IMPACT OF THE COVID-19 PANDEMIC ON THE DIVIDEND POLICIES OF FINNISH PUBLIC COMPANIES

Lappeenranta–Lahti University of Technology LUT

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ABSTRACT

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The statutory duty of a limited liability company is to generate profit for its shareholders. One way to fulfill this obligation is through dividends, traditionally achieved by distributing a specific amount of money per share. Most companies follow a certain dividend policy, aiming for steady annual increases while avoiding any drastic changes. Dividend policies are influenced by numerous factors, including earnings, investment opportunities, firm size, and historical dividend trends. These policies are of interest to both corporate managers and investors, as they attract certain groups of investors, signal financial health and help mitigate agency costs.

This thesis investigated how the COVID-19 pandemic influenced the dividend policies of Finnish public companies listed on the Nasdaq Helsinki stock exchange. Using a logistic regression model, the study investigates firm-specific and sectoral factors that shaped the dividend decisions during the crisis. The findings reveal that the pandemic had a negative but gradual effect on dividends, reflecting companies' preference for stability. Sectoral differences, changes in earnings, and firm size were found to drive the changes, aligning with existing literature and expanding our understanding of dividend decisions during periods of economic uncertainty.

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COVID-19 PANDEMIAN VAIKUTUKSET SUOMALAISTEN JULKISTEN OSAKEYHTIÖIDEN OSINKOPOLITIIKKOIHIN

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Osakeyhtiön lakisääteinen tehtävä on tuottaa voittoa osakkeenomistajilleen. Yksi tapa täyttää tämä velvoite on maksaa osinkoja, mikä tapahtuu perinteisesti jakamalla määrätty rahasumma osaketta kohden. Useimmat yritykset noudattavat ennalta määrättyä osinkopolitiikkaa, pyrkien vuosittaisten osinkojen asteittaiseen kasvuun ja välttäen äkillisiä muutoksia. Osinkopolitiikkaan vaikuttavat monet tekijät, kuten tulos, investointimahdollisuudet, yrityksen koko ja aiemmat osingot. Osinkopolitiikka on sekä yritysjohdon että sijoittajien kiinnostuksen kohde, sillä se houkuttelee tietynlaisia sijoittajaryhmiä, viestii yrityksen taloudellisesta vakaudesta ja vähentää agenttikustannuksia.

Tämä tutkimus tarkasteli, kuinka COVID-19-pandemia vaikutti suomalaisten Nasdaq Helsinki -pörssiin listattujen julkisten yhtiöiden osinkopolitiikkoihin. Tutkimuksessa hyödynnettiin logistista regressiomallia, joka keskittyi yrityskohtaisiin ja sektorikohtaisiin tekijöihin kriisiaikana tehtyjen osinkopäätösten taustalla. Tulokset osoittivat, että pandemia vaikutti negatiivisesti suomalaisten yritysten osinkoihin, mutta muutokset olivat asteittaisia, mikä heijastaa yritysten pyrkimystä vakauteen. Alakohtaiset erot, tulojen muutokset ja yrityksen koko vaikuttivat merkittävästi muutoksiin, mikä tukee aiempaa aiheeseen liittyvää kirjallisuutta, laajentaen ymmärrystämme osinkopäätöksistä taloudellisen epävarmuuden aikana.

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1 Introduction

In recent years, the global economy has experienced significant fluctuations due to economic crises, the most influential being the COVID-19 pandemic. The impact of the crisis to the global economy has been significant; stock prices have decreased while market volatility has increased. For many companies, the crisis has meant a decrease in earnings as well as increase in uncertainty concerning financial prospects (Ntantamis & Zhou 2022). The crisis has exposed the vulnerability of companies to external economic shocks, prompting a re-evaluation of corporate financial strategies, including dividend policies.

The statutory duty of a limited liability company is to generate profit for its shareholders. One of the ways this obligation can be fulfilled is through dividends; either by paying a certain amount of money per share or repurchasing existing stock back from the market, driving the existing stock price up. However, the company can also invest the excess and grow the company, which also benefits the shareholder. Usually, the decision is a combination of both, depending on several factors. The decision of dividend payouts is influenced by a variety of these factors, both internal—such as profitability, liquidity, ownership, earnings, cash holdings and capital structure—and external, such as interest rates and inflation.

The debate on dividends has been going on since the late 1950's, when Lintner (1956) introduced the model on dividends. Miller & Modigliani (1961) argued about the irrelevance of dividends, suggesting that dividend policy should not affect the value of a firm under perfect market conditions and the investors should be indifferent between growth and dividends. However, it has been since debated that dividends and dividend policies actually do matter when certain factors, such as taxes, asymmetric information, signaling and uncertainty of future are taken into account. Dividends are also considered in the valuating of a company and changes in dividends directly affect the stock price (Gordon 1963), putting them under the interest of both shareholders and the management.

The debate on dividends, or The Dividend Puzzle (Black 1996) goes on and is more relevant than ever, due to companies having to make decisions in times of uncertainty and the age of internet, when up-to-date information about companies is available to a larger audience than ever before. For shareholders, dividends are not only a clear return on investment but also serve as a signal of a company's financial health and prospects. While much of the information is publicly available, corporate managers have a better understanding of the financial situation of the company. Asymmetric information (Miller & Rock 1985) and signaling models (John & Williams 1985) suggest that dividends can be seen as a signal of good financial health and prospects, and dividend cuts and omissions as a warning sign of decreasing future profits. During unstable economic times, some corporate managers have had to reduce or even cancel dividend distribution to keep the long-term prospects of the firm positive (Ali 2022).

Numerous studies have approached the problem of dividend policy during economic crises. It was found already during the financial crisis of 2008 that the companies were more likely to decrease or omit dividends (Hauser 2013). More recently, the COVID - 19 showed similar results. However, most of the previous studies were conducted in the context of major global economies, such as the United States, China and G-12 countries (Ali 2022; Ntantamis & Zhou 2022). The existing study has shown the effects of the crises on dividend policies, but there seems to be a lack of evidence from smaller economies.

As a small, open and export-driven economy, Finland is subject to reacting differently to exogenous shocks, which could show unexpected results in comparison to previous research. The companies in Finland are often publicly owned, which seems to affect the dividend policy (Maury & Pajuste 2002). Finland's economy is often compared to other Nordic countries, and conducting the study in this context provides a foundation for future comparative studies. It offers a localized perspective while remaining relevant for broader Nordic or European contexts.

While some of the literature suggests that companies should not omit or decrease dividends, they have had to do so due to disrupts in cash flow, profitability and financing during the pandemic. Previous literature has considered the negative effect of the pandemic on dividends, but there is limited research focusing on how Finnish companies specifically adjust their dividend policies during such crises, and which factors, such as profitability, debt levels, firm size and industry, drive these adjustments.

1.1 Research Questions and Objectives

The objective of this study is to examine, how the COVID-19 pandemic impacted the dividend policies of Finnish companies, and which factors contributed to the change. By doing this, the aim is to contribute to the existing literature about dividend policies during times of economic trouble, extending the works of e.g. Hauser (2013), Ali (2022), Krieger, Mauck & Pruitt (2021) and Ntantamis & Zhou (2022). This thesis will bring a new perspective to the literature by conducting the study in the context of Finnish economy. The results of the study aim to help in providing a deeper understanding of managing dividend policies in Finland under financially unstable times. Additionally, they provide information to corporate managers and dividend-preferring investors, helping them make decisions in an economically turbulent environment.

The main objective of this thesis is to evaluate how, and to what extent, the COVID-19 pandemic affected the dividend policies of Finnish public companies. This objective will be fulfilled through the following main research question:

Q1: How has the COVID-19 pandemic affected the dividend policies of Finnish public companies?

The main question captures the research problem, assessing the global crises and their effects on financial environment for companies. The study aims to identify if, and how, these crises have prompted adjustments in dividend payouts and whether these changes are temporary or long-term shifts.

To further investigate the relationship between economic crises and dividend policies, we must investigate the factors that affect dividend policies. The second question addresses the different firm-specific factors that influence dividend decisions. The third question considers the differences between different sectors. The main research question will be supported by the following secondary research questions:

Q2: Which firm-specific factors influenced dividend policies during the COVID-19 pandemic?

Q3: Do the effects of COVID-19 pandemic on dividend policies differ across sectors in Finland?

1.2 Theoretical Framework

Research on dividends can be divided into two schools: the one that argues for dividend relevance and the one against it. This thesis bases its theoretical framework on an assumption that dividends are relevant and a vital part of a company's financials. This assumption is based on the work of Lintner (1956) and Gordon (1963), and opposed to Miller and Modigliani (1961). The thesis views dividends as central part of corporate finance, when real-life factors, such as taxes and different stakeholders are considered. The theoretical framework reviews Lintner's and Gordon's models, which are essential in understanding the rest of models and theories on dividend policies. However, the critique against their theories is also assessed, as it is vital to understand both sides of the argument.

The central theories incorporated in the thesis are Signal Theory, Agency Problem and Bird-in-Hand Theory. The argument about why dividend policies matter and why the management of corporations should care about it especially during financially unstable times is based on these theories. The theories form a basis on our assumptions and are supported by the Residual Theory and the Pecking Order theory, which explain how much a company is expected to pay dividends based on their income and available cash. These theories are crucial in explaining dividend determinants and ultimately lead to the dividend policy of a company under a crisis. The theoretical framework is pictured in Figure 1.

