



FINANCING FROM SUPPLIERS DURING COVID-19 PANDEMIC: EVIDENCE FROM BULGARIAN LISTED FIRMS

Galya Taseva¹

Abstract: *The article examines which firms rely more heavily on supplier financing and how the crisis caused by the Covid-19 pandemic has affected supplier financing for these firms. The research is based on information about manufacturing companies listed on the stock exchange in Bulgaria for the period 2018 - 2021. The results of the research show that companies that are net debtors on trade credit have worse financial indicators. Accounts payable of companies net debtors to suppliers have shrunk in absolute terms in both years since the start of the pandemic. But for companies that are net debtors on trade credit, the reduction in payables to suppliers is much smaller than the reduction in loans to banks and other financial institutions in the first year of the pandemic. In the first year of the pandemic, when the initial shock to the economy was the strongest, the relative importance of trade credit as a source of financing for firms with poorer financial performance and lower creditworthiness grew.*

Keywords: *trade credit, supplier financing, financial performance, Covid-19, Bulgaria*

JEL: *G30, G32*

1. Introduction

The disruption to supply chains and liquidity problems for companies caused by the coronavirus pandemic have challenged the existence of many businesses. The pandemic caused a macroeconomic shock to the supply of labor and resources for production and hence to the activity of companies around the world. Firms have been forced to change their strategies and policies in response to the changes that have occurred. The impact of the pandemic on the trade credit policies of companies has been extremely significant, as real business activity and hence cash flows for suppliers and buyers along the supply chains have been directly and drastically affected (Luo, 2021). The shock to firms' cash flows caused by the pandemic has focused attention on the ability of companies to pay their suppliers.

The purpose of the article is to examine which firms rely more heavily on supplier financing and how the crisis caused by the Covid-19 virus pandemic has affected supplier financing for these firms. The tasks that are set are:

¹ Galya Taseva, Ph.D., Chief Assistant at the University of National and World Economy, Bulgaria, g.taseva@unwe.bg, galya_taseva@abv.bg,



- To outline the profile of companies that are net debtors to suppliers, analyzing the main indicators of their financial position and the changes in these indicators in the period before the pandemic and at the beginning of the pandemic;
- To track changes in the levels of firms' trade payables under pandemic conditions to assess the importance of trade credit for net debtor firms.

The main hypotheses are:

H1: The first hypothesis in the research is that companies that are net debtors on trade credit are companies that perform weaker financially.

H2: The second hypothesis to be tested in the study is that the crisis caused by the pandemic led to changes in the levels of trade indebtedness and increased the relative importance of supplier financing for firms with worse creditworthiness in the first year of the pandemic.

The research methods used are: analysis and summary of the literature in the field, analysis of main indicators of the financial condition of companies, comparative analysis, trend analysis, index analysis, structural analysis, statistical analysis.

2. Theoretical overview

Some authors (Khan, 2022) draw a parallel between the crisis of 2008-2009 and the crisis caused by COVID-19. There are similarities such as the burden the two crises created on the global economy due to liquidity shortages, corporate bankruptcies and losses (Khan, 2022, p. 3). But during the crisis caused by the coronavirus pandemic, an aggregate demand and supply shock developed simultaneously for lenders and borrowers (Khan, 2022, pp. 3-4). During the protracted crisis caused by the pandemic, the sales revenue of the companies has been disrupted indefinitely, which is accompanied by the burden of fixed costs, including the fixed costs of servicing the debt and simultaneously reducing the cash holdings of the companies. Against this backdrop, adverse financial conditions make it more difficult for firms to raise urgently needed liquidity due to banks' reluctance to lend to non-creditworthy firms with low asset values (Khan, 2022, p. 4).

The ambiguity about how long the negative effects of the crisis caused by the pandemic will be felt in parallel with the new geopolitical realities further fuel uncertainty and make it difficult for companies to access finance and to recover economies in the region and around the world. After the global economic crisis of 2007-2008, which affected most countries of the Balkan region, a recessionary gap was formed in the majority of Balkan economies, which had been developing for years below their potential (Nenkova, Angelov, 2020).

According to Bureau, Duquerroy, Vinas (2021, p. 1), for the correct assessment of liquidity shortages in crisis conditions, it is extremely important to consider the channel of trade credit. The bulk of short-term financing for non-financial enterprises is provided by suppliers. Trade credit is extremely important for maintaining the liquidity of companies. In 2019, the trade payables of French firms exceeded seven times the amount of short-term bank loans (Bureau, Duquerroy, Vinas (2021, p. 1).



The importance of trade credit is confirmed by numerous studies that show that industries in which the use of trade credit is widespread grow faster and are more resilient to financial crises (Chen, Ghoul, Guedhami, Kwok, & Nash, 2021, p. 2). According to many studies, firms experiencing financial difficulties use more credit from their suppliers (Petersen and Rajan, 1994; Petersen and Rajan, 1995; Petersen and Rajan, 1997; Frank and Maksimovic, 2005; Molina and Preve, 2007; Wilner, 2000).

