Vol.3, Issue 1

DOI: 10.20544/SERBE.05.01.22.P01

ANALYSIS OF DETERMINANTS OF CORPORATE CASH HOLDING OF LISTED MANUFACTURING COMPANIES ON THE MACEDONIAN STOCK EXCHANGE

Aleksandar Naumoski[1], Simona Ruseva[2]

Abstract

In this study, we identify the determinants of cash holding in Macedonian manufacturing companies. The analysis was conducted using accounting data from publicly available financial statements of the sample of Macedonian industrial companies for the 2005 to 2019 period. The research was conducted through the prism of the postulates of the three main theories in corporate finance, i.e., the trade-off theory, pecking order theory,and thefree cash flow theory. To that end, we applied a panel regression analysis, while from the obtained results we assess which theoretical model best explains the cash management in Macedonian companies. We found that the cash to total assets ratio averaged 3.1%. The cash holding decreases with the decrease of the net working capital, financial leverage,cash flow variability, andcash conversion cycle. Cash holding increases with the increase of the company size, cash flow, debt maturity, and capital investments. We concluded that most of the results are in line with the pecking order theory, which indicates that Macedonian companies do not have predefined cash balances, and the cash holdings are abuffer between retained earnings and investments. The level of cash holding is not planned and is not optimized, but is determined during the work processes and depends on other business decisions.

Keywords: cash holding, trade-off theory, pecking order theory,free cash flow theory, North Macedonia

[1] St. Cyril and Methodius University in Skopje, Faculty of Economics, Republic of North Macedonia; e-mail: aleksandar.naumoski@eccf.ukim.edu.mk

[2]Cushman&Wakefield FORTONMKA, Republic of North Macedonia; e-mail: rusevasimona@gmail.com

1. Introduction

Effective and efficient management of the company's liquidity includes the management of cash, which is necessary for the normal execution of the company's business operations. The amount of cash is not a static parameter in different companies, nor the same company at different times. The financial statements of the companies offer a picture of the size and dynamics of the cash holding. Of course, it is indisputable that cash holding or lack of cash, causes costs of various kinds. On the one hand, the excess cash causes an opportunity cost, i.e., unrealized returns that companies could achieve if they invested them in other assets. On the other hand, the lack of cash leads to liquidity problems, inability to pay liabilities on time, loss of trust with suppliers,penalties, costs for providing cash, etc. Many analysts over time have tried to find the answer to the question of why and what is the optimal amount of a firm’s cash holding. Their explanations are relatedto the identified motives for cash holdings, such as transaction motive, precautionary motive, speculative motive, agency motive, and tax motive.The motives for holding cash are elaborated through the three main theories in corporate finance: trade-off theory, pecking order theory,and thefree cash flow theory. According to trade-off theory, companies optimize cash, which is the amount of cash that equatestothe marginal benefits and costs of cash holding. In contrast, the pecking order theory is based on the postulate that there is a hierarchy in corporate financing. Namely, companies should strive to be financed primarily from their internal sources of retained earnings, and if they are not sufficient, they should access external sources of financing, primarily debt issuance, and in the last instance a new issue of shares. Based on that, there are no optimal cash balances, but the size of the cash holding is a result of the financial and investment policies of the companies. Free cash flow theory is based on the impact of agency problems, conflicts of interest between the company's stakeholders, primarily managers as shareholders' agents and shareholders as principals, on business decisions. According to this theory, managers do not aspire to optimize cash, according to costs and benefits of cash holding, but hold cash at a level that will serve to satisfy their interests, which is sometimes opposite or to the detriment of the interests of shareholders. Based on these three theoretical assumptions, several determinants of cash holding have been identified.

