Governance in the Treasury: The Impact of Corporate Governance on Cash Holdings in the Eurozone

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Abstract

The objective of this master thesis is to investigate the relationship between corporate governance and cash holdings in Eurozone companies with a timespan from 2014 to 2022. Using regression analysis, this research included firm-specific control variables, including firm size, leverage, market to book ratio, and cash flow to sales, along with time and industry fixed effects. The goal is to research on the impact of governance structures on cash management strategies. In the first regressions, there were a significant relationship between cash holdings and corporate governance. However, when time fixed effects were introduced, the governance score lost its explanatory power on cash holdings. Robustness checks such as introducing firm fixed effects and country fixed effects, dividing the sample before and post pandemic, changing the way dependent variables are computed and adding interaction terms and lagged variables all had the same results, governance was not statistically significant to explain changes in cash holdings. The conclusion of this thesis is that the governance score does not explain changes in cash holdings, except after the Covid-19, where it was found that after this period governance had a negative effect in explaining cash holdings.

Keywords: governance, cash holdings, Eurozone

Governação na Tesouraria: O Impacto na Governação Empresarial nas Reservas de Dinheiro na Zona Euro

Mariana Sardinha

Resumo

O objetivo desta tese de mestrado é investigar a relação entre o governo das sociedades e as reservas de dinheiro nas empresas da Zona Euro no período de 2014 a 2022. Ao utilizar a análise de regressões, esta pesquisa incluiu variáveis de controlo específicas da empresa, incluindo a dimensão da empresa, a alavancagem, o rácio entre o valor de mercado e o valor contabilístico e o fluxo de caixa em relação às vendas, em conjunto com efeitos fixos temporais e setoriais. O objetivo é investigar o impacto das estruturas de governação nas estratégias de gestão da tesouraria. Nas primeiras regressões, verificou-se uma relação significativa entre as reservas de dinheiro e o governo das sociedades. No entanto, quando foram introduzidos os efeitos fixos temporais, a governação perdeu o seu poder explicativo sobre as reservas de dinheiro. As verificações de robustez, tais como a introdução de efeitos fixos de empresa e de país, a divisão da amostra entre antes e depois da pandemia, a alteração da forma como as variáveis dependentes são calculadas e a adição de termos de interação e variáveis desfasadas, tiveram todas os mesmos resultados: a governação não foi estatisticamente significativa para explicar alterações nas disponibilidades de caixa. A conclusão desta tese é que o índice de governação não explica as alterações nas disponibilidades de tesouraria, exceto após a Covid-19, em que se verificou que, após este período, a governação teve um efeito negativo na explicação das disponibilidades de tesouraria.

Palavras-chave: governação, reservas de dinheiro, Zona Euro

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1. Introduction

In a world that is always changing and where we have much more information but also many more threats and impactful events, such as a pandemic, wars and inflation, the way that a company is managed is much more difficult and has many more aspects to consider, especially the finances of the company. In corporate finance, the management of cash holdings is a very important factor that influences the firm value, financial stability, investment decisions, and in the end, the wealth of its investors. The way cash is utilized is a constant concern for researchers and practitioners, especially in an environment such as the one we are living in, with economic uncertainties and changing business conditions. In these circumstances, a firm's governance structure plays an important role in cash management decisions.

The use and collection of cash holdings reflects a trade-off between the need for cash and the opportunity costs of having cash sitting in the accounts instead of being used to invest. The previous literature has already researched the determinants of cash holdings, such as economic conditions and firm-specific characteristics (Opler *et al*, 1999; Bates, Kahle, & Stulz, 2009). Nevertheless, the part of firm governance, which evaluates the firm's management, is a very important factor to consider when searching for the determinants of cash holdings.

The current global challenges, especially the ones caused by the Covid-19 pandemic and rising inflation, introduced new difficulties to firms in the Eurozone. As firms deal with these economic uncertainties, the relationship between cash holdings and corporate governance becomes vital. The Eurozone, as a monetary union, presents a different context to evaluate the role of governance mechanisms in shaping the financial strategies in different regulatory environments and economic conditions at the same time all of them sharing the same currency. For example, according to the economic bulletin for the fourth quarter of 2022, released by the European Central Bank, non-financial companies decreased the growth rate of financing, by deceleration in financing by loans and other credit mechanisms (European Central Bank, 2023)

Corporate governance can be considered as a practical tool to guide the firms during changing times by including the way that firms are directed and controlled. This can a have a large impact in the Eurozone, where companies have different levels of economic integration and governance practices (Claessens, 2006). The existing literature recognizes the role of

governance in influencing agency conflicts and taking into consideration stakeholder interests (Schleifer & Vishny, 1997).

This master's thesis has the purpose of understanding the relationship between cash holdings and governance structures with companies. The premise of this thesis is that governance may influence the processes associated to cash management.

This thesis is organized in the following way. Section 2 provides an overview on the literature regarding cash holdings and governance. Section 3 describes the methodology and data used. Section 4 presents the results. Section 5 presents the robustness tests performed and discusses all the results and presents the limitations. Section 6 presents the conclusion.

2. Literature review

In a perfect capital markets world, it is irrelevant how much cash a firm holds (Modigliani-Miller, 1958). In this setting, a firm can raise funds instantly at a fair rate, so it is never short of funds. In a similar fashion, the firm can invest these funds at the same just rate to get a NPV of zero.

However, in the real world, that is not the case. We have many imperfections that do not allow for these ideal circumstances. Liquidity has a cost since holding cash can have a below-market return and a company can have transaction costs if it needs liquidity in a short period of time.