But there are also studies, such as that of Bureau, Duquerroy, Vinas (2021), according to which the use of trade credit in a certain situation, as observed at the beginning of the pandemic, may pose additional risk to companies. Based on daily data for 175,000 French firms for 2019 and 2020 on the default of payments to suppliers Bureau, Duquerroy, Vinas (2021, p. 1) find that trade credit amplifies the Covid-19 shock in the first months of the pandemic, dramatically increasing the need for short-term liquidity in the most affected downstream sectors. However, they stress that this effect is short-term and pro-cyclical and concentrated on financially constrained firms. The conclusions reached by Bureau, Duquerroy, Vinas (2021) are contrary to the traditional understanding of trade credit as a countercyclical source of financing that serves as a substitute for bank credit when bank lending shrinks (Bureau, Duquerroy, Vinas (2021, p. 2). The results of their research show that companies that are net debtors on trade credit experience severe liquidity problems as a result of the lockdown at the beginning of the pandemic, which significantly increases the risk of non-payment of trade debts. However, this effect is short-term and cyclical in nature, peaking in April and gradually declining and reversing in June 2020. They also find that smaller, riskier, financially distressed, less profitable and generally financially weak firms that are net trade credit debtors are more likely to default on their obligations to suppliers. Another conclusion reached by Bureau, Duquerroy, Vinas (2021, p. 2) is that firms can offset the effect of non-payment of trade credit obligations by hedging liquidity risk. They also found a reduction in default risk when using trade receivables financing, but only for the largest firms (Bureau, Duquerroy, Vinas (2021, p. 2).

Firms' trade credit balance (whether they are net debtors or creditors) depends on the payment terms negotiated in trade transactions and is largely determined by the specifics of the industry and the firms' position in the supply chain. Firms that sell to final customers tend to be net borrowers because final customers pay in cash and payment delays increase upstream (Gonzalez, 2020 - cited in Bureau, Duquerroy, and Vinas (2021, p. 2).

Bureau, Duquerroy, and Vinas (2021) describe the mechanism by which the lockdown at the beginning of the pandemic affected the commercial credit chain. If the level of activity of the firm does not change between two dates, then, other things being equal, its trade lending position remains unchanged, since both trade receivables and trade payables are continuously reproduced. As demand plummets as a result of the lockdown, sales revenue plummets, and accounts payable accrued prior to the demand shock remain past due. Thus, for companies that are net debtors on trade credit, liquidity problems arise, escalating to the impossibility of paying due obligations. Conversely, *ceteris paribus*, net creditor companies on trade credit experience an increase in liquidity as a result of an excess of cash inflows over cash outflows. The reduced demand for production during the lockdown, in turn, reduces the demand for resources for production, and hence the amount of obligations to suppliers. When economic activity recovers, the increase in sales and, accordingly, cash and trade receivables leads to an increase in liquidity



for the original net debtors and, accordingly, to an increase in cash outflows for net creditors (Bureau, Duquerroy and Vinas (2021, p.3).

Trade credit can serve as a mechanism for companies to adapt to the conditions of the environment in which they operate, but this requires flexibility in the management of trade receivables and payables. According to Zimon and Dankiewicz (2020), maintaining liquidity and generating profit, especially for small firms, requires optimizing trade credit management policies. Zimon and Dankiewicz (2020) investigate trade credit management strategies in Polish group purchasing construction firm organizations during the COVID-19 pandemic. Trade credit occupies a large share in the financing of the construction sector in Poland. Zimon and Dankiewicz (2020) conclude that during the pandemic, the trade credit management strategy changes, moving from a moderately conservative to a highly conservative policy. The changes they found in the Polish construction companies regarding the management of trade obligations are related to the formation of large reserves in purchases.

Luo (2021) examines the extent to which COVID-19 affects corporate trade credit policy in the US. He identifies the US economy as one of the most affected by the pandemic. Luo (2021) finds that COVID-19 significantly accelerated the rate of convergence of US firms to targeted trade credit. The adjustment to the target level of trade credit is faster for companies that are ex-ante exposed to a higher operational risk. The results of Luo's (2021) study are generally consistent with the understanding that changes in firms' trade credit policies correspond to risk aversion in adverse shocks.

According to previous research by Luo (2021), there is an optimal level of trade credit that firms aim for, with the adjustment rate being about 70% of the difference between the actual and target level of trade credit for each year. During the pandemic, the speed of trade credit adjustment increased significantly compared to the pre-pandemic period. Also, the adjustment speed is higher for trade payables compared to trade receivables.