The purpose of this research is to identify the determinants of corporate cash holdingaccording to theoretical models. We used the numerous scientific researches on this topic as a basisespecially those that have the greatest impact, such as the researches of Opler et al. (1999), Ozkan and Ozkan (2004), Ferreira and Vilela (2004), Bates et al. (2009). The research was conducted on a selected sample of Macedonian industrial

companies listed on the Macedonian Stock Exchange, for which we took their accounting datafrom their audited financial statements for the period 2005 to 2019. We employed a panel regression model where the dependent variable is cash ratio and the exogenous independent and control variables are consistent with the transaction motive and the precautionary motive of the cash holding: net working capital, leverage, firm size, cash flow, cash flow variability,and cash conversion cycle.

The main goal of this paper is the identification of the influence of determinants on the cash holdings by Macedonian companies. The analysis was conducted on the representative sample consisting of ten Macedonian industrial companies in the time period from 2005-2019. To conduct the analysis, we used the publicly available financial reports published on the Macedonian Stock Exchange. The focus will be on the elaboration of the basic theoretical models for the motives for holding cash balances by companies, i.e. the trade-off theory, pecking order theory, and thefree cash flow theory.We applied a panel regression analysis to find the causalities and explanation of how the obtained results correspond with the cash holding theories. The main question we would like to get an answer to be whether companies have pre-defined cash balances, which is the basic postulate of the trade-off theory, or cash balances are not planned but are defined during work processes and depend on other business decisions.This paper will make a great contribution to the disclosure of the cash management practices and policies of Macedonian companies. The greatest contribution will be in determining the causal determinants of cash holding as implications for improving managers' cash management practices.

2. Determinants of cash holding

In this section, we elaborate on the determinants that influence the company's cash holding decisions. Inspired by previous studies conducted on this issue, we focused on those having the greatest impact and considered the most relevant. Subsequently, we will explain each of them one by one as well as each positive or negative impact on cash.

The size of the company. Trade-off theory assumes that larger companies are stable, highly profitable,havinga high degree of diversification of business activities. Analogously, they have a constant cash flow, and thus a minimal likelihood of financial distress. These features represent the basis for companies to save less cash. Thus, there is a negative relationship between cash holding and company size. In their studies,Miller and Orr (1966), and later Bigelli and Sanches - Vidal (2012) point out that larger

companies enjoy the benefits of economies of scale in their operations, which in turn allows these companies to access faster and cheaper external sources of funding. It should be noted here that borrowing costs are inversely proportional to the size of borrowing, and these costs are significantly higher for smaller companies (Kim et al., 2011). According to Al-Najjar and Belghitar (2011), the higher diversification of larger companies compared to smaller ones makes larger companies less susceptible to financial distress, which can even lead to the bankruptcy of the company. Given the fact that borrowing transaction costs are lower for larger companies, company size and cash are expected to be inversely related. Previous research conducted on this topic by Opler et al. (1999), Ferreiraand Vilela (2004), Drobetz and Gruninger (2007), Chen (2008), Al-Najjar and Belghitar (2011) and Bigelli and Sanches-Vidal (2012), indicates a negative relationship between company size and corporate cash holdings. Pecking order theory implies a positive relationship between the size of the company and the corporate cash holdings, because the size of the company is considered a kind of accelerating force towards the business success of the company. Ferreira and Vilela (2004) point out that large companies, after the completion of their investment projects, achieve greater financial success and, as a result, have even higher cash holdings.Free cash flow theory also assumes a positive relationship. Large companies have many dispersed shareholders, which then allows managers to exercise greater autonomy over investment decisions, so they keep larger cash balances. Opler et al. (1999) suggests that company size can be a barrier to takeover. Namely, the larger the targeted company, the more cash the buyer should have. A large company can take advantage of this, which finally indicates that large companies should have excess cash.

