



TRADE CREDIT AND BANK CREDIT IN CONDITIONS OF INFLATION: EVIDENCES FOR PUBLICLY TRADED NON-FINANCIAL ENTERPRISES IN BULGARIA

Galya Taseva¹

Abstract: *The purpose of the article is to examine the relationship between financing with trade credit and bank credit in the conditions of inflation in Bulgaria. The analysis in the article is based on data for 43 non-financial publicly traded enterprises in Bulgaria for the period 2018 - 2022. The results of the study show that with the sharp acceleration of inflation in Bulgaria in 2022, increase sharp also the ratio Trade credit / Total liabilities to banks and non-bank financial institutions. The research show that trade credit and bank credit are complementary sources of financing for publicly traded enterprises in Bulgaria in the period 2018 - 2021. With the acceleration of inflation in 2022, which is accompanied by a serious increase in the interest costs of companies, the nature of the relationship between trade credit and bank credit is changing. For 2021 and 2022, a statistically significant positive correlation is established between the ratio Interest expenses / Total liabilities to banks and other financial institutions and the ratio Trade credit / Credit from banks and non-bank financial institutions. As inflation accelerates, firms are looking to raise more interest-free financing from their suppliers to ease the burden of rising interest costs on bank loans.*

Keywords: *trade credit, bank credit, supplier financing*

JEL: *G30; G32; G39, G20*

1. Introduction

Inflation is a major macroeconomic factor of the business environment and is in the focus of attention of central banks around the world. The trade credit by the supplier companies has a non-monetary nature. But numerous theoretical and empirical studies reveal the role of trade credit for the transmission of monetary policy. There are many studies according to which, in conditions of monetary policy tightening, trade credit could play the role of a substitute for bank lending. But also a number of publications present evidence that credit from suppliers and credit from banks can be complementary sources of financing. The analysis in the article is based on data for non-financial publicly traded enterprises in Bulgaria. The purpose of the article is to

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



examine the relationship between financing with trade credit and bank credit in the conditions of inflation in Bulgaria.

2. Theoretical overview

Existing research on the relationship between trade credit and bank credit shows mixed results (Afrifa, Tingbani, Alshehabi, Halabi, 2023). Trade credit is a substitute for bank credit when an increase in the use of trade credit results in a decrease in bank credit financing. When an increase in the use of trade credit leads to an increase in the use of bank credit it indicates the presence of a complementary effect (Engemann et al., 2014; Lin & Chou, 2015 - cited in Afrifa, Tingbani, Alshehabi, Halabi, 2023, p. 748). Trade credit and bank credit are complementary when the demand for external financing is inelastic, i.e. when the firm's access to external financing is limited. But if the demand for external finance is elastic and firms can use one source of finance instead of another, trade credit and bank credit are substitutes (Myers and Majluf, 1984 - cited in Afrifa, Tingbani, Alshehabi, Halabi, 2023, p. 748).

Firms can use trade credit as a substitute for bank credit (Nielsen, 1999, Petersen and Rajan, 1997). This is particularly relevant in conditions of restrictive monetary policy. Based on data on small firms, which are more likely than large firms to have difficulty accessing finance, Nielsen (1999) finds an increase in the value of trade credit used in cases of bank contraction. Sahin (2019) found evidence supporting the hypothesis of substitution of bank credit with trade credit among SMEs in Turkey for the period 2008–2016. However, no such effect was observed for the large firms studied. Sahin (2019) notes that bank loans and trade loans have a dominant share in the financial structure of firms in Turkey.

Petersen and Rajan (1997) conclude that firms have advantages over banks in assessing the creditworthiness of their customers because of the informal information they receive in their commercial relationships. Given that both supplier firms and local cooperative banks rely on informal information in their lending decisions, it follows that trade credit and bank credit may be substitutable sources of financing (Filomeni, Modina, and Tabacco, 2023).

