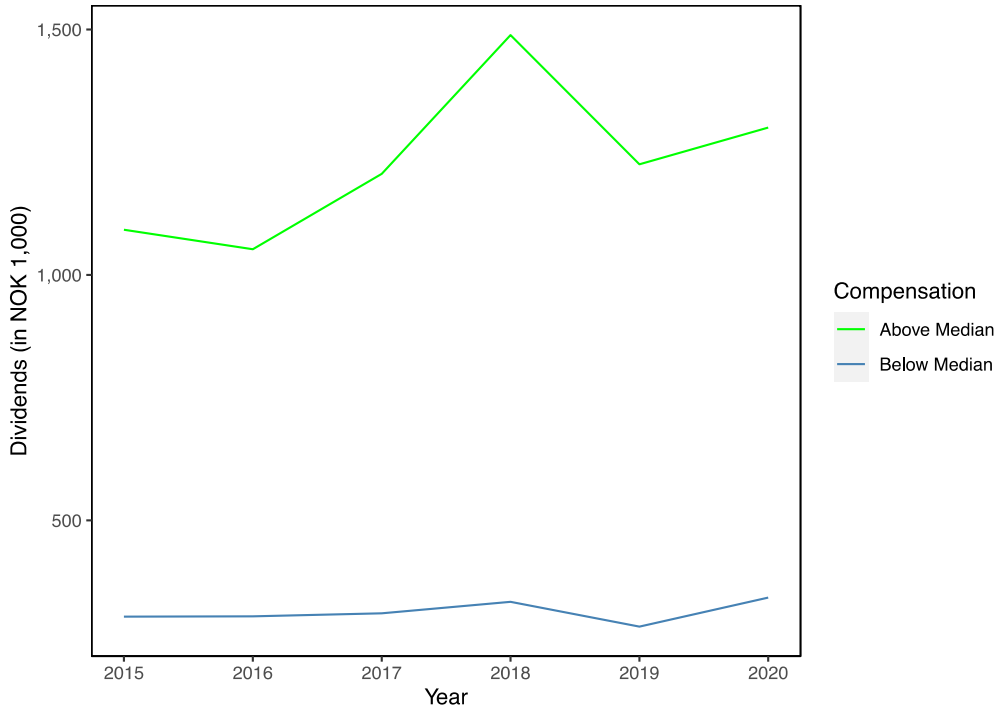
Table 3: Descriptive Statistics of Cross-Sectional Data on Compensation and Dividends in 2020

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Compensation	24,300	355,779.00	5,004,980.00	4.00	24,784.25	58,059.50	159,833.80	351,456,389.00
Compensation/Assets	24,300	0.07	0.22	0.0000	0.01	0.02	0.06	16.29
Dividend Dummy	24,300	0.14	0.35	0	0	0	0	1
Company Age	24,300	13.47	11.83	0	5	10	19	120
Number of Employees	24,300	16.70	97.31	1	3	6	14	8,048

4.3.3 Descriptive statistics of Panel Data on Compensation and Dividends from 2015 to 2020

Figure 6 shows the average dividend payments of companies in our panel data set from 2015 to 2020 divided by companies which received compensation above and below the median of NOK 64,875. From the figure, we observe an upward trend in dividend payments over the period in both lines, with an average change in average dividend payments from year to year of 4.56% and 3.11% for companies which received compensation above and below the median, respectively. We also observe a substantial difference in the size of the dividend payments between these two groups. For companies that received compensation above the median, the average dividend payment was NOK 1,300,152 in 2020, while those that received compensation below the median on average paid out NOK 342,806. We also notice that the average dividend payment of companies that received compensation above the median was 6.08% higher in 2020 than in 2019, whereas it was 2.08% higher for those that received compensation below the median. For companies that received compensation above the median, the average dividend payment of NOK 1,300,152 in 2020 is also higher than that over the period of NOK 1,227,469.

Figure 6: Average Dividend Payments over the Period 2015-2020 of Companies That Received Compensation Above and Below the Median

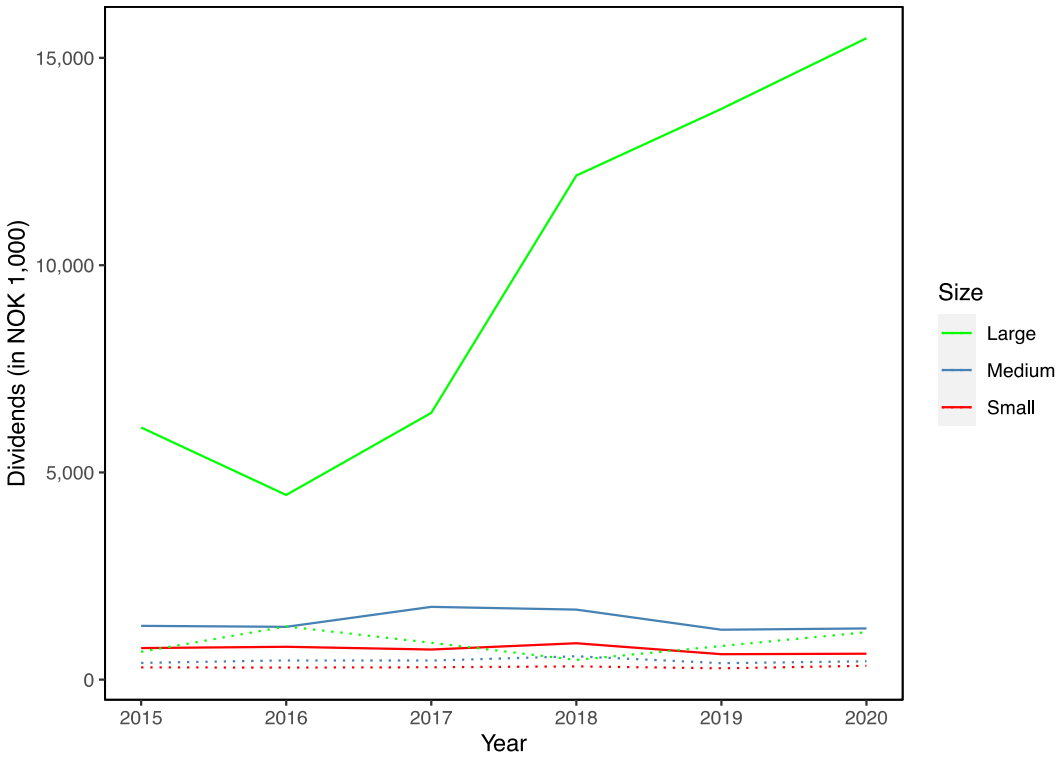


Further, a multiple line graph displaying average dividend payments of small-, medium-, and large-sized companies from 2015 to 2020 is given in Figure 7. The graph also presents the differences in dividend payments between companies that received compensation above and below the median. For small- and medium-sized companies, average dividend payments have remained more or less stable over the period for companies that received compensation both above and below the median. The graph also shows that there are no substantial differences between small-, medium- and large-sized companies that received compensation below the median. We notice, however, that dividend payments on average appear to be generally higher for companies that received compensation above the median compared to those that received compensation below the median.

What is noteworthy is that large-sized companies that received compensation above the median, when compared to small- and medium-sized companies, on average have paid considerably much more in dividends over the period. The average dividend payment over the period for large-sized companies which received compensation above the median is NOK 9,730,394, while the average for small- and medium-sized companies is NOK 733,989 and NOK 1,410,715, respectively. Further, the difference between small-, medium- and large-

sized companies appears to be the greatest in year 2020. While large-sized companies on average paid out NOK 15,473,250 in dividends, small- and medium-sized companies paid out NOK 1,238,271 and NOK 625,434, respectively. This implies that the average dividend payment of those large-sized companies in 2020 is almost 25 and 12 times larger than that of small- and medium-sized companies, respectively. Lastly, unlike small- and medium-sized companies that received compensation above the median, large-sized companies have also had a substantial increase in average dividend payments from 2019 to 2020 of 12.37%.

Figure 7: Average Dividend Payments over the Period 2015-2020 Divided by Company Size



Note: the dotted lines represent companies that received compensation below the median of NOK 64,875.

The descriptive statistics of the variables in the panel data set are presented in Table 4. As in the other two data sets, the compensation data is widely spread and has a positively skewed distribution. This is also the case for the dividend data. In the same way as in the data set on compensation and dividend payments in 2020, we adjust compensation and dividends for total assets in order to achieve a narrower spread and less skewness. The average company age of the companies in this data set of approximately 18 years is slightly higher than in the other

two, whereas the variable number of employees have rather similar statistics as those in the other two data sets.

Table 4: Descriptive Statistics of Panel Data on Compensation and Dividends from 2015 to 2020

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Compensation	43,764	247,509.60	1,116,241.00	2,448.00	29,258.00	64,875.00	168,796.50	49,627,685.00
Compensation/Assets	43,764	0.01	0.03	0.00	0.00	0.00	0.00	2.13
Dividends	43,764	770,381.00	11,221,907.00	0	0	0	500,000	1,439,088,000
Dividends/Assets	43,764	0.08	0.17	0.00	0.00	0.00	0.12	15.18
Company Age	43,764	17.95	11.69	5	9	15	24	115
Number of Employees	43,764	18.90	115.60	1	4	8	16	8,048

4.4 Empirical Models

In this section, we present the empirical models employed to test the hypotheses presented in Section 4.1. First, we present the OLS regression model employed to investigate our first hypothesis. Second, we introduce the logit regression model for analysis of the second hypothesis. Third, we present the two-way fixed regression model to study the third hypothesis Lastly, we address the concerns with presence of heteroscedasticity, serial correlation, and clustering in our data and how we account for them.