Risk aversion is one of the channels through which pandemic-induced uncertainty affects the adjustment speed of trade credit (Luo, 2021, p. 1). Uncertainty about how long the macroeconomic shocks the pandemic has caused will continue is adding to the uncertainty for businesses. The increase in uncertainty is a consequence of the volatility of cash flows, the increase in financing costs and the risk of non-payment by trading partners. Firms have the ability to increase or decrease the absolute level of trade credit depending on their specific constraints, but large deviations from the optimal level of trade credit expose firms to more risks (Luo, 2021, p. 5).

Adjustment costs are determined both by general economic conditions and specific characteristics of firms (Cook and Tang 2010 and Hackbarth et al. 2006 - cited in Luo, 2021, pp. 1 -2). As uncertainty increases during the pandemic, so does liquidity risk and default risk, which also affects trade credit adjustment costs. As a result of higher operational risk and difficult access to credit, it becomes more expensive for firms to adjust trade credit the greater the deviation of the actual level of trade credit from the optimal level. This means that it is in the interest of firms to adjust trade credit more quickly in order to avoid a significant deviation from its optimal level. If the higher rate of convergence of the actual level of trade credit to its optimal level during the pandemic reflects risk aversion, the adjustment should be faster for



riskier firms (Luo, 2021, p. 2). The results of Luo's (2021) study show that firms with higher operational risk experience a faster adjustment during the crisis.

Luo (2021) also considers that the speed of adjustment depends not only on the willingness of firms, but also on their ability to do so. It is established that companies with higher contractual power can impose more favorable terms on their trade partners and, accordingly, achieve a higher speed of adjustment to the optimal level of trade credit. Firms with more significant market share and correspondingly better contractual positions adjust trade credit faster during the crisis Luo (2021, p. 2).

Khan (2022) finds that constraints in bank lending prior to the spread of the COVID-19 virus exacerbated the effects of the pandemic. Companies that have been subjected to restrictions on access to bank credit are exposed to a greater risk of more serious problems with liquidity and cash flows, and hence bear a greater risk of defaulting on obligations to creditors financial institutions through the economic crisis caused by the pandemic. It also found that firms with limited access to bank credit before the crisis were less likely to draw on bank loans as a primary source of financing to address liquidity and cash flow problems that arose from the pandemic. Khan's (2022) research findings also show that firms with limited access to bank credit before the crisis are more likely to use trade credit, delay payments to suppliers and employees, and rely on government grants for support during the pandemic.

Ferrando and Ganoulis (2020) examine firms' attitudes toward access to finance at the onset of the COVID-19 virus pandemic. They analyze the channels of impact on access to finance. According to the firms they studied, the observed supply and demand shocks would have affected access to finance for many firms even if banks had not changed their lending policies in line with the impact of these shocks on income and balance sheets (equity) of the companies and from here on their creditworthiness. Ferrando and Ganoulis (2020, p. 11) highlight two other channels of influence on firms' access to external financing. One is the deterioration of the economic outlook and the resulting sharp fall in asset prices, and the other, an extremely important transmission mechanism, is related to trade credit. Trade credit can contract rapidly following severe demand and/or supply shocks as a result of firms' reluctance to lend (Deutsche Bundesbank, 2012 - cited in Ferrando and Ganoulis (2020, p. 11)). Ferrando and Ganoulis (2020, p. 11) emphasize that the net effect of the contraction of trade credit on the balance sheet of non-financial enterprises may be limited if trade receivables and payables decrease simultaneously. But the impact of the contraction in trade credit on business activity and creditworthiness could be significant as a result of difficulties arising in supply chains and trade agreements.

Ferrando and Ganoulis (2020, p. 23) concluded that firms in different countries had different expectations about the intensity of the financial impact of the shock caused by the pandemic. They also find that firms with poor credit histories, high debt-to-asset ratios, and that do not use factoring (as a substitute for liquidity management) were more likely to expect a deterioration in their access to external financing. Companies in the service sector also had more negative expectations. Another conclusion reached by Ferrando and Ganoulis (2020, p. 23) is that SMEs are less likely to have expectations of a deterioration in their access to trade credit, which they explain by considering trade credit as a form of of a financial buffer for smaller firms.

Shah, Liu, Shah, and Shah (2022) examine the importance of trade credit for the development of the textile sector in Pakistan and its importance in overcoming the problems of SMEs that have arisen due to the pandemic. Shah, Liu, Shah and Shah (2022) indicated that the pandemic had a direct effect on the financial condition of the small and medium-sized enterprises of the textile sector in Pakistan, which is defined as the backbone of the Pakistani economy. The study by Shah, Liu, Shah, and Shah (2022) is based on survey data of 115 Pakistani firms in the textile sector. According to Shah, Liu, Shah and Shah (2022), trade credit is an ideal solution for SMEs in the context of the crisis caused by the pandemic. They recommend that measures be taken at the government level to facilitate the use of trade credit by firms.