As a source of financing, trade credit is important in the transmission of monetary policy to business, as well as for the financial health of firms (Fitzpatrick and Lien, 2013). Trade credit can serve as an alternative to credit from banks and mitigate the adverse effects for companies when interest rates increase and bank credits become more expensive or access to bank credit is reduced. Where trade credit terms do not include a discount on the price of the goods for early payment, supplier financing is considered interest-free. Trade credit gives companies the opportunity to secure interest-free credit, with which they can replace bank credit to a certain extent, when it becomes more expensive as a result of an increase in interest rates.

Typically, the cost of trade credit has not correlated with changes in interest rates (Fitzpatrick and Lien, 2013, p. 41). The implicit price of the trade credit is determined by the terms of the credit sale transaction, by whether a discount is provided for early payment. Under two-part contract terms, where a discount for early payment is provided, trade credit may be more expensive than bank credit because of costs associated with the possibility of late payment,



greater risk of non-payment, and higher costs of acquisition of funds (Cunat, 2003). Petersen and Rajan (1997) find a negative relationship between the strength of firm-bank relationships and firms' demand for trade credit. Trade credit is mostly relied on by companies whose access to bank financing is difficult, as long-term credit from suppliers is more expensive. Nielsen (1999) also shows that in countries where firms have good relations with banks, the use of trade credit is lower.

Fitzpatrick and Lien (2013) examine the micro-level relationship between trade credit and bank credit using data on non-public firms in Australia. Fitzpatrick and Lien (2013) do their research on whether the two types of credit are substitutes under the assumption that bank credit affects trade credit, but the use of trade credit does not affect the use of bank credit. The results of Fitzpatrick and Lien's (2013) study show that there is partial substitution between trade credit and bank credit for Australian non-listed firms.

Tabash, Farooq, Hamouri, Kumar, and Al-Faryan (2023) examine the impact of government governance on trade credit using data on Pakistani non-financial firms from 2010 to 2019. At high interest rates, external financing becomes expensive for firms, so they reduce their borrowing or abandon debt financing altogether. At high interest rates, corporations are looking for alternative sources of financing such as trade credit. In their study, Tabash, Farooq, Hamouri, Kumar and Al-Faryan (2023) found a positive relationship between the real interest rate and trade receivables and payables. The reason is that the increase in the cost of bank loans stimulates companies to seek more financing from suppliers. The rate of inflation is also a factor in making financing decisions for companies. Rising inflation makes financing from financial institutions expensive and unattractive for firms (Tabash, Farooq, Hamouri, Kumar, & Al-Faryan, 2023). The interest rate on loans from financial institutions is formed based on the rate of inflation, since financial institutions take into account the rate of return adjusted for inflation. This suggests a positive relationship between the inflation rate and trade credit. However, Tabash, Farooq, Hamouri, Kumar and Al-Faryan (2023, p. 13) find a negative relationship of inflation with trade receivables and payables. The explanation, according to them, is that high inflation increases uncertainty and restricts the commercial activity of enterprises. High inflation and high price volatility discourage supplier firms from selling on credit. High inflation also reduces the purchasing power of buyer firms and further shrinks the volume of sales and trade receivables (Musarat et al., 2020 - cited in Tabash, Farooq, Hamouri, Kumar and Al-Faryan, 2023).

Srivastava and Gopalakrishnan (2021) examine the effect of the crisis caused by the Covid-19 pandemic on the trade credit channel and conclude that trade credit depends on product market conditions and is not always a substitute for bank lending. Trade credit replaces bank credit only under favorable product market conditions. The pandemic had a strong negative impact on economic conditions (Miteva, 2022). The crisis that was triggered by the Covid-19 pandemic has specific characteristics, such as the disruption of supply chains, which led to an increase in demand and prices for a number of goods whose supply turned out to be insufficient (Nenkov and Hristozov, 2023, p. 137).