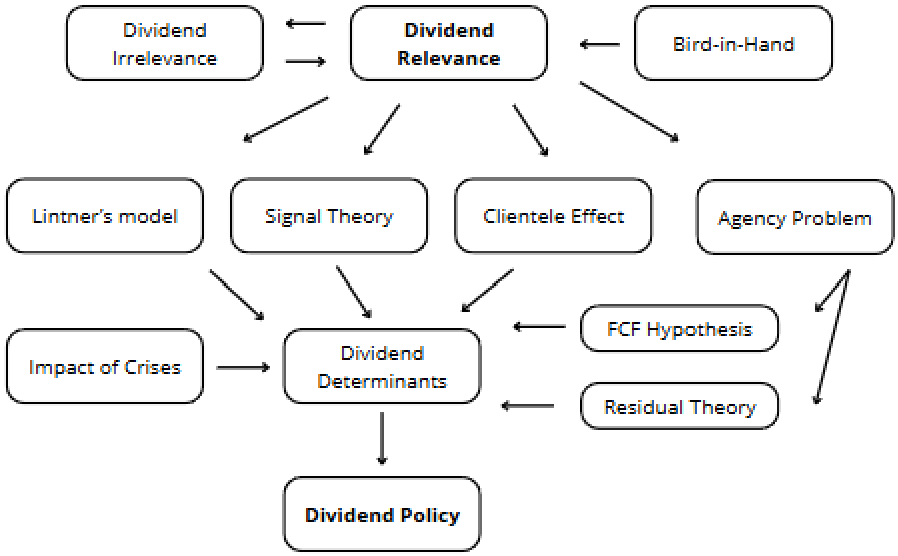


Figure 1: Theoretical framework

1.3 Research Methodology

This thesis employs a quantitative approach to investigate the impact of economic crises on the dividend policies of Finnish public companies. Using panel data from 86 firms over the period from 2016 to 2023, a fixed-effects logistic regression is conducted to account for unobservable heterogeneity among firms while examining firm-specific and crisis-related factors influencing dividend decisions. Independent variable is calculated from a change in dividend yield of a company on a fiscal year and converted to a dummy variable. Independent variables of profitability, leverage, liquidity, firm size, and changes in equity are analysed to understand their effects on dividend decisions. The data is further categorized into two broad sectors—industrial and consumer-based—to assess potential sectoral differences in response to the crisis. Additionally, the data is divided by time into two groups: before the start of the pandemic in 2019 and after it, including four years in both groups.

1.4 Scope and Delimitations

This research examines the impact of COVID-19 pandemic on the dividend policies of Finnish public companies over the period from 2016 to 2023, following the approach taken by Ali (2022) and Ntantamis & Zhou (2022). Compared to earlier studies, this thesis will also consider the year 2023, while also employing a later starting year of 2016 compared to some of the prior studies. The choice of this timeframe allows for the inclusion of four years after the start of the COVID-19 pandemic, while also including the same timespan of more economic stability before the pandemic. The study focuses on companies listed on the Nasdaq Helsinki that paid dividends during the timeframe, ensuring that the analysis is concentrated on public firms operating within the Finnish economic environment.

1.5 Structure of the Thesis

This thesis consists of six main chapters: Introduction, literature review, data and methods, results, discussion and conclusions. The first chapter introduced the research topic, outlining the background and significance of the study. It also presented the research questions, and shortly reviews the theoretical framework, methodology, scope and delimitations of the study. The second chapter reviews the existing literature on dividend policies and their determinants, particularly in times of economic crises. It introduces key theories and models on dividend research, such as Lintner's model, agency theory, signaling theory and dividend determinants. This section also explores previous literature on the characteristics of dividend policies in Finland, as well as the effects of crises on dividend policies.

The third chapter explains the data collection process and research methodology. It explains the selection of Finnish public companies, the time period analysed, and the variables incorporated. It also explains the quantitative approach used, and the process of choosing the most viable model. The fourth chapter discusses the results and the assumptions of the model. The fifth chapter concludes the thesis, including discussion on the findings of the thesis compared to prior literature, recommendations for further research, advice for managers and shareholders, and limitations of the study.

2 Literature review

Before we examine the relationship between crises and dividend policies, we must first understand how a dividend is determined, and which factors affect dividend decisions on a corporate level. This literature review consists of four parts. First of them will review some of the foundational literature, research and theories on dividends. The second part will introduce the context of the study, reviewing dividend policies and their characteristics in Finland. The third part will introduce some of the relevant prior literature on dividend determinants overall and during crises. In the fourth part, the hypotheses of this thesis are introduced based on literature.

2.1 Theories on Dividends

Dividend policy research is underpinned by several key theories and models. Numerous factors have been found to predict dividend payments of a company. These dividend determinants include e.g. company size, financial leverage, profits, past dividends and liquidity (Ain & Manping 2022). In addition to the company-specific factors, external factors such as changes in inflation and interest rate affect dividend decisions, as they directly affect companies' financials.

Despite extensive research, there is no consensus on a general dividend theory that can completely predict dividend policies, or even fully explain why dividends are paid despite many downsides of it. The debate and lack of unanimity in dividend policy research highlight the complexity of the phenomenon, termed as the "Dividend Puzzle" (Black 1996). Thus, while there is a way of predicting future dividends and changes in dividends of a company, there is no clear explanation on why dividends are paid, and how much so. However, there are theories that can help in understanding, why some investors prefer dividends and why companies want to pay them.

2.1.1 Lintner's Model on Dividends

To further examine dividend policies and their changes from a theoretical point of view, we must first review factors influencing dividend payout decisions.The foundation for the research on dividends was laid by Lintner (1956) in a research where he introduced some of the key factors influencing dividend policy decisions. There are two key takeaways from the research.

Firstly, companies prefer to keep their dividends stable and predictable. They are hesitant to cut dividends and in contrary, want to either keep them at the same level or increase them gradually. However, companies do not want to increase the payout extensively at once, as it could result in lack of sustainability and a cut in dividend payout in the following years. As a result, it is argued that companies will only increase dividends, if their management believes that there has been a permanent increase in earnings. (Lintner 1956)

The second major takeaway from Lintner's research is that companies generally have a target payout ratio. This means that they have a long-term objective for the proportion of earnings that they aim to pay out as dividends. However, firms do not adjust their dividends to this target ratio immediately. Instead, they make slight changes towards this target over time. (Lintner 1956)

Based on the factors discovered in the research, Lintner proposes a model for determining a change in dividend payout for an individual company, explained in Formula 1:

$$\Delta D_t = a + c(\mathrm{r}P_t - D_{t-1}) + u_t \tag{1}$$

where a = Positive constant

c = Difference between target payout and actual dividend

ΔD_t = Change in dividend payment

r = Target pay-out ratio

P_t = Current year's profit after taxes

u_t = Residual

The model demonstrates that the dividend payout depends on last year's dividend. It is based on two assumptions; that there is a long-term target payout ratio for a company and a speed at which current dividends adjust to said target. This means that while the profits after taxes may vary, it might not result in a change in dividend payments, at least not as drastic a change as the profits might be. (Lintner 1956)

Fama and Babiak (1968) added to Lintner's model by testing it empirically with a sample of 392 companies, proving its effectiveness in explaining the dividends. What they also found out was that the model could be improved by removing the positive constant and adding a lagged variable. Benartzi, Michaely & Thaler (1997) describe Lintner's model as "the best description of the dividend setting process available", adding that changes in dividends mostly tell us something about the past, rather than the future.

The model has been tested in the 21st century as well, proven effective numerous times in different contexts. Gugler & Yurtoglu (2003) apply the model to German companies to understand how firms with different ownership structures behave in adjusting their dividends, finding differences in target payout ratios between majority-controlled and minority-controlled firms. A more recent study by Benlemlih (2019) applies the model, showing that firms with higher corporate social responsibility (CSR) not only pay higher dividends but also maintain more stable payout policies over time. The consistent use of Lintner's model throughout the years not only emphasizes its foundational status in dividend policy research, but also underlines its reliability and relevance even after almost seventy years.

2.1.2 Dividend Irrelevance

While Lintner's Model has been proven to predict and explain the number of dividends a certain firm is going to pay, it doesn't really consider the reason or the relevance of a dividend payment. After all, a company can provide value to its shareholders in other ways, such as investing in positive-NPV projects and growing in value. Dividend Irrelevance Theory by Miller and Modigliani (1961), proposes that dividend policy does not affect a firm's value. The theory suggests that under perfect market conditions with no taxes, no transaction costs, no bankruptcy costs, and symmetric information, a firm's dividend policy is irrelevant to its valuation. In other words, the value of a firm is determined by its earnings and investment decisions, not by how it distributes dividends (Miller & Modigliani 1961).

Although the research acclaimed a wide range of criticism, there seems to be some empirical support to the theory as well. Kowerski & Haniewska (2022) found empirical evidence supporting the theory in two out of three years studied. This theory suggests that investors can create any desired dividend pattern regardless of the company's policy. Magni (2007) clarified that dividend irrelevance holds even with retention, provided the net present value of extra funds is zero.

However, while there seems to be some evidence supporting the theory, its assumptions often fail to hold in real-world markets where taxes, transaction costs, and investor preferences influence firm value.

2.1.3 Bird-in-Hand

The dividend irrelevance theory raised quite a bit of controversy. Not long after Modigliani and Miller, Lintner (1962) and Gordon (1963) argued that the dividend policy of a company does matter in reality contrary to the prior theory. First, Lintner (1962) argued that dividend policy has a strong influence on stock prices as many investors prefer dividends over potential future capital gains. Gordon (1963) added to the study by suggesting that, due to uncertainty about future earnings, investors value current dividends, or a “bird in the hand” more than the promise of future earnings or capital gains, or the “two birds in the bush”. Hence, the bird-in-hand -theory.

While dividend irrelevance argues that the dividend policy does not really matter and thus, companies should not worry about paying dividends, bird-in-hand theory suggests otherwise. According to Gordon (1963), there are two reasons investors might prefer dividends. Firstly, investors want to avoid uncertainty and risk. A cash flow, or dividend, right now is more valuable than the same one in a year. Secondly, as there will always be corporate risk to some extent, the uncertainty of a dividend payment in the future increases with the time. Given these conditions, it is argued that the dividend payment has a direct impact on the stock price of the company. (Gordon 1963)

Gordon demonstrates the conclusion with the classic dividend discount model in Formula 2 below:

$$P_0 = \frac{D_1}{r - g} \tag{2}$$

where

P_0 = Current stock price

D_1 = Value of the next dividend

r = Rate of return

g = Growth rate

Gordon's model suggests that the value of a stock is the sum of the present values of its future dividends. The model implicates three main points. First of them is that a stock price increases when a firm has a higher dividend payout. According to the model, firms that pay regular dividends are valued more highly than firms that retain earnings, potentially with the promise of future growth. The second implication is that there is a direct trade-off between the required rate of return (r) and the growth rate of dividends (g). If a firm increases its dividend payout ratio, investors see it as reducing risk, leading to a lower required return. The third point is directly tied to bird-in-hand theory. The model suggests that the current stock price is the sum of an infinite number of future dividends that are discounted by the rate of return. That being said, the further in the future the dividend payment will be, the lower its effect to the current stock price and thus, the value to the investor is (Gordon 1963).

Besides net present value models such as Gordon's model, there are other ways to value stocks that don't include dividends, example given market multipliers Price-to-Book and Price-to-Earnings ratios. However, Gordon's growth model and its applicants have remained consistent and reliable ways for analysts and investors to value stocks. (Fabozzi, Focardi & Jonas 2017) The models have been tested multiple times in different contexts. Zhao, Ni & Ren (2023) link Bird-in-Hand model assumptions with the price-to-earnings P/E ratio, suggesting that investors in China favor dividend payout over high earnings ratios. Ali (2020) tests the theory in Jordan, arguing that dividends lead to more predictable earnings and investor satisfaction, particularly in volatile markets revealing a preference among investors for dividends as a more secure return.