3. Empirical study

The research is based on data for 23 manufacturing companies from various sectors of the economy listed on the Bulgarian Stock Exchange in the period 2018 - 2021. The period considered covers the first two years of the coronavirus pandemic in Bulgaria (2020 and 2021) and the previous two years, which makes it possible to track the changes that occur as a result of the pandemic.

Public enterprises have a wider range of alternative financing options. In countries with well-developed capital markets, bond issues are the main source of attracting credit financing for corporations (Nenkov, Hristozov, 2020). But the stock market in Bulgaria is characterized by low liquidity, high price volatility and insufficient depth (Stefanova, 2019, p. 103). In the Bulgarian economy, bank loans remain the main liability item on the balance sheet of companies. In a crisis situation, disrupting supply chains, collapsing demand and restricting access to bank credit, the importance of companies' ability to attract financing from suppliers is increasing. The ability of enterprises to attract financing from their suppliers depends on many factors. Among them is the financial position of the companies.

The following table presents the average values by year of the researched period of the indicators for the size of the companies and for the net financial result of the entire set of analyzed companies and of the companies that are net debtors on trade credit. As net debtors on trade credit are defined companies where the liabilities to suppliers and customers exceed the receivables from customers and suppliers for the relevant period.

Companies that are net debtors on trade credit are significantly smaller companies in terms of total assets and net sales. In addition, it finds that firms that are net debtors on trade credit achieve on average lower net profits and higher net losses over the entire period 2018-2021.

Table 1. Indicators for the size of the companies and for the net financial result

	2018	2019	2020	2021
For the entire sample of companies				
Total assets	125287,609	135821,522	132475,000	145377,565
Net sales	80699,261	82700,783	78571,087	100972,696
Net profit	4715,435	4747,870	3401,783	3340,478

Net loss	181,000	196,826	788,522	3311,130
For companies that are net debtors				
Total assets	49269,625	86169,100	61195,167	72882,778
Net sales	31458,875	45969,800	27008,833	42179,556
Net profit	803,750	2395,100	1811,500	830,667
Net loss	510,625	408,700	1227,333	6669,222

Source: Author's calculations

Companies that are net debtors on trade credit are significantly smaller companies in terms of total assets and net sales. In addition, it finds that firms that are net debtors on trade credit achieve on average lower net profits and higher net losses over the entire period 2018-2021.

From the analysis of the changes in percentage, which are presented in the following table, it can be seen that in the first year of the pandemic, there was a significantly more serious collapse of the amount of assets and turnover of companies that are net debtors on trade credit, but also relatively faster improvement of these indicators in 2021. For companies that are net debtors to suppliers, the decrease in net profit in 2020 is slightly weaker, but for them the deterioration in this indicator continues in the next year 2021, when an even more significant percentage (54.14%) of a decrease in net profit was found.

A similar change is observed in terms of net loss. For net trade credit debtors, the increase in net loss in the first year of the pandemic was weaker, but the net loss for these firms continued to grow more strongly in the second year of the pandemic.

Table 2. Change in the indicators for the size of the companies and for the financial result in percentage

	2019	2020	2021
For the entire sample of companies			
Total assets	8,41	-2,46	9,74
Net sales	2,48	-4,99	28,51
Net profit	0,69	-28,35	-1,80
Net loss	8,74	300,62	319,92
For companies that are net debtors			
Total assets	74,89	-28,98	19,10
Net sales	46,13	-41,25	56,17
Net profit	197,99	-24,37	-54,14
Net loss	-19,96	200,30	443,39

**Small differences result from rounding*

Source: Author's calculations

The following table presents the indicators of indebtedness, liquidity and risk of bankruptcy of the companies.

Table 3. Indebtedness, liquidity and bankruptcy risk indicators

	2018	2019	2020	2021
For the entire sample of companies				
Total Liabilities / Total Assets	0,396	0,397	0,389	0,437
Long-term Debt / Equity	0,315	0,323	0,387	0,876
Long-term debt / (Long-term debt + Equity)	0,209	0,214	0,228	0,286
Long-term debt / Total Assets	0,149	0,140	0,159	0,199
Current liabilities / Total Assets	0,251	0,258	0,231	0,247
Current Liquidity Ratio	3,836	3,181	3,982	3,078
Interest coverage ratio	247,164	419,352	448,531	621,071
Beaver coefficient	0,417	0,355	0,358	0,294
For companies that are net debtors				
Total Liabilities / Total Assets	0,582	0,597	0,492	0,637
Long-term Debt / Equity	0,723	0,592	0,530	1,991
Long-term debt / (Long-term debt + Equity)	0,359	0,367	0,257	0,501
Long-term debt / Total Assets	0,225	0,233	0,188	0,337
Current liabilities / Total Assets	0,357	0,367	0,304	0,301
Current Liquidity Ratio	1,183	1,621	1,709	1,729
Interest coverage ratio	11,272	8,447	13,788	10,042
Beaver coefficient	0,143	0,143	0,198	0,114

Source: Author's calculations

The following table shows the percentage changes of the above indicators for the financial condition of the companies by years of the researched period.