Nevertheless, we observe big firms having large cash holdings. Particularly, in 2003, large public US firms had cash and cash equivalents representing more than 13% of their assets (Dittmar and Mahrt-Smith, 2007). Therefore, this is a relevant topic to study. In this case, what influences firms to hold so much cash having into account the costs of these assets?

Not so long ago, researchers paid sparse notice to the causes of corporate cash holdings. They used to think transaction costs were the largest determinants of cash in firms and the ones which had a higher marginal cost of cash shortfalls were regarded as likely to have more liquidity (Miller and Orr, 1966; Meltzer, 1993; Mulligan, 1997).

Opler *et al*. (1999) increased the grounds on the determinants of corporate cash holdings. They consider two causes for cash holdings: the tradeoff theory and the financing hierarchy theory.

The tradeoff theory proposes firms choose between the benefits and costs to achieve optimal cash levels. In these circumstances, they consider asymmetric information and agency costs of external financing in addition to the transaction costs as determinants in the requirements of cash holdings.

The financing hierarchy theory proposes that there is not an optimal amount of cash holdings, according to arguments resembling the pecking order theory of capital structure. According to this theory, as the firm becomes more profitable and does not want more external debt, cash holdings will increase, and debt will decrease.

In their research, Opler *et al*. (1999) found considerable support for the tradeoff theory. According to them, companies have more liquidity when they are smaller, have more R&D and investment expenditures, better growth opportunities, riskier cash flows and lower net working capital. These are attributes that increase the costs of raising funds and cash shortfalls.

Other important aspects in this model are asymmetric information and transaction costs. Nevertheless, in their research, there is not enough evidence to imply the importance of agency costs of allowing top managers freedom of decision-making. Consonant to this result, Mikkelson and Partch (2003) do not find any variation between ownership structures of companies which regularly have more cash holdings and those with normal cash holdings. In contrast, Harford (1999) finds that agency costs weight when managers choose how to deploy the built-up cash in the context of firm acquisitions.

Agency costs and ownership structures are metrics considered to evaluate the governance of a firm. Governance is defined as the way the companies interact with all the stakeholders. Before, governance only included shareholder rights as a factor to evaluate it. Nowadays it also includes the metrics considered above and many others. The disputes between shareholders and managers such as the distribution of the companies' funds are related to the governance of the firm (Jensen, 1986). This issue must be directed to any debate about governance, more specifically to the mechanisms to control managers (Harford, Mansi, and Maxwell, 2008).

The free cash flow hypothesis, developed by Jensen (1986) and Stulz (1990), forecasts that managers' access to cash will be limited by shareholders to decrease agency conflicts over cash distribution. The most important takeaway of these papers is that managers should have enough funds to invest in all the good enterprises but not have excess funds that would allow them to put money in investments that do not benefit the shareholders. Without control, it is almost impossible to persuade managers to pay dividends to the shareholders and the governance of the firm will be affected.

Harford, Mansi, and Maxwell (2008) test three hypotheses to relate the governance of agency conflicts and the management of the firm liquid resources:

- Flexibility hypothesis, where self-interested managers prefer the versatility and independence from capital market discipline (Easterbrook, 1984; Jensen, 1986).
- Spending hypothesis, where self-interested managers will prefer to expand the firm and will use the excess cash flow (Jensen and Meckling, 1976).
- Shareholder power hypothesis, where shareholders who effectively control the managers will let them save excess cash to avoid underinvestment due to possible expensive external funds.

In their research, their results meet the spending hypothesis which means that for a group of firms with high levels of cash holdings, everything else constant, the firms with worse governance will spend the cash holdings faster than the firms with better governance.

Previous research is mainly about the relation between cash holdings and governance, especially shareholders rights, another governance metric, at an international level. According to this cross-country research, better shareholder rights are related to lower cash holdings (Dittmar, Mahrt-Smith, and Servaes, 2003; Lins and Kalcheva, 2004). These results propose that managers are forced by the shareholders to give them money back when they have the power to do so.

In conclusion, by using agency costs, ownership structures and shareholders rights as governance metrics, it is possible to evaluate the relation between governance and corporate cash holdings (Harford, Mansi, and Maxwell, 2008).

The data used will be from the Eurozone. An aspect which is interesting to the research is that in Europe there is also another kind of agency costs besides the conflicts between shareholders and managers. In the US, major shareholders can have a positive influence in the monitoring of the firm and benefit all the shareholders, but their role in Europe is ambiguous. They can decrease the agency costs between them and the management, but they can also exploit the minority shareholders. This would be difficult to happen in the US, where all shareholders' rights are well-protected. However, in most European countries this protection is limited or even non-existent (La Porta *et al,* 1998).

3. Methodology

3.1. The Cash Holdings Variable

To address the research question, it is necessary to define the cash holdings variable. Since the objective of this thesis is to understand how governance affects the percentage of cash in a firm's assets, I define the cash holdings variable as the ratio of cash & cash equivalents to net assets, where net assets are calculated as assets less cash & cash equivalents. Similarly, to Opler *et al*. (1999), I use net assets since the profitability of the company is related to its assets and cash should be quantified to this base.

3.2. The Governance Variable

The main independent variable of this research is governance. Governance refers to how a company is managed and the structures in place in order to have transparency and good management practices (Conmy, 2023). According to Refinitiv Eikon database, governance is measured in a scale from 0 to 100 and it is computed by evaluating its Corporate Social Responsibility Strategy, Management and Shareholders. They evaluate the CSR Strategy by giving points to the CSR Strategy and ESG reporting and transparency. Management is evaluated through the Structure (independence, diversity, and committees) and Compensation items. Shareholders are evaluated taking into account Shareholder Rights and Takeover defenses. Some examples are board composition, independence of directors and shareholder rights. A higher score can mean that the management and shareholders cooperate with each other, the shareholder rights are well protected and there are internal controls in place.