A number of authors prove that there can be a complementarity effect between supplier financing and bank credit (Ng, Smith and Smith, 1999; Demirguc-Kunt and Maksimovic, 2001; Cole, 2010; Daripa and Nilsen, 2005; Antov and Atanasova, 2007). Whether trade credit and bank credit will be substitutes or complementary sources of financing depends on certain conditions, such as the wealth of the borrower (Burkart and Ellingsen, 2004). The difference in the term of trade credit, which is usually short-term, and bank credit, which can be of a longer term, is also a reason for their simultaneous use (Cole, 2010). Even in the presence of a substitution effect, it does not exclude the possibility of complementarity, especially for certain groups of firms such as younger and smaller firms (Gama, Mateus and Teixeira, 2008).

Afrifa, Tingbani, Alshehabi, Halabi (2023, p. 748) examine the relationship between trade credit and short-term bank credit in UK public and private firms using a sample of 254,352 firm-year observations for the period 2008–2021. They find that trade credit is a substitute for bank credit for publicly traded firms that have easy access to cheap external financing, but the two types of credit are complementary sources of funds for non-publicly traded firms that have limited access to alternative sources of funding. Also, the results obtained by Afrifa, Tingbani, Alshehabi, Halabi (2023) show that publicly traded firms adjust faster to their optimal levels of trade and bank credit.

Afrifa, Tingbani, Alshehabi, Halabi (2023) make an additional analysis of the influence of certain factors such as financial constraints and the size of firms on the nature of the relationship between trade credit and bank credit. Examining the impact of financial constraints, they find that trade credit serves as a complementary source of financing for both public and non-public firms that experience more financial constraints. Regarding the influence of firm size, their research results show that both public and non-public small and medium-sized enterprises use trade credit and bank credit as complementary sources of financing.

Trade credit facilitates the attraction of bank lending due to the signaling effect of trade credit (Alphonse, Ducret and Severin, 2003; Biais and Gollier, 1997; Antov and Atanasova, 2007). The ability of firms to attract credit from their suppliers is indicative of a low probability of becoming unable to pay their debts to creditors. In addition, extending trade credit to customers is a positive signal to banks, which increases supplier firms' access to finance (Biais and Gollier, 1997).

Afrifa, Tingbani, Alshehabi, Halabi (2023, p. 763) find that non-public firms and firms that are financially constrained use trade credit not only to signal their creditworthiness to banks but also to supplier firms. Firms that are more financially constrained use credit from their suppliers to signal their creditworthiness to banks or use their access to bank credit to signal their creditworthiness to their suppliers.

3. Empirical study

The study of the dependence between trade credit and bank credit in the conditions of inflation is based on data from the financial statements of 43 enterprises listed on the Bulgarian Stock Exchange for the period of 2018. - 2022. The research methods used are horizontal and vertical

financial analysis, descriptive statistics, Pearson correlation, analysis of variance with Kruskal-Wallis test. Nonparametric analysis of variance with Kruskal-Wallis test was used because it is appropriate when the conditions for applying parametric analysis of variance are not met, as in the case. In order to be able to apply a parametric analysis of variance with an F-test, the following restrictive conditions must be met: independent random samples; normal distribution of the outcome variable in each subset; equality of variances for the outcome variable in the subsets (Boshnakov, 2009, p. 81).

In 2022, a sharp jump in inflation is observed in Bulgaria. Table 1 presents the average annual inflation in Bulgaria during the period 2018-2022 according to data from the National Statistical Institute.

Table 1. Average annual inflation in Bulgaria during the period 2018 – 2022.

	2018	2019	2020	2021	2022
Total CPI (%)	2.8	3.1	1.7	3.3	15.3

Source: National Statistical Institute

The following figure shows the dynamics of payables to suppliers and customers in the period 2018 - 2022. The graph shows that there was a serious drop in payables to suppliers and customers in the first year of the Covid-19 pandemic in Bulgaria, which mainly is due to a decrease in economic activity as a result of the strict measures to limit the spread of the virus. In 2021, with the recovery of economic activity, the value of payables to suppliers and customers increased, even surpassing the level of 2019. This increase continues in 2022.