2.1.4 Signaling Theory

Closely tied to bird-in-hand theory, signaling theory first introduced by Spence (1973) in the context of job markets, and later applied to financial markets by Ross (1977) suggests that dividend announcements serve as a signal to the market about the company's prospects and financial health. While most of the statistics and key figures of public companies are available to the public, the management of the company typically has more accurate and up-to-date information about the financials. In short, the theory posits that there is information asymmetry between the managers and the investors, and dividend payments are a tool to reduce it (Ross 1977).

Miller and Rock (1985) add to the view by suggesting that companies can use dividends to signal private information about their future profitability to the markets. They argue that dividends act as a credible signal to investors because paying out dividends requires actual cash flows, which are difficult to manipulate. It is highlighted that dividends are a costly signal, in comparison to announcements of financials. This leads to the prediction that stock prices react positively to unexpected increases in dividends, as investors see these announcements as credible signals of future profitability. In contrary, a reduction or omission of dividends may negatively impact stock price due to the implied weaker earnings outlook. (Miller & Rock 1985)

Signaling theory appears to hold strongly in the 2000s, as evidenced by numerous studies. However, it has been noted that as there is asymmetry in information between the managers and investors, there seems to be asymmetry in the stock price reaction to the dividends as well. Gupta, Dogra, Vashisht & Ghai (2012) find support to signaling theory, emphasizing the asymmetry between increasing and decreasing the dividend. Dasilas & Leventis (2011) find a similar outcome in the Greek markets; a decrease in dividends leads to a far greater negative reaction in comparison to the positive reaction on increasing the dividend

2.1.5 Principal-Agent Problem

An extension of signaling theory, agency theory also addresses the information asymmetry between corporate managers and shareholders. Principal-agent problem arises when there's a conflict of interest between a principal and an agent tasked with acting on the principal's behalf. In the context of public companies, agents can be seen as corporate managers and principals as shareholders. Managers may prioritize personal goals over shareholder interests, potentially leading to inefficient or self-serving decisions. This misalignment creates agency costs, such as lost profits or unnecessary expenditures, due to actions that don't maximize shareholder value. (Jensen & Meckling 1979)

Dividends are one of the ways of mitigating the agency problem, aligning managers' interests with those of shareholders and reducing potential conflicts. Paying dividends reduces the amount of available free cash flow that managers could use in their best interest, e.g. inefficient investments that increase their power in the company. (Jensen & Meckling 1979) Recently, agency problem has not only been addressed between just managers and shareholders, but also between controlling shareholders and minority shareholders (Lindén, Lehner, Losbichler & Martikainen 2023).

Principal-Agent Problem birthed further applications to dividend policy theories. Jensen developed the agency theory further in 1986, introducing the free cash flow hypothesis. The hypothesis suggests that firms with excess cash should distribute it to shareholders rather than allowing management to retain it for discretionary use, thus lowering agency costs. High dividends, in this case, act as a tool to reduce potential inefficiencies in capital allocation (Jensen 1986). DeAngelo, DeAngelo & Stulz (2006) connect the agency theory with the lifecycle theory of dividends, arguing that mature firms with fewer growth opportunities use dividends to distribute excess earnings and reduce agency costs.

Miller & Modigliani (1961) argue that dividends are only paid after all suitable investments have been financed. Essentially, dividends are a "residual" payment to shareholders, after profitable projects are funded. The Pecking Order Theory, developed by Myers & Majluf (1984), suggests that firms prioritize internal financing, followed by debt, and only use equity financing as a last resort due to information asymmetry. During economic crises, firms may prioritize retaining earnings over paying dividends to avoid external financing costs and maintain financial flexibility. In contrary, the theory suggests that when there are no positive-NPV projects due to inflation and high rates during a crisis, a greater amount of the excess cash could be distributed as dividends.

2.1.6 Clientele Effect

While many of the companies decide to distribute dividends despite the numerous downsides of it, some companies decide not to. For example, lifecycle theory suggests that newer companies in their growth stage might prefer to invest the excess cash to grow the company instead of paying high dividends. On the other hand, more established companies in their maturity stage might prefer to distribute more of the free cash as dividends, due to lack of more growth opportunities (DeAngelo, DeAngelo & Stulz 2006). This creates a division between companies that are known to pay dividends, and companies that focus on growth.

Due to different ways that companies provide returns on their investors, it is implied that there might be differences in preferences between these types of return on investment. The "clientele effect" suggests that companies attract different investor groups based on their tax, dividend, or other policy practices. Introduced first by Miller & Modigliani (1961), it is suggested that due to tax advantages for example, some investors prefer growth over dividend payments. One example of this is the fact that private investors must pay a tax on the dividends they receive even if they reinvest it right after, while growth of a share is not taxed until the stock is realised.

However, the "clientele effect" works the other way as well. For instance, income-focused investors, such as retirees might prefer stable dividends, as it provides a stable passive income without a need to "create their own dividends" by selling shares. Also, shareholders could be indifferent between dividends and growth. An example of this group would be institutional investors, as they can reinvest the received dividends without paying taxes in Finland. This creates three groups: dividend-preferring investors, investors that prefer growth and indifferent investors (Maury & Pajuste 2002).

While it has been controversial whether the clientele effect is a real phenomenon or not, it might have a small part in explaining changes in the changes of stock prices as a result of companies' policy changes. An unfavourable change in a dividend policy may cause investors to sell their holdings, causing the share price to decrease. As a result, large dividend policy shifts can be disruptive for the long-term interests of a company. So, once a company establishes a dividend policy and attracts a certain clientele, it should not make major short-term changes to it.

2.2 Dividend Policies in Finland

The study is conducted in Finland, which brings a unique aspect to it from the perspective of dividend policies. Finnish corporate governance practices, market structures, and tax policies differ from those in larger and more diverse economies like the United States or the United Kingdom. Moreover, Finnish companies often operate in a relatively concentrated and export-driven economy, which may influence their earnings stability and dividend practices. Additionally, Finland's legislative and economic responses to crises, such as the COVID-19 pandemic, offer valuable insights into how firms adapt their dividend policies during periods of economic uncertainty. This setting allows for understanding dividend determinants in smaller, open economies.

Finnish shareholders have historically shown a preference for dividends, with spring traditionally marking the period when Finnish companies distribute the payments. Later, most Finnish public companies have started to adopt the international way, distributing dividends twice a year or quarterly. (Kauppalehti 2024a) Still, dividends seem to play a central role for investors in Finland, as they are often covered in the media, and unexpected increases or decreases are discussed thoroughly.

Dividend policies in Finland reflect the unique characteristics of Finnish financial markets, which previously leaned towards debt-dominated financing, though since the 90's we have seen increased equity market participation. Moreover, the Finnish markets and public companies, as well as their dividend policies are distinguished by their institutionally- and state-dominant ownership structure, thin equity markets, strict regulation and tax laws (Kasanen, Kinnunen & Niskanen 1996).

The Finnish companies and markets seem to have distinguishable aspects that might affect corporate dividend payments. Concretely, institutions don't pay taxes for received dividends, while an individual investor does. The ownership structure in Finland is found to differ from many of the Western countries as well; largest shareholder has a voting power of 33.2 percent, being significantly higher than in England and the US (9,9% and 5,4%, respectively) but lower than in eight European countries (44%). (Maury & Pajuste 2002) Additionally, Finnish law permits shareholders owning at least 10% of a company's shares to demand a "minority dividend," which is capped at half of the annual profit or a maximum of 8% of the company's equity. (Kinkki 2008)

In Finland, most companies have announced to be following a dividend policy. Usually, this includes gradually increasing the dividend, while keeping it stable. Despite the strict tax laws and regulations and rather counterintuitively, Finnish companies' dividend yields are quite high in comparison to many European countries. With an average of a little under 4% in Finland, France, Denmark, Switzerland and Italy are left behind with around 3% and the U.S. with around 2% (TopForeignStocks.com 2015).

2.3 Prior studies

2.3.1 Dividend Determinants

Dividend determinants have been a focal point of corporate finance research, with numerous studies identifying patterns that can help predict whether a company will pay dividends and, if so, how much. In line with prior theoretical discussion, empirical findings introduce several firm-specific factors that significantly influence dividend policies. These include company size, financial leverage, profitability, past dividends, growth opportunities, and liquidity, as noted by Denis and Osobov (2008) and Ain &

Manping (2022). These factors provide a framework for understanding the dividend behaviour of firms across different industries and markets.

Company size is often linked to dividend payments, with larger firms more likely to pay dividends due to their stable earnings and lower growth constraints. Profitability also plays a central role, as firms with higher profits are better positioned to distribute earnings to shareholders while maintaining sufficient funds for operations and investments. Liquidity, often presented by free cash flow, enables companies to sustain dividend payouts without compromising financial stability. Past dividend payments are another strong predictor, reflecting the signaling theory's emphasis on dividend consistency to reassure investors. Meanwhile, financial leverage can constrain dividend payments, as highly leveraged firms may prioritize debt obligations over shareholder returns. Growth opportunities present a nuanced dynamic, as firms with high growth prospects often retain earnings to finance expansion, aligning with the pecking order theory (Lintner 1962; Baker, Veit & Powell 2001).

Dividend payment practices vary significantly across sectors due to differences in profitability, growth opportunities, and capital intensity. For instance, capital-intensive industries, such as utilities, tend to have more stable dividend payments as they generate consistent cash flows and attract income-oriented investors (Pinto & Rastogi 2019). In contrast, sectors like technology, which are characterized by high growth potential and capital reinvestment needs, are less likely to pay dividends, opting instead to retain earnings for expansion (Brawn & Šević 2018).

Economic factors also play a role in sectoral differences. For example, in cyclical industries like manufacturing and energy, dividend payments may fluctuate in response to economic conditions, reflecting earnings volatility. Khan and Shamim (2017) observed similar trends, emphasizing the role of sector-specific attributes in shaping dividend policies.

2.3.2 The Effects of crises

In times of crises, most companies find it difficult to maintain the level of cash flow, e.g. due to inflation and challenges in the supply chain. When companies face financial challenges, it often becomes trade-off between maintaining stable dividends and conserving cash. DeAngelo & DeAngelo (1990) find that firms under financial distress often reduce or eliminate dividends as a cash-preservation strategy, supporting the notion that dividend payouts serve as signals of financial stability.