4.4.1 OLS Regression Model

To investigate whether companies with moderate and high probability of going bankrupt received more compensation than companies with low probability, we employ an ordinary least squares (OLS) regression model. As the data set for investigating the first hypothesis is cross-sectional and our dependent variable is continuous, we believe that an OLS regression model is the most suitable for this analysis. Our OLS regression model is given by:

$$\begin{aligned} log(compensation)_{ijkl,2020} \\ &= \beta_1 Distress_{ijkl,2019} + \beta_2 CompanySize_{ijkl,2022} \\ &+ \beta_j CompanyAge_{2019} + \beta_k Sector + \beta_l Region + u_{ijkl,2020} \end{aligned} \tag{4.6}$$

The model employs $log(compensation)_{ijkl,2020}$ as a continuous dependent variable, which constitute the natural logarithm of received compensation for the period March-August 2020. The reason for applying the natural logarithm to this variable is that the compensation data turned out to have outliers and high skewness and kurtosis. All the zero-values of compensation were removed from the data set, and there is therefore no need to add 1 to the natural logarithm.

The independent variable, $Distress_{ijkl,2019}$, is an ordinal categorical variable which gives two coefficients: one for the grey zone and one for the distress zone. The coefficients of this variable will thus show the effect of a company being in either one of the zones on received compensation compared to companies in the safe zone.

Further, the model employs one control variable and several fixed effects to enhance the internal validity and limit the influence of extraneous variables in the model. First, we control for companies' size by applying a continuous variable, $CompanySize_{ijkl,2022}$, which is measured by the number of employees that a company had in 2022. It would be optimal to employ number of employees in 2019 to be time-consistent with the independent variable, but due to limited data availability, we could not access these numbers. We believe, nevertheless, that it is appropriate to control for company size as it is highly likely to correlate with the companies' fixed, unavoidable costs and thus influence how much compensation they received.

Further, $CompanyAge_{2019}$ is employed as a fixed effect to control for companies' age in 2019, calculated using companies' incorporation dates. The age of a company is a factor which is also likely to affect how much compensation a company received, because the fixed, unavoidable costs might be correlated with a company's age.

Moreover, $Sector$ is a categorical variable which we employ as a fixed effect in the model to control for companies' sector affiliation, based on divisions identified by two-digit NACE codes. By controlling for sector affiliation, the model considers that COVID-19 affected the financial health of companies in different sectors unevenly. Since companies' decline in turnover during the pandemic is one of the factors that determined the amount of compensation that a company received, the size of the received compensation amount varies across sectors, as illustrated in Table A3 in the appendix.

Likewise, we also control for companies' regional affiliation by employing a categorical variable, $Region$, as a fixed effect. The variable is based on the municipalities that companies are located in. By including this variable, we take into account that companies in different municipalities in Norway were unequally affected by the pandemic, as shown in Table 1.

4.4.2 Logit Regression Model

To analyse whether the companies that received more compensation had a higher probability of paying out dividends in 2020, we apply a logit regression model. In this model, we employ a binary dummy variable, indicating whether the companies paid out dividends in 2020 or not, as the extensive dependent variable to obtain the effect of the size of compensation on the likelihood of paying out dividends in 2020. Thus, the dependent variable of the model is given by:

$$Y = \begin{cases} 0, & Did\ not\ pay\ out\ dividends \\ 1, & Paid\ out\ dividends \end{cases}$$

An analysis with a binary dependent variable can be conducted by applying an OLS regression model as a linear probability model. However, this type of model has several drawbacks, such as fitted probabilities being able to be less than zero or greater than one, and partial effect of any explanatory variable being constant (Wooldridge, 2013). To overcome these drawbacks, one can use binary response models, such as logit or probit models. As these models have been shown to generate similar results (Woolridge, 2013), we choose to employ a logit regression model.

By using a logit regression model, we seek to estimate the probability of a company paying out dividends in 2020 given the amount of compensation a company has received. A general response probability is given by:

$$P(y = 1|x) = P(y = 1|x_1, x_2, \ldots, x_k) \tag{4.7}$$

where x is a full set of explanatory variables (Wooldridge, 2013).

Further, a general binary response model can be written as:

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k) \tag{4.8}$$

where G is a function which can only take on values between 0 and 1 for all real numbers, denoted by z. $G(z)$ thus gives us probabilities within the interval $[0,1]$. The logit regression model is used to ensure that these probabilities stay within this interval. Further, in a logit regression model, G is given by the logistic function:

$$G(z) = \frac{exp(z)}{1 + exp(z)} \tag{4.9}$$

where G is within the interval $[0,1]$ for all real numbers z (Wooldridge, 2013).

To analyse the compensation's effect on companies' probability of paying out dividends in 2020, we thus construct the following logit regression model:

$$\begin{aligned} P(Paid\ out\ dividends = 1|x) = \\ = G(\beta_1 \frac{Compensation}{Total\ Assets}_{ijk,2020} + \beta_2 CompanySize_{ijk,2022} \\ + \beta_j CompanyAge_{2020} + \beta_k Sector + u_{ijk,2020}) \end{aligned} \tag{4.10}$$

The dependent variable of the model is, $Paid\ out\ dividends$, which is a dummy variable indicating whether a company paid out dividends in 2020 or not, as shown above. Further, the model employs $\frac{Compensation}{Total\ Assets}_{ijk,2020}$ as the independent variable, which is a continuous variable based on the compensation that companies received for the period March-December 2020 adjusted for total assets.

In addition, the model includes $CompanySize_{ijk,2022}$ as a control variable, and $CompanyAge_{ij,2020}$ and $Sector$ as fixed effects, being used as factor variables. The variables are of the same type and based on the same measures as in the OLS regression model. The only difference is that the variable $CompanyAge_{ijk,2020}$ is calculated as the age of a company in 2020 instead of in 2019 in order for the variable to be time-consistent with the independent variable. These factors must be taken into account because they may play a role as to whether a company paid out dividends in 2020 or not, which is supported by several studies. For instance, Brawn and Šević (2018) find when analysing publicly listed US companies that company size appears to be the dominant predictor of whether a company pays out dividends or not, followed by sector affiliation and company age.

Moreover, the generated coefficients of the logit regression model are estimates of the partial effects each explanatory variable has on the response probability (Wooldridge, 2013). The interpretation of these coefficients is therefore challenging. Therefore, the results of such models are often presented as marginal effects, which shows how a change in the independent variable impacts the probability of a given outcome (Norton & Dowd, 2018). The results of our model given in Section 5.2 are thus presented as marginal effects, which in turn represent the partial effects for the average observation.

4.4.3 Two-Way Fixed Effects Regression Model

For the analysis of the third hypothesis, we use panel data on compensation and dividends paid out during the period 2015-2020 and apply it to a two-way fixed effects regression model. In this model, we apply annual dividend payments as the intensive dependent variable to obtain the effect of the size of compensation on the size of annual dividends. We motivate the use of a two-way fixed effects model with the ability to include unit and time fixed effects, which accounts for unit-specific and time-specific unobserved confounders (Imai & Kim, 2021). Our two-way fixed effects model is given by

$$\frac{Dividends}{Total\ Assets_{it}} = \beta \frac{Compensation}{Total\ Assets}_{it} + \alpha_i + \gamma_t + \delta_{jt} + \varepsilon_{it} \tag{4.11}$$

The dependent variable of the model, $\frac{Dividends}{Total\ Assets_{it}}$, is a continuous variable based on companies' dividend payments in the period 2015-2020. Since the companies vary considerably in size, we adjust the dividend payments for the companies' total assets. In this way, we achieve a measure of dividends which is comparable across all companies.

The independent variable is denoted as $\frac{Compensation}{Total\ Assets}_{it}$, and takes on zero-values in the years 2015-2019 and non-zero values in 2020. In the same way as for the dependent variable, we adjust compensation for companies' total assets to make it comparable across companies. Consequently, we need to multiply companies' figures on total assets with 1,000 as they are stated in NOK 1,000, whereas the compensation figures are not.

Further, the error terms α_i and γ_t represents firm-specific and year-specific fixed effects, respectively. The inclusion of company fixed effects allows the model to account for the average impact of unobservable differences that are constant across companies but vary over

time. Similarly, year fixed effects are included to account for the differences that are time-invariant but vary across the companies. In this way, we are able to control for heterogeneity across companies and year-specific shocks that impact the companies equally in different years. In addition, the term δ_{jt} represents sector-time fixed effects, creating an intercept for each combination of sector j and time t. The term is included to account for the differences in yearly trends that are sector driven.

4.4.4 Issues With Heteroscedasticity and Clustered Data

Our models account for potential issues with heteroscedasticity, serial correlation, and clustering in the data. First, without controlling for heteroscedasticity, the variance of our models' standard errors could end up no being constant across different segments of observations, making them not valid as estimates (Wooldridge, 2013). Further, we account for serial correlation in the two-way fixed effects model for which we employ time series data. Lastly, our data consists of companies belonging to different sectors and regions, which implies that our data contains clusters. This is problematic for the internal validity of our analyses as such clusters can lead to understatement of standard errors and overstatement of statistical significance of estimators (Cameron & Miller, 2010).

We solve the mentioned issues by clustering the standard errors in all of the three regression models. Even though our models include fixed effects, we still need to adjust the standard errors for clustering. This is because fixed effects do not completely control for neither within-cluster error correlation nor heteroscedasticity (Cameron & Miller (2015). In addition, Abadie, Athey, Imbens and Wooldridge (2017) argue that when the residuals and the regressors are both correlated within clusters, one should cluster at the highest level of aggregation possible. Thus, we cluster the standard errors by sector in all of the three models. To avoid problems with "overfitting" in the presence of few clusters (Cameron & Miller, 2015), we cluster by sector at division level instead of section level[12], as the latter would merely constitute 19 clusters in our data. As our panel data set on compensation and dividend payments includes few years, we do not cluster by year.

[12] In the NACE classification, there are 22 sections and 88 divisions, as illustrated in Table A2 in the appendix.

5. Empirical Analysis

This section presents the results of the three different regression models to test our three hypotheses. First, we present the results of the analysis estimating the effect of companies' bankruptcy probability on received compensation. Second, we present the results of our analysis of the relationship between received compensation and the companies' dividend payments in 2020. Third, we examine results of the model analysing compensation's impact on dividend payments in the period 2015-2020. Lastly, the robustness of the analyses is tested.

5.1 Hypothesis 1

Table 5 presents the regression results using the OLS regression model to investigate the impact of a company's probability of going bankrupt on received compensation. From our hypothesis, we expect a positive relationship between a company being in the grey and distress zones and received compensation amount, where being in the safe zone is employed as the base. The table shows the regression outputs with four different specifications given by columns (1) to (4) where different controls and fixed effects are either included or excluded.