3.3. Control Variables

The remaining variables are firm-specific controls. These variables are firm size, leverage, market to book and cash flow to total assets and were chosen from Harford, Mansi, and Maxwell (2008). Firm size, a proxy for takeover deterrent, is computed as the natural log of total assets, leverage is measured as the ratio of total debt to assets. The market to book ratio is defined as the market value of ordinary equity divided by the balance sheet value of ordinary equity in the company. The cash flow to sales is computed as the ratio of cash flow to sales.

Following the definition of the dependent variable, cash holdings, and the explanatory variables, the next step is to build a robust regression model to investigate the relationship between cash holdings, governance, and the control variables with emphasis on reliability. A robust regression will be used to mitigate the potential impact of heteroskedasticity. The data was winsorized at 10%. Year and industry fixed effects will be used to control for industry or year specific factors that could impact the analysis. The inclusion of these effects will be able to help understanding the actual effects of the variables chosen. The estimation is described by the following equation:

$$
\begin{aligned}
Cash\ Holdings_{it} &= \beta_0 + \beta_1 Governance_{ijt} + \beta_2 Firm\ size_{ijt} \\
&+ \beta_3 Leverage_{ijt} + \beta_4 Market\ to\ book_{ijt} + \beta_5 Cash\ flow\ to\ sales_{ijt} + \varepsilon_{ijt} \\
&+ \delta_t + \varphi_j
\end{aligned}
$$

3.4. Data

The data used for this thesis is annual data from 2014 to 2022 and it was downloaded from Refinitiv Eikon Datastream. I collected data from public companies from the Eurozone. This zone was fixed since all the companies share the same currency, so in theory, they face a homogeneous economic environment regarding monetary policy. The countries used were Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Netherlands, Slovenia, and Spain because there was not data available for the other countries in the Eurozone. These nations represent a sample of the Eurozone. In the end, 805 companies and 24 industries were considered which offers a wide selection of corporate entities in the Eurozone. All companies were considered except from the financial services sector, such as investment funds, banks, and insurance companies. This criterion was used to maintain a focus on non-financial corporations and allowing at the same time for more targeted research on the

determinants of cash holdings. Companies were classified according to the Thomson Reuters Business Classification (TRBC), the Refinitiv industry classification system, according to the four-digit business sector categorization. This industry approach allows us to explore potential variations in the cash holdings in different industries.

3.5. Descriptive Statistics

Considering all the observations in the database, descriptive statistics were computed as in Table 1.

Table 1 – Descriptive statistics with all the observations

Cash holdings is computed as cash and cash equivalents to net assets and is a ratio from 0 to 1. Governance is a score from 0 to 100. Firm size is log of natural assets, leverage is the ratio between total debt and total assets. Market to book is the ratio between market equity and book value equity and cash flow to sales is the ratio between cash flow and sales. This data is from 2014 to 2022 for Eurozone companies, with 24 industries and 805 companies.

	N	Mean	p25	Median	p75	SD	Min	Max
cash holdings	4440	.153	0.050	.098	.181	.277	0	9.319
governance	4440	53.623	36.470	54.755	71.485	22.164	.87	98.58
firm size	4440	15.058	13.843	15.05	16.23	1.778	9.142	20.129
leverage	4440	.283	0.158	.271	.387	.172	0	1.503
market to book	4440	1.664	1.140	1.89	3.24	63.19	-4196.14	82.91
cashflow sales	4440	4.715	6.180	11.345	18.105	123	-3594.29	301.15

Given these extreme values for the cash holdings ratio, market to book ratio and cash flow to sales ratio, these variables were first winsorized at 5% as in Table 2. However, there were still some outliers. Taking into account the potential impact of extreme values on the robustness and reliability of the analysis, the cash holdings ratio, market to book ratio and cash flow to sales were winsorized at 10% in order to take out outliers, which were affecting the statistical analysis. To describe the final data in the sample, descriptive statistics were computed as in the Table 3.

Table 2 – Descriptive statistics winsorized at 5%

Cash holdings is computed as cash and cash equivalents to net assets and is a ratio from 0 to 1. Governance is a score from 0 to 100. Firm size is log of natural assets, leverage is the ratio between total debt and total assets. Market to book is the ratio between market equity and book

value equity and cash flow to sales is the ratio between cash flow and sales. Cash holdings, market to book and cash flow to sales were winsorized at 5%. This data is from 2014 to 2022 for Eurozone companies, with 24 industries and 805 companies.

	N	Mean	p25	Median	p75	SD	Min	Max
cash holdings	4440	.134	0.050	.098	.181	.114	.012	.441
governance	4440	53.623	36.470	54.755	71.485	22.164	.87	98.58
firm size	4440	15.058	13.843	15.05	16.23	1.778	9.142	20.129
leverage	4440	.283	0.158	.271	.387	.172	0	1.503
market to book	4440	2.529	1.140	1.89	3.24	1.926	.505	7.725
cashflow sales	4440	13.317	6.180	11.345	18.105	10.322	-2.64	38.04

Table 3 – Descriptive statistics winsorized at 10%

Cash holdings is computed as cash and cash equivalents to net assets and is a ratio from 0 to 1. Governance is a score from 0 to 100. Firm size is log of natural assets, leverage is the ratio between total debt and total assets. Market to book is the ratio between market equity and book value equity and cash flow to sales is the ratio between cash flow and sales. Cash holdings, market to book and cash flow to sales were winsorized at 10%. This data is from 2014 to 2022 for Eurozone companies, with 24 industries and 805 companies.