Figure 1. Arithmetic mean of payables to suppliers and customers

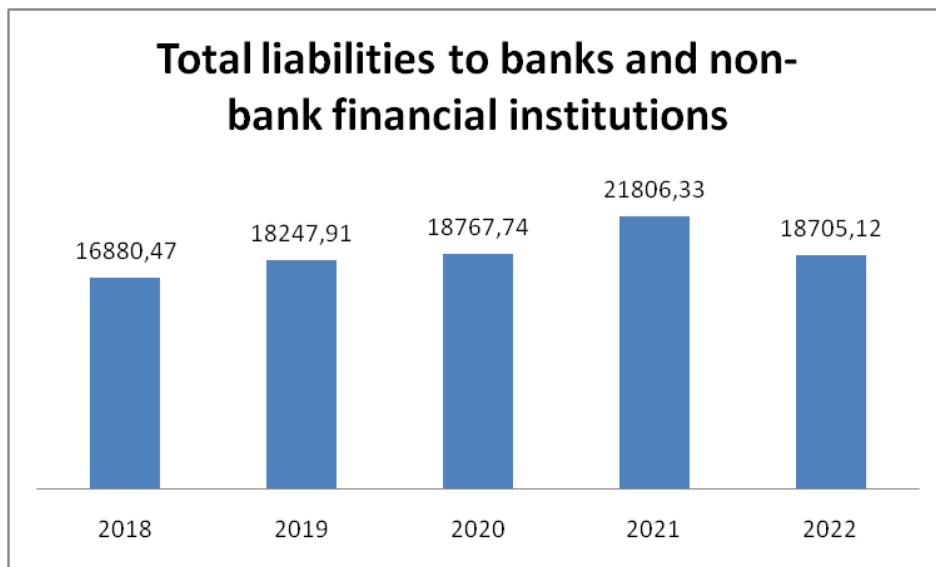


Source: Author's calculations

The following figure shows the dynamics over time of the amount of loans drawn from banks and non-bank financial institutions. From 2018 to 2021, an increase in liabilities to banks and

non-bank financial institutions is observed. The highest value of this indicator is in 2021. In 2022, a serious decrease in credit by banks and non-bank financial institutions was registered.

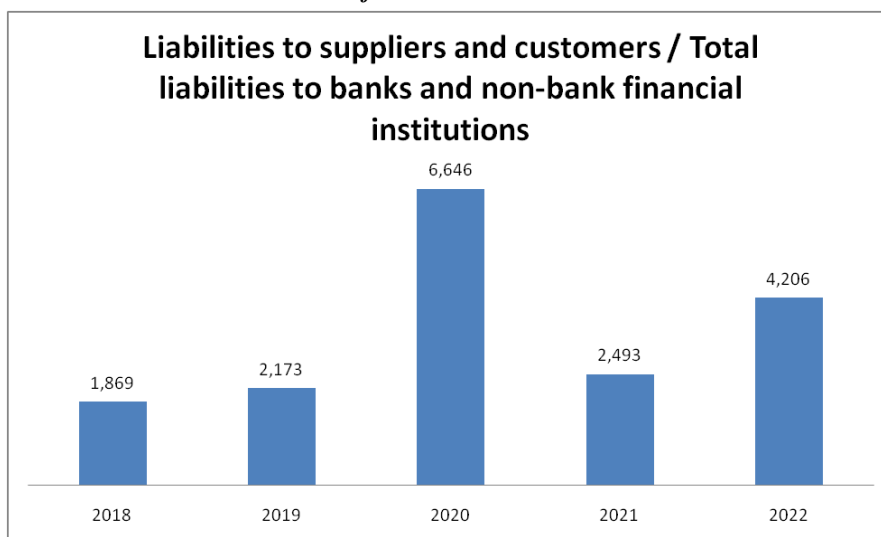
Figure 2. Arithmetic mean of liabilities to banks and non-bank financial institutions



Source: Author's calculations

During the analyzed period 2018 - 2022, a significant dynamic of the ratio of Liabilities to suppliers and customers / Credits from banks and non-bank financial institutions is established. There is a sharp increase in the first year of the pandemic, followed by a significant decrease in 2021. Again, a very sharp increase is seen in 2022.