In the last 20 years, we have faced quite a few economic downturns, starting from the financial crisis of 2008 all the way to the most recent, the COVID-19 pandemic. The lessons from 2008 are still quite fresh in the memory of Finnish investors, as the GDP of Finland still has not recovered to the level prior the crisis (Tilastokeskus 2023). The probability of firms paying dividends significantly declined during 2008 and 2009, even after accounting for the firms' financial conditions. This suggests that the crisis prompted a cautious approach toward cash conservation, with firms opting to retain earnings instead of distributing them as dividends. (Hauser 2013) After the crisis, firms have opted to keep more liquidity in order to prepare for possible future crises.

More recently, the COVID-19 pandemic impacted profits, prices and most importantly, lives around the world. As a result, corporate dividend policies were also impacted across various countries. Many firms opted to cut or omit dividends, with the proportion of such actions being notably higher during the pandemic compared to previous periods (Krieger & al. 2021; Ali 2022). However, a majority of firms still managed to maintain or increase dividends, possibly to signal financial stability and due to excess liquidity (Ali 2022). The impact varied geographically, with European firms more likely to cut dividends, while U.S. and Canadian firms reduced cash payouts primarily through share repurchases (Ntantamis & Zhou 2022).

Factors influencing dividend decisions during the pandemic included profitability, earnings prospects, firm size, and leverage (Ali 2022; AlGhazali & Yilmaz 2023). Corporate cash holdings helped mitigate the negative impact on payouts, although this effect was less pronounced for European firms. (Ntantamis & Zhou 2022) The pandemic's impact on dividends was widespread across industries, unlike the 2008 financial crisis (Krieger & al. 2021)

In Finland, the effects of the crisis were quite similar. Lintner’s model on dividends seems to hold in the Finnish markets, as companies aim to gradually increase and keep the payments stable. There is no evidence of dividend irrelevance, but rather of relevance, mostly due to signaling effect and agency problem.

2.4 Hypotheses development

Lintner's (1956, 1962) work argued that firms prefer to follow stable dividend policies, and any changes to dividends are often gradual. He also emphasized that firms base their dividend strongly on the previous dividend. Firms are cautious about cutting dividends because such a move could signal financial weakness, which they avoid in order to maintain investor confidence. (Ross 1977; Miller & Rock 1985)

However, as dividends are always paid from the excess cash of the company, they cannot be sustainably kept at the same level if the cash flow declines. Additionally, prior studies on dividend policies have shown that the amount of dividend cuts and omissions increase during crisis periods (Krieger & al. 2021; Ntantamis & Zhou 2022; Ali 2022). This leads to the first hypothesis of the thesis.

In addition to observing the effects of crisis, the study aims identify the factors that drive these changes. Research indicates that the industry in which a company operates significantly influences its dividend policy during a crisis (Ali 2022; Ntantamis & Zhou 2022). Furthermore, sectoral differences also play a role in shaping dividend policies, as noted by Pinto & Rastogi (2019) and Brawn & Šević (2018), even during a crisis (Krieger et. Al. 2021). These differences are attributed to factors such as the clientele effect and the capital intensity of a sector. Based on these insights, he second hypothesis is constructed.

To gain a more comprehensive understanding, it is essential to analyse the firm-specific factors that influenced changes in dividend policies, alongside sectoral differences. Previous studies have shown that companies were affected differently, depending on some of these firm-specific indicators (Hauser 2013; AlGhazali & Yilmaz 2023; Krieger et. Al. 2021). In this study, the included factors are profitability, liquidity, leverage and company size. The hypotheses three, four and five arise from these firm-specific differences between the changes in dividend policies during the crises.

I construct the following hypotheses to my research questions:

Table 1: Table of hypotheses

Number	Hypothesis (H1)	Null Hypothesis (H0)
H1	*The crisis had a negative effect on the dividend yields of Finnish companies.*	*The crisis had no effect on the dividend yields of Finnish companies.*
H2	*The impact of the crisis varied between the sectors.*	*The impact of the crisis did not vary between the sectors.*
H3	*Firms with higher profitability were less likely to reduce or omit dividends during the crisis.*	*Profitability did not affect the likelihood of reducing or omitting dividends during the studied period.*
H4	*Firms with lower debt levels and larger cash reserves were less likely to reduce dividends during the crisis.*	*Debt and liquidity did not affect the likelihood of reducing or omitting dividends during the studied period.*
H5	*Larger firms were less likely to reduce dividends during the crisis.*	*Firm size did not affect the likelihood of reducing or omitting dividends during the studied period.*

3 Data and Methods

This section outlines the variables, data sources, and methodological approach used in this study to analyse the research objective. In the first part of this chapter, the sourcing and parsing of the data are explained. Following the sourcing of the raw data, the variables used in the study are argued for and explained. In the second part, the most suitable methodological approach employed is chosen and explained.

3.1 Data and Variables

This thesis uses panel data of Finnish public companies and their dividends and other publicly available financial information between the years 2016 and 2023. There were 232 publicly listed companies in Finland in 2024, according to Kauppalehti (2024b). Of these, 146 companies are listed in OMX Helsinki exchange and 86 in First North stock exchange. For this study, companies listed on First North were deleted due to insufficient data availability in the Orbis Europe dataset for the entire study timeframe. Consequently, the sample for this research focuses on Finnish public companies listed on OMX Helsinki.

To refine the sample and align it with the study objectives, several exclusions were made. Firstly, financial companies and companies that did not pay dividends during the period from 2016 to 2023 were removed, following Ali (2022). Companies incorporated or founded after 2015 were also excluded, along with any companies lacking complete data for the timeframe. Additionally, companies with multiple classes of shares (e.g., A and B shares) that resulted in duplicate entries were adjusted by retaining only one entry per company. Following these eliminations, the final sample consisted of 86 Finnish public companies that paid dividends at least once during the studied timeframe.

Dividend payment data for the companies was obtained from Kauppalehti. The data includes all the dividend payments a listed company made per share between the period of 1.1.2015 and 31.12.2023. As dividends are often paid several times a year and the raw data included all these payments separately, the dividend payments for a company were summed for a fiscal year between 1.1. and 31.12. of the year to compare the data accurately between the companies. For the purpose of this study, it was necessary to calculate the changes in dividends, which was done using the equation in Formula 3:

$$\Delta Div = \frac{Div_t - Div_{t-1}}{Div_{t-1}} \tag{3}$$

where

ΔDiv = Change in yearly dividend payment per share

Div_t = Dividend payment on a year t

Div_{t-1}= Dividend payment on the previous year

While the change in dividend itself is an informative variable, it doesn't consider that a dividend can remain the same and be omitted at the same time, as both of those result in a dividend change of 0. The dividend change dummy variable was created to classify whether a company's dividend payment was increased, remained the same, decreased or omitted on a given year. If the dividend payment in year t was higher or remained the same than in previous year, the dummy variable was assigned a value of 1. Conversely, if the dividend payment in year t was omitted or less than in the previous year, the dummy variable was assigned a value of 0. This approach was adopted from e.g. Ali (2022), Ntantamis & Zhou (2022) and Krieger et. Al. (2021), with the exception of using a binary classification instead of four-category one. This enabled the study to analyze the relationship between changes in financial indicators and the likelihood of cutting a dividend against not cutting it.

The other financial data for the companies in the sample was fetched from Orbis Europe dataset. The included indicators were total assets, net income, sales, long-term debt, current assets and current liabilities. From these indicators, six independent variables were calculated, chosen according to known determinants of dividends (Ain & Manping 2022), and explanatory variables of previous studies on dividend decisions during a crisis (e.g. Ali 2022; Krieger & al. 2021) The chosen variables for this thesis include Return on Assets (ROA), Change in Earnings (ChE), Asset Turnover (AsTvr), Leverage, (lev), Firm Size (logSize) and Liquidity (Liq).

Additionally, the companies were divided into two groups according to their industry classification in Kauppalehti (2024b). Consumer-based industries, such as consumer staples, health, and consumer goods were sorted to “Utilities” sector. In contrary, basic industry, and industrial goods and services were sorted to “Industrials” sector. This approach, adopted from Krieger et. Al. (2021) allowed for comparison of the results between the sectors. From the two sectors, a dependent dummy variable of “Sector” was created. The approach was taken, due to low number of observations in some of the industries, as shown in Table 5 later.

Finally, to account for the COVID-19 pandemic, a dummy variable “Pandemic” was created. This allowed for comparison between years prior to, and after the start of the pandemic in the same model. Table 2 presents an overview of all the variables created for this study.

Table 2: Variable names, their definitions and descriptions.

Variable	**Type**	**Definition**	**Description**
Div	Dependent	Dividend Dummy	A dummy variable that equals 1, if dividend increased or remained, and 0 otherwise
ROA	Independent	Return on Assets	The ratio of net income to total assets
ChE	Independent	Change in Earnings	Change in net income in year t-1, standardized by book equity in the previous year
AsTvr	Independent	Asset Turnover	The ratio of sales to total assets
Lev	Independent	Leverage	The ratio of total long-term debt to total assets
logSize	Independent	Firm Size	The logarithm of total assets
Liq	Independent	Firm’s Liquidity	The ratio of current assets to current liabilities
Pandemic	Independent	Pandemic dummy	A dummy variable that equals 1 before the start of the pandemic (year < 2020), and 0 after
Sector	Independent	Sector Dummy	A dummy variable for company's sector, 1 stands for utilities sector, and 0 for industrial

3.2 Methodology

The study employs a logistic regression model employed form Hair (1998), to analyse the effects of economic crises on the dividend policies of Finnish public companies listed on Nasdaq Helsinki. This method was chosen due to the nature of dividend payments, which can be categorized into binary outcomes, in this case, whether the dividend was reduced/omitted or not.

Logistic regression was chosen instead of linear regression, as in linear regression, one cannot differentiate between a dividend omission and keeping the dividend on the same level. This is because both outcomes show a dividend change of 0. Given this focus, the binomial logistic regression model is used to capture the relationship between the dependent and independent variables.

The logistic regression model used in the study is conducted in Formula 4 below:

$$log\frac{P(Y=1)}{1-P(Y=1)} = a + \beta_1 ROA + \beta_2 ChE + \beta_3 AsTvr + \beta_4 Lev + \beta_5 logSize + \beta_6 Liq + \beta_7 Pandemic + e \quad (4)$$

where

$log\frac{P(Y=1)}{1-P(Y=1)}$ = The odds ratio of increasing or keeping the same level of dividend, compared to decreasing or omitting the dividend

a = Constant

βi = The coefficients for each independent variable

e = Residual

Additionally, it must be addressed that the study is conducted with panel data, which consists of cross-sectional units (N) over a period of time (T). In this study, the number of units (companies) N = 86, and the timeframe T = 8 years, making the panel "Short and wide". In the beginning of the study, the panel is also balanced, but due to some deletions later in the study, it becomes unbalanced (Hill 2018).