The coefficients for both the grey zone and the distress zone are positive in all four columns, at different levels of significance. Thus, the results suggest that being in one of those zones has a positive effect on received compensation for a company. Column (1) shows that without controlling for company size, sector, region and age, the relationship between being in the grey zone and received compensation is significantly positive at the 1%-level. The coefficient indicates that companies in the grey zone received 26.8% more compensation than companies in the safe zone did. Being in the distress zone and received compensation seem to have a similar relationship, but the coefficient is less positive and less significant.

Including the control variable and the fixed effects generate somewhat different results. We observe that when company age, sector and region fixed effects are included in column (2), the coefficients get smaller, but the significance levels remain the same as in column (1). This indicates that some of the effect is explained by companies' age, sector and regional affiliation. When controlling for only company size in column (3), we no longer observe a significant relationship between being in the distress zone and compensation. The significantly positive coefficient for company size suggests that a company having more employees positively

influences the received compensation received. Thus, it absorbs some of the effect of being in either the grey or the distress zone obtained in column (1). Lastly, column (4) shows the relationship between being in either the grey or the distress zone and compensation when the control variable and all the three fixed effects are included. This specification generates smaller coefficients than the other three specification, implying that controlling for these factors absorbs some of the positive effect obtained in column (1). The coefficient for being in the distress zone is also no longer significant. Being in the grey zone, however, still has a positive effect on received compensation at the 1%- level.

Overall, our results indicate that companies that were in either the grey or the distress zone have received significantly more compensation than those that were in the safe zone. This applies especially to companies that were in the grey zone, for which the effect is more positive and significant compared to companies in the distress zone.

Table 5: OLS Regression Analysis

	Dependent variable:			
	log(compensation)			
	(1)	(2)	(3)	(4)
Grey Zone	0.268***	0.189***	0.240***	0.170***
	(0.049)	(0.029)	(0.048)	(0.030)
Distress Zone	0.123*	0.071**	0.105	0.054
	(0.071)	(0.034)	(0.066)	(0.033)
Company Size			0.003***	0.003***
			(0.001)	(0.001)
Constant	10.941***		10.891***	
	(0.108)		(0.107)	
Region Fixed Effects	No	Yes	No	Yes
Sector Fixed Effects	No	Yes	No	Yes
Age Fixed Effects	No	Yes	No	Yes
Observations	22,665	22,665	22,665	22,665
R^2	0.005	0.250	0.063	0.288
Adjusted R^2	0.005	0.232	0.063	0.270
Residual Std. Error	1.338 (df = 22662)	1.175 (df = 22125)	1.298 (df = 22661)	1.146 (df = 22124)

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

As we have seen that there is heterogeneity across received compensation in different sectors in Figure 4, we find it appropriate to investigate if being in the grey and distress zones affects received compensation uniquely in different sector divisions. We therefore conduct a sector-specific regression analysis, which is displayed in Table 6. We choose to separately investigate the accommodation and food service activities, the arts, entertainment and recreation, the administrative and support service activities, and the transportation and storage sectors, which are the four sectors that have been shown in Figure 1 to be the hardest hit by the pandemic. In addition, we analyse the wholesale and retail trade sector, which has seemingly managed through the crisis well (see Figure 1). As displayed in Table A3 in the appendix, these sectors are also some of those that have received the most compensation. For this analysis, we employ the model specification used in column (2) in Table 5. Our reason for leaving out company size as a control is that it can potentially be affected by a company being in a specific zone, which in turn can result in the variable absorbing some of the variation that we are interested in. Thus, in the sector-specific analysis displayed in Table 6, we only control for companies' age and regional affiliation.

From the table, we first observe that being in the grey and distress zones while belonging to one of the five sectors appear to have a positive effect on received compensation. The arts, entertainment and recreation sector in column (2) stands out as the one with substantially higher effects compared to the other four sectors. The coefficients are significant at the 1%-level and suggest that being in the grey and distress zones in this sector results in receiving 46% and 35.3% higher compensation than being in the safe zone, respectively. Further, being in the grey zone while belonging to the administrative and support service activities sector appears to have the next largest significant effect on received compensation at the 1%-level, followed by the accommodation and food service activities, the wholesale and retail, and the transportation and storage sector in columns (3), (1), (5) and (4), respectively. With regard to being in the distress zone, the next largest effect is for companies that belong to the transportation and storage sector, followed by administrative and support service activities sector and the accommodation and food service activities sector. Interestingly, the coefficient of being in the distress zone while belonging to the wholesale and retail sector in column (5) is negative, indicating that companies in the distress zone in this sector received less compensation than companies in the safe zone. The coefficient is, however, not significant. Moreover, we observe that, by excluding these five sectors, we still obtain a positive

significant relationship between being in the grey zone or the distress zone and received compensation in the other sectors, as shown in column (2).

Table 6: Sector-Specific OLS Regression Analysis

	Dependent variable:					
	log(compensation)					
	Accommodation and food service activities	Arts, entertainment and recreation	Administrative and support service activities	Transportation and storage	Wholesale and retail trade; repair of motor vehicles and motorcycles	Other
	(1)	(2)	(3)	(4)	(5)	(6)
Grey Zone	0.123*	0.460***	0.313***	0.034	0.110*	0.245***
	(0.064)	(0.164)	(0.103)	(0.164)	(0.061)	(0.048)
Distress Zone	0.012	0.353***	0.190**	0.218	-0.030	0.085***
	(0.049)	(0.114)	(0.079)	(0.158)	(0.042)	(0.028)
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,113	1,040	1,101	661	5,350	10,400
R^2	0.319	0.350	0.406	0.499	0.179	0.220
Adjusted R^2	0.247	0.104	0.227	0.185	0.115	0.181
Residual Std. Error	1.240 (df = 3722)	1.349 (df = 753)	1.278 (df = 845)	1.497 (df = 406)	1.152 (df = 4961)	1.087 (df = 9912)

*Notes: standard errors in parentheses are clustered at region level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

Further, to investigate heterogeneity across municipalities, we conduct a region-specific regression analysis, which is presented in Table 7. We choose the three municipalities which are shown to have suffered the most from COVID-19, as illustrated in Table 1. We notice that Oslo stands out as the municipality with the highest positive effects. These effects indicate that a company being in the grey and distress zones and being located in Oslo, received 40.9% and 15% more compensation than companies in the safe zone, respectively. Both coefficients are also significant at the 1%-level. In addition, these positive effects are substantially higher than those for companies located in Bergen and Trondheim in columns (2) and (3), respectively. Of those municipalities, only Trondheim show significant effect at the 10%-level

for being in the grey zone. Interestingly, we see in column (3) that the coefficient indicates a negative relationship between a company being in the distress zone while being located in Trondheim and received compensation. The coefficient is, however, not significant. When excluding these three municipalities, we see in column (4) that the positive effect is slightly lower for companies in the grey zone relative to the one we obtain than in column (2) in Table 7, suggesting that belonging to the municipality of Oslo stands for a considerable part of the effect. We see that the effect of being in the distress zone is also more significant when these municipalities are excluded from the analysis.

Table 7: Region-Specific OLS Regression Analysis

	Dependent variable:			
	log(compensation)			
	Oslo	Bergen	Trondheim	Other
	(1)	(2)	(3)	(4)
Grey Zone	0.409***	0.147	0.213*	0.155***
	(0.062)	(0.109)	(0.121)	(0.029)
Distress Zone	0.150***	0.075	-0.049	0.075**
	(0.055)	(0.083)	(0.139)	(0.032)
Region Fixed Effects	No	No	No	Yes
Sector Fixed Effects	Yes	Yes	Yes	Yes
Age Fixed Effects	Yes	Yes	Yes	Yes
Observations	3,643	1,185	876	16,961
R^2	0.251	0.295	0.309	0.219
Adjusted R^2	0.217	0.223	0.219	0.211
Residual Std. Error	1.323 (df = 3484)	1.206 (df = 1073)	1.180 (df = 774)	1.143 (df = 16789)

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

5.2 Hypothesis 2

Table 8 displays the results we obtain when applying a logit regression model for analysing compensation's impact on companies' probability of paying out dividends in 2020. As mentioned in Section 4.4.2, the coefficients are presented as marginal effects. The marginal effects show instantaneous rate of change in the probability of a company paying out dividends in 2020 when the compensation over total assets increases by 1 percentage point. Columns (1) and (2) present the regression results including and excluding the fixed effects, respectively.

Column (3) displays the regression results when both controlling for company size and including fixed effects.

The coefficient of -1.248 in column (1) is significant at the 1%-level indicating that the probability of a company paying out dividends in 2020 is negatively affected by compensation over total assets. When including age and sector fixed effects in column (2), the effect is smaller, but still significantly negative. Further, column (3) also suggests that company size has almost no effect on dividend payments in 2020, but the effect is not significant. We see that when including this control, the marginal effect of compensation over total assets on the probability of paying out dividends is slightly higher. Overall, all three regression specifications suggest that a 1 percentage point increase in compensation over total assets leads to a lower probability of a company paying out dividends in 2020.

Table 8: Logit Regression Analysis

	Dependent variable:		
	Dividend Dummy		
	(1)	(2)	(3)
Compensation/Assets	-1.248***	-1.008***	-1.009***
	(0.169)	(0.114)	(0.114)
Company Size			0.000
			(0.000)
Sector Fixed Effects	No	Yes	Yes
Age Fixed Effects	No	Yes	Yes
Observations	24,300	24,300	24,300
AIC	18,990.9	18,508.8	18,508.7
BIC	19,007.1	20,023.2	20,031.2
Log Likelihood	-9,493.429	-9,067.396	-9,066.370

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

Further, we conduct a logit regression analysis, given in Table 9, where we have divided the sample by company size into small-, medium- and large-sized companies. As the compensation amounts are highly concentrated around a few relatively large companies, we find it appropriate to investigate whether there has been heterogeneity across small-, medium- and large-sized companies. The regression results show that the marginal effect is still significantly negative regardless of company size. Nevertheless, we observe in columns (1)

and (3) that the marginal effect is the largest for small-sized companies and the smallest for large-sized companies. This indicates that receiving more compensation affects the probability of a company paying out dividends in 2020 more negatively for small-sized companies than it does for medium- and large-sized companies.