Figure 3. Arithmetic mean of the ratio Liabilities to suppliers and customers / Liabilities to banks and non-bank financial institutions



Source: Author's calculations

The Pearson correlation coefficient study shows a positive statistically significant relationship between trade credit and institutional credit in 2018, 2020 and 2021 at the 0.05 significance level, and at the 0.1 significance level in 2019 as well. This gives reason to assume that trade credit and lending from banks and non-bank financial institutions are complementary sources of financing for publicly traded enterprises in Bulgaria in the period 2018 - 2021. In 2022, in the conditions of high inflation, is absent such statistically significant dependence.

Table 2. Correlation dependence between liabilities to suppliers and customers and the total liabilities to banks and non-bank financial institutions

	Sig.	Pearson correlation
2022	0,210	0,195
2021	0,003	0,436
2020	0,001	0,471
2019	0,064	0,285
2018	0,007	0,408

Source: Author's calculations

Analogous results are also obtained when investigating the existence of a statistically significant relationship between trade credit and short-term lending by banks and other financial institutions.

Table 3. Correlation dependence between payables to suppliers and customers and short-term liabilities to banks and non-bank financial institutions

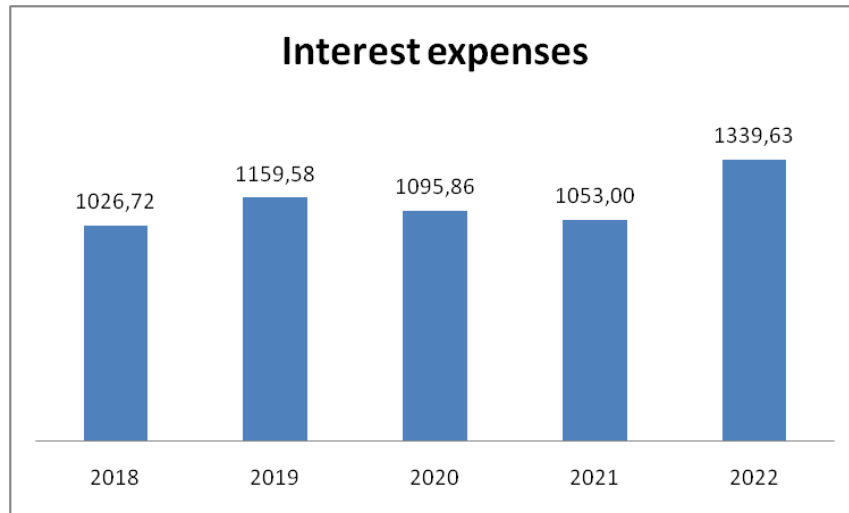
	Sig.	Pearson correlation
2022	0,105	0,251
2021	0,001	0,494
2020	0,001	0,503
2019	0,079	0,271
2018	0,009	0,393

Source: Author's calculations

It is widely accepted in the literature that one of the factors that influence the relationship between liabilities to suppliers and customers and liabilities to banks and other financial institutions is the level of interest rates and interest costs that firms bear. They are directly related to the rate of inflation. In 2022, a serious increase in the interest costs of the surveyed

companies was established. The dynamics of interest expenses of the surveyed companies in the period 2018-2022 is shown in the following figure.