The panel data is set in Stata by *xtset* command. When dealing with panel data, the choice is between pooled, random effects (RE), and fixed effects (FE) models. The decision depends on how the structure of the data is handled and what is the type of variation across panels. A pooled model assumes that all observations are independent and ignores the panel structure of the data. A random effects model assumes that the differences between panels, in this instance, companies, are random and uncorrelated with the independent variables. A fixed effects model assumes that the panel-specific effects are fixed and potentially correlated with the independent variables (Hill 2018).

In this study, the fixed and random effects of the different companies must be considered. A Hausman test is conducted to determine which model fits better. First, the logistic model is conducted with both random and fixed effects, and their estimates are stored. Then, a Hausman test is conducted, giving a p-value of 0,0000 (Appendix 1.). This implies that we should reject the null hypothesis that there are individual, company-level effects. Thus, we should use the fixed effects estimator instead of a random effect one.

Next, the decision between fixed effects model and pooled model must be made. To do this, we look at the *rho-value* of the RE regression. The rho-value is 5,41, which means that the observations are not independent, and we cannot ignore the panel effects of the data. Hence, the pooled model is not a valid option, and the FE model is chosen. The decision also aligns with expectations, as most of the indicators of the companies can be expected to correlate with the ones from the prior years.

4 Results

This section presents the results of the empirical study. To ensure the reliability of the results, the descriptive statistics of the variables and background assumptions of the model are tested first. After reviewing these assumptions, the logistic regression model is conducted, first with the whole dataset and then separately with the sectors. Supporting the discussion of the results, graphs of yearly dividend decisions of the companies are considered in addition to the logistic regression models.

4.1 Descriptive Statistics and Assumptions

First, the dependent variables were plotted in scatterplots against the year (Appendix 2). This was done for two reasons: to find outliers and check for signs of stationarity. The reliability of logistic regression suffers, if there are major outliers in the data. Following the findings in the scatter plots, a total of 69 outliers were deleted from the sample. After the deletions, 632 observations in total were left. Additionally, no signs of non-stationarity can be seen from the scatterplots, which is expected as most of the dependent variables are yearly ratios, not absolute measures.

After deleting the outliers and before forming the regression model, the relevant descriptive statistics of the data are covered briefly. Table 3 shows the descriptive statistics of the dependent variables, including mean, standard deviance, minimum, maximum and total number of observations.

Table 3: The descriptive statistics of the dependent variables.

Variable	Mean	SD	Min	Max	N
ROA	0,0401	0,0723	-0,3854	0,2987	632
ChE	0,0048	0,0601	-0,4328	0,2939	612
AsTvr	1,1351	0,5354	0,0164	2,9779	632
Lev	0,1763	0,1255	0,0000	0,5864	632
Liq	1,5011	0,7272	0,1458	0,9931	632
log_Size	12,8851	1,8660	8,6656	16,9785	632

Additionally, the division to two sectors by the company industry resulted 38 companies being sorted in the "Utilities" sector, and 48 companies in the "Industrial" sector. The industrial sector accounted for 56% of the companies, while utilities accounted for 44% of the sectors. The breakdown of sectors and the industries in them is presented in Table 4.

Table 4. The number and percentage of the companies in each sector and industry.

Companies by Sector and Industry

Sector	N	Percentage
Industrial	**48**	**56 %**
Basic industry	6	7 %
Industrial goods and services	28	33 %
IT & Telecommunications	14	16 %
Utility	**38**	**44 %**
Consumer goods	20	23 %
Consumer staples	8	9 %
Real estate	3	3 %
Utilities	3	3 %
Health	4	5 %
Total	**86**	**100 %**

After reviewing the descriptive statistics, the background assumptions of the logistic model are considered. While there are some assumptions, logistic models are generally less critical of assumptions in comparison to linear regression, as there are fewer method-specific assumptions that need to be satisfied (Hair 1998). Additionally, panel regressions are also less strict when it comes to these assumptions.

Next, the linearity of independent variables with the outcomes is covered. This was tested by adding quadratic terms of all continuous independent variables to the model. As Appendix 4 shows, the quadratic variables were not significant with the exception of change in earnings. After converting the variable to a lagged variable, there was no need for transformation of the other variables, confirming the linearity of the independent variables.

The specification of the model was tested through Hosmer & Lemeshow test, which showed signs of misspecification. This implies that the model misses some variables, as can be assumed. The dividend decision of a company is a complex phenomenon, and it cannot possibly be explained by only 6 variables, which should be considered when the results of the study are discussed.

Multicollinearity was tested through a correlation matrix in Appendix 3. The matrix shows minor significant correlations between some of the variables, but they are not big enough to cause perfect multicollinearity. This concludes the background assumption tests.

4.2 Hypotheses testing

Now, the results of the logistic regression models are presented. Three models are considered in this section: the fixed effects logistic model and two models separated by their sectors. Additionally, yearly dividend decisions of the companies are considered as supporting evidence to the main model. The results of the logistic regression, presented in Table 5, are analysed and compared to test the hypotheses conducted at the beginning of the thesis.

Table 5: Results of the overall logistic regression model

All companies			
Variable	**Coefficient**	**Std. Err.**	**p**
ROA	1,351	2,181	0,536
ChE	7,807	1,890	0,000***
AsTvr	0,549	0,677	0,417
Lev	-3,135	1,685	0,063
Liq	0,317	0,312	0,309
log_Size	1,469	0,474	0,002***
Pandemic	-0,477	0,230	0,038**
Obs	**Groups**	**LR chi2**	**p**
524	69	39,92	0***

Statistifically significant at 99% = *** and 95% = **

In fixed-effects models, groups with all positive or all negative outcomes are omitted from the analysis. This resulted in 524 observations from 69 firms included in the final model. The likelihood ratio of the overall model was statistically significant, with LR chi2 = 44,07 and p = 0,0000.

The first hypotheses were:

H0: The crisis had no effect on the dividend decisions of Finnish companies.

H1: The crisis had a negative effect on the dividend decisions of Finnish companies.

In the logistic regression model, the dummy variable *Pandemic* represents the years after the COVID-19 pandemic started in 2019. The variable was found to be statistically significant, with a coefficient = −0,477 and p = 0,038. This indicates that during the pandemic period, firms were more likely to omit or decrease dividends. The finding supports the hypothesis that the COVID-19 pandemic negatively impacted firms' dividend yields. According to the model, null hypothesis can be rejected and H1 approved.

However, while the pandemic seemed to affect the dividend decisions of Finnish companies, the change was subtle. In 2019, 38% of the companies omitted or decreased their dividend payments, compared to 44% in 2020 after the pandemic started. In 2021, the number of dividend omissions and decreases was the same as in 2019. While 2020 showed a peak in dividend cuts, it seems that the dividend decisions have almost recovered back to the pre-pandemic level. The dividend decisions of the 86 companies included in the study are listed in Appendix 5 and visualised in Figure 2 below.

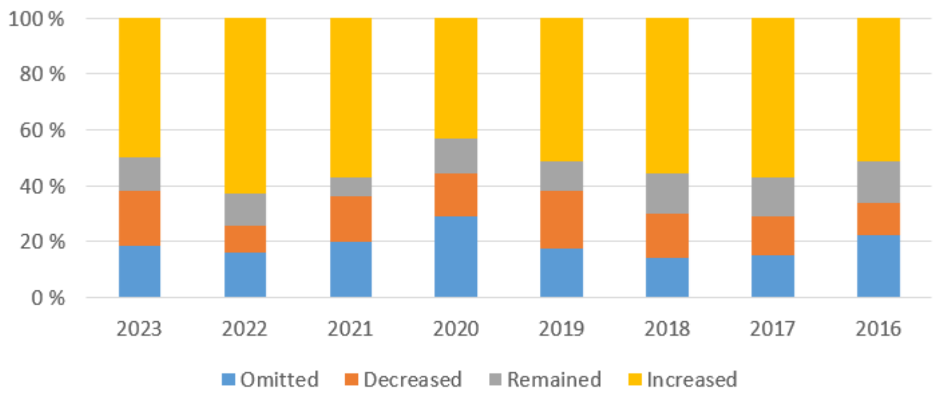


Figure 2: Yearly dividend decisions of the companies, in percentages.

The second hypotheses considered the effect of the sector a company belongs to:

H0: The impact of the crisis did not vary across different sectors.

H2: The impact of the crisis varied across different sectors.

Table 6 presents the results of the logistic regression models performed separately between the two sectors. Using the FE model resulted in the same omissions as in the overall model, leaving 39 firms in the "Industrial" sector and 30 in the "Utilities" sector. There seems to be differences on the results: on industrial sector, the model was statistically significant (p = 0,000), indicating the predictors collectively explain variations in dividend policies for this sector. The pandemic variable was negative and statistically significant (p = 0,010), demonstrating a negative effect of the crisis on dividend policies in this sector. In the industrial sector, change in earnings, leverage and firm size were also significant.

Table 6: Results of the logistic regressions, sorted by the sector of the company

Industrial

Variable	Coefficient	Std. Err.	p
ROA	1,351	2,181	0,953
ChE	7,807	1,890	0,001***
AsTvr	0,549	0,677	0,882
Lev	-3,135	1,685	0,011**
Liq	0,317	0,312	0,179
log_Size	1,469	0,474	0,001***
Pandemic	-0,477	0,230	0,010**
Obs	**Groups**	**LR chi2**	**p**
297	39	41,00	0,000***

Utility

Variable	Coefficient	Std. Err.	p
ROA	3,193	3,602	0,277
ChE	5,751	2,626	0,029**
AsTvr	1,132	1,015	0,265
Lev	-0,139	2,201	0,950
Liq	-0,018	0,390	0,962
log_Size	0,340	0,798	0,670
Pandemic	-0,057	0,334	0,862
Obs	**Groups**	**LR chi2**	**p**
227	30	9,91	0,194

Statistifically significant at 99% = *** and 95% = **

On the other hand, the model of utility sector was not statistically significant (p = 0,193), suggesting the predictors collectively do not explain variations in dividend policies for this sector. The pandemic variable was not significant (p = 0,862), indicating no measurable effect of the crisis on dividend policies within this sector. Other variables were also insignificant, with the exception of change in earnings (p = 0,029), which was positive and significant. The model supports the hypothesis that the impact of the COVID-19 pandemic varied between the sectors. Therefore, the null hypothesis is rejected and the second hypothesis approved.