Table 4. Change in indicators of indebtedness, liquidity and risk of bankruptcy

	2019	2020	2021
For the entire sample of companies			
Total Liabilities / Total Assets	0,35	-2,07	12,39
Long-term Debt / Equity	2,67	19,78	126,40
Long-term debt / (Long-term debt + Equity)	2,30	6,64	25,09
Long-term debt / Total Assets	-5,79	13,63	24,92
Current liabilities / Total Assets	2,88	-10,53	6,62
Current Liquidity Ratio	-17,08	25,19	-22,70
Interest coverage ratio	69,67	6,96	38,47
Beaver coefficient	-14,85	0,83	-17,79
For companies that are net debtors			
Total Liabilities / Total Assets	2,53	-17,51	29,45

Long-term Debt / Equity	-18,08	-10,58	275,83
Long-term debt / (Long-term debt + Equity)	2,34	-29,90	94,65
Long-term debt / Total Assets	3,81	-19,38	79,02
Current liabilities / Total Assets	2,78	-17,17	-1,18
Current Liquidity Ratio	37,00	5,38	1,20
Interest coverage ratio	-25,06	63,23	-27,17
Beaver coefficient	-0,29	38,69	-42,42

**Small differences result from rounding*

Source: Author's calculations

The obtained results show that companies that are net debtors on trade credit are more heavily indebted in all years of the analyzed period according to all calculated indebtedness indicators. High indebtedness gives rise to many direct and indirect negative effects for companies, including loss of suppliers and customers and deterioration of financing conditions from suppliers (Aleksandrova, 2016).

In the first year of the pandemic, there were serious reductions in debt ratios for companies that were net debtors on trade credit. The reason is the extremely sharp fall (40.97%) of long-term liabilities in 2020 compared to pre-crisis 2019 for companies that are net debtors to suppliers. The opposite is observed for the entire set of companies, a 19.13% increase in long-term liabilities was recorded in 2020 compared to 2019. The decrease in current liabilities in 2020 compared to the pre-crisis 2019 is also much greater as a percentage at companies that are net debtors on trade credit (41.09 %) compared to the average reduction for the entire population (17.69 %).

The liquidity of companies that are net debtors is lower in all years of the researched period. It is noteworthy that for the entire set of 23 firms, there is a decrease in current liquidity in the year before the pandemic, then a significant improvement in liquidity in the first year of the pandemic, and again a deterioration in liquidity in the second year of the pandemic. The reason is that for the whole population of 23 companies, the decrease in current liabilities in 2020 compared to the pre-crisis year 2019 is much stronger (17.69%) compared to the decrease in current assets for the same period (5.8%).

The companies that are net debtors also recorded an improvement (an increase of 5.38%) in the current liquidity ratio in the first year of the pandemic. The reason is also that current liabilities decrease more strongly (by 41.09%) compared to the decrease in current assets (by 31.66%). The more significant reduction of current assets and liabilities for companies that are net debtors on trade credits is proof of the stronger negative impact of the crisis on their operational activity. These firms are more vulnerable to the shock caused by the pandemic.

In the second year of the pandemic, a decrease in the current liquidity ratio was observed for all companies as a whole, which is the result of the excess of the increase in current liabilities (by 30.68%) over the increase in current assets (26.71%). For companies that are net debtors in 2021 compared to 2020, the increase in current liabilities (by 17.32%) slightly exceeds the increase in current assets (by 15.31%). This slightly larger increase in current liabilities over current assets in 2021 for companies that are net debtors cannot compensate for the significantly

larger drop in current liabilities from the previous period, resulting in a weak increase (by 1.2%) of the current liquidity ratio.

Table 5. Change in current assets and liabilities of companies

	2019	2020	2021
For the entire sample of companies			
Current assets	7,72	-5,80	26,71
Current liabilities	20,76	-17,69	30,68
	2019	2020	2021
For companies that are net debtors			
Current assets	222,56	-31,66	15,31
Current liabilities	75,91	-41,09	17,32

Source: Author's calculations

The lower liquidity of companies that are net debtors under trade credit is also evidenced by the repeatedly lower values, in all years of the researched period, of the interest coverage ratio. The reason for the sharp increase in the interest coverage ratio of companies net debtors in the first year of the pandemic is due to the drastic decrease in interest expenses (by 41.94%) compared to pre-crisis 2019. The decrease in interest expenses in 2020 compared to 2019 for the whole group of 23 companies is much lower (13.27%). The decrease in pre-tax profit is at a similar rate for companies net debtors (26.59 %) and for the entire group of companies (28.6 %).

