CASH HOLDINGS AND INDEBTEDNESS OF PUBLICLY TRADED COMPANIES IN BULGARIA DURING COVID-19 PANDEMIC

Galya Taseva[1]

Abstract: *The aim of the study is to examine the impact of the level of indebtedness of companies in Bulgaria on their cash holdings during the crisis caused by the COVID 19 pandemic. The analysis in the article is based on data on non-financial enterprises listed on the Bulgarian Stock Exchange during the period 2020 - 2021. Multiple linear regression analysis establishes a statistically significant negative impact of leverage, measured by the ratio Total debt / Total assets, on the cash holdings of companies, measured by the ratio Cash and cash equivalents / Total assets. Companies that have more debt have lower cash holdings. Debt service costs, measured by the ratio Interest Expenses / Interest Debt, also have a negative impact on the ratio Cash and Cash Equivalents / Total Assets. High debt service costs are depleting companies' cash holdings during the pandemic.*

Keywords: *cash holdings, debt, corporate indebtedness, Covid-19 pandemic*
JEL: *G32, G30*

1. Introduction

The Covid-19 pandemic and the extraordinary economic conditions it has created have greatly increased the risks for companies, including the risk of bankruptcy. The challenges during the crisis were even more serious for heavily indebted companies. On the one hand, the reduction in cash flows of companies as a result of the contraction of economic activity and the tightening of access to credit from financial institutions due to the sharp increase in risk in the economy imply difficulties for companies in ensuring liquidity. But on the other hand, these problems strengthen the desire of companies to maintain and even increase liquidity. Existing empirical research shows contradictory results on the relationship between cash holdings and the level of leverage of firms. Cash and cash equivalents are the most liquid assets of enterprises and analyzing their relationship with the level of indebtedness is even more important in times of crisis. The purpose of the study is precisely to analyze the impact of the level of indebtedness on the cash holdings of publicly traded non-financial enterprises in Bulgaria during the pandemic.

2. Theoretical overview

The impact of corporate debt on firms' cash holdings has been the subject of numerous studies based on both cross-sectional and panel data (Vuong, Dao, Le, & Nguyen, 2022, p. 186). However, there is still insufficient research on the relationship between leverage and corporate cash holdings during the unprecedented crisis caused by the COVID-19 virus pandemic.

[1] *Galya Taseva, Ph.d. Chief Assistant, University of National and World Economy, Bulgaria, galya_taseva@abv.bg, g.taseva@unwe.bg*

Xu and Jin (2022) examine the impact of the 2019 COVID-19 pandemic on the financial performance and cash holdings of Chinese agri-food companies. They find that during the pandemic, the financial performance of state-owned companies improved, but the financial performance and cash holdings of privately owned companies deteriorated. The negative impact of the pandemic on the cash holdings of companies was stronger for those that were heavily indebted.

Nicoletti, Setzer, Tujula, and Welz (2022) find that during the coronavirus pandemic, with the increase in gross debt of non-financial corporations, there is also a strong accumulation of liquid assets, which is particularly characteristic of large corporations. Already at the beginning of the pandemic, companies formed reserves in the form of deposits, setting aside a significant part of cash receipts from newly attracted bank loans and issued debt securities, in order to secure a resource for their future needs of working capital and investments and as a preventive measure against a possible cash shortages as a result of shrinking sales and operating cash flows. (Nicoletti, Setzer, Tujula, and Welz, 2022, pp. 4 - 5).

In uncertain cash flows, holding cash reduces the risk of default, leading to improved access to short-term bank credit (Kling, 2012). But the higher the financial leverage, the smaller the effect of holding cash in reducing default risk Kling (2012, p. 11). It should also be borne in mind that during the coronavirus pandemic, the benefits of using debt financing increase as a result of the immediately induced cash flow shortfall (Halling et al., 2020; Li et al., 2020 - cited in Huang and Ye (2021, page 4760).

Jebran, Iqbal, Bhat, Khan, and Hayat (2019) examine the determinants of corporate cash holdings using panel data for 280 firms listed on the Pakistan Stock Exchange. The data they examine is for the period 2005 to 2014, which covers different economic conditions - pre-crisis (2005–2007), crisis (2008–2010), and post-crisis (2011–2014). They conclude that financial crises affect firms' cash holdings policies and also that financial crises affect the relationship between leverage and cash holdings.

A study of the impact of the mortgage crisis on private firms in the United Kingdom found that firms typically hold cash and issue equity to hedge the risk of credit defaults during an economic downturn (Akbar et al., 2013 - cited in Zeitun, Temimi, and Mimouni, 2017).