The hypotheses three, four and five considered the firm-specific effects that affected the dividend decisions of the companies. The third hypotheses were the following:

H0: Profitability did not affect the likelihood of reducing or omitting dividends during the studied period.

H3: Firms with higher profitability were less likely to reduce or omit dividends during the studied period.

Profitability was measured by return on assets (ROA) and change in earnings (ChE). The first had an insignificant positive coefficient, with β = 1,4719 and p = 0,501. The latter, however, had a positive and significant coefficient of β = 7,9327 and p = 0,000. Additionally, ChE was the only significant variable in all three models. This indicates that firms with a positive change in earnings in the prior year are significantly less likely to increase or keep the dividends at the same level. While ROA did not have a significant effect according to the model, there is strong evidence that firms with higher profitability were less likely to reduce or omit dividends during the studied period. Therefore, the null hypothesis is rejected.

The fourth hypotheses were the following:

H0: Debt and liquidity did not affect the likelihood of reducing or omitting dividends during the studied period.

H4: Firms with lower debt levels and larger cash reserves were less likely to reduce dividends during the studied period.

The coefficient for leverage (Lev) is insignificant and negative ($\beta = -3{,}4993$, $p = 0{,}063$). While significant on a 90% level shows some support for the variable, this confidence level is not recognised in this study. Additionally, leverage was significant on a 95% confidence level in the "Industrial" model. While there is support to the variable, the null hypothesis cannot be rejected on this basis.

The liquidity coefficient ($\beta = 0{,}2731$, $p = 0{,}370$) is positive as expected, but not statistically significant. Liquidity is not a statistically significant in the sectoral models either. This suggests no strong evidence that firms with larger cash reserves were more likely to pay dividends during the crisis. Thus, the null hypothesis is not rejected.

H0: Firm size did not affect the likelihood of reducing or omitting dividends during the studied period.

H5: Larger firms were less likely to reduce dividends during the studied period.

The coefficient for firm size on the overall model ($\beta = 1{,}6059$, $p = 0{,}001$) is positive as expected, and statistically significant. This indicates that larger firms were indeed more likely to pay dividends overall. Additionally, firm size was significant in the "Industrial" model, with a positive coefficient of 1,469 and p-value of 0,001, adding to the robustness of the model. The findings align with the hypothesis that firm size is associated with greater stability and capacity to maintain dividends during crises. Thus, null hypothesis is rejected and hypothesis 5 is approved.

5 Discussion

Dividend policies of companies remain a vital indicator of health and a central valuation method for corporations. The results of the study indicate a statistically significant overall negative impact of the pandemic on dividends, consistent with global findings during economic crises. Sectoral analysis revealed pronounced differences, and firm-specific factors influenced dividend decisions variably.

Compared to the theories, the findings of the study are mixed. Lintner's model posits that companies aim for stable and predictable dividends, adjusting gradually to changes in earnings. A similar conclusion can be made according to signal theory, as companies avoid signaling financial incompetence (Ross 1977). This study's findings align with these theories, as while the pandemic had a negative effect on dividends, many firms preferred maintaining dividends despite reduced earnings, showing a reluctance to make drastic changes. The gradual recovery of dividend levels post-pandemic further reinforces Lintner's proposition that firms adjust dividends carefully to maintain stability.

Agency theory suggests that dividends can mitigate conflicts between managers and shareholders by reducing free cash flow available for discretionary use (Jensen & Meckling 1979). The evidence from this study aligns partially with this framework. Firms with higher leverage in the industrial sector cut dividends, which may indicate managers prioritizing debt management over shareholder distributions during a crisis, thus reflecting an internal reallocation of resources to maintain financial health and reduce agency costs.

The clientele effect (Miller & Modigliani 1961) posits that companies attract specific investor groups based on their dividend policies. The stability observed in the utility sector and the significant firm size effect may suggest that these companies aim to maintain dividend levels to retain income-focused investors. However, the increased variability in the industrial sector indicates a shift in dividend policies, potentially aligning with firms that recalibrate policies to adapt to less dividend-sensitive growth investors during crises.

As suggested by the Hosmer & Lemeshow test and some of the theories on dividends, the model could have been improved by adding more explanatory variables. Dividend policy of a company is a sum of numerous variables, and all the effects cannot be captured on one model with few variables. However, for the sake of future studies, it is crucial to discuss, how the model could have been improved. First, by considering internal financing preferences, firms' reliance on retained earnings to finance operations during crises could be better understood. This aligns with the pecking order theory, suggesting that during financial stress, firms prioritize retained earnings over external financing, influencing dividend decisions.

The model could also have been improved by including variables for investment and growth opportunities, aligning with the residual theory (Miller & Modigliani, 1961). The theory states that dividends should be paid only after all positive-NPV projects have been financed. Firms with many investment opportunities are expected to retain earnings and grow the company, and vice versa. The absence of growth variables might on its part explain the insignificance of asset turnover and liquidity, as these may only partially capture investment behaviour.

Additionally, including past dividends as an explanatory variable could have improved the model's predictive capability. Lintner’s (1956) model emphasizes the importance of previous dividends in current payout decisions. The study observed this aspect partially, as firms maintained or quickly returned to prior dividend levels. However, including past dividends as a variable could have allowed examining, how the model holds under financial distress.

6 Conclusions

In this study, a fixed-effects binomial logistic regression model was used to analyse how the COVID-19 pandemic impacted the dividend policies of Finnish public companies from 2016 to 2023. The objective was to find different sectoral and firm-specific indicators that predict if, and to what level, a company is to change is dividend policy during the period. The empirical findings of the study partly align with the previous literature and theories, indicating a varying negative effect of the pandemic on dividend payments depending on the sector and firm-specific factors. The first section of this chapter answers the research questions based on the empirical findings of this study and supported by prior literature.

This thesis establishes itself as a part of research on dividend determinants and dividend decisions during financial uncertainty, extending it to a Finnish context. It builds upon Lintner's (1956) model on dividends, and vouches for the relevance of dividends (Gordon 1963; Lintner 1962). The thesis applies some of the relevant theories on dividend research, particularly the signaling theory, agency problem and clientele effect. By applying these frameworks in the context of an understudied region, this research offers evidence that expand the understanding of dividend behaviour during crises. The research can offer new insights to investors and managers interested in dividend behaviour, explained more thoroughly in the second section.

The aim of the study was to contribute to the existing literature on the topic while providing new insights for managers and dividend-preferring investors. While the study could fulfil the objective on its part, the results of the study should be interpreted carefully. The research focuses on a small number of companies in only one country, which might make the results biased. Additionally, the limitations of the chosen model might affect the reliability of the results. These limitations are considered in the final section, in addition to suggestions of future research.

6.1 Answering the Research questions

The main objective of this thesis was to evaluate how, and to what extent, the COVID-19 pandemic affected the dividend policies of Finnish public companies. The main objective was fulfilled with the following main research question:

Q1: How has the COVID-19 pandemic affected the dividend policies of Finnish public companies?

According to the logistic regression model, COVID-19 pandemic had a statistically significant negative impact on dividend policies of Finnish public companies overall. Additionally, according to the sectoral models, the pandemic had a negative effect on companies on the "Industrial" sector, but not on "Utilities" sector. The findings are in line with prior literature on dividends during crisis periods, first on financial crisis of 2008 (Hauser 2013), and later on COVID-19 (Ali 2022; Ntantamis & Zhou 2022; Krieger et. Al. 2021). According to the empirical results, the pandemic had a similar effect on dividend decisions in Finland compared to many other studied countries.

However, while the negative effect of the pandemic was significant, it seems that the change was not as drastic as it could have been. The graph of yearly dividend decisions (Appendix 5.) showed us that while 2020 was the peak year in dividend omissions and reductions during the studied period, the amount recovered back to the pre-COVID level rather quickly. Additionally, most of the companies could either keep the same level, or even increase the dividends during the pandemic. These findings are in line with Lintner (1956) and Gordon (1963), who argue that companies want to keep the dividend payments stable, and avoid drastic changes. The findings also support the signaling theory (Ross 1977; Miller & Rock 1985), and clientele effect (Miller & Modigliani 1961) showing that firms avoid signaling financial incompetency and changing their dividend policy even during a decline in income.

Additionally, there were two supporting research questions. The second research question was:

Q2: Which firm-specific factors influenced dividend policies during the COVID-19 pandemic?

According to the model, several firm-specific factors played a significant role in shaping dividend policies during the crises. Change in earnings on the prior year was positive and significant across sectors, indicating that firms with stronger earnings growth were more likely to maintain or increase dividend payouts. Firm size was significant and positive in the overall model and industrial sector, suggesting that larger firms were better able to sustain dividends compared to smaller companies. Leverage was significant and negative in the "Industrial" sector, indicating that highly leveraged firms might have been more likely to reduce dividends. These findings show support to prior research in other regions during the pandemic (Ali 2022; Ntantamis & Zhou 2022; AlGhazali & Yilmaz 2023).

Conversely, there were also variables that showed insignificance during the study period. Return on assets, asset turnover and liquidity didn't affect the dividend decisions during the study period according to the models. This might be due to misspecification of the model, or that the variables captured too many of the effects of each other. This opposes the prior literature on the pandemic, as well as the free cash flow hypothesis of Jensen (1986).

The third research question was:

Q3: Do the effects of COVID-19 pandemic on dividend policies differ across sectors in Finland?

The effects of economic crises on dividend policies seem to differ across sectors. The industrial sector experienced a notable negative effect, with firms in this sector reducing and omitting dividends. This finding aligns with Krieger et, Al. (2021), who found that during the pandemic, "industrial firms had much greater rates of dividend omissions." In comparison, in the utilities sector, no significant effect of the crises on dividend policies was observed. The stability of demand for essential goods and services in this sector likely mitigated the impact of the crises on financial performance and dividend decisions.

While the findings seem to align with prior literature, the models don't necessarily confirm the research question. While the model with industrial firms was found statistically significant, the model with utilities was not. Additionally, many of the firm-specific variables that were found to be significant in the original model were insignificant in the sectoral model. In short, there is evidence that the effects of the pandemic differed across the sectors, but confirming the statement needs complementing and more thorough research.