Liquid assets substitutes. If the company has a shortage of cash, it can sell other assets it owns or accessthe financial markets. Other working capital items, primarily cash equivalents, are considered cash substitutes. Liquid assets substitutes are all those non-cash items that can be converted into cash quickly and with little or no transaction costs (Al-Najjar &Belghitar, 2011). At the same time, as Ozkan and Ozkan (2004) point out, liquid assets can be converted into cash much cheaper than other assets, thus avoiding expensive financing in capital markets. According to this, per the trade-off theory, companies that have more liquid assets have fewer cash reserves. This view is supported by several researchers including (Bates et al.., 2009; Gill& Shah, 2012; Bigelli & Sanchez-Vidal, 2012; Uyar & Kuzey, 2014).

Leverage. According to trade-off theory, companies having high leverage face significantly higher risks of financial distress and potential bankruptcy, precisely because of the pressures of such debts on financial management. Al-Najjar and Belghitar (2011) and Kim et al. (2011), state that highly indebted companies, driven by prudent motives,hold large amounts of

cash to avoid possible bankruptcy. In contrast, D'Mello et al.. (2008) predicted that companies, with a high ability to secure additional borrowing, would keep smaller cash balances. Thus,thetrade-off theory is unconvincing about the relationship between cash and leverage.According to pecking-order theory, the level of debt increases when the investments exceed the retained earnings of the company, and consequently the cash decreases (Ferreira & Vilela, 2004). This indicates a negative relation between cash and leverage.Additionally, several studies confirm thathigh levered companies have lower cash holdings (Opler et al.,1999; Ferreira&Vilela, 2004;Ozkan&Ozkan, 2004; Al-Najjar&Belghitar, 2011). Although some researchers likeDrobetz and Gruninger (2007) and Guney et al. (2003) found a nonlinear relationship between leverage and cash holding, the latest studies on this topicfind that highly indebted companies tend to hold less cash(Al-Najjar &Belghitar, 2011; Subramaniam et al., 2011; Uyar&Kuzey, 2014; Wasiuzzamam, 2014).

Cash flow .Cash flow is a source of liquidity for companies. According to trade-off theory, there is a negative relationship between cash flow and cash holding. By this, Kim et al. (1998), Subramaniam et al. (2011), Islam (2012),and Nyborgand Wang (2014) confirm a negative relationship, as operating cash flow reduces the need to hold large cash balances. Conversely, the pecking order theory pointsto a positive relationship between cash flow and cash holdings, supported by the fact that companies that generate large cash flows are likely to retain some of the cash they will use to finance new investments and eventually use it in a situation of financial difficulties. According to this theory, previous research conducted by Opler et al. (1999),Ozkan and Ozkan (2004),Drobetzand Gruninger (2007), García Teruelet et al. (2009), Duchin (2010),Ogundipeet al. (2012),Mugumisi and Mawanza (2014), Maheshwari and Rao (2017), Chauhan et al. (2018) demonstrates a positive relationship between cash flow and cash holding.

Cash flow volatility. Companies that have high cash flow volatility face liquidity constraints, which in turn leads to a lack of cash, forcing companies to give up some profitable investment projects (Ozkan&Ozkan, 2004). For this reason, companies havinghigh volatility of their cash flows are expected to keep larger cash balances, which would eliminate liquidity constraints and related costs. Thus, according to Trade-off theory, there is a positive relationship between the volatility of cash flows and the cash balances held by companies. Empirical research conducted by Guneyet et al. (2003), Al-Najjar and Belghitar (2011) and Bigelli and Sanchez-Vidal (2012) confirms this positive relationship.

Cash conversion cycle. The cash conversion cycle is a metric that shows the length of time from the moment of outflow of cash for the purchase of raw materials that are included in the production process until the collection, i.e., cash inflows from finished products and services sold. Namely, the cash cycle shows the time in which cash is included in the company in various forms of assets before being returned in cash. Drobetz and Gruninger (2007) in their research found that the shorter cash conversion cycle ensures better alignment of cash inflows and outflows, thus reducing the need to hold cash. Hence, according to trade-off theory, a positive relationship is expected between the conversion cycle and the cash balances. At the same time, the research of Deloof (2001) emphasizes the existence of a negative relationship between the cash conversion cycle and the cash holding, because the longer cash conversion cycle leads to a larger amount of receivables and inventories that are significantly more liquid than other assets, while the long cash conversion cycle also leads to a smaller volume of liabilities to be paid in a shorter period. Hence, the longer conversion cycle is a kind of additional source of company liquidity. John (1993), Kim et al. (1998),and Wang et al.(2014), also support this claim.