Table 9: Logit Regression Analysis Divided by Company Size

	Dependent variable:		
	Dividend Dummy		
	Small	Medium	Large
	(1)	(2)	(3)
Compensation/Assets	-1.079***	-0.601***	-0.006*
	(0.131)	(0.075)	(0.003)
Sector Fixed Effects	Yes	Yes	Yes
Age Fixed Effects	Yes	Yes	Yes
Observations	20,434	3,444	422
AIC	15,684.4	2,587.3	316.2
BIC	16,302.6	3,011.2	522.5
Log Likelihood	-7,764.214	-1,224.636	-107.086

Notes: standard errors in parentheses are clustered at sector level.
*Significance levels: *p<0.1;**p<0.05;***p<0.01.*

5.3 Hypothesis 3

The regression results of the two-way fixed effects model employed for analysing our third hypothesis is presented in Table 10. The model specification in column (1) includes firm fixed and year fixed effects but leaves out year-sector fixed effects, whereas the specification in column (2) includes all three fixed effects.

According to our hypothesis, we expect a significantly positive relationship between received compensation and companies' dividend payments. However, we perceive from the table that receiving more compensation, which likely corresponds with having suffered more, seems to have had a negative effect on companies' dividend payments. In other words, companies that received more compensation seemingly had lower dividend payments after they received compensation than they did before. The effect is significant at the 1%-level regardless of whether we include year-sector fixed effects or not. Further, the coefficient for compensation

over total assets of -0.197 in column (2) is lower than that of -0.224 in column (1), meaning that the observed effect is less negative when we run the regression with all three fixed effects. This indicates that there are yearly sector-driven trends in the dividend data that have been absorbed by the inclusion of year-sector fixed effects and that have a positive effect on compensation over total assets.

Table 10: Two-Way Fixed Effects Regression Analysis

	Dependent variable:	
	Dividends/Assets	
	(1)	(2)
Compensation/Assets	-0.224***	-0.197***
	(0.038)	(0.045)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Year*Sector Fixed Effects	No	Yes
Observations	43,764	43,764
R^2	0.363	0.380
Adjusted R^2	0.235	0.245
Residual Std. Error	0.147 (df = 36464)	0.146 (df = 35950)

Notes: standard errors in parentheses are clustered at sector level.
*Significance levels: *p<0.1;**p<0.05;***p<0.01.*

As discussed in Section 4.3.3, we observe from Figure 7 that there are considerable differences in average dividend payments in the period 2015-2020 between companies of different sizes and between those that received compensation above and below the median. Particularly, large-sized companies that received compensation above the median differ greatly from small- and medium-sized companies by having had a substantial increase in dividend payments over the period on average. In addition, the average dividend payment of those large-sized companies in 2020 is both the largest in the period for this company size and considerably larger than that of the other two sizes in 2020. We therefore find it applicable to divide the sample by the three company size classifications to study the effect of received compensation on dividend payments by companies of different sizes. The regression results of this two-way fixed effects model by the three company sizes is presented in Table 11, where columns (1), (3) and (5) leave out year-sector fixed effects, whereas columns (2), (4) and (6) include all three fixed effects.

Based on Figure 5, it could seem as if we would observe a different effect for large-sized companies than we would for small- and medium-sized companies. However, the regression results given in Table 11 indicate that higher received compensation seems to have had a negative effect on companies' dividend payments regardless of company size. As in the basic two-way fixed effects regression analysis given in Table 10, the effect is significant at the 1%-level regardless of whether we include year-sector fixed effects or not. Further, we notice by the coefficients for compensation over total assets that yearly sector-driven trends in the dividend data have a positive effect on compensation over total assets for small- and medium-sized companies and a negative effect for large-sized companies. When we compare the results for the three different company sizes, we observe that the significantly negative effect is the greatest for large-sized companies when we include year-sector fixed effects and the greatest for medium-sized companies when leave such fixed effects out.

Table 11: Company Size-Specific Two-Way Fixed Effects Regression Analysis

	Dependent variable:					
	Dividends/Assets					
	Small		Medium		Large	
	(1)	(2)	(3)	(4)	(5)	(6)
Compensation/Assets	-0.207***	-0.190***	-0.276***	-0.213***	-0.219**	-0.282***
	(0.052)	(0.057)	(0.045)	(0.027)	(0.086)	(0.077)
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year*Sector Fixed Effects	No	Yes	No	Yes	No	Yes
Observations	35,700	35,700	7,254	7,254	810	810
R^2	0.360	0.383	0.374	0.401	0.250	0.445
Adjusted R^2	0.232	0.247	0.248	0.227	0.094	-0.163
Residual Std. Error	0.156 (df = 29744)	0.154 (df = 29237)	0.105 (df = 6039)	0.106 (df = 5623)	0.083 (df = 669)	0.094 (df = 386)

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

5.4 Robustness of Results

To analyse the uncertainty of our empirical models and to test whether the estimated effects presented in Section 5 are sensitive to changes in the model specifications, we conduct a series of robustness tests for the analyses of our three hypotheses.

5.4.1 Hypothesis 1

For the analysis of our first hypothesis, we have conducted five different robustness tests, each representing an alteration to the data set. The results of these tests are given in Table 12. All five model specifications include age, sector, and regional fixed effects. When conducting these tests, we do nevertheless not control for company size due to it possibly being a "bad" control and absorbing some of the variation that we are interested in, as pointed out in Section 5.1.

First, we want to investigate whether we obtain any different results when we rather employ Z-Score as a continuous independent variable, instead of the categorical variable which categorize Z-Scores into the three zones. We observe in column (1) that having a higher Z-Score, meaning a lower bankruptcy probability, turns out to have a slightly positive effect on received compensation. The coefficient is, however, not significant. As we suspect that this relationship differs from the one we obtained in the main analysis because of extreme outliers in the Z-Score data, we conduct another robustness test in column (2) where we drop the top and bottom 1% of Z-Score observations. The coefficient then becomes negative, suggesting that companies that had a higher bankruptcy probability received more compensation. However, this coefficient is not significant either.

Further, we find it relevant to analyse whether dropping the top and bottom 1% Z-score observations give different results when using our main model specification with the categorical variable of the three zones. The results of this test, given in column (3), are very similar to those of our main regression analysis in Table 5. The effect becomes slightly smaller for the grey zone, and slightly higher and more significant for the distress zone. This suggests that employing a categorical variable for bankruptcy probability contributes to obtaining robust results that are not highly influenced by outliers.

Lastly, we examine whether the heterogeneity across sectors and municipalities observed in Section 5.1 has an impact on the results of our main analysis of our first hypothesis. We observed from the results of our sector-specific and region-specific analyses that, out of the sectors and municipalities that we investigated, the positive effect of being in the grey and distress zones on received compensation was the highest for the arts, entertainment, and recreation sector and for the municipality of Oslo. Thus, we conduct two more robustness tests; one where we remove the arts, entertainment, and recreation sector from the data set in column (4) and one where we remove the municipality of Oslo in column (5). We see that removing these observations has a minor impact on our results. Compared to the main regression results, column (4) shows that being in the grey zone now has a slightly higher effect on received compensation, while the coefficient in column (5) indicates a slightly lower effect. The coefficients are significant at the same levels as in the main regression. The effects of being in the distress zone in both columns are also similar to those obtained in the main regression analysis, yet no longer significant.

Table 12: Robustness Tests for the Analyses of Hypothesis 1

	Dependent variable:				
	log(compensation)				
	Z-Score as continuous variable	Z-Score as continuous variable & remove top and bottom 1%	Remove top and bottom 1%	Remove sector R	Remove region Oslo
	(1)	(2)	(3)	(4)	(5)
Z-Score	0.0004	-0.002			
	(0.0005)	(0.004)			
Grey Zone			0.178***	0.182***	0.145***
			(0.028)	(0.028)	(0.031)
Distress Zone			0.078**	0.057	0.051
			(0.032)	(0.033)	(0.033)
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	Yes	Yes	Yes	Yes	Yes
Age Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	22,665	22,131	22,131	21,625	19,022
R^2	0.248	0.251	0.253	0.236	0.256
Adjusted R^2	0.230	0.232	0.234	0.216	0.235
Residual Std. Error	1.177 (df = 22126)	1.176 (df = 21592)	1.174 (df = 21591)	1.168 (df = 21089)	1.134 (df = 18494)

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

5.4.2 Hypothesis 2

To test whether the results of the regression analyses of our second hypothesis are robust, we find it relevant to do an alteration to the dependent variable. In the main logit regression model, the dependent variable is constructed as a binary dummy variable which indicates whether a company paid out dividends in 2020 or not. We find it appropriate to conduct robustness tests to investigate whether we obtain different results for the total sample and for the three company sizes by rather employing dividend payments in 2020 over total assets as a continuous dependent variable. We run these tests with the inclusion of sector and age fixed effects. Table 13 presents the results of these tests, where the test in column (1) analyses the total sample and the tests in columns (2), (3) and (4) analyse small-, medium- and large-sized companies, respectively.

The coefficient for compensation over total assets is negative for all of the tests. Unlike the main regression results, these results indicate that the effect is the most negative for large-sized companies and the least negative for small-sized companies, yet the effect for large-sized companies is not significant. Overall, we observe the same tendencies when we run these tests as we do when we interpret the results of the main regression analyses.

Table 13: Robustness Tests for the Analyses of Hypothesis 2

	Dependent variable:			
	Dividends/Assets			
	Total Sample	Small	Medium	Large
	(1)	(2)	(3)	(4)
Compensation/Assets	-0.019***	-0.018**	-0.034**	-0.038
	(0.007)	(0.007)	(0.014)	(0.035)
Sector Fixed Effects	Yes	Yes	Yes	Yes
Age Fixed Effects	Yes	Yes	Yes	Yes
Observations	24,300	20,434	3,444	422
R^2	0.037	0.040	0.034	0.231
Adjusted R^2	0.029	0.031	-0.010	-0.048
Residual Std. Error	0.101 (df = 24113)	0.104 (df = 20255)	0.084 (df = 3292)	0.059 (df =309)

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

5.4.3 Hypothesis 3

For the analysis of our third hypothesis, we find two alterations to the model specification to be of particular relevance for us to do. First, we find it relevant to conduct robustness tests to identify whether the significantly negative effects we observe in Table 10 and Table 11 for the total sample and for the three company sizes, respectively, changes in size or significance if we do not adjust compensation and dividends by total assets. Second, we test the robustness of the results by applying the panel data to investigate the effect of received compensation on companies' probability of paying out dividends. We run these tests with the inclusion of firm and year fixed effects.