6.2 Practical implications

The results of this thesis are the most useful to two groups: income-preferring investors and corporate managers. For investors, the findings suggest focusing on larger, well-established firms with stable earnings, particularly in resilient sectors like utilities. Firms in utilities sectors, which showed less significant dividend changes, may offer greater dividend stability during economic downturns. Industrial sectors, in contrast, were more affected, making them riskier for income-focused investments. Key firm-specific factors like changes in equity were strongly associated with dividend policy changes. Investors should prioritize firms with strong cash flow management and profitability metrics when seeking dividend-paying stocks. Additionally, larger firms exhibited more stable dividend payments. Income-preferring investors looking for lower risk during crises may benefit from focusing on well-established, larger firms.

On the other end, managers should consider the importance of stable dividends for investor confidence, especially during crises. Effective cash flow management and debt reduction strategies can help maintain or recover dividend policies. For firms in the industrial sector, it is crucial to implement measures that mitigate the financial strain during crises, such as diversifying revenue streams or building liquidity reserves. In times of crisis, managers should communicate clearly about dividend decisions, linking them to broader financial strategies and market conditions. This can help maintain investor trust and support.

6.3 Limitations and further research

While the study provides insights to the dividend decisions of Finnish companies after the start of the pandemic, it faces challenges and limitations due to its methods, available data and sample size. The first limitation arises from the sample. The study is limited to Finland, focusing on a single country with a sample size of only 86 firms, reduced to only 69 firms in the final model. The availability of the company data was also a big challenge, which lead to mostly older, more established companies being chosen to the study. This reduces the generalizability of the findings to other countries and smaller companies.

Secondly, due to the small sample size, the study could not fully explore industry-specific effects. For example, in the final sample of 86 companies, only four were in the healthcare industry and three in the industry of real estate. Due to this, firms were grouped into two broad sectors. While the company-specific and sector-specific factors were considered, this approach potentially led to oversimplifying the nuanced impacts across different industries.

The third potential limitation arises from the chosen method of the study. While logistic regression was essential in differentiating the omitting/reducing the dividend payment from remaining/increasing the dividend, the approach does not really consider the amount of increase or decrease. Additionally, the logistic regression could be conducted with a multinomial model to better understand the difference between all four outcomes.

Future studies could examine dividend policy responses in other Nordic countries, larger European economies, or the U.S. in comparison to Finnish companies, to provide broader insights and comparative analyses of crisis impacts. The comparison could also be made between the Nasdaq list and the First North list, to understand how growing companies answer to uncertainty in comparison to more established companies.

Additionally, future research could focus on how firms that omitted or reduced dividends during the pandemic recovered, comparing recovery times and strategies across industries. In the future, investigating the effect of the Russian-Ukrainian war on Finnish firms' dividend policies compared to other European economies would provide insights into how geopolitical events influence financial decisions.

References

Ain, Q.U. & Manping, T. 2022. Determinants of Dividend Policy of Non-Financial Publicly Traded Firms: A Review. Journal of Advanced Research in Economics and Administrative Sciences, 3, 2, pp. 95–112. URL: https://doi.org/10.47631/jareas.v3i2.482.

AlGhazali, A.M. & Yilmaz, I. 2023. How COVID-19 Affected Corporate Dividend Decisions: Novel Evidence from Emerging Countries. Financial Internet Quarterly, 19, 4, pp. 25–48. URL: https://doi.org/10.2478/fiqf-2023-0025.

Ali, H. 2022. Corporate dividend policy in the time of COVID-19: Evidence from the G-12 countries. Finance Research Letters, 46, pp. 102493. URL: https://doi.org/10.1016/j.frl.2021.102493.

Ali, M.S. 2020. Evaluating the Effectiveness of the Bird-in-Hand-Dividends Policy in the Stability of Jordanian Listed Banks. International Journal of Financial Research, 11, 4, pp. 96–110.

Baker, H.K., Veit, E.T. & Powell, G.E. 2001. Factors Influencing Dividend Policy Decisions of Nasdaq Firms. Financial Review, 36, 3, pp. 19–38. URL: https://doi.org/10.1111/j.1540-6288.2001.tb00018.x.

Benartzi, S., Michaely, R. & Thaler, R. 1997. Do Changes in Dividends Signal the Future or the Past? The Journal of Finance, 52, 3, pp. 1007–1034. URL: https://doi.org/10.2307/2329514.

Benlemlih, M. 2019. Corporate social responsibility and dividend policy. Research in International Business and Finance, 47, pp. 114–138. URL: https://doi.org/10.1016/j.ribaf.2018.07.005.

Black, F. 1996. The dividend puzzle. Journal of Portfolio Management, pp. 8–12.

Brawn, D.A. & Šević, A. 2018. “Firm size matters: Industry sector, firm age and volatility do too in determining which publicly-listed US firms pay a dividend”. International Review of Financial Analysis, 58, pp. 132–152. URL: https://doi.org/10.1016/j.irfa.2018.05.002.

Comparing Dividend Yields Across Countries | TopForeignStocks.com 2015. URL: https://topforeignstocks.com/2015/11/24/comparing-dividend-yields-across-countries/. Accessed: 30 October 2024.

Dasilas, A. & Leventis, S. 2011. Stock market reaction to dividend announcements: Evidence from the Greek stock market. International Review of Economics & Finance, 20, 2, pp. 302–311.

DeAngelo, H. & DeAngelo, L. 1990. Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms. The Journal of Finance, 45, 5, pp. 1415–1431. URL: https://doi.org/10.2307/2328743.

DeAngelo, H., DeAngelo, L. & Stulz, R.M. 2006. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. Journal of Financial Economics, 81, 2, pp. 227–254. URL: https://doi.org/10.1016/j.jfineco.2005.07.005.

Denis, D.J. & Osobov, I. 2008. Why do firms pay dividends? International evidence on the determinants of dividend policy. Journal of Financial Economics, 89, 1, pp. 62–82. URL: https://doi.org/10.1016/j.jfineco.2007.06.006.

Fabozzi, F.J., Focardi, S.M. & Jonas, C. 2017. Equity Valuation: Science, Art, or Craft? CFA Institute Research Foundation.

Fama, E.F. & Babiak, H. 1968. Dividend Policy: An Empirical Analysis. Journal of the American Statistical Association, 63, 324, pp. 1132–1161. URL: https://doi.org/10.2307/2285874.

Gordon, M.J. 1963. Optimal Investment and Financing Policy. The Journal of Finance, 18, 2, pp. 264–272. URL: https://doi.org/10.2307/2977907.

Gugler, K. & Yurtoglu, B.B. 2003. Corporate governance and dividend pay-out policy in Germany. European Economic Review, 47, 4, pp. 731–758. URL: https://doi.org/10.1016/S0014-2921(02)00291-X.

Gupta, S., Dogra, B., Vashisht, A.K. & Ghai, S. 2012. Stock Price Reaction to Dividend Announcements. International journal of financial management, 2, 2. URL: https://www.academia.edu/download/54106933/4.pdf. Accessed: 29 October 2024.

Hair, J.F. 1998. Multivariate data analysis. Prentice Hall. Upper Saddle River (NJ).

Hauser, R. 2013. Did dividend policy change during the financial crisis? Managerial Finance, 39, 6, pp. 584–606. URL: https://doi.org/10.1108/03074351311322861.

Hill, R.C. 2018. Principles of econometrics. John Wiley & Sons. Hoboken, N.J.

Jensen, M.C. 1986. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. The American Economic Review, 76, 2, pp. 323–329.

Jensen, M.C. & Meckling, W.H. 1979. Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure. Springer Netherlands. Dordrecht. URL: https://doi.org/10.1007/978-94-009-9257-3_8. Accessed: 29 October 2024.

John, K. & Williams, J. 1985. Dividends, Dilution, and Taxes: A Signalling Equilibrium. The Journal of Finance, 40, 4, pp. 1053–1070. URL: https://doi.org/10.1111/j.1540-6261.1985.tb02363.x.

Kasanen, E., Kinnunen, J. & Niskanen, J. 1996. Dividend-based earnings management: Empirical evidence from Finland. Journal of Accounting and Economics, 22, 1, pp. 283–312. URL: https://doi.org/10.1016/S0165-4101(96)00435-1.

Kauppalehti 2024a. Tässä ovat loppusyksyn muhkeimmat osingot – Jukka Oksaharju kertoo, mitä rahoilla kannattaa tehdä | Kauppalehti. URL: https://www.kauppalehti.fi/uutiset/tassa-ovat-loppusyksyn-muhkeimmat-osingot-jukka-oksaharju-kertoo-mita-rahoilla-kannattaa-tehda/a233f350-afaa-43ad-bbf5-105f02493349. Accessed: 29 October 2024.

Kauppalehti 2024b. Osinkohistoria | Pörssi | Kauppalehti. URL: https://www.kauppalehti.fi. Accessed: 21 November 2024.

Khan, M.N. & Shamim, M. 2017. A Sectoral Analysis of Dividend Payment Behavior: Evidence From Karachi Stock Exchange. Sage Open, 7, 1, pp. 2158244016682291. URL: https://doi.org/10.1177/2158244016682291.

Kinkki, S. 2008. Minority Protection and Dividend Policy in Finland. European Financial Management, 14, 3, pp. 470–502. URL: https://doi.org/10.1111/j.1468-036X.2007.00408.x.

Kowerski, M. & Haniewska, L. 2022. The Miller–Modigliani dividend irrelevance theory as a warning for investors looking for quick profits from investments in companies paying dividends. Financial Internet Quarterly, 18, 4, pp. 77–88. URL: https://doi.org/10.2478/fiqf-2022-0029.

Krieger, K., Mauck, N. & Pruitt, S.W. 2021. The impact of the COVID-19 pandemic on dividends. Finance Research Letters, 42, pp. 101910. URL: https://doi.org/10.1016/j.frl.2020.101910.

Lindén, A., Lehner, O.M., Losbichler, H. & Martikainen, M. 2023. Dividend payout decisions under uncertainty: the ownership influence in the early days of the COVID-19 pandemic in Finland. Journal of Applied Accounting Research, 24, 2, pp. 299–317. URL: https://doi.org/10.1108/JAAR-10-2021-0274.

Lintner, J. 1956. Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. The American Economic Review, 46, 2, pp. 97–113.

Lintner, J. 1962. Dividends, earnings, leverage, stock prices and the supply of capital to corporations. The review of Economics and Statistics, pp. 243–269.

Magni, C. 2007. Relevance or Irrelevance of Retention for Dividend Policy Irrelevance. Monetary Economics. URL: https://www.semanticscholar.org/paper/Relevance-or-Irrelevance-of-Retention-for-Dividend-Magni/f57227c31d049229199c560b0f4540b186b58085. Accessed: 14 October 2024.