Debt maturity. Ferreira and Vilela (2004) found that debt maturity affects cash holdings. The use of short-term debt involves the renewal and negotiation of credit terms regularly. As a result, companies may face refinancing risks if they fail to meet these criteria, which can lead to disruption of financial stability. The risk of not being able to refinance is the risk that the company will not be able to borrow additional funds to repay its existing debt. This situation causes financial difficulties, because the company does not have the financial sources to cover the outstanding liabilities and repay the debts to the creditors. Thus, the company must approach alternative sources of cash, i.e., sell some significant assets at a lower price to repay its debt. Harford et al. (2008) found that high cash balances could help avoid selling the company's key assets, thus preventing inefficient disposal. Thus, if the other variables are under control, Ferreira and Vilela (2004) consider that there is a negative relationship between debt maturity and cashholdings. On the other hand, the research of Barclay and Smith (1995) shows that the companies with the highest credit rating easily provide short-term financing. If we consider the fact that the companies with the highest credit rating have easier access to the capital markets, then they are expected to have less cash, which causes a positive relation of the debt maturity with the cash holdings.

Capital investments. Trade-off theory suggests that capital investments reflect the financial strength of the company (Bates et al., 2009). Hence, companies withthehigh capital investment will face high transaction costs in the capital markets to provide the necessary funds. Riddick and Whited

(2009) argue that to avoid these high transaction costs, companies maintain higher cash balances. Kim et al. (2011) points out that capital expenditures lead to investments in new assets thatlater can be used ascollateral, which strengthens the lending capacity of companies. Consequently, companies that have easier access to lending will keep smaller cash balances, establishing a positive relationship between cash and capital expenditures. Pecking order theory assumes that cash balances depend on capital investment (Dittmar et al., 2003). Based on this, any increase in capital expenditures reduces cash balances, resulting in a negative relationship between cash holdings and capital investments (Dittmar et al., 2003; Bates et al., 2009). However, empirical research on the relationship between cash holdings and capital investment has so far been unconvincing. Namely, Chen (2008) indicates that companies with high capital expenditures tend to keep lower cash balances, while Opler et al. (1999) in his research presents diametrically opposite evidence.

Table 1. Expected impact of the determinants on the cash holding according to the theories

Variable	Trade-off theory	Pecking order theory	Free cash flow theory
Company size	Negative	Positive	Positive
Liquid assets substitutes	Negative		
Leverage	Positive and negative	Negative	Negative
Cash flow	Negative	Negative	
Cash flow volatility	Positive		
Cash conversion cycle	Positive and negative		
Debt maturity	Negative	Positive	
Capital Investments	Positive	Negative	

Source: Authors' own calculations

3. Data and measurements

To examine the impact of the above determinants on the cash holding of Macedonian companies, we used the accounting data from the financial statements that are available on the Macedonian Stock Exchange. We analyzed a balanced sample of data from 10 industrial companies in the 2005-2019 period.

The dependent variable in our research isthecash to assets ratio, which we calculated as the ratio between the sum of cash and short-term investments divided by total assets. We define cash as bank cash and cash on hand plus liquid short-term financial instruments that are considered cash equivalents.

Measurement of exogenous variables.