The results of the robustness analysis where compensation and dividends are not adjusted for total assets are given in Table 14. The test in column (1) analyses the total sample and the tests in columns (2), (3) and (4) analyse small-, medium- and large-sized companies, respectively. The compensation coefficient in column (1) implies that, without adjusting for total assets, we obtain a positive effect of higher received compensation on dividend payments for the total sample. This is in line with our hypothesis but not with the results of our main analysis. The effect is nevertheless not significant. The tests for small- and medium-sized companies in columns (2) and (3), respectively, deliver negative and significant compensation coefficients, which is consistent with the results of our company size-specific analysis. These effects are also more negative, especially for small-sized companies, when we do not adjust dividend compensation and dividends by total assets. When we test for large-sized companies in column (4), we obtain a positive, yet not significant, coefficient for compensation. We note, however, that the residual standard error in all four columns is extremely high relative to the ones in our main analyses, which indicates that a regression model in which we do not adjust compensation and dividends by total assets is a worse fit for our data set.

Table 14: Robustness Tests for the Analyses of Hypothesis 3 – Two-Way Fixed Effects Regression Analysis

	Dependent variable:			
	Dividends			
	Total Sample	Small	Medium	Large
	(1)	(2)	(3)	(4)
Compensation	0.519	-1.574***	-0.558**	1.125
	(2.939)	(0.419)	(0.263)	(4.652)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	43,764	35,700	7,254	810
R^2	0.213	0.528	0.468	0.179
Adjusted R^2	0.056	0.433	0.361	0.007
Residual Std. Error	10,904,453.000 (df = 36464)	2,216,997.000 (df = 29744)	3,995,736.000 (df = 6039)	78,039,940.000 (df = 669)

Notes: standard errors in parentheses are clustered at sector level.
*Significance levels: *p<0.1;**p<0.05;***p<0.01.*

Further, a test for the analysis of compensation's impact on the probability of paying out dividends is conducted by applying the panel data to a logit regression model. Thus, we create dummy variables for the years 2015-2020 taking on value 1 if a company paid out dividends in the respective year and value 0 if it did not. The results of the test analysis are given in Table 15, where the coefficients are presented as marginal effects. We see in column (1) that the effect of higher received compensation on the probability of paying out dividends remains significantly negative. Further, the marginal effects in columns (2) and (3) are still significantly negative for small- and medium-sized companies, but no longer significant for large-sized companies in column (4). These findings are consistent with the main analyses of our third hypothesis presented in Table 10 and Table 11. In accordance with the results of the main analysis in Table 10, the effect is also in test analysis the greatest for medium-sized companies, followed by large- and small-sized companies. Thus, these tests suggest that our findings in Section 5.3 are robust.

Table 15: Robustness Tests for the Analysis of Hypothesis 3 – Logit Regression Analysis

	Dependent variable:			
	Dividend Dummy			
	Total Sample	Small	Medium	Large
	(1)	(2)	(3)	(4)
Compensation/Assets	-2.150***	-1.858***	-3.284***	-2.577
	(0.318)	(0.387)	(0.438)	(2.970)
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	39,816	32,232	6,798	786
AIC	56,395.9	45,755.2	9,494.4	1,101.5
BIC	113,464.2	90,826.7	17,267.4	-1,740.9
Log Likelihood	-21,555.972	-17,499.594	-3,608.205	-413.766

*Notes: standard errors in parentheses are clustered at sector level. Significance levels: *p<0.1;**p<0.05;***p<0.01.*

These tests, together with the robustness tests conducted for the analyses of our first and second hypotheses, give varying indications of the robustness of our results. Taking into account the changes of the coefficients and their significance, we argue that the results of the robustness tests do not seem to deviate greatly from the main results. In the cases where they do, the effects are no longer significant. Overall, the various robustness tests of the results of our analyses show similar tendencies as the main results, and thus, our main regression results generally appear to be robust.

6. Discussion

In this section, we first discuss implications and potential explanations of the results of our analyses and compare our results with similar studies analysing government support to companies during the COVID-19 pandemic. Further, we discuss limitations of our study. Lastly, we provide suggestions for relevant future research.

6.1 Implications and Potential Explanations of Results

6.1.1 Effect of Having Moderate or High Bankruptcy Probability on Received Compensation

From our investigation of whether a disproportionate share of compensation has been given to non-viable companies we get some interesting results. It may seem like companies that had a moderate or high probability of going bankrupt have received significantly more compensation than those that had a low probability. This is consistent with what we observe in Figure 3, which displays the different means and confidence intervals of compensation given to companies in the three different bankruptcy probability zones. The positive effect of having either a moderate or high bankruptcy probability on received compensation generally also seems to apply when we look specifically at different sectors and municipalities, even though we observe some heterogeneity across them. Overall, these findings support our hypothesis, and it may thus seem as if the scheme has failed to a certain extent in terms of targeting otherwise viable companies, which was part of the main purpose. This implies that the scheme seemingly has prolonged the lifeline of non-viable companies, which is worrying, as this importantly hinders efficient reallocation of resources and will undermine aggregate productivity. In addition, it can lead to the economic recovery in the aftermath of the crisis being less swift and robust.

Noticeably, our results show that the positive effect is higher for companies that had a moderate bankruptcy probability than those that had a high probability of going bankrupt. One potential explanation for this finding can be related to companies' turnover trends prior to the pandemic. It is reasonable to believe that companies with a moderate probability of going bankrupt could have had higher turnovers prior to COVID-19 compared to those with a high probability, resulting in them experiencing a higher decline in turnover and thereby receiving

less compensation. In addition, companies with a high probability of going bankrupt can, as mentioned, often be growing companies, which most likely do not yet have as high fixed, unavoidable costs as companies that are at a more mature stage in the business life cycle. This is, however, somewhat contradicting to what we see in Figure 3, which shows that companies with a high bankruptcy probability on average received marginally more compensation than those with a moderate probability of going bankrupt. We believe that this inconsistency can be related to the log transformation of the compensation data used in the regression analysis, which removes the skewness of the data.

Further, we believe that the urgency of putting the scheme in place during the lockdown, which in turn resulted in relatively less stringent requirements for receiving compensation, may be a determining factor for our findings. Considering the unprecedented nature and magnitude of the COVID-19 crisis, with many uncertainties, it would nonetheless be unrealistic for the government not to make any policy missteps in responding to the crisis. The government has been clear on that the initial scheme was by no means perfect. They have emphasised the importance of getting the money out quickly to a wide range of companies to avoid unnecessary bankruptcies at that time, rather than the scheme being perfectly well-targeted and fair (Finansdepartementet, 2020c). Based on this, our findings seem reasonable and not highly unanticipated.

What is also challenging, seen from the government's perspective, is that there exist no efficient sorting mechanism that can be set up to ensure that government support is only reaching companies that are illiquid but not non-viable. Distinguishing illiquid from non-viable companies when setting up a government support policy in an unforeseen crisis like COVID-19 is therefore exceedingly difficult. Thus, governments had to face a trade-off between keeping the economy afloat and risking funding some non-viable companies (Gourinchas et al., 2022; Gagnon, 2020). Preventing the failure of both viable and non-viable companies has after all, in the short term, dampened unemployment and bankruptcy spillover effects during the crisis (Helmersson et al., 2021). Considering this, our obtained results do not seem to deviate from how successful the scheme was expected to be in terms of targeting otherwise viable companies.

Even though we find evidence of mistargeting in the sense that the scheme seemingly has given a disproportionate share of compensation to non-viable companies, it is important to

emphasise that there is a possibility that some of the companies we have defined as viable and non-viable may not be so. When predicting bankruptcy probability using a statistical model like the Altman's Z-Score model, Type I and Type II errors will occur. These errors are positive and false negatives, respectively, meaning that some companies that go bankrupt are misclassified as non-distressed and some companies are misclassified as distressed when they do not go bankrupt (Altman et al., 2020). This comes from the model, as mentioned, not being fully accurate. Moreover, Nurmi et al. (2020) show that zombie companies, as commonly defined in the literature, are often not truly distressed companies but rather companies that experience temporary revenue declines. They also find that several of these companies in fact are growing companies or recovering from the zombie status to become financially healthy companies.

Another aspect related to business viability worth emphasising is that sector affiliation can have an impact on a company's probability of going bankrupt. In our sector-specific analysis, we find that companies belonging to the accommodation and food service activities sector, the arts, entertainment, and recreation sector, and the administrative and support service activities sector, and that had a moderate or high probability of going bankrupt, have received a disproportionate amount of compensation. As displayed in Figure A3 in the appendix, these are sectors in which companies' bankruptcy probability on average has been relatively high. This implies that companies in these sectors may usually have a higher bankruptcy probability compared to those in other sectors, yet they manage to stay afloat. This makes it somewhat questionable whether it is accurate for all sectors to classify a company as non-viable if it has a low Altman's Z-Score. In addition, the positive effect we find for these sectors is perhaps then not that surprising, considering that companies in these sectors have both had a relatively high bankruptcy probability and have received relatively much compensation (see Table A3 in the appendix). However, we notice that this does not apply to the wholesale and retail trade sector, in which companies on average have had a relatively lower bankruptcy probability and have also received relatively much compensation. Thus, the significantly positive effect we find for companies belonging to this sector while having a moderate bankruptcy probability is less ambiguous.