	N	Mean	p25	Median	p75	SD	Min	Max
cash holdings	4440	.126	0.050	.098	.181	.093	.022	.311
governance	4440	53.623	36.470	54.755	71.485	22.164	.87	98.58
firm size	4440	15.058	13.843	15.05	16.23	1.778	9.142	20.129
leverage	4440	.283	0.158	.271	.387	.172	0	1.503
market to book	4440	2.384	1.140	1.89	3.24	1.532	.73	5.52
cashflow sales	4440	13.03	6.180	11.345	18.105	8.559	2.15	29.43

The table above provides statistics for the sample, and it includes the number of observations, the mean, 25th percentile and 75th percentile, the median, the standard deviation, the minimum and the maximum. The dependent variable, cash holdings, has a mean of 12.6% and a standard deviation of 9.3%. Since the number of observations for country and year are not the same, a distribution table by country and by year was computed in order to assess the share of observations by country and by year.

Table 4 – Distribution by country

This table presents the distribution of observations according to the country where the firms are located in the Eurozone.

country	Freq.	Percent	Cum.
Austria	159	3.58	3.58
Belgium	231	5.20	8.78
The Netherlands	298	6.71	15.50
Finland	362	8.15	23.65
France	954	21.49	45.14
Germany	1256	28.29	73.42
Greece	126	2.84	76.26
Ireland	72	1.62	77.88
Italy	491	11.06	88.94
Luxembourg	37	0.83	89.77
Portugal	84	1.89	91.67
Slovenia	8	0.18	91.85
Spain	362	8.15	100.00
Total	4440	100.00	

As it can be observed in Table 4, observations are not distributed in the same way. The country with most observations, Germany, accounts for 28,29% and the country with less observations, Slovenia, only has 0,18% of the observations. This might deviate the results. For example, Germany is considered the largest economy in Europe with big industries such as manufacturing, automotive and engineering. It was one of the founding members of the European Union and a leader in the economic integration. Slovenia is a smaller economy which had many economy reforms since it gained independence and only joined the Eurozone in 2007. These are just some differences between the countries with the largest and smallest share of the observations that can influence the management of the firms and consequently the cash holdings.

Table 5 – Distribution by year

This table represents the distribution of observations regarding the year.

year	Freq.	Percent	Cum.
2014	281	6.33	6.33
2015	294	6.62	12.95
2016	305	6.87	19.82
2017	359	8.09	27.91
2018	540	12.16	40.07
2019	582	13.11	53.18
2020	750	16.89	70.07
2021	761	17.14	87.21
2022	568	12.79	100.00
Total	4440	100.00	

It was in 2014 that Non-Financial Reporting Directive was published by the European Parliament. This document directs firm to disclose information regarding ESG questions (Directive 2014/95/EU). After 2014, companies started to disclose their ESG data, and that number has been increasing over the years as it can be observed in Table 5. This trend shows the importance of ESG factors on the understanding of the company's sustainability. However, 46,82% of the observations are from the post-Covid-19 era, a period with many global disruptions. The inclusion of this data allows to research on the impact of the pandemic and the inflation period. Consequently, this may influence the results given that those were disruptive years.

Table 6 - Correlation matrix

This table presents the pairwise correlation between the variables and their corresponding significance. The asterisk represents the significancy of the correlation as present in the legend below.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) cash_holdings	1.000					
(2) governance	-0.058***	1.000				
(3) firm_size	-0.310***	0.381***	1.000			
(4) leverage	-0.143***	0.050***	0.122***	1.000		
(5) market_to_book	0.194***	-0.006	-0.174***	-0.095***	1.000	
(6) cashflow_sales	-0.122***	0.078***	0.139***	0.154***	0.185***	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

According to Table 6, every correlation except for market to book to governance is significant at 1% level which means we might get significant results. The variable governance has a negative correlation with the main dependent variable which implies that the regression coefficient for governance might be negative.

According to the literature (Dittmar, Mahrt-Smith, and Servaes, 2003; Lins and Kalcheva, 2004) companies with better governance have lower cash holdings. This negative relationship is due to the premise that when there are effective governance structures in place, such as management controls and shareholder rights, companies are using the excess cash through dividend payouts or share repurchases. This might come from that companies with transparent data are prioritizing shareholders instead of idle cash reserves. Firms with a high governance score may also have a better Corporate Social Responsibility strategy and are using these resources in community welfare and socially responsible causes. This allocation of funds reinforces the negative relationship between governance and cash holdings.

The main hypothesis that is going to be analyzed in this thesis is that in the Eurozone, governance has a negative impact on cash holdings. This hypothesis comes from the theory that good governance practices prioritize the efficient allocation of funds. In conclusion, I expect that the coefficient of governance will be negative.

4. Results

As described in the methodology, this thesis relates cash holdings with governance. For that, several regressions were computed as in the table below.

First, a robust regression was computed with just cash holdings as the dependent variable and governance as the independent variable (Table 7). Both the constant and the governance variables were significant at 1% level and contrary to the hypothesis, governance has a positive coefficient. This means that when the governance score increases one unit, cash holdings will increase 0,000226 units, or 0,0226 percentage points. However, other things might be affecting this result so firm specific control variables were added.