Alves and Morais (2018) examine the determinants of firms' cash holdings and the impact of the 2008 financial crisis on cash reserves using data from 54 countries for the period 1995–2014. Firms prefer to finance their investments with retained earnings, if sufficient, and to repay debt and increase their cash reserves. Otherwise, if retained earnings do not cover the need for financial resources to finance the firm's investments, firms would resort to their cash savings and, if necessary, issue debt (Alves and Morais (2018), p. 8). An indicator of the level of leverage in the study by Alves and Morais (2018) is the ratio of the amount of debt to the amount of assets. They also conclude that firms' cash holdings are negatively correlated with cash substitutes (liquidity and leverage). They argue that firms do not need high cash holdings because they can easily sell their liquid assets when they need cash. Alves and Morais (2018) find that firms tend to hold higher cash reserves when they incur high external financing costs.

Vuong, Dao, Le, and Nguyen (2022) examine the impact of debt on firms' cash holdings and the differences in this impact across ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, and Thailand), which are characterized by different macroeconomic factors and legal characteristics. Their analysis is based on panel data for the period 2009–2018. Vuong, Dao, Le, and Nguyen (2022) find that the firms studied have maintained relatively high cash

holdings since the financial crisis. They show that the impact of debt on firms' cash holdings is consistently influenced by macroeconomic and legal factors across countries. Of the firm-internal factors in Vuong, Dao, Le, and Nguyen's (2022) study, the most notable is the negative correlation between cash holdings and the level of leverage, the most indebted firms holding the least cash relative to their assets. The level of leverage can be considered as an indicator of the ability of firms to attract debt (Vuong, Dao, Le, & Nguyen, 2022). Many studies find an inverse relationship between the level of leverage and the cash holdings of firms (Vuong, Dao, Le, & Nguyen, 2022).

Arguments in support of the existence of such a negative relationship are also provided by Jensen (1986). To prevent wasting money, firms should finance themselves with more debt, the repayment of which reduces the free cash flows available to managers and reduces agency costs (Jensen, 1986).

Guney, Ozkan and Ozkan (2007) find a statistically significant nonlinear relationship between cash holdings and indebtedness based on data for companies from France, Germany, the UK, the US and Japan for the period 1996-2000. According to them, a negative relationship (substitution effect) can be expected between the degree of indebtedness of companies and their cash holdings, if indebtedness is considered as a proxy for the ability of companies to attract financing from creditors. However, as indebtedness increases, so do the fears of companies of falling into financial distress, which stimulates the desire to accumulate cash reserves for precautionary purposes. This creates expectations of a positive relationship (precautionary effect) between leverage and cash holdings of companies. Guney, Ozkan and Ozkan (2007) also find that the impact of leverage on cash holdings depends on the degree of protection of the rights of creditors and shareholders in different countries, as well as on the concentration of ownership.

Anderson (2002) examines two panel data sets, one from Belgian firms and the other from UK firms, and finds a positive correlation between firms' levels of liquid assets and their levels of leverage in the long run, which is explained by the precautionary motive for holding liquidity. The existing financial structure of firms is a major factor influencing their decisions regarding the levels of liquidity they maintain, as the degree of indebtedness determines the risk that the firm's cash flows will be insufficient to cover debt payments.

Using data on firms from seven European countries (Belgium, France, Germany, Italy, the Netherlands, Sweden and the UK) for the period 1981–2010, Quader and Abdullah (2016) conclude that financially distressed firms tend to save relatively more cash, while firms that are not financially distressed do not engage in this behavior. Sufi (2009) also shows that distressed firms that do not have access to credit lines are more likely to hold more cash for precautionary reasons.

Acharya, Davydenko, and Strebulaev (2012) also show that riskier firms accumulate larger cash reserves due to the precautionary motive for holding cash. Larger cash holdings reduce the risk of bankruptcy in the short run, but liquidity is positively related to the long-run probability of bankruptcy.

Acharya, Almeida, and Campello (2007) examine the relationship between cash and debt management using data from a large sample of constrained and unconstrained firms. They conclude that cash cannot be defined as negative debt under financial frictions.

Contrary to the results of Opler, Pinkowitz, Stulz, and Williamson (1999), who find that large, highly leveraged publicly traded firms hold less cash, Faulkender (2002, p. 6) finds that small, highly leveraged firms hold more cash as a precaution.

Faulkender (2002, p. 7) points out that the literature mostly focuses on issues that concern firms' demand for cash, but in fact firms' cash positions are not only a result of demand but also a function of firms access to cash. Ultimately, firms' cash positions are the result of the interaction between these two forces.