In accordance with the results obtained for the much lower liquidity and higher indebtedness of the companies that are net debtors on trade credit, it is also established that the risk of bankruptcy is much more serious for them. Bankruptcy risk was measured by the Beaver Ratio (1966). With a value of the coefficient greater than or equal to 0.45, it is assumed that the financial condition of the respective enterprise is stable, with a value of 0.15, there is a risk of bankruptcy after five years, and with a value of the coefficient - 0.15, the company is expected to went bankrupt after a year.

The results of the study of the profitability of the assets of the companies show a slightly higher profitability of the entire population of companies compared to the profitability of the assets of the companies net debtors on trade credit during the analyzed period except for 2020. The reason for the increase in the profitability of the companies net debtors in the first year of the pandemic is the sharp fall in their assets, which is much stronger than the average decline in assets for firms in the entire population. The declines in operating profit and net profit for the entire set of companies and for companies that are net debtors on trade credit are relatively comparable in size in the first year of the pandemic.

Return on equity is also slightly higher for the population of all firms analyzed compared to the population of net debtors firms. Again, only 2020 is an exception, and the explanation for this is that for companies that are net debtors on trade credit, the equity decreases significantly (16.2%), and for the totality of all companies studied, it increases by 0.98% . Firms that are net debtors achieve lower asset turnover throughout the analyzed period.

Table 6. Profitability indicators

	2018	2019	2020	2021
For the entire sample of companies				
Net Profit / Total Assets	0,038	0,033	0,030	0,032
Operating profit / Total Assets	0,042	0,037	0,033	0,035
Net Profit / Equity	0,053	0,047	0,049	0,050
Net Sales / Total Assets	0,748	0,697	0,652	0,764
For companies that are net debtors				
Net Profit / Total Assets	0,025	0,028	0,032	0,023
Operating profit / Total Assets	0,028	0,031	0,036	0,026
Net Profit / Equity	0,042	0,045	0,053	0,048
Net Sales / Total Assets	0,686	0,597	0,587	0,689

Source: Author's calculations

The following table shows the changes in profitability indicators.

Table 7. Change in profitability indicators

	2019	2020	2021
For the entire sample of companies			
Net Profit / Total Assets	-10,85	-10,70	6,57
Operating profit / Total Assets	-12,48	-10,63	6,54
Net Profit / Equity	-11,79	4,43	1,95
Net Sales / Total Assets	-6,79	-6,46	17,21
For companies that are net debtors			
Net Profit / Total Assets	11,39	14,84	-28,71
Operating profit / Total Assets	11,36	15,35	-27,83
Net Profit / Equity	6,01	20,05	-9,60
Net Sales / Total Assets	-13,00	-1,63	17,30

**Small differences result from rounding*

Source: Author's calculations

It can be summarized that the first hypothesis is confirmed, that companies that are net debtors on trade credit are companies that perform weaker financially.

The shock created by the pandemic forces companies to look for mechanisms to adapt to the new economic conditions. It can be seen that in the new environment, the relative importance of trade credit as a source of financing for companies that are net debtors to suppliers has increased in the first year of the pandemic.

Table 8. Indicators of the importance of trade credit as a source of financing during the pandemic

	2018	2019	2020	2021
For the entire sample of companies				
Accounts payable	10731,91	14052,70	9984,04	13789,61
Long-term liabilities to banks and other financial institutions	5611,09	6323,74	7621,09	9486,61
Short-term liabilities to banks and other financial institutions	11489,96	12111,91	10819,26	12451,78
Accounts payable / Current assets	0,28	0,23	0,21	0,22
Accounts payable / Current liabilities	0,35	0,36	0,32	0,37
Accounts payable / Total liabilities	0,25	0,25	0,22	0,23
For companies that are net debtors				
Accounts payable	8435,75	21252,50	16739,17	14608,22
Long-term liabilities to banks and other financial institutions	5044,00	9891,70	2218,83	11273,67
Short-term liabilities to banks and other financial institutions	3593,38	2908,20	1013,33	2594,22
Accounts payable / Current assets	0,56	0,38	0,39	0,39
Accounts payable / Current liabilities	0,46	0,44	0,47	0,48
Accounts payable / Total liabilities	0,26	0,28	0,29	0,23

Source: Author's calculations

The following table presents the changes to the above indicators.