Table 7 – Simple robust regression

The table presents the estimate results for the robust regression with cash holdings as the dependent variable and governance as the independent variable. The values in parentheses represent the p-values. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
governance	0.000226***
	(7.53e-05)
Constant	0.122***
	(0.00487)
Observations	4,440
Number of company	805
Industry Fixed Effects	No
Time Fixed Effects	No
R-squared	0.00334

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In this new robust regression (Table 8), control variables were added to enhance the precision of the analysis. Leverage is used to account for the influence of the company's capital structure. This variable is useful to understand the financial risk impact the cash holdings since the higher the level of debt, the financial obligations also increase, putting pressure in the cash reserves of the company. Firm Size is used to distinguish small firms from big firms. This allows to explore the variations in cash holdings due to size, since larger firms may have different cash management strategies. The Market to Book ratio is used to control for differences in the valuation of the company. This allows us to understand how the different valuations of the firm may influence cash holdings. The cash flow to sales is used to account for the efficiency in cash generation and to account for the financial health of the company. Even though cash flow to sales is not an usual variable to be considered as a control variable for firms, I decided to choose it since I want to account for the firm's financial health which is closely related with the cash management of the firm.

In this regression (Table 8), governance is still significant at 1% percent level and all the control variables are significant at least in the 5% level. Governance has a positive coefficient of 0,000414 which means that, everything else constant and on average, when the Governance score increases one unit, the cash holdings ratio increases 0,000414 units, or 0,0414 percentage points. This is a higher coefficient than the one in Table 7. The sample has companies from many different industries for which the governance and other variables might be very different. For example, we cannot expect that a company in the energy sector has a similar governance score as a company in the retail sector. For this case, time and industry fixed effects were added to the regression.

According to Table 9, when only industry fixed effects are considered, governance is still significant at 1% but when the year fixed effects are introduced, the variable loses all its significance. As contrary to the literature, governance cannot explain, even at 10% level, variation in the dependent variable when the year fixed effects are introduced. This unexpected shift asks for a reevaluation of the relationship between governance and cash holdings. This can mean that the changes in cash holdings might not be explained by governance when year fixed effects are introduced. These fixed effects introduce a new perspective that cash holdings may be more impacted by temporal factors instead of governance structures. This implies that over time, companies may have different cash management strategies that are not captured by the governance metrics.

Table 8 – Regression with control variables

The table represents the robust regression with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
governance	0.000414***
	(7.53e-05)
firm_size	-0.0158***
	(0.00156)
leverage	-0.0227
	(0.0139)
market_to_book	0.00300**
	(0.00125)
cash flow_sales	0.000527**
	(0.000252)
Constant	0.335***
	(0.0234)
Observations	4,440
Number of company	805
Industry Fixed Effects	No
Time Fixed Effects	No
R-squared	0.106

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The control variables, contrary to governance, have statistical significance to explain variation in cash holdings. Firm size and leverage have negative coefficients which means that as firms become larger and have more debt, they will have less cash holdings. These results meet the Trade-Off Theory since larger firms may have a better access to capital markets and may have more debt financing than having cash. The negative coefficients of firm size and leverage may reflect an inclination towards optimization of the financial structures, where companies may have more external financing, reducing the need for cash holdings. This corroborates the idea that larger firms with its different financing sources and economies of scale, think it is better to deploy funds through debt instruments instead of having idle cash. Market to book and cash flow to sales have a positive relationship with cash holdings which means that as these two variables increase, cash holdings will also increase.

These results may arise from the fact that when a firm is well perceived in the market, investors will easily put money in these companies and since the cash flow to sales represents the efficiency of cash generation of a firm, it is expected that cash holdings and cash flow to sales ratio have a positive relationship since the companies with a better ability to generate cash are more likely to have higher levels of liquidity. The only result that does not meet the expectations is the fact that governance apparently cannot explain the changes in cash holdings when the year fixed effects are introduced. The inexistence of explanatory power of the governance variable may accentuate the interplay of time factors and governance structures. Even though in the literature governance is considered an important determinant in financial decisions, the introduction of year fixed effects shows that time trends may be more impactful on cash holdings instead of governance structures.

Table 9 – Regressions with fixed effects

The table presents three robust regressions with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. Regression (1) has time fixed effects. Regression (2) has industry fixed effects. Regression (3) has time and industry fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings	(2) cash_holdings	(3) cash_holdings
governance	-2.03e-05	0.000363***	-4.21e-05
	(8.38e-05)	(7.62e-05)	(8.40e-05)
firm_size	-0.0127***	-0.0116***	-0.00888***
	(0.00165)	(0.00171)	(0.00177)
leverage	-0.0484***	-0.0155	-0.0411***
	(0.0133)	(0.0141)	(0.0135)
market_to_book	0.00299**	0.00214*	0.00215*
	(0.00127)	(0.00125)	(0.00128)
cash flow_sales	0.000356	0.000682***	0.000493**
	(0.000232)	(0.000260)	(0.000241)
Constant	0.299***	0.284***	0.260***
	(0.0243)	(0.0310)	(0.0312)
Observations	4,440	4,440	4,440
R-squared	0.133	0.196	0.219
Number of company	805	805	805
Industry Fixed Effects	No	Yes	Yes
Time Fixed Effects	Yes	No	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Robustness Checks

In order to assess the robustness of the findings presented above, given that governance is not able to explain the changes in cash holdings, several additional analyses will be conducted. These robustness checks are computed to ensure the reliability of the findings across different conditions.