- **Net working capital.** This ratio is calculated as follows: total current assets minus cash and cash equivalents divided by total assets;
- **Leverage.** This ratio is calculated as follows: total debt (short-term and long-term) is divided by total assets;
- **The size of the company.** We calculate it as a natural logarithm of the total assets;
- **Cash flow.** This ratio is calculated when pre-tax profit plus depreciation is divided by total assets such as Ozkan and Ozkan (2004);
- **Cash flow volatility.** We measure it by the standard deviation of the company's cash flows divided by total assets;
- **Cash conversion cycle.** We calculated as the sum account receivables collection period plus inventories period minus account payables payment period:
- **Debt maturity.** According to Ferreira and Vilela (2004), the maturity of the debt is calculated when the difference between the total debt and the debt due for payment within one year is divided by the total debt;
- **Capital expenditures.** This ratio is calculated when capital expenditures are divided by total assets.

4. Empirical results

The results of the descriptive statistics showed that the cash in the total assets of the companies that were the subject of this research in the 2005-2019 period averaged 3.1%. Macedonian companies in the analyzed period have lower cash to assets ratio compared to companies from other countries.

Thus, this ratio for companies in the UK is 9.9% (Ozkan and Ozkan, 2004), in EU countries it is 14.8% (Ferreira & Vilela, 2004) while for US companies it is 7.2%. (Bates et al., 2009). The maximum relative share of cash in the total assets in our analyzed sample reaches 48.7%, and the minimum is 0%.

Net working capital is 2.5% of the total assets. This ratio is also lower compared to developed countries where, for example, forcompanies in the US, is 17.6% (Bates et al., 2009), for companies in the UK is 4.8% (Ozkan&Ozkan, 2004), while in the countries of the EU is 3.5% (Ferreira &Vilela, 2004). The maximum share of the net working capital reaches up to 52.5%, and the minimum to -84.7%.

Macedonian companies in the analyzed period have a total indebtedness rate of 29.2%. This rate indicates that Macedonian companies have a high degree of indebtedness compared to companies from other countries. For example, in the United Kingdom, the corporate debt ratio is 16.2%. The maximum indebtedness rate of Macedonian companies reaches 80.4%, and the minimum is 0%.

The average cash conversion cycle for the analyzed companies is 277 days, with a maximum number of days of 3598 and a minimum of -59 days. Precisely, the averageaccount receivables conversion period is 101 days,theinventory conversion period is 315 days, and the account payables payment period is 138 days.

Table 2. Descriptive statistics

	Cash to assets ratio	Net working capital	Leverage	Company size	Cash flow	Cash flow volatility	Cash conversion cycle	Debt maturity	Capital expenditures
Average	0.0305	0.0252	0.2922	21.02	0.0367	1.2760	277.5	0.4161	0.0426
Median	0.0167	0.0706	0.2883	21.29	0.0465	0.0391	161.8	0.3983	0.0269
Maximum	0.4876	0.5259	0.8040	23.33	0.6080	23.539	3598.3	1.0000	0.3190
Minimum	0.0000	-0.8479	0.0000	17.00	-0.9708	0.0049	-59.3	0.0000	0.0000
Standard deviation	0.0541	0.2546	0.1844	1.410	0.1867	4.5636	415.4	0.3103	0.0492
Observations	150	150	150	150	150	150	150	150	150

Source: Authors' own calculations

Table 3. Correlation matrix

	Cash to assets ratio	Net working capital	Leverage	Company size	Cash flow	Cash flow volatility	Cash conversion cycle	Debt maturity	Capital expenditures
Cash to assets ratio	1								
Net working capital	0.2003	1							
Leverage	-0.304	-0.6343	1						
Company size	0.0732	-0.1235	-0.0794	1					
Cash flow	0.3773	0.5064	-0.3644	-0.0471	1				
Cash flow volatility	-0.0375	0.2809	-0.0797	-0.7039	0.1184	1			
Cash conversion cycle	-0.0449	0.3679	-0.1759	-0.0299	-0.0906	0.1101	1		
Debt maturity	0.1973	0.3145	-0.1119	-0.1000	-0.0141	0.1996	0.1089	1	
Capital expenditures	0.1365	0.0942	-0.0551	0.0559	0.2696	0.0680	-0.2441	0.2114	1

Source: Authors' own calculations

The next step in our research is to conduct a panel regression analysis. The dependent variable is the cash ratio, and independent variables are net working capital, leverage, company size, net cash flow, cash flow volatility, cash conversion cycle, debt maturity, and capital expenditures.