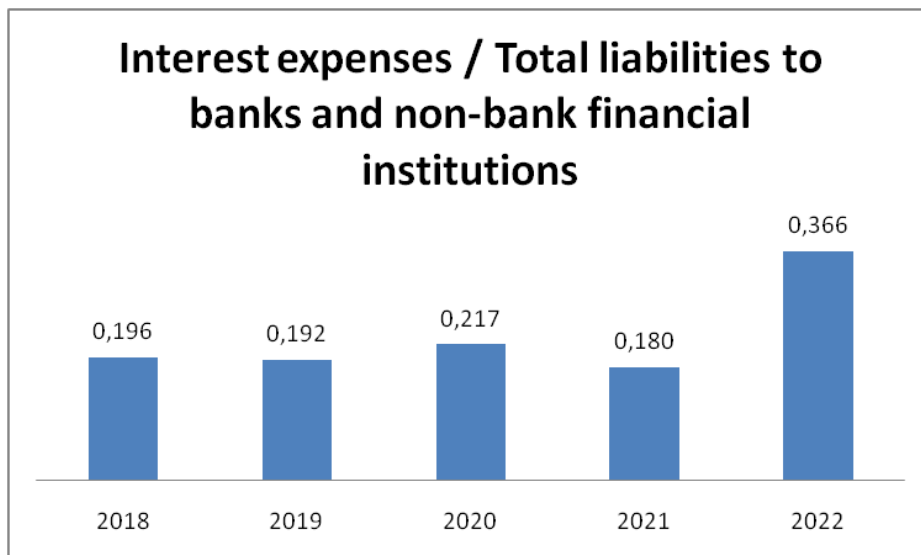
Figure 4. Arithmetic mean of interest expenses



Source: Author's calculations

The very strong increase in the ratio Interest expenses / Total liabilities to banks and non-bank financial institutions in 2022 is evidence of the increasing burden that firms bear in servicing their interest debt.

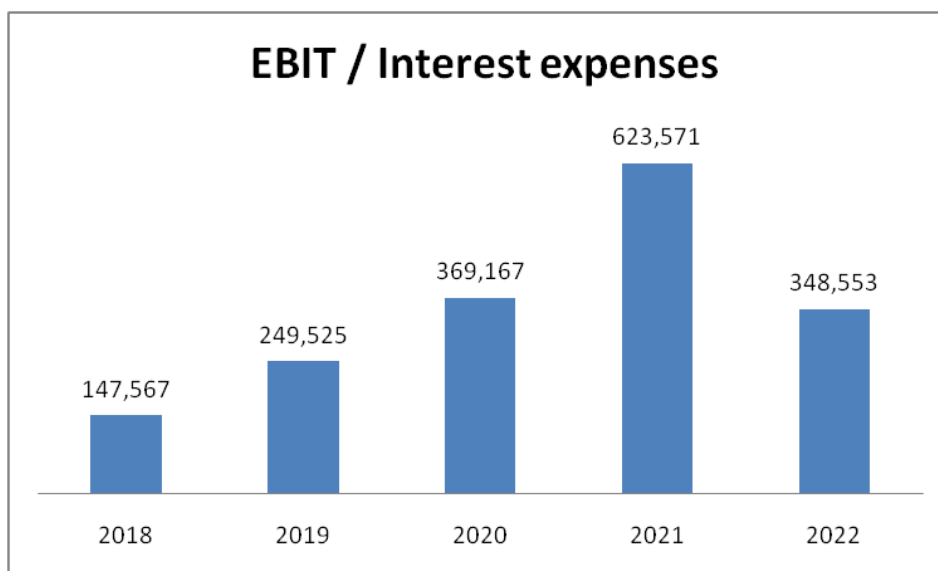
Figure 5. Arithmetic mean of the ratio Interest expenses / Total liabilities to banks and non-bank financial institutions



Source: Author's calculations

The interest coverage ratio is also indicative of the burden of enterprises in servicing obligations to banks and non-bank financial institutions. This ratio increases continuously from 2018 to 2021, when it reaches its peak. In 2022, the interest coverage ratio drops very sharply, which is an indicator of a serious increase in the risk of companies.

Figure 6. Arithmetic mean of the interest coverage ratio



Source: Author's calculations

From the data in table 4, it can be seen that from 2021, with the acceleration of inflation in Bulgaria and the strengthening of inflationary expectations of economic agents, a positive statistically significant relationship appears between the interest burden on servicing bank loans and loans from non-bank financial institutions and the ratio of trade credit, which is largely interest-free to institutional lending. Firms that begin to experience higher interest costs on loans from banks and other financial institutions in 2021 and 2022 have a higher ratio of trade credit to institutional credit.