5.1. Firm Fixed Effects

In the regressions in Table 9, industry fixed effects were used to differentiate the different sectors in which the companies operate. However, specific factors related to the companies might be affecting the regression outcome. For that, it was computed a regression with firm fixed effects instead of industry fixed effects. The firm fixed effects allow for a more in-depth examination, capturing the specific factors of each company that may affect the cash holdings. By doing this, the analysis is able to account for company-specific determinants that were probably not captured with just industry fixed effects.

In this new regression, in Table 10, governance still does not have explanatory power to account for the changes in cash holdings. The difference is that some control variables lost some of their significance. For example, firm size is now statistically significant at 5%, instead of 1% like presented in Table 9. This means that when considering firm fixed effects, we can capture the variation of the heterogeneity between firms and improve the model fit. The firm fixed effects might now be capturing the variation that was causing the coefficients to change.

5.2. Covid-19 Analysis

As it was mentioned before, this dataset includes the years during the Covid-19 pandemic. This was a very disruptive time for businesses since the Covid-19 impacted demand across every sector and there were many supply challenges due to closed borders which all were very challenging for all companies. Since these were abnormal years, I decided to have two samples, one with the years from 2014 to 2019 (before the pandemic), and another with the years from 2020 to 2022 (after the pandemic). After having these new samples, robust regressions with the control variables and industry fixed effects were run.

Table 10 – Regression with firm fixed effects

The table presents a robust regression with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. The regression includes time and firm fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
governance	-8.94e-05
	(9.65e-05)
firm_size	-0.0152**
	(0.00600)
leverage	-0.0331**
	(0.0165)
market_to_book	0.000286
	(0.00150)
cash flow_sales	0.000978***
	(0.000276)
Constant	0.336***
	(0.0886)
Observations	4,440
Number of company	805
R-squared	0.092
Firm Fixed Effects	Yes
Time Fixed Effects	Yes
R-squared	0.107

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In Table 11, we can observe that the regression from the years before the pandemic still has governance without statistical significance, so it is not still able to account for the cash holdings. This finding suggests that external factors or time trends had more influence in cash management strategies during the pre-pandemic instead of governance. However, in the regression for the period after the pandemic, (2), governance is significant at 5% level and takes the value of -0.000284, which means that when the governance score increases one unit, the cash holdings will decrease -0.000284 units. It is important to note that these regressions do not have time fixed effects, the observations were just divided in two samples. This result meets the hypothesis that cash holdings and governance are negatively related. This result indicates that companies with higher governance scores will have lower levels of cash holdings. This governance significance after the pandemic introduces a temporal dimension to the analysis. This means that after the pandemic companies started to adjust their cash management

strategies with the governance structures in place playing a more important role in these decisions in this timeframe.

5.3. Country Analysis

Even though all the countries in the sample are from the Eurozone, that does not mean that they are not subject to different legislations and may face different economic conditions. These countries also have distinct cultures. For example, companies that are in less trusting societies will have save more cash to account for the difficult access to capital markets (Dudley and Zhang, 2016).

Table 11 – Covid-19 Analysis

The table presents two robust regressions with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. The two regressions include industry fixed effects. They were computed using the two subsamples which were separated regarding time. Regression (1) has data from 2014 to 2019, before the Covid-19 pandemic. Regression (2) has data from 2020 to 2022, after the Covid-19 pandemic. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings	(2) cash_holdings
governance	5.95e-05	-0.000284**
	(9.67e-05)	(0.000133)
firm_size	-0.0109***	-0.00806***
	(0.00214)	(0.00196)
leverage	-0.0429**	-0.00385
	(0.0179)	(0.0178)
market_to_book	0.00473***	0.00600***
	(0.00145)	(0.00151)
cash flow_sales	0.000488	-0.000110
	(0.000335)	(0.000305)
Constant	0.292***	0.275***
	(0.0367)	(0.0322)
Observations	2,361	2,079
R-squared	0.234	0.175
Number of company	588	795
Industry Fixed Effects	Yes	Yes
Covid-19	Before	After

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All these conditions may affect the way businesses are run and how the cash is spent. According to Dittmar, Mahrt-Smith, and Servaes (2003) countries where shareholders rights are not well protected will have the double of cash of countries where the shareholders are well protected, and these rights account for the governance score. For that, I decided to introduce another control variable, the country fixed effects. For this analysis, the time and industry were also considered.

The results in Table 12 show that even when accounting for the jurisdiction where is the company, governance is still not able to explain the changes in cash holdings. This finding suggests that in the Eurozone, country-specific factors may not be determinants in the variation in cash holdings. The control variables, however, meet the results mentioned above in Table 6, with firm size and leverage with negative coefficients market to book ratio and cash flow to sales ratio with positive coefficients.

5.4. New dependent variables

For the effect of this thesis, cash holdings were defined as the ratio of cash to net assets. As a robustness check, the way that the cash holdings ratio is computed will have a new denominator. I will run two new regressions, one with cash holdings computed as the ratio of cash to assets and another with cash to sales as in Harford, Mansi, and Maxwell (2008). In this paper, the regressions computed with new dependent variables are expected to hold the same results since this is a test to ascertain the consistency of the results presented above. Time and industry fixed effects will still be considered as to better compare with the original regression.

According to the results of Table 13, with the new definitions for cash holdings, we still do not have governance able to explain the changes in the cash holdings. This reinforces the previous findings that in the Eurozone, governance might not be a determinant in the variation of cash holdings, even when using different definitions of cash holdings. This result adds credibility to the previous results that governance has a limited impact on cash management. The control variables still have the same coefficients except for leverage in the regression where cash holdings are defined as cash to sales, it takes a positive coefficient which means that a company which has a higher percentage of debt in its capital structure will have higher cash holdings.