Table 9. Changes of indicators of the importance of trade credit as a source of financing during the pandemic

	2019	2020	2021
For the entire sample of companies			
Accounts payable	30,94	-28,95	38,12
Long-term liabilities to banks and other financial institutions	12,70	20,52	24,48
Short-term liabilities to banks and other financial institutions	5,41	-10,67	15,09
Accounts payable / Current assets	-19,67	-7,63	7,31

Accounts payable / Current liabilities	1,35	-9,89	14,64
Accounts payable / Total liabilities	1,22	-13,93	7,35
For companies that are net debtors			
Accounts payable	151,93	-21,24	-12,73
Long-term liabilities to banks and other financial institutions	96,11	-77,57	408,09
Short-term liabilities to banks and other financial institutions	-19,07	-65,16	156,01
Accounts payable / Current assets	-31,82	2,20	0,73
Accounts payable / Current liabilities	-5,87	7,25	2,30
Accounts payable / Total liabilities	6,10	3,67	-20,08

**Small differences result from rounding*

Source: Author's calculations

The data show that for the aggregate of all firms studied, the value of current accounts payable decreases in the first year of the pandemic and then increases again in 2021. While for net debtor firms, the value of accounts payable increases in the pre-pandemic period and decreases during the two years at the beginning of the pandemic. But despite the decrease in trade payables in absolute terms, their importance as a source of financing for net debtor firms increased at the beginning of the crisis. Proof of this is the changes that have occurred in the financing structure of these companies since the beginning of the pandemic. The results obtained confirm the second research hypothesis.

The decrease in the liabilities to suppliers of the firms net debtors on trade credit is much smaller than the decrease in loans to banks and other financial institutions. In the event of an unexpected shock, trade credit turns out to be a more sustainable source of financing for companies with financial problems and low creditworthiness. It should also be borne in mind that the reduction in payables to suppliers is largely the result of the disruption of supply chains and the contraction of demand during the pandemic, not just the unwillingness of supplier firms to sell on credit.

For companies that are net debtors on trade credit, that are in a worse financial position and with lower creditworthiness in 2020, there is a very sharp decrease in both long-term (by 77.57%) and short-term (with 65.16%) loans from banks and other financial institutions. For the entire set of companies for 2020, there was a decrease only in short-term loans from banks (by 10.67%). For the entire population of firms, the ratio of payables to suppliers to current assets for the first year of the pandemic decreased by 7.63%, and for firms net debtors increased by 2.2%.

The importance of trade payables in financing net debtor firms at the start of the pandemic is even more apparent when we compare them to current liabilities. The ratio of short-term payables to suppliers and current liabilities for the entire set of firms decreased in 2020 by 9.89%, while for firms net trade credit debtors increased by 7.25%.

The importance of financing from suppliers in the event of unexpected shocks, such as the outbreak of the pandemic, is also confirmed when relating them to the total liabilities of companies. In 2020, for companies that are net debtors, the ratio of liabilities to suppliers to total liabilities increased by 3.67%, and for the entire set of companies, it decreased by 13.93%. The initial shock at the beginning of the pandemic led to a sharp contraction in access to long-term financing, especially for firms with lower creditworthiness. With the gradual normalization of the situation in the second year of the pandemic, the importance of supplier financing is also adjusted.

4. Conclusion

The results of the research prove that the companies that are net debtors on trade credit are in a worse financial condition and with a lower creditworthiness compared to the entire studied set of companies. They achieve a lower return on assets and equity, and are also more indebted, less liquid, and more likely to default. During the pandemic, they experienced a sharper decline in sales revenue, assets and financial results. Also, due to the lower creditworthiness and higher risk, they experience more serious difficulties in attracting financing from banks and other financial institutions in the first year of the pandemic. The account payables of companies that are net debtors on trade credit have shrunk in absolute value in both years since the start of the pandemic. But the reduction in trade credit payables to companies net debtors is much smaller than the reduction in loans to banks and other financial institutions. In the first year of the pandemic, the relative share of financing from suppliers increased.

The results of the study prove the importance of trade credit as an important source of financing for companies with weaker financial performance. Supplier financing cushioned the severe shock in the first year of the pandemic for firms with weaker financial indicators and lower creditworthiness.

References

- Александрова, М., (2016). Прилагане на съвременните методи за оценка на финансовата ефективност на инвестиционни проекти в непублични предприятия. Научни трудове на УНСС, том 1/2016, с. 35-75, http://unwe-research-papers.org/uploads/ResearchPapers/Research%20Papers_vol1_2016_No2_M%20Alexandrova.pdf
- (Aleksandrova, M., (2016). Prilagane na savremennite metodi za otsenka na finansovata efektivnost na investitsionni projekti v nepublichni predpriyatia, Nauchni trudove na UNSS, tom 1/2016, s. 35-75, http://unwe-research-papers.org/uploads/ResearchPapers/Research%20Papers_vol1_2016_No2_M%20Alexandrova.pdf)
- Ненков, Д., Я. Христозов, (2020), Корпоративни финанси : Учебно помагало, Издателски комплекс - УНСС, 220 с., ISBN 978-619-232-274-8
- (Nenkov, D., Ya. Hristozov, (2020), Korporativni finansi : Uchebno pomagalo, Izdatelski kompleks - UNSS, 220 s., ISBN 978-619-232-274-8)
- Ненкова, П., А. Ангелов, (2020), Оценка на фискалната позиция на страните от Балканския регион, Народностопански архив, брой 4, с. 14-37
- (Nenkova, P., A. Angelov, (2020), Otsenka na fiskalnata pozitsia na stranite ot Balkanskia region, Narodnostopanski arhiv, broj 4, s. 14-37)