Maury, C.B. & Pajuste, A. 2002. Controlling shareholders, agency problems, and dividend policy in Finland. LTA, 1, 2, pp. 15–45.

Miller, M.H. & Modigliani, F. 1961. Dividend Policy, Growth, and the Valuation of Shares. The Journal of Business, 34, 4, pp. 411–433.

Miller, M.H. & Rock, K. 1985. Dividend Policy under Asymmetric Information. The Journal of Finance, 40, 4, pp. 1031–1051. URL: https://doi.org/10.1111/j.1540-6261.1985.tb02362.x.

Myers, S.C. & Majluf, N.S. 1984. Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13, 2, pp. 187–221. URL: https://doi.org/10.1016/0304-405X(84)90023-0.

Ntantamis, C. & Zhou, J. 2022. Corporate payout, cash holdings, and the COVID-19 crisis: Evidence from the G-7 countries. Finance Research Letters, 50, pp. 103275.

Pinto, G. & Rastogi, S. 2019. Sectoral Analysis of Factors Influencing Dividend Policy: Case of an Emerging Financial Market. Journal of Risk and Financial Management, 12, 3, pp. 110. URL: https://doi.org/10.3390/jrfm12030110.

Ross, S.A. 1977. The Determination of Financial Structure: The Incentive-Signalling Approach. The Bell Journal of Economics, 8, 1, pp. 23–40. URL: https://doi.org/10.2307/3003485.

Spence, M. 1973. Job Market Signaling. The Quarterly Journal of Economics, 87, 3, pp. 355–374. URL: https://doi.org/10.2307/1882010.

Tilastokeskus 2023. Tilastokeskus. Tilastokeskus. URL: https://stat.fi/tup/suoluk/suoluk_kansantalous.html. Accessed: 30 October 2024.

Zhao, Z., Ni, J. & Ren, G. 2023. An Empirical Study on the Impact of P/E Ratio on Dividend Policy Based on Gordon Model Assumptions. URL: https://doi.org/10.2139/ssrn.4442137. Accessed: 28 October 2024.

Appendices

Appendix 1. The results of the Hausman test.

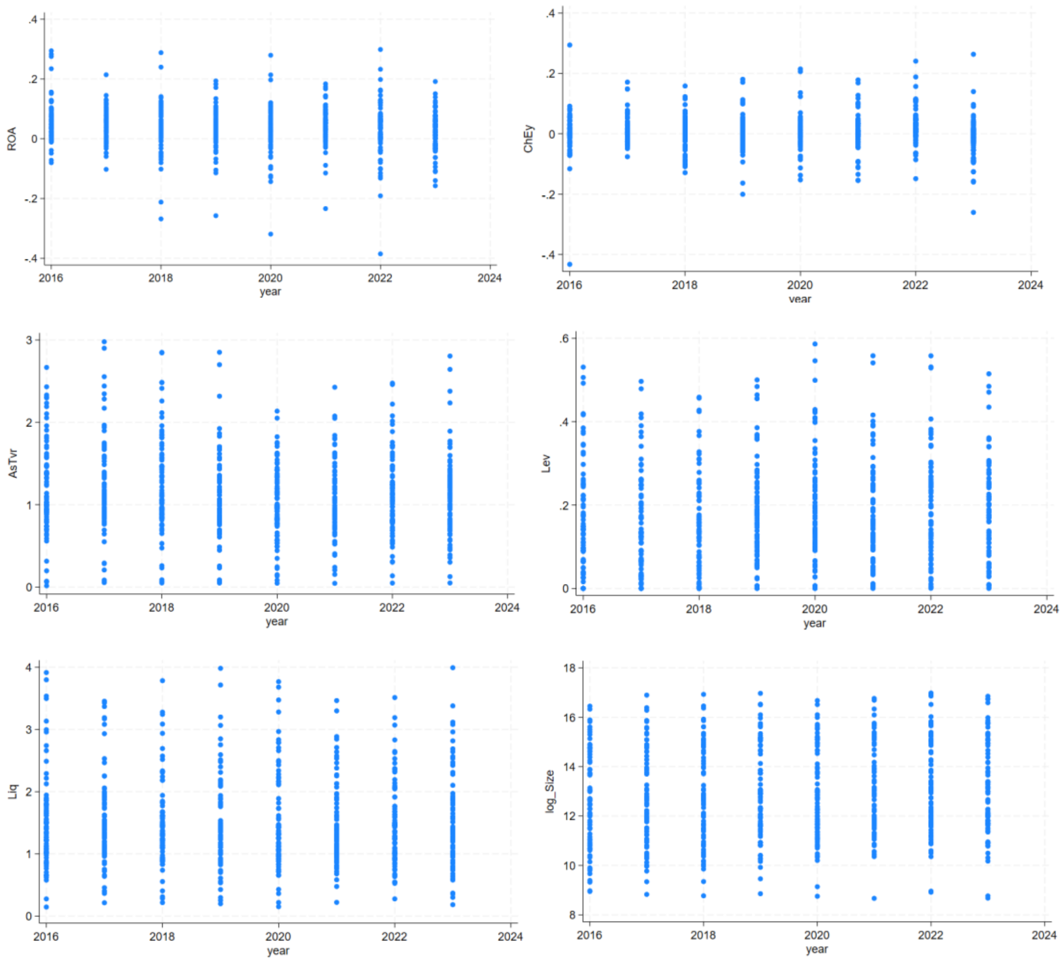
	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
ROA	1.471858	7.564176	-6.092317	1.101635
ChEy	7.932668	7.222993	.7096746	.4668026
AsTvr	.6495172	.3475395	.3019777	.6316277
Lev	-3.499319	-.687722	-2.811597	1.39601
Liq	.2730812	-.0277708	.300852	.2567806
log_Size	1.605959	.3248135	1.281145	.4596634
1.pandemic	-.4839893	-.1621498	-.3218395	.1091453

```
                          b = Consistent under H0 and Ha; obtained from xtlogit.
           B = Inconsistent under Ha, efficient under H0; obtained from xtlogit.

Test of H0: Difference in coefficients not systematic

    chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =  42.61
Prob > chi2 = 0.0000
```

Appendix 2. The scatterplots of the dependent variables against the year.



Appendix 3. Correlation matrix of the dependent variables.

Variable	ROA	ChE	AsTvr	Lev	Liq	log_Size
ROA	1,000					
ChE	0,2569 (0,0000***)	1,000				
AsTvr	0,0305 (0,4437)	0,0500 (0,2168)	1,000			
Lev	-0,179 (0,0000***)	-0,0435 (0,2825)	-0,2506 (0,0000***)	1,000		
Liq	0,2657 (0,0000***)	0,0607 (0,1337)	-0,0735 0,0648)	-0,1845 (0,0000***)	1,000	
log_Size	0,1064 (0,0074**)	0,0132 (0,7437)	-0,3155 (0,0000***)	0,1537 (0,0001***)	-0,0660 (0,0973)	1,000

Statistifically significant at 99%=*** and 95%=**

Appendix 4. The quadratic dependent variables and their significances.

```
Logistic regression                                     Number of obs =    632
                                                        LR chi2(12)   = 165.82
                                                        Prob > chi2   = 0.0000
Log likelihood = -319.59895                             Pseudo R2     = 0.2060
```

DivD	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
ROA	18.82729	2.470369	7.62	0.000	13.98545	23.66912
ROAsq	-4.192742	16.43839	-0.26	0.799	-36.41139	28.02591
ChE	-14.57212	2.338729	-6.23	0.000	-19.15594	-9.988293
ChEsq	-46.21135	17.93311	-2.58	0.010	-81.35959	-11.06311
AsTvr	1.182053	.6281458	1.88	0.060	-.0490904	2.413196
AsTvrsq	-.3168652	.2204282	-1.44	0.151	-.7488964	.1151661
Lev	2.648369	2.414786	1.10	0.273	-2.084524	7.381262
Levsq	-5.118612	5.198421	-0.98	0.325	-15.30733	5.070107
Liq	-.5238857	.5706188	-0.92	0.359	-1.642278	.5945065
Liqsq	.1365323	.1545489	0.88	0.377	-.1663781	.4394426
Size	1.76e-07	8.26e-08	2.13	0.034	1.37e-08	3.37e-07
Sizesq	-3.34e-15	4.64e-15	-0.72	0.471	-1.24e-14	5.75e-15
1.pandemic	-.0499017	.1986478	-0.25	0.802	-.4392443	.3394408
_cons	-.5784082	.5866982	-0.99	0.324	-1.728316	.5714991

Appendix 5. The yearly dividend decisions of the companies overall and by sector.

Overall

Year	Omitted	Decreased	Remained	Increased
2023	16 (19%)	17 (20%)	10 (12%)	43 (50%)
2022	14 (16%)	8 (9%)	10 (12%)	54 (63%)
2021	17 (20%)	14 (16%)	6 (7%)	49 (57%)
2020	25 (29%)	13 (15%)	11 (13%)	37 (43%)
2019	15 (17%)	18 (21%)	9 (10%)	44 (51%)
2018	12 (14%)	14 (16%)	12 (14%)	48 (56%)
2017	13 (15%)	12 (14%)	12 (14%)	49 (57%)
2016	19 (22%)	10 (12%)	13 (15%)	44 (51%)

Utility

Year	Omitted	Decreased	Remained	Increased
2023	5 (13%)	12 (32%)	5 (13%)	16 (42%)
2022	5 (13%)	5 (13%)	5 (13%)	23 (61%)
2021	7 (18%)	7 (18%)	2 (5%)	22 (58%)
2020	10 (26%)	5 (13%)	5 (13%)	18 (47%)
2019	4 (11%)	10 (26%)	5 (13%)	19 (50%)
2018	4 (11%)	9 (24%)	6 (16%)	19 (50%)
2017	5 (13%)	8 (21%)	2 (5%)	23 (61%)
2016	8 (21%)	5 (13%)	9 (24%)	16 (42%)

Industrial

Year	Omitted	Decreased	Remained	Increased
2023	11 (23%)	5 (10%)	5 (10%)	27 (56%)
2022	9 (19%)	3 (6%)	5 (10%)	31 (65%)
2021	10 (21%)	7 (15%)	4 (8%)	27 (56%)
2020	15 (31%)	8 (17%)	6 (13%)	19 (40%)
2019	11 (23%)	8 (17%)	4 (8%)	25 (52%)
2018	8 (17%)	5 (10%)	6 (13%)	29 (60%)
2017	8 (17%)	4 (8%)	10 (21%)	26 (54%)
2016	11 (23%)	5 (10%)	4 (8%)	28 (58%)