Table 12 – Regression with country fixed effects

The table presents a robust regression with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. The regression includes time, industry, and country fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
governance	-1.71e-05
	(8.44e-05)
firm_size	-0.0102***
	(0.00181)
leverage	-0.0439***
	(0.0135)
market_to_book	0.00237*
	(0.00128)
cash flow_sales	0.000472**
	(0.000241)
Constant	0.286***
	(0.0350)
Observations	4,440
Number of company	805
Industry Fixed Effects	Yes
Time Fixed Effects	Yes
Country Fixed Effects	Yes
R-squared	0.242

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.5. Interaction terms

Another way to check for the robustness is to introduce interaction terms to use with the governance to check if it is affecting the regression results. Industry and time fixed effects were maintained, and a dummy variable was introduced for time. Considering the Covid-19 analysis, it will take the value of 1 if it is after the pandemic, and 0 if it is before. The interaction variables will use governance, and this will be related to time, firm size, and leverage. When looking at Table 14, the dummy introduced is significant at 1% level, which meets the results of the Covid-19 analysis, so after the pandemic, the cash holdings ratio will increase 3.9 percentage points. This meets the result of Qin *et al.* (2020), which concludes that the Covid-19 pandemic had a positive impact in firm's cash holdings in industries which were severely affected by the

pandemic. This is not an unexpected result since during Crisis time the firms saved more as a preventive measure and in some countries, there were lots of government support.

Regarding the interaction terms, governance_firm size does not have statistical significance. With leverage and the Covid dummy we have different results. For the governance leverage, we can see that it has explanatory power which means that leverage and governance are related so when governance and leverage increase one unit, cash holdings will increase 1,21 percentage points. That goes against the individual variables which both have negative coefficients.

Table 13 – Regressions with new dependent variables.

The table presents two robust regressions with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. In Regression (1), cash holdings are computed as the ratio of cash and equivalents to total assets. In Regression (2), cash holdings are computed as the ratio of cash and cash equivalents to total sales. The two regressions include industry and time fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings_assets	(2) cash_holdings_sales
governance	-2.93e-05	-7.82e-05
	(6.28e-05)	(0.000127)
firm_size	-0.00652***	-0.000568
	(0.00133)	(0.00298)
leverage	-0.0316***	0.0434*
	(0.0101)	(0.0232)
market_to_book	0.00160*	-0.00200
	(0.000934)	(0.00168)
cash flow_sales	0.000378**	0.00101**
	(0.000179)	(0.000449)
Constant	0.204***	0.156***
	(0.0232)	(0.0523)
Observations	4,440	4,440
R-squared	0.219	0.223
Number of company	805	805
Industry Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Dependent Variable	Cash to Assets	Cash to Sales

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

For the governance Covid interaction term, we have an interesting result. According to the regression, governance is closely related with time since the coefficient is statistically

significant at 5%. This means that after 2020, after the pandemic, governance has a stronger negative effect in cash holdings than before. This meets the result in Table 11, where after the pandemic, governance has explanatory power. For the first time, a variable related to governance is statistically significant to account for the changes in cash holdings while having time fixed effects. At last, consistent with the previous results, the governance variable is still not able to explain the cash holdings of the company in the pre-pandemic period.

5.6. Lagged variables

Given that ESG scores (where governance is included) and yearly financial statements are released once a year, the companies may take some time to react to these changes. Given the likelihood of the firms taking their time to adjust to the changes, a regression with all the control variables was run but with a change, a lag of one period was applied to all the independent variables. This adjustment has the objective of capturing the delayed changes of the ESG score on cash management.

With the new regression in Table 15, only the firm size and leverage have explanatory power which means that when firm size and leverage increase in the past, cash holdings will decrease in the current period. These results meet the ones in Table 7 since the coefficients are also negative. However, all the other variables are not able to explain cash holdings. Regarding governance, it has a different outcome than the one expected. When the companies have a higher governance score, it was expected for the cash holdings to decrease since the shareholders may be getting dividends or the company may be repurchasing shares. It was not expected for governance not to able to account for cash holdings considering all the other previous regressions.

Table 14 – Regression with interaction terms

The table presents a robust regression with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. It also includes a dummy variable, Covid_year, which takes the value 1 if the observation is after 2020 and 0 otherwise. Interaction terms were also computed in this new regression. The three are governance with the Covid dummy, governance with firm size and governance with leverage. The regression has industry fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
governance	-0.000261
	(0.000616)
firm_size	-0.00914***
	(0.00276)
leverage	-0.0959***
	(0.0264)
market_to_book	0.00329***
	(0.00124)
cash flow_sales	0.000529**
	(0.000243)
Covid_year	0.0390***
	(0.00739)
governance_firm_size	-5.34e-06
	(3.99e-05)
governance_leverage	0.00121***
	(0.000447)
Covid_governance	-0.000223**
	(0.000113)
Constant	0.279***
	(0.0447)
Observations	4,440
Number of company	805
Industry Fixed Effects	Yes
R-squared	0.212

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15 – Regression with lagged variables

The table presents a robust regression with cash holdings as the dependent variable and governance, firm size, leverage, market to book ratio and cash flow to sales ratio as independent variables. The independent variables are all lagged one period. The regression has time and industry fixed effects. Asterisks ***,**, and * represent a statistical significance of 1%, 5%, and 10% respectively.