We implemented Fixed effect model and Random effect model. To determine which model we should accept as the most relevant, we conducted the Hausman Test. The hypotheses of the Hausman test are:

- Hypothesis H_0: Random effect model is the most appropriate
- Hypothesis H_1: Fixed effect model is the most appropriate

The results obtained by conducting this test indicate that we should accept Hypothesis 1, i.e., that the Fixed Effect Model is the most appropriate. The results of this model are shown in Table 4.

Table 4. Results from the regression analysis

Variable	Coefficient	Standard error
Intercept	-0.4264**	0.2392
Net Working Capital	-0.0426*	0.0266
Leverage	-0.0415	0.0300
Company size	0.0223**	0.0111
Cash Flow	0.0884***	0.0286
Cash Flow volatility	-0.0047**	0.0024
Cash Conversion Cycle	-0.0000242*	0.00000928
Debt Maturity	0.0167	0.0132
Capital Investments	0.0763	0.0711
R^2	0.6744	
Adjusted R^2	0.6325	
F-statistic	16.085	
Prob(F-statistic)	0.0000	

Source: Authors' own calculations

Note: ***statistically significant variables at 1%, **statistically significant variables at 5%,*statistically significant variables at 10%

According to the model estimation, statistically significant variables are the net working capital, company size, cash flow, cash flow volatility, and cash conversion cycle. The other variables are not statistically significant.

The obtained results indicate that any increase in net working capital by one percentage point will cause a decrease in the share of cash in total assets by 4.2 p.p., any increase in the size of the company (i.e., any increase in total assets ofthecompany) for one percentage point will cause an increase in the share of cash in total assets by 2.2p.p., any increase in cash flows by one percentage point will cause an increase in the share of cash in total assets by 8.8 p.p., whileincrease of the cash conversion cycle by one day will cause a decrease in the share of cash in total assets by 0.0000242%.

Net working capital is a measure of the company's liquidity, a measure of operational efficiency, and an indicator of the short-term financial health of the company. The results of our analysis indicate a negative relationship between cash and net working capital, which is in line with the Trade-off theory.

The results obtained by conducting the analysis indicate that there is a negative relationship between cash holdings and leverage, and this is consistent with the predictions made by pecking order theory and free cash flow theory. Pecking order theory elaborates on this negative correlation with the view that as soon as all possibilities for securing cash from own sources are exhausted in a situation when the company's investments exceed the retained earnings, the company must approach alternative sources of cash from other external sources, i.e., increase the debt. Free cash flow theory suggests that companies with high debt ratios keep lower cash balances to protect themselves from a sort of powerful managerial discretion. Trade-off theory explains that the costs of providing liquidity increase with the increase of borrowing, which would mean a decrease in cash because of the increased percentage share of debt in the overall capital structure.

We found a positive relationship between cash holding and company size. Such results are in line with pecking order theory which predicts that large companies seek to implement larger projects, which result in increased company performance and subsequently contribute to achieving even larger cash balances. Free cash flow theory joins this view for a positive relationship between cash and company size, and explains that large companies often have dispersed shareholders, giving managers greater discretion over financial and investment decisions in the company, which in turn contributes to higher cash balances. We cannot prove this theory in this research, because we do not have data to measure the dispersion of shareholders, as well as the discretionary power of managers.