Table 4. Correlation between the ratio *Interest expenses / Total liabilities to banks and non-bank financial institutions* and the ratio *Liabilities to suppliers and customers / Total liabilities to banks and non-bank financial institutions*

	Sig.	Pearson correlation
2022	0,004	0,520
2021	0,005	0,509
2020	0,851	0,037
2019	0,120	0,313
2018	0,696	0,079

Source: Author's calculations

The results of the non-parametric analysis of variance with the Kruskal Wallis test, which are presented in the following table, are in accordance with the above correlation dependences.

Table 5. Results of a study with non-parametric analysis of variance for the presence of a statistically significant difference in the value of the ratio Interest expenses / Total liabilities to banks and other financial institutions for companies net trade credit creditors and net trade credit debtors

	Sig.
2022	0,030
2021	0,030

Source: Author's calculations

In 2022 and 2021, a statistically significant difference is established between the value of the ratio Interest expenses / Total liabilities to banks and other financial institutions for companies net trade credit creditors and net trade credit debtors. The analysis of mean ranks shows that firms experiencing a higher interest burden on bank loans and loans from non-bank financial institutions tend to reduce their interest costs by trying to attract more interest-free financing from their suppliers and become net trade credit debtors.

4. Conclusion

The results of the research show that with the sharp acceleration of inflation in Bulgaria in 2022, a sharp increase in the ratio of trade credit to credit from banks and non-bank financial institutions is also observed. Trade credit is a flexible source of financing for businesses through which businesses adapt to adverse economic events, such as supply and demand shocks such as those caused by the Covid-19 pandemic, the inflation and related changes in interest rates. The obtained results give reason to assume that trade credit and bank credit are complementary sources of financing for publicly traded enterprises in Bulgaria in the period 2018 - 2021. With the acceleration of inflation in 2022, which is accompanied by a serious increase of interest costs of companies, the nature of the relationship between trade credit and bank credit is changing. In 2022, trade credit and bank credit are no longer complementary sources of funding. For 2021 and 2022, a statistically significant positive correlation is established between the ratio Interest expenses / Total liabilities to banks and other financial institutions and the ratio Trade credit / Credit from banks and non-bank financial institutions. As inflation accelerates, firms are looking to raise more interest-free financing from their suppliers to ease the burden of rising interest costs on bank loans.

References

- Afrifa, G. A., Tingbani, I., A. Alshehabi b., Halabi, H. (2023). Do trade credit and bank credit complement or substitute each other in public and private firms?. - International Review of Economics and Finance, 88(2), p. 748 -765.
- Alphonse, P., Ducret, J. and Severin, E. (2003). When trade credit facilitates access to bank finance: Evidence from US small business data, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=462660>
- Antov, D. S. and Atanasova, C. V. (2007). Trade Credit Financing: How Expensive Is It Really?, Available at: <<http://ssrn.com/abstract=967522>>