VARIABLES	(1) cash_holdings
lag_governance	8.53e-05
	(7.99e-05)
lag_firm_size	-0.00940***
	(0.00172)
lag_leverage	-0.0313**
	(0.0127)
lag_market_to_book	0.00179
	(0.00144)
lag_cashflow_sales	-8.53e-05
	(0.000250)
Constant	0.274***
	(0.0310)
Observations	3,629
Number of company	775
Industry Fixed Effects	Yes
Time Fixed Effects	Yes
Lagged Variables	Yes
R-squared	0.228

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.7. Limitations

Contrary to the previous literature on the subject, for the first time, governance was measured using the governance score from ESG metrics. In previous research this was not the metric used. This might explain why governance apparently is not able to account for the changes in the cash holdings in firms, as observed in the regression results. Historically, the governance metrics used were board structures, shareholder rights or executive compensation. The introduction of the governance score coming from ESG introduces a new way to study the impact of governance in cash holdings. Since the governance accounts for many factors than

the ones in the previous research, such as the corporate social strategy, this may give light to other factors which were previously overlooked by the traditional governance metrics.

Another limitation of this research is that it only uses data from 2014 onwards. Before that, many companies did not disclose their ESG scores, so it was not possible to have a larger timeframe to analyze this question. In the future, when more data is available and there are not so many disruptive years, we might get different results since, according to table 3, the majority of observations come from the years after the pandemic.

Another issue presented in this study is that the distribution of the observations is not the same across the Eurozone. Germany and France have the larger number of observations while Slovenia and Luxembourg had the lowest number of observations. Even though all the countries share the same currency, the companies have different regulations according to the jurisdiction where they are located which influences the cash levels as the tax rates are not the same across the monetary union which can influence the previous results. It is very important to acknowledge that regulations specific to country, such as tax policies, can significantly impact cash management strategies. To address this issue, an approach could be to apply different weights according to the observations in each country. This would allow for a more in-depth analysis of governance and other determinants on cash holdings with each Eurozone country.

At last, also regarding the location of the companies, previous literature focused on an international level, such as Dittmar, Mahrt-Smith, and Servaes (2003) or in the US such as Harford, Mansi and Maxwell (2008). Previous research did not focus on the Eurozone. Countries in this area not only share the same currency, the companies in these jurisdictions also face the same regulations from the European Union. This shared regulatory environment implies that companies in the Eurozone have similar regulations to obey than compared to studies in an international level. Taking this into account, companies located in this zone have more regulations in place than in the US. That might be a reason why governance is not able to account for the changes in cash holdings of these firms. The European Union directives may influence the way the companies manage their cash holdings, taking away the impact of governance structure on cash management. Also, the absence of the explanatory power of governance may attributed to the influences of these common regulations. To address this issue, future research on this subject could go deeper in specific regulations within the Eurozone

which can take away the impact of governance. If the way that these shared regulations affect the financial decisions of each could be studied could provide valuable insights.

6. Conclusion

The objective of this master thesis was to explore the relationship between cash holdings and governance within Eurozone companies from 2014 to 2022. The main point of this research was to use the governance score from ESG data to account for the changes in cash holdings, contrary to the previous literature which used more traditional governance measures such as agency problems, shareholder rights, board structures and independence of directors. Along the governance, other control variables were considered, such as firm size, leverage, market to book ratio and cash flow to sales ratio to account for firm-specific factors. Time and industry fixed effects were also used to take away difference due to the industry or the year.

Contrary to the expectations regarding previous literature, which predicted that governance had a negative relationship, which meant the higher the governance score, the lower the cash levels, the findings revealed a different outcome. The governance did not have explanatory power in accounting for changes in cash holdings. This was not an expected result since it comes against previous studies which demonstrated that governance factors impact cash management of the firms and can be considered as a determinant of cash holdings.

Several robustness tests were performed to ensure the consistency of the results. Despite the several variations in the models used, such as introducing firm fixed effects, new definition for the dependent variable, separating the samples regarding the pandemic, introducing country fixed effects, including interaction terms, and introducing lagged variables. All the previous results persisted except for one. When an interaction term of governance and a dummy variable that takes the value 1 if the observation is after 2020 was introduced, that was only governance related variable that had explanatory power which means that after the pandemic, governance has an extra effect on cash holdings. The same result was achieved when the database was divided in two samples, one before the pandemic, and other after the pandemic. For the post-pandemic sample, governance had an explanatory power of 5% to account for changes in cash holdings.

The uniqueness of this approach by using ESG-derived governance scores, introduces a new perspective to the current discussion on governance and financial decisions. At the same time, given that it was not possible to find a significant relationship between governance and cash holdings, this challenges prior expectations and may give a reevaluation of the conventional governance metrics since the governance score takes account of many more subjects. For example, now governance account also for the Corporate Social Responsibility strategy and the transparency of the ESG, factors that were not considered before.

However, there are some limitations to this study. The timespan was from 2014 to 2022, which gives a comprehensive view of companies in the Eurozone. After 2020, there some disruptive events such as the Covid-19 pandemic and the invasion of Ukraine and subsequent inflation which might have impacted the way the companies manage their cash since in times of uncertainty, they will try to save in order to be prepared for bad times in business. In the future research, it would a good idea to extend the period studied and try to understand better the relationship between cash holdings and governance.

In conclusion, the unexpected findings of this master thesis emphasize the complexity of the relationship between corporate governance and cash management in Eurozone companies. The departure from the conventional governance metrics highlighted the need to have new governance measures to evaluate its impact on financial decisions of the companies. This research contributes to the ongoing research of how corporate governance affects cash holdings and corporate finance.

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