Faulkender (2002) highlights that smaller firms tend to hold more cash as their debt increases, while larger, highly leveraged firms tend to hold less cash. The reason for this is the difference in access to credit. Larger firms can more easily obtain cash when needed, which is why they have a lower marginal utility from holding cash and it is more profitable to use the cash to repay debt. Conversely, for small firms, access to credit is more difficult than for large firms, which is why for them the marginal benefit of holding cash is greater than the marginal benefit of paying off debt (Faulkender, 2002, p. 31).

Using data on 395 non-financial companies from Pakistan that were listed on the stock exchange for the period 2005–2011, Anjum and Malik (2013) conclude that the level of leverage is among the main determinants of firms' cash holdings. As firms' debt increases, their cash decreases.

García-Teruel, Martínez-Solano and Sánchez-Ballesta (2008) also find that firms' cash decreases when they use more bank loans and when cash substitutes are available. A negative impact of leverage on cash is also revealed by Ozkan and Ozkan (2004, p. 2103) using data on British firms.

Ferreira and Vilela (2004) examine the determinants of corporate cash holdings in the countries of the Economic and Monetary Union (EMU). Their study is based on panel data for non-financial corporations for the period 1987–2000. They define the dependent variable in their model as the ratio of cash to assets. The results of their study show a negative impact of the level of leverage on cash holdings. Ferreira and Vilela (2004, p. 298) define cash held by firms as a "safety reserve" in cases of unexpected losses or difficulties in attracting external financing. Firms' incentives to hold cash reserves as insurance against a shortage of funds are lower when they have good relationships with banks.

The outbreak of the pandemic has unprecedentedly increased the risk in the economy and led to a sharp decline in sales revenues and cash flows from operations of companies. A natural reaction of companies that are more indebted and have higher debt costs in these conditions is to seek to increase their liquid assets, including their cash holdings. From this perspective, due to the precautionary motive for seeking money, a positive impact of the level of indebtedness of companies on their cash holdings can be expected. On the other hand, the companies studied are publicly traded and have relatively easier access to credit in the event of an unexpected liquidity shortage. In conditions of crisis and more difficult generation of internal financial resources, the ability to attract debt becomes key in companies' decisions regarding the level of their cash reserves. The higher level of debt can be seen as an indicator of easier access of companies to credit. Therefore, a negative impact of leverage on companies' cash holdings should be expected. Moreover, most empirical studies on the topic reveal precisely such a negative impact.

Of importance for the relationship between debt and the level of cash holdings of companies are also the measures that were taken by the state to alleviate the negative effects of the crisis caused by the pandemic. The measures were aimed specifically at ensuring liquidity of companies and preventing mass bankruptcies. The measures also included a moratorium on loan payments.

Based on the literature review and analysis above, the following hypotheses can be formulated:

H1: The level of indebtedness of enterprises has a negative impact on their cash holdings during the crisis caused by the pandemic of the COVID 19 virus.

H2: Firms that incur higher debt financing costs have lower cash holdings during the pandemic.

3. Empirical analysis

The study is based on pooled data for 43 publicly traded companies in Bulgaria during the height of the Covid crisis in the country during the period 2020 – 2021. An indicator of the level of cash reserves of companies is the ratio Cash and cash equivalents / Total assets. The analysis with the Pearson correlation coefficient shows the presence of a medium-power statistically significant inverse correlation between the degree of indebtedness of companies and the ratio Cash and cash equivalents / Total assets. The level of indebtedness of companies is measured by the indicator Total debt / Total assets. This ratio is a widely used measure of leverage in empirical research in the field. The results of the analysis with the Pearson correlation coefficient are presented in the following table.

Table 1. Relationship between the ratio Cash and cash equivalents / Total assets and the ratio Total Debt / Total assets

Variables	Pearson Correlation	Sig.
Ratio Cash and cash equivalents / Total assets and Ratio Amount of debt / Total assets	- 0,448	0,000

Source: Author's calculations

A medium-strong negative correlation is also found between the ratio Cash and cash equivalents / Total assets of the companies and the debt financing costs they pay. A measure of the debt financing costs of the companies is the ratio Interest expense / Interest debt. Interest debt is calculated by deducting the value of current liabilities to suppliers and customers from the amount of debt. The results of the analysis with the Pearson correlation coefficient are presented in the following table.