Our results indicate a positive relationship between the cash holdings and the cash flow of the company. They are in line withthepecking order theory which explains the positive relationship by the fact that companies that have high cash flows and do not face restrictive investment policies, will use the cash for new investments or use it in a situation of financial distress.

We found a negative correlation between cash and cash flow volatility. They do not correspond to the Trade-off theory which points to a positive correlation. Namely, the companies that have riskier cash flows keep larger cash balances. However, our study as well as the studies of Opler et al. (1999), which use a fixed-effects model, detected a negative correlation.

Trade-off theory claims that there is both a positive and a negative relationship between cash and the conversion cycle. Our results indicate a negative relationship. According to Deloof (2001), John (1993), Kim (1998) andWanget al. (2014), the negative relationship of cash with the cash conversion cycle is a consequence of the fact that the longer period of cash conversion contributes to an increased number of receivables and stocks that are significantly more liquid compared to other types of assets, and at the

same time contributes to a smaller volume of liabilities. which must be paid in a short period.

Our results point to a positive relationship between cash holdings and debt maturity and are consistent with the pecking order theory. We can explain such claims with real examples that indicate that banks are more inclined to approve loans to companies with higher credit ratings than to companies with high credit risks. Thus, companies that have achieved positive financial results will need less borrowing and less debt, and companies with low credit risk will have better access to borrowing and lower cash balances because they will be driven by a precautionary motive, which would contributeto a positive relation between debt maturity and cash.

The results of the analysis indicate a positive relationship between cash and capital investment. This outcome is consistent with the trade-off theory. Although this result is a bit more difficult to explain, it would suggest that companies that have their own funds tend to increase their investments by tending to rely on their own sources instead of borrowing funds.

Most of the obtained results are by the pecking order theory, which indicates that Macedonian companies do not have pre-defined optimal cash balances, but cash is used as a buffer between retained earnings and investments. The coefficient of determination determines that the internal factors explain the size of the cash owned by the company with 67%, and the unexplained part is due to other factors that are not part of our analysis. This size of the determinant coefficient is considered a high degree with high explanatory power

5. Conclusion

In this paper, we investigated the determinants of corporate cash holdings on a selected sample of Macedonian industrial companies listed on the Macedonian Stock Exchange using their accounting data for the 2005-2019period. The average share of cash in the total assets of the companies subject to this research is 3.1% and is significantly lower compared to developed countries with developed capital markets, such as the United Kingdom with 9.9%, the EU with 14%, and the United States with 7.2%. The maximum share of cash in the total assets reaches 48.7%.

According to the obtained results, the cash to assets ratio decreases with the increase of net working capital, leverage, cash flow variability, and conversion cycle, while itrises with the increase of the company size, cash flow, debt maturity, and capital investments.

The negative relationship between cash with net working capital and the conversion cycle is consistent with the Trade-off theory. Meanwhile, the negative relationship of cash with leverage is consistent withthepecking order theory. Our research has also shown a negative relation between cash and cash flow volatility which is not in line with Trade-off theory, yet our results correspond to research conducted by (Opler et al., 1999) and (Ferreira & Vilela, 2004), when using the fixed effects model.A positive relation between cash and company size, cash flow and debt maturity, is consistent with pecking order theory, while a positive correlation between cash and capital investment is consistent with trade-off theory. Most of the obtained results correspond, i.e., are in line withthepecking order theory, which on the other hand indicates that Macedonian companies do not have a predefined optimal cash balance, but cash is used as a buffer between retained earnings and investments.

References

Al-Najjar, B.,& Belghitar, Y. (2011). Corporate cashholdings and dividend payments: evidence from simultaneous analysis. *Managerial and Decision Economics*, 32, 231–41;

Barclay, M., & Smith, W.C. (1995). The Maturity Structure of Corporate Debt. *The journal of finance*, 50 (2), 609-631. https://doi.org/10.1111/j.1540-6261.1995.tb04797.x;

Bates, W.T., Kathleen M. K., & Stulz, M