6.1.2 Effect of Received Compensation on Dividend Payments

When investigating whether compensation has been given to companies that were not in relatively great need of support in order to be able to cope with the crisis, we do not get results that indicate that this is the case. First, we find that the probability of companies paying out dividends in 2020 is significantly negatively affected by received compensation, something which seems to apply regardless of company size. Further, we find that companies which received more compensation paid out significantly less dividends after they received compensation than they did before, something which also seems to apply regardless of company size. Thus, the results of these analyses are not in line with our second and third hypotheses. We believe that a possible explanation for these findings is that the companies that received compensation on the whole genuinely suffered financially due to the pandemic, such that they were not capable of paying out more dividends in 2020 or pay out dividends at all.

The criticism related to this aspect of compensation scheme targeting in the media is inconsistent with our findings. As mentioned in Section 2.3.1, it has been shown that the companies which received compensation overall paid out more dividends in the first year of the pandemic than they did in 2019. However, it is also mentioned that companies which paid out dividends in 2020 received a relatively small share of the compensation of 7.6% (Fraser et al., 2021b). Similarly, based on our data set on compensation and dividend payments, only 14% of companies which received compensation paid out dividends in 2020. Thus, the controversy about this topic in the media seem to be concentrated around a fairly small share of companies that received compensation. This may be a potential explanation to our findings, which indicate a different relationship between received compensation and companies' dividend payments than that portrayed by the media.

Nevertheless, it can be discussed whether we can conclude that the compensation has merely gone to companies that were hard-hit by the pandemic based on our results. One factor which should be considered before drawing such a conclusion, is companies' possibility for postponing dividend payments. In relation to when it was considered whether to implement a prohibition of dividend payments for companies that received compensation, the possibility for postponement of dividends was mentioned as a potential weakness of such a restriction (e.g., Fraser et al., 2021b; Hopland et al., 2021). Thus, to avoid negative attention in the media,

a company that received compensation while not having genuinely suffered from COVID-19 could strategically delay dividend payments by one or several years. Consequently, the possibility for postponement of dividends may be a factor which makes the negative relationship between compensation and dividends less apparent in the real world than our results suggest.

Moreover, it is important to accentuate that paying out dividends is not always equivalent to distributing a company's earnings to its shareholders. It must be emphasised that there can be other reasons to why a company pays out dividends. First, dividends can be taken out as salary to company owners (Skårdalsmo & Rønning, 2021). Further, Fraser et al. (2021b) point to that companies may decide to take out dividends to pay taxes and fees and to invest in new workplaces. They exemplify this with a particular case of an oil drilling company, MHWirth, that received compensation of NOK 16.6 million and had a book value of dividends of NOK 1.4 billion in 2020. However, it turned out that the dividend payment was used for internal transactions and no money had gone out of the company. Considering this, we find it necessary to emphasise that a company taking out dividends does not necessarily imply that it has not suffered due to the pandemic, even though it can signal that a company is doing well financially.

6.2 Comparison With Prior Research

To further evaluate our findings, it is appropriate for us to compare the results of our thesis study with existing research articles that also investigate the targeting of government support policies during COVID-19. As mentioned in Section 3, the research conducted on this field is still limited in Norway. Except for the study by Hjelseth et al. (2021), the mentioned studies on this field are in addition not highly comparable to our thesis study. Therefore, we mainly compare our findings with the study by Hjelseth et al. (2021) and rather compare our findings with those of other studies on a more general level.

Hjelseth et al. (2021) analyse, as mentioned, the relationship between companies' viability and their probability of receiving compensation during the pandemic in Norway. Their logit regression estimates mainly show that non-viable companies did not have a higher probability of receiving compensation than viable companies had. This finding is contradicting to our results, which suggest that companies with a moderate or high bankruptcy probability received

more compensation than companies with a low probability of going bankrupt. Further, the authors find that non-viable companies in some sectors had a significantly lower probability of receiving compensation than viable companies did. Specifically, their results show that non-viable companies in the food and beverage service activities sector had a significantly lower probability of receiving compensation. Similarly, the probability of receiving compensation is shown to be lower for non-viable companies in the accommodation sector, but this is nevertheless not significant. On the contrary, the results of our sector-specific analysis show that being in the grey and distress zones while belonging to the accommodation and food service activities sector had a significant positive effect on received compensation.

There are a few potential explanations to our results being contradicting to the findings of Hjelseth et al. (2021). First, the method that we use for analysing whether non-viable companies have received a disproportionate share of the compensation is different from their method. While we use Altman's Z-Score zones as a categorical independent variable, their study employs the lowest credit score, C, as a measure for a company being non-viable. In addition, they use a binary response variable to estimate the probability of a company receiving compensation, whereas we rather employ received compensation as a continuous dependent variable. Their analysis also only includes companies that had a turnover higher than NOK 1.5 million in 2019, while we have not removed any companies based on their turnover. Further, the study of Hjelseth et al. (2021) is based on the period March-December 2020, while we base our analysis of the first hypothesis on the compensation period March-August 2020. Thus, they analyse both Compensation Scheme 1 and a part of Compensation Scheme 2. This may be a source to the differences as Compensation Scheme 2 is, as described in Section 2.3, somewhat different from Compensation Scheme 1.

As described in Section 3.2, some studies find that government support during COVID-19 in other countries have led to an "insolvency gap" in the economy and a "zombification" or "hibernation" of the economy, all suggesting that some government support policies have kept non-viable companies afloat (Dörr et al., 2021; Hoshi et al., 2022; Cros et al., 2021). These studies are, however, not directly comparable to our study, as they investigate various other types of support measures in other countries. Nevertheless, our findings show similar tendencies as those of these studies and suggest that non-viable companies have been kept afloat by the compensation scheme in Norway.

Further, there is, to our knowledge, not yet been conducted any studies in Norway that analyse the impact of government support on companies' dividend payments. Our analysis on this topic of study is nevertheless somewhat comparable to the study by Kluzek and Schmidt-Jessa (2022), which analyse the impact of received government support on companies' dividend payments in Poland. In line with our findings, they find that receiving government support has a negative impact on the probability of a company paying out dividends in 2020. Nevertheless, they investigate a relatively small sample of only listed companies in Poland, whereas we analyse a large sample consisting of both listed and unlisted companies in Norway. Therefore, their results cannot be compared directly to ours.

Lastly, as described in Section 3.2, there are also several studies conducted in other countries that address the general concern that government support during COVID-19 has flowed to companies that did not actually suffer financially due to the pandemic (Cirera et al., 2021; Granja et al., 2020; Gourinchas et al., 2022). The overall findings of these studies can, in some degree, be compared to the results of our analysis of the relationship between received compensation and companies' dividends payments. Generally, the studies indicate that companies and areas which did not experience shocks and that could have managed through the crisis well without support, have been given government support during COVID-19. On the contrary, our findings suggest that companies that received more compensation had a lower probability of paying out dividends in 2020 and also paid out less dividends that year. As opposed to these studies, we cannot, based on our results, conclude that compensation in Norway flowed to companies that were not in great need of it in order to survive COVID-19.

6.3 Limitations

We recognise several limitations of our study that could have impacted the results of the analyses, and which we therefore find appropriate to emphasise. As the existing body of literature on this topic is still very limited, we did not have access to concrete guidelines on various challenges that may arise. Consequently, we have taken independent assumptions and decisions when collecting and managing the data sets and constructing the regression models.

Our data is collected and sorted manually from multiple external databases, which can be a source to a number of limitations. First, we lost a relatively high number of observations when we matched the compensation data with the companies' respective accounting data, as

described in Section 4.2.2. Further, many observations had to be removed as some of the accounting figures were not fit to manual calculations of Altman's Z-Scores. Considering that these observations potentially could be of high importance for our regression results, this may be concerning. Lastly, because of limited data access, we could not employ numbers of employees in 2019 and 2020 to control for company size in the analyses of the first and second hypotheses, respectively. Instead, number of employees in 2022 was employed, which does not match the timing of the other variables in our models.

Further, there is a possibility that our models do not include relevant factors that could potentially have an impact on our dependent variables. For instance, the models for the analyses of the second and third hypotheses should have perhaps included various controls such as company growth, leverage, liquidity, and profitability, which may have had an influence on dividend payments. Nevertheless, these could potentially be "bad" controls as they in turn may be affected by compensation and thereby absorb some of the variation that we are interested in. On the other hand, our choice to exclude such variables could also be a limitation due to their potential influence on dividends.

Moreover, our employment of Altman's Z-Scores may also be a source to several limitations of our analysis. First, as pointed out by Plenborg and Kinserdal (2020), statistical bankruptcy prediction models like the Altman's Z-Score model suffer from several deficiencies. Among other limitations, Plenborg and Kinserdal (2020) draw attention to the models being based on historical information and not including forward-looking information. Another deficiency that they mention is that qualitative information about companies' financial health, which could be of high importance for bankruptcy probability, is not accounted for in the financial ratios of the models. Further, assuming that the coefficients of the models are not stable over time, the authors argue that new sets of coefficients should ideally be generated regularly. Thus, there is a risk that the Altman's Z-Score model provide us with somewhat unreliable measures of companies' bankruptcy probability. Another type of limitation is related to the use of Altman's Z-Score zones as a categorical variable. Such a classification may give a wrong picture of companies' bankruptcy probability, as some company could have a Z-Score which is almost high enough for being in the safe zone yet end up being in the grey zone. Small errors in companies' accounting data used for the calculation of Z-Scores could thus cause zone misclassification and thereby unreliable regression results.

Lastly, our employment of annual dividend payments for the analysis of the second and third hypotheses may generate unreliable results. Due to restricted data availability, we were not able to access data on companies' monthly dividend payments in 2020. As the compensation scheme started in March 2020, there are approximately three months in the beginning of 2020 where companies could have paid out dividends. It is obvious that compensation has not influenced dividends paid out in those three months. Because of this data restriction, we are nevertheless obligated to include these months in our analyses. It is therefore reasonable to believe that the inclusion of dividends paid in the beginning of 2020 could generate results that show a misleading picture of compensation's impact on dividend payments in 2020. We nevertheless believe that this limitation has less implications for the reliability of the analysis of the third hypothesis, as it employs a panel data of 6 years. The analysis of the second hypothesis, however, investigates compensation's impact on dividend payments only in year 2020, which could deliver less trustworthy results.