- Стефанова, Ю., (2019), Институционална устойчивост и развитие на фондовите пазари в Централна и Източна Европа: 30 години преход, Сборник с доклади „Човекът - мярка на всички неща? Предизвикателствата на постиндустриалното информационно общество”, Издателство: Технически университет София, стр. 92 – 109, ISSN 2603- 4999
- (Stefanova, Yu., (2019), *Institutsionalna ustoychivost i razvitie na fondovite pazari v Tsentralna i Iztochna Evropa: 30 godini prehod, Sbornik s dokladi „Chovekat - myarka na vsichki neshta? Predizvikatelstvata na postindustrialnoto informatsionno obshtestvo”*, Izdatelstvo: Tehnicheski univrsitet Sofia, str. 92 – 109, ISSN 2603- 4999)
- Beaver, W., (1966), Financial Ratios as Predictors of Bankruptcy. *Journal of Accounting Research*, vol. 6, pp. 71-102
- Bureau, B., A. Duquerroy, F. Vinas, (2021), Corporate Liquidity During the Covid19 Crisis: the Trade Credit Channel, Working Papers 851, Banque de France
- Chen, R., S. El Ghoul, O. Guedhami, Ch. C. Y. Kwok, and R. Nash, (2021), International evidence on state ownership and trade credit Opportunities and motivations, *Journal of International Business Studies*, Available at: <https://doi.org/10.1057/s41267-021-00406-5>
- Cook, D.O., Tang, T., (2010). Macroeconomic conditions and capital structure adjustment speed. *J. Corp. Financ.* 16, 73–87
- Deutsche Bundesbank (2012), The importance of trade credit for corporate financing in Germany – evidence from financial statements statistics, *Monthly Report*, October, pp. 51-63
- Ferrando, A., I. Ganoulis, (2020), Firms’ expectations on access to finance at the early stages of the Covid-19 pandemic, European Central Bank, Working Paper Series No 2446
- Frank, M. Z., and V. Maksimovic, (2005), Trade Credit, Collateral, and Adverse Selection, Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=87868
- Gonzalez, O. (2020). Les structures de production et les rapports de force figent la situation en matière de délais et de retards de paiement. *Bulletin de la Banque de France* (227)
- Hackbarth, D., Miao, J., Morellec, E. (2006). Capital structure, credit risk, and macroeconomic conditions. *J. Financ. Econ.* 82, 519–550
- Khan, S. U., (2022), Financing constraints and firm-level responses to the COVID-19 pandemic: International evidence, *Research in International Business and Finance*, 59, Available at: <https://doi.org/10.1016/j.ribaf.2021.101545>
- Luo, H., (2021), COVID-19 and trade credit speed of adjustment, *Finance Research Letters*, Available at: <https://doi.org/10.1016/j.frl.2021.102541>
- Molina C. A. и L. A. Preve, (2007), An Empirical Analysis of the Effect of Financial Distress on Trade Credit, Available at: http://69.175.2.130/~finman/Prague/Papers/Molina_Preve_TradeCreditnFD_FMA.pdf
- Petersen, M. A., R. G. Rajan, (1994), The benefits of lending relationships: Evidence from small business data, *Journal of Finance*, (1994), Vol. 49, pp. 3-37
- Petersen, M. A., R. G. Rajan, (1995), The effect of credit market competition on lending relationships, *Quarterly Journal of Economics*, vol. 110, pp. 407 – 444
- Petersen, M. A., R. G. Rajan, (1997), Trade Credit: Theories and Evidence, *Review of Financial Studies*, vol. 10, issue 3, pp. 661-691
- Shah, F., Liu, Yu., Shah, Ya., & Shah, F., (2022), Trade credit promotes industrial growth during the COVID-19 pandemic: Evidence from the textile sector of Pakistan. *R-economy*, 8(1), 68–76. doi: 10.15826/recon.2022.8.1.006
- Wilner, B. S., (2000), The Exploitation of Relationship in Financial Distress: The Case of Trade Credit, *The Journal of Finance*, vol. 55, No.1, pp. 153-178
- Zimon, G., R. Dankiewicz, (2020), Trade Credit Management Strategies in SMEs and the COVID-19 Pandemic - A case of Poland, *Sustainability* 2020, 12, 6114; doi:10.3390/su12156114