- Biais, B. and Gollier, C. (1997). Trade Credit and Credit Rationing. - *Review of Financial Studies*, 10(4), p. 903-957
- Boshnakov, V. (2009). *Statisticheski metodi v empirichnite izsledvaniya*, Sofiya: Avangard Prima, ISBN 978-954-323-576-6 [Boshnakov, V. (2009). *Statistical methods in empirical research*, Sofia: Avangard Prima, ISBN 978-954-323-576-6 (in Bulgarian)]
- Burkart, M. and Ellingsen, T. (2004). In-Kind Finance: A Theory of Trade Credit. - *The American Economic Review*, 94(3), p. 569-590
- Cole, R. A. (2010). Bank Credit, Trade Credit or No Credit: Evidence from the Surveys of Small Business Finances, Available at: <<http://mpr.ub.uni-muenchen.de/24689/>>
- Cunat, V. (2003). Trade Credit: Suppliers as Debt Collectors and Insurance Providers, Available at: <<http://www.cepr.org/meets/wkcn/6/6620/papers/cunat.pdf>>
- Daripa, A. and Nilsen, J. (2005). Subsidizing Inventory: A Theory of Trade Credit and Prepayment, Birkbeck Working Papers in Economics & Finance, Available at: <<http://www.ems.bbk.ac.uk/research/wp/PDF/BWPEF0522.pdf>>
- Demirguc-Kunt, A. and Maksimovic, V. (2001). Firms as Financial Intermediaries: Evidence from Trade Credit Data, Policy Research Working Paper Series No. 2696, The World Bank, Available at: <<https://documents1.worldbank.org/curated/en/973231468767093690/pdf/multi0page.pdf>>
- Engemann, M., Eck, K., and Schnitzer, M. (2014). Trade credits and bank credits in international trade: Substitutes or complements? - *The World Economy*, 37(11), p. 1507–1540
- Filomeni, S., Modina M., and Tabacco E. (2023), Trade credit and firm investments: empirical evidence from Italian cooperative banks. - *Review of Quantitative Finance and Accounting*, 60, p. 1099–1141
- Fitzpatrick, A. and Lien, B. (2013). The Use of Trade Credit by Businesses, Bulletin – September 2013, Reserve Bank of Australia, Available at: <<https://www.rba.gov.au/publications/bulletin/2013/sep/pdf/bu-0913-5.pdf>>
- Gama, A. P. M., Mateus, C. and Teixeira, A. (2008). Does trade credit facilitate access to bank finance? An empirical evidence from Portuguese and Spanish small medium size enterprises, Available at: <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1310818>
- Lin, T.T. and Chou, J.H. (2015). Trade credit and bank loan: Evidence from Chinese firms. - *International Review of Economics & Finance*, 36, p. 17–29
- Miteva, D. (2022). Impact of pandemics – an economic perspective, Papers of 8th Annual Monetary Research Center Scientific Conference "Economic challenges in the context of pandemic and war circumstances", Available at: <<https://mrcenter.info/Doc/ConferencePapers/2022/19.pdf>>
- Musarat, M. A., Alaloul, W. S., Liew, M. S., Maqsoom, A., and Qureshi, A. H. (2020). Investigating the impact of inflation on building materials prices in construction industry. - *Journal of Building Engineering*, 32 (November), 101485
- Myers, S. C., and Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. National Bureau of Economic Research Working Paper No. w1396, Available at: <https://ssrn.com/abstract=274547>
- Nenkov, D. and Hristozov, Y. (2023). DCF Valuation: the Interrelation between the Dynamics of Operating Revenue and Gross Investments. - *Economic Studies journal*. 32(7), p. 114-138
- Ng, C. K., Smith, J. K. and Smith, R. L. (1999). Evidence on the determinants of credit terms used in interfirm trade. - *The journal of finance*, 54(3), p. 1109-1129
- Nielson, J. (1999). Trade Credit and the Bank lending Channel. Working Paper No. 99.04, Swiss National Bank, Study Center Gerzensee, Gerzensee, Available at: <<https://www.econstor.eu/bitstream/10419/127985/1/wp-9904.pdf>>
- Petersen, M. A. and Rajan, R. G. (1997), Trade Credit: Theories and Evidence. - *Review of Financial Studies*, 10(3), p. 661-691
- Sahin, A. (2019). Does Trade Credit Channel Operate in Turkey? An Analysis with CBRT Sector Statistics. - *Ege Academic Review*, 19(4), p. 437-455



- Srivastava, J. and Gopalakrishnan, B. (2021). In-kind financing during a pandemic: Trade credit and COVID-19, MPRA Paper No. 111433, Available at: <https://mpra.ub.uni-muenchen.de/111433/8/MPRA_paper_110965.pdf>
- Tabash, M. I., Farooq, U., Hamouri, B., Kumar, A. and Al-Faryan, M. A. S. (2023). Effect of country governance on trade credit activities: Empirical evidence from Pakistan. - *Cogent Economics & Finance*, 11(2), p. 1-17