Table 2. Relationship between the ratio Cash and cash equivalents / Total assets and the ratio Interest expense / Interest debt

Variables	Pearson Correlation	Sig.
Ratio Cash and cash equivalents / Total assets and Ratio Interest expense / Interest debt	- 0,428	0,000

Source: Author's calculations

The multiple linear regression analysis method tests the combined influence of the ratio Total debt / Total assets and the ratio Interest expenses / Interest debt on the ratio Cash and cash equivalents / Amount of assets. The following table presents descriptive statistics of the variables in the model.

Table 3. Descriptive statistics for the variables in the model

	Mean	Std. Deviation
Cash and cash equivalents / Total assets	0,044	0,081
Total debt / Total assets	0,496	0,324
Interest expenses / Interest debt	0,024	0,020

Source: Author's calculations

The model is adequate, the level of significance of the F statistic sig. = 0.000. A medium-strength correlation dependence is established, the correlation coefficient (R) is equal to 0.504. The combined influence of the factor variables included in the model explains 25% of the change in the dependent variable.

Table 4. Model features

Correlation coefficient (R)	0,504
Coefficient of determination (R^2)	0,254
Adjusted R^2	0,236
Std. Error of the Estimate	0,0705178
F statistic	14,103
Sig.	0,000

Source: Author's calculations

The two factors included in the model are statistically significant (sig. < 0.05).

Table 5. Results for the explanatory variables in the model

	B Unstandardized Coefficients	Std. Error	Beta Standardized Coefficients	t	Sig.
(Constant)	0,108	0,014		7,508	0,000

Total debt / Total assets	-0,077	0,028	-0,310	-2,799	0,006
Interest expenses / Interest debt	-1,062	0,438	-0,268	-2,423	0,018

Source: Author's calculations

The correlation matrix shows that multicollinearity is not present, i.e. the factor variables are independent of each other.

Table 6. Correlation matrix for the factors in the model

	Total debt / Total assets	Interest expenses / Interest debt
Total debt / Total assets	1	0,516
Interest expenses / Interest debt	0,516	1

Source: Author's calculations

The results of the multiple regression analysis confirm the first hypothesis of a negative impact of firms' indebtedness on their cash holdings. The explanation for this negative relationship may be the substitution effect between debt and cash. The level of leverage can be considered as an indicator of easier access of firms to credit even in the conditions of the crisis caused by COVID 19. If firms can easily secure debt financing, they do not need to maintain large cash reserves. However, another possible explanation for the negative impact of the level of leverage on the ratio of Cash and cash equivalents / Total assets is that the costs of servicing higher indebtedness deplete the cash holdings of firms in the conditions of the pandemic, when sales revenues and cash flows from operations of firms sharply decreased. In line with this explanation is the established negative impact of the ratio of Interest expenses / Interest debt. The results of the study also confirm the second hypothesis that companies that have higher debt service costs have lower cash reserves.

4. Conclusion

The results of the multiple linear regression analysis showed a negative impact of the ratio of Total Debt / Total Assets on the cash holdings of publicly traded non-financial corporations in Bulgaria at the height of the crisis caused by the coronavirus pandemic. The level of indebtedness is an indicator of the confidence of creditors in companies, i.e. for easier access to credit in the event of an unexpected liquidity shortage and, accordingly, a lower need for cash holdings. However, higher debt also means more costs for its servicing, which may also explain the lower levels of cash holdings in more indebted companies. The ratio of Interest Expenses / Interest Debt also has a negative impact on the ratio of Cash and Cash Equivalents / Total Assets. This shows that high debt servicing costs deplete the cash reserves of companies during the pandemic.

REFERENCES

Acharya, V., Almeida, H., Campello, M. (2007). Is Cash Negative Debt? A Hedging Perspective on Corporate Financial Policies, Journal of Financial Intermediation, Volume 16, Issue 4, p. 515-554, DOI: 10.1016/j.jfi.2007.04.001

Acharya, V., Davydenko, S., Strebulaev, I. (2012). Cash Holdings and Credit Risk, available at: <http://ssrn.com/abstract=972508>

Akbar, S., Rehman, S.U., Ormrod, P. (2013). The impact of recent financial shocks on the financing and investment policies of UK private firms. International Review of Financial Analysis, 26, pp.59–70

Alves, P., Morais, F. (2018). Cash holdings are increasing and financial crisis strenghts it, available at: <https://mpra.ub.uni-muenchen.de/83799/>

Anderson, R. W. (2002). Capital structure firm liquidity and growth, NBB WORKING PAPER No. 27, National Bank of Belgium