6.4 Future Research

As the pandemic is still an ongoing event and the last adopted compensation scheme for companies applied up until just recently, the targeting of government support during COVID-19 will continue to be a relevant research topic in the foreseeable future. Although we have gained some valuable insights into how well-targeted the compensation scheme in Norway has been, there are still several important unanalysed aspects related to this topic that are relevant for future research. There are also possible extensions to our work. In this section, we provide suggestions for further research on the targeting of government support in Norway during COVID-19.

Our focus in this study has been on the compensation scheme for companies that applied to the first phase of the pandemic and not to later phases. For this reason, we are not able to do a comprehensive assessment of the overall scheme. For further research, it would thus be appropriate to study all four periods for which the compensation scheme applied to and also compare them. It would also be of great relevance to evaluate the compensation scheme against other government support measures implemented during the pandemic, such as deferral of tax payments and reduced fees, guarantee and loan schemes, and other direct subsidies.

With regard to investigating whether a disproportionate amount of compensation has been given to non-viable companies, it would be relevant to eventually compare the companies' bankruptcy predictions in 2019 with actual bankruptcy figures in the aftermath of COVID-19. In this way, it would be possible to identify if there was reason to fear a zombification of the economy caused by the government support. This is too early for us to look into, as it can probably take time before bankruptcy figures increase. Going forward, it will also be essential to analyse potential effects of policy misallocation in terms of inhibited prospects for recovery and growth in the post-pandemic period.

After some years, it would also be appropriate to investigate the relationship between compensation and dividends by applying dividend data for more years during and after the pandemic, which we could not. It is reasonable to assume that this would contribute to a more thorough analysis of this relationship. In relation to this, it could also be relevant to account for the companies that voluntarily paid back the compensation amount. Finally, going forward, it could be relevant to investigate whether companies that received compensation during COVID-19 and that did not genuinely need it strategically postponed dividend payments or made any other strategic moves to take advantage of the scheme.

7. Conclusion

The aim of our thesis was to investigate whether government support during COVID-19 in Norway has reached the right companies. Based on the scheme's purpose, we define the right companies as the ones that were both viable and that genuinely suffered financial distress due to the pandemic. Thus, we assess the targeting of the scheme by conducting a twofold analysis. First, we investigate whether a disproportionate share of the compensation has gone to non-viable companies. Second, we examine whether compensation has gone to companies that were not relatively hard-hit by COVID-19 and that could have survived without the support.

By employing publicly available data on compensation payments to companies in Norway during COVID-19 and matching it with the companies' respective company information and accounting data, our twofold analysis investigates both the impact of companies' bankruptcy probability on received compensation and the impact of received compensation on companies' dividend payments. Findings of the former analysis reveal that companies that had a moderate or high probability of going bankrupt within the next two years seemingly have received significantly more compensation than those that had a low probability. The results of analyses of the latter indicate that companies which received more compensation had a lower probability of paying out dividends in 2020 and that they also paid out less dividends after receiving support than they did before.

Our results also suggest presence of heterogeneity across sectors, regions, and company sizes. Specifically, we find that companies in the arts, entertainment, and recreation sector with a moderate or high bankruptcy probability received more compensation than those with a low probability did, relative to companies in other sectors. Further, we find that companies located in the municipality of Oslo with a moderate or high probability of going bankrupt received significantly more compensation than those with a low probability did, relative to companies located in other regions. In addition, when we compare companies of different sizes, we find that, received compensation had a less negative effect on the probability of paying out dividends in 2020 for large-sized companies than it had for small- and medium-sized companies. However, for large-sized companies, receiving more compensation seems to have had the highest negative effect on dividend payments compared to small- and medium-sized companies.

To conclude, it appears that the compensation scheme has not fully lived up to its purpose of targeting companies that were viable. This may suggest a somewhat inefficient reallocation of public funds, which is critical considering that approximately NOK 6.5 billion was spent by the initial scheme on this purpose. Further, we find no evidence that the compensation has gone to companies that were not hard-hit by the pandemic, which may imply that deadweight loss as a result of the scheme is limited. These insights can contribute to better understanding of how such support policies can be more well-targeted in future crises. Nevertheless, further research is needed to investigate the long-term effects of received compensation on companies, as it is, at this moment, still too early to draw definitive conclusions on this topic.

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Appendix

Table A1: Overview of the Ten Companies That Received the Highest Amounts of Compensation

	Org. no.	Company Name	Sector	Region	Compensation
1	960563085	PGS Geophysical AS	Professional, scientific and technical activities	Oslo	351 456 389
2	953149117	Scandic Hotels AS	Accommodation and food service activities	Oslo	329 858 051
3	982410614	Strawberry Group AS	Real estate activities	Oslo	319 493 479
4	974526689	Hurtigruten Pluss AS	Transportation and storage	Oslo	300 668 380
5	910310895	Fjord Line AS	Transportation and storage	Eigersund	268 643 777
6	931531018	Radisson Hotels Norway AS	Accommodation and food service activities	Oslo	177 386 987
7	991779493	Color Line Transport AS	Transportation and storage	Oslo	150 873 128
8	892625522	SATS Norway AS	Arts, entertainment and recreation	Oslo	79 854 904
9	948181150	Oslo Plaza Hotel AS	Accommodation and food service activities	Oslo	70 497 248
10	887209812	Travel Retail Norway AS	Wholesale and retail trade; repair of motor vehicles and motorcycles	Ullensaker	63 597 626
Sum					**2 112 329 971**
Total compensation paid out in 2020					**9 517 036 157**
Share of compensation paid to the ten highest-paid companies					**22,20 %**

Sources: The Norwegian Tax Administration and the Brønnøysund Register Centre.

Table A2: Standard Industrial Classification 2007

Section	Section Name	Division	Division Name
A	Agriculture, forestry and fishing	1	Crop and animal production, hunting and related service activities
		2	Forestry and logging
		3	Fishing and aquaculture
B	Mining and quarrying	5	Mining of coal and lignite
		6	Extraction of crude petroleum and natural gas
		7	Mining of metal ores
		8	Other mining and quarrying
		9	Mining support service activities
C	Manufacturing	10	Manufacture of food products
		11	Manufacture of beverages
		12	Manufacture of tobacco products
		13	Manufacture of textiles
		14	Manufacture of wearing apparel
		15	Manufacture of leather and related products
		16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials, except furniture
		17	Manufacture of paper and paper products
		18	Printing and reproduction of recorded media
		19	Manufacture of coke and refined petroleum products
		20	Manufacture of chemicals and chemical products
		21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
		22	Manufacture of rubber and plastic products
		23	Manufacture of non-metallic mineral products
		24	Manufacture of basic metals
		25	Manufacture of fabricated metal products, except machinery and equipment
		26	Manufacture of computer, electronic and optical products
		27	Manufacture of electrical equipment
		28	Manufacture of machinery and equipment n.e.c.
		29	Manufacture of motor vehicles, trailers and semi-trailers
		30	Manufacture of other transport equipment

		31	Manufacture of furniture
		32	Other manufacturing
		33	Repair and installation of machinery and equipment
D	Electricity, gas, steam and air conditioning supply	35	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities	36	Water collection, treatment and supply
		37	Sewerage
		38	Waste collection, treatment and disposal activities, materials recovery
		39	Remediation activities and other waste management services
F	Construction	41	Construction of buildings
		42	Civil engineering
		43	Specialised construction activities
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45	Wholesale and retail trade and repair of motor vehicles and motorcycles
		46	Wholesale trade, except of motor vehicles and motorcycles
		47	Retail trade, except of motor vehicles and motorcycles
H	Transportation and storage	49	Land transport and transport via pipelines
		50	Water transport
		51	Air transport
		52	Warehousing and support activities for transportation
		53	Postal and courier activities
I	Accommodation and food service activities	55	Accommodation
		56	Food and beverage service activities
J	Information and communication	58	Publishing activities
		59	Motion picture, video and television programme production, sound recording and music publishing activities
		60	Programming and broadcasting activities
		61	Telecommunications
		62	Computer programming; consultancy and related activities
		63	Information service activities
K	Financial and insurance activities	64	Financial service activities, except insurance and pension funding
		65	Insurance, reinsurance and pension funding, except compulsory social security
		66	Activities auxiliary to financial services and insurance activities
L	Real estate activities	68	Real estate activities
M	Professional, scientific and technical activities	69	Legal and accounting activities
		70	Activities of head offices; management consultancy activities

		71	Architectural and engineering activities; technical testing and analysis
		72	Scientific research and development
		73	Advertising and market research
		74	Other professional, scientific and technical activities
		75	Veterinary activities
N	Administrative and support service activities	77	Rental and leasing activities
		78	Employment activities
		79	Travel agency, tour operator and other reservation service and related activities
		80	Security and investigation activities
		81	Services to buildings and landscape activities
		82	Office administrative, office support and other business support activities
O	Public administration and defence; compulsory social security	84	Public administration and defence; compulsory social security
P	Education	85	Education
Q	Human health and social work activities	86	Human health activities
		87	Residential care activities
		88	Social work activities without accommodation
R	Arts, entertainment and recreation	90	Creative, arts and entertainment activities
		91	Libraries, archives, museums and other cultural activities
		92	Gambling and betting activities
		93	Sports activities and amusement and recreation activities
S	Other service activities	94	Activities of membership organisations
		95	Repair of computers and personal and household goods
		96	Other personal service activities
T	Activities of household as employers; undifferentiated goods- and services-producing activities of households for own account	97	Activities of households as employers of domestic personnel
U	Activities of extraterritorial organisations and bodies	99	Activities of extraterritorial organisations and bodies
X	Not specified	0	Not specified

Source: Statistics Norway.