Anjum, S., Q. A. Malik. (2013). Determinants of Corporate Liquidity - An Analysis of Cash Holdings, IOSR Journal of Business and Management, Volume 7, Issue 2, p. 94-100

Faulkender, M. (2002). Cash Holdings Among Small Businesses, available at: <SSRN: https://ssrn.com/abstract=305179 or http://dx.doi.org/10.2139/ssrn.305179>

Ferreira, M., Vilela, A. (2004). Why Do Firms Hold Cash? Evidence from EMU Countries, European Financial Management, Vol. 10, No. 2, p. 295–319

García-Teruel, P., J., P., Martínez-Solano, J., P. Sánchez-Ballesta. (2008). FINANCIAL REPORTING QUALITY AND CORPORATE CASH HOLDINGS, available at: <https://www.academia.edu/34210052/Financial_Reporting_Quality_ and_Corporate_Cash_Holdings>

Guney, Y., Ozkan, A., Ozkan, N. (2007). International evidence on the non-linear impact of leverage on corporate cash holdings, Journal of Multinational Financial Management, Volume 17, Issue 1, p. 45 -60, DOI: 10.1016/j.mulfin.2006.03.003

Halling, M., Yu, J., Zechner, J. (2020). How did COVID-19 affect firms' access to public capital markets? Review of Corporate Finance Studies, Volume 9, Issue 3, p. 501–533, https://doi.org/10.1093/rcfs/cfaa008

Huang, H., Ye, Y. (2021). Rethinking capital structure decision and corporate social responsibility in response to COVID-19, Accounting & Finance 61, p. 4757–4788

Jebran, K., Iqbal, A., Bhat, K. U., Khan, M. A., Hayat, M. (2019). Determinants of corporate cash holdings in tranquil and turbulent period: Evidence from an emerging economy, Financial Innovation, ISSN 2199-4730, Springer, Heidelberg, Vol. 5, Iss. 1, pp. 1-12

Jensen, M.C. (1986). Agency costs of free cash flow, corporate finance, and takeovers, American Economic Review 76, p. 323-329

Kling, G. (2012). A short-term theory of cash holding, available at: <https://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL% 20MEETINGS/2012 Barcelona/papers/EFMA2012_0296_fullpaper.pdf>

Li, L., Strahan, P.E., Zhang, S. (2020). Banks as lenders of first resort: Evidence from the COVID-19 crisis, The Review of Corporate Finance Studies, Volume 9, Issue 3, p. 472–500, https://doi.org/10.1093/rcfs/cfaa009

Nicoletti, G., R. Setzer, M. Tujula and P. Welz. (2022). Assessing corporate vulnerabilities in the euro area, available at: <https://www.ecb.europa.eu/pub/economic-bulletin/articles/2022/html/ecb.ebart202202_02~7a61e442be.en.html>

Opler, T., L. Pinkowitz, R. Stulz, Williamson, R. (1999). The Determinants and Implications of Corporate Cash Holdings, Journal of Financial Economics 52, p. 3-46

Ozkan, A., N. Ozkan. (2004). Corporate cash holdings: An empirical investigation of UK companies, Journal of Banking & Finance, 28, p. 2103–2134

Quader, S. M., M. N. Abdullah. (2016). Cash Flow Sensitivity of Cash: A Cross Country Analysis, International Journal of Economics and Financial Issues, 6(2), p. 562-572

Sufi, A. (2009). Bank lines of credit in corporate finance: An empirical analysis, Review of Financial Studies, 22, (3), pp. 1057-1088

Vuong, T. H. G., Dao, T. H., Le, T. T. H. and Nguyen, H. M., (2022). Debts and corporate cash holdings: Evidence from ASEAN-5. Investment Management and Financial Innovations, 19(1), 186-200. doi:10.21511/imfi.19(1).2022.14

Vuong, T. H. G., Dao, T. H., Le, T. T. H., Nguyen, H. M. (2022). Debts and corporate cash holdings: Evidence from ASEAN-5. Investment Management and Financial Innovations, 19(1), p. 186-200. doi:10.21511/imfi.19(1).2022.14

Xu, J., Jin, Z. (2022). Exploring the Impact of the COVID-19 Pandemic on Firms' Financial Performance and Cash Holding: New Evidence from China's Agri-food Sector. Agronomy 2022, 12(8):1951

Zeitun, R., Temimi, A., Mimouni, K. (2017). Do Financial Crises Alter the Dynamics of Corporate Capital Structure? Evidence from GCC Countries, Quarterly Review of Economics and Finance, Vol. 63, 2017, p. 21 - 33