Table A3: Compensation Given to Different Sectors in the Period March-August 2020

Section	Section Name	Number of Companies	Compensation	
			Amount	*%*
I	Accommodation and food service activities	4,972	1,705,879,245	25.92%
H	Transportation and storage	2,199	870,488,413	13.23%
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	6,103	859,718,608	13.06%
R	Arts, entertainment and recreation	1,237	540,104,014	8.21%
M	Professional, scientific and technical activities	1,545	440,825,397	6.70%
N	Administrative and support service activities	1,298	420,501,418	6.39%
C	Manufacturing	1,705	369,339,207	5.61%
L	Real estate activities	467	319,394,958	4.85%
Q	Human health and social work activities	4,948	244,064,023	3.71%
F	Construction	1,583	196,487,399	2.99%
S	Other service activities	4,762	191,127,992	2.90%
X	Not specified	1,090	111,726,757	1.70%
P	Education	1,162	102,690,945	1.56%
B	Mining and quarrying	49	87,272,382	1.33%
J	Information and communication	488	87,247,661	1.33%
A	Agriculture, forestry and fishing	284	26,789,932	0.41%
E	Water supply; sewerage, waste management and remediation activities	27	5,028,396	0.08%
D	Electricity, gas, steam and air conditioning supply	3	1,695,316	0.03%
K	Financial and insurance activities	6	804,379	0.01%
O	Public administration and defence; compulsory social security	-	-	0.00%
T	Activities of household as employers; undifferentiated goods- and services-producing activities of households for own account	-	-	0.00%
U	Activities of extraterritorial organisations and bodies	-	-	0.00%
Sum		**33 928**	**6 581 186 442**	**100%**

Sources: The Norwegian Tax Administration and Statistics Norway.

Figure A1: Histogram of Compensation in the Period March-August 2020

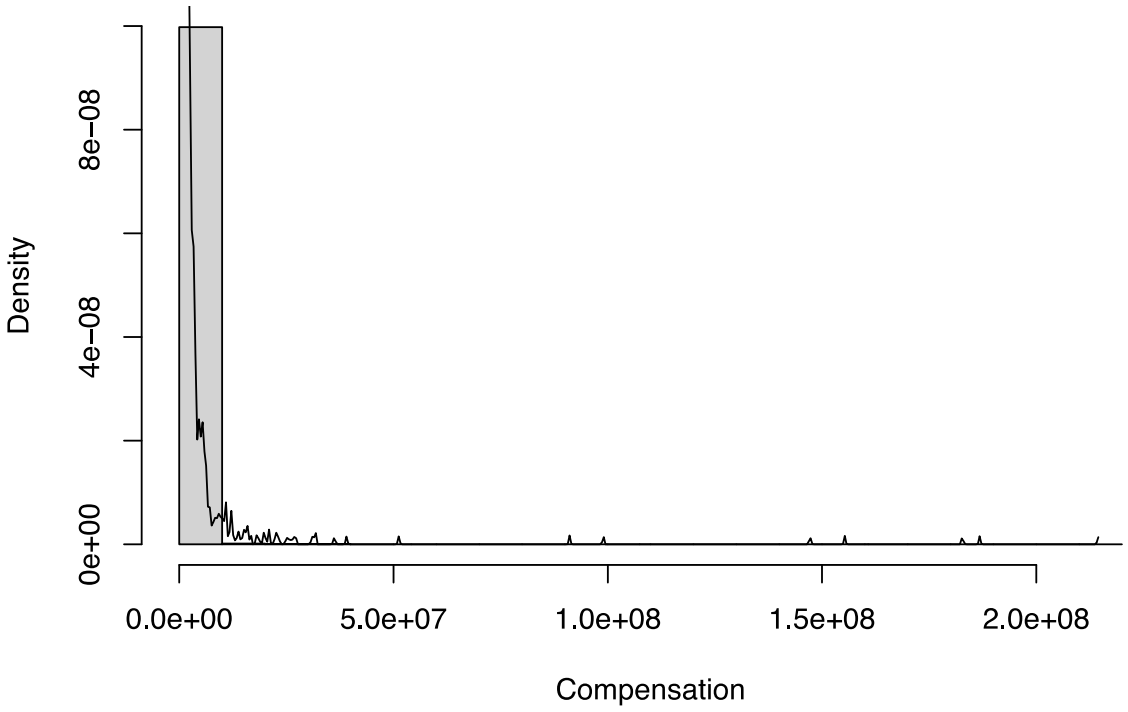


Figure A2: Histogram of Altman's Z-Score Based on Accounting Figures in 2019

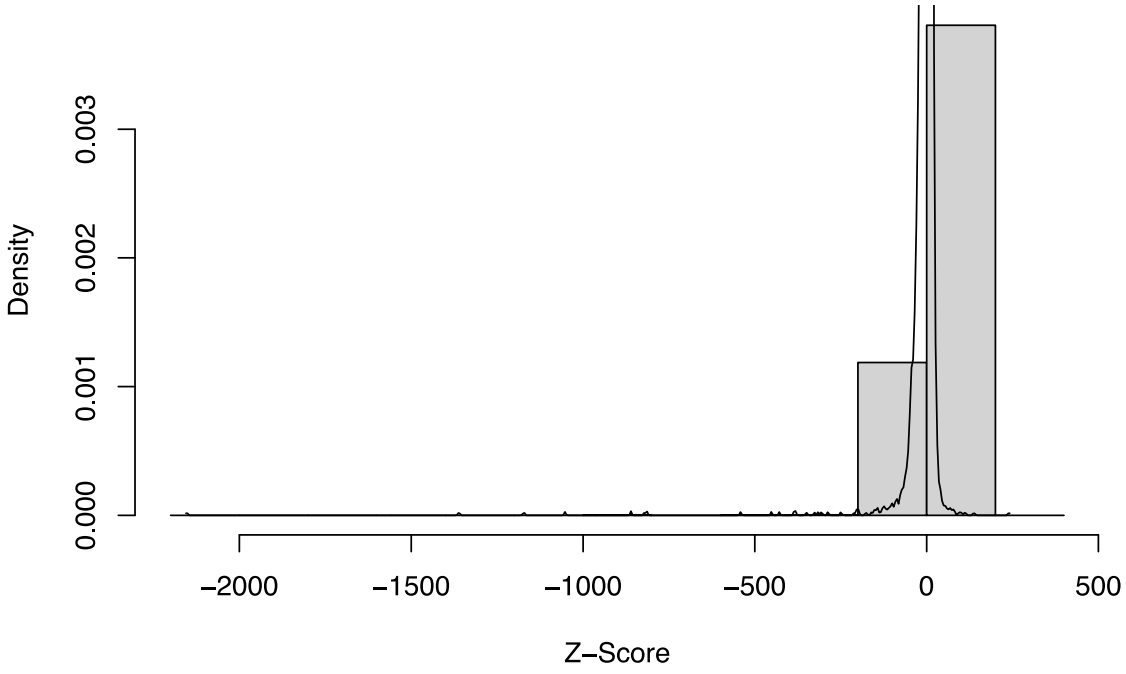
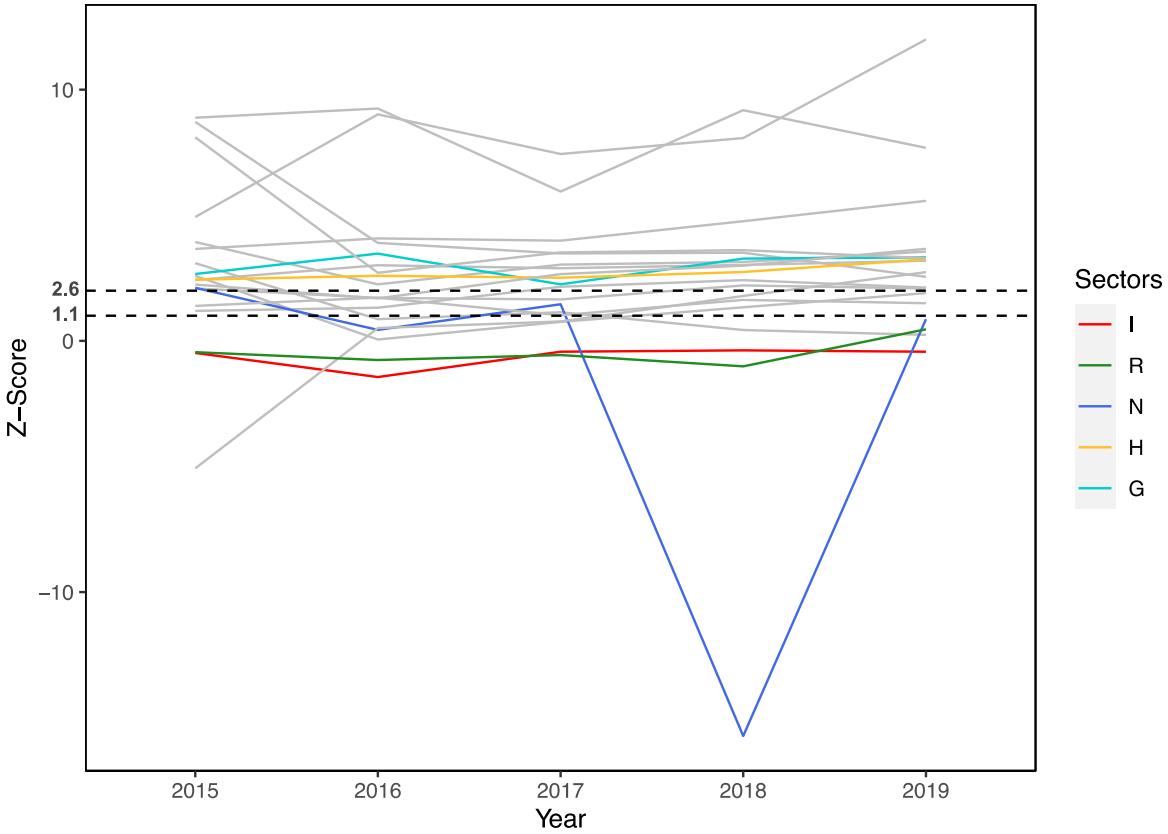


Figure A3: Average Z-Scores by Sector over the Period 2015-2019



Note: Z-Scores are based on a sample of 17,414 companies that received compensation for the period March-August 2020, and that had accounting figures for all years in the period 2015-2019. For the calculation of Z-Score, the accounting figures are retrieved from Bisnode SmartCheck. Dotted lines represent the cut-offs for the three zones, where the distress zone is below Z-Score of 1.1, the grey zone is between Z-Scores of 1.1 and 2.6, and the safe zone is above Z-score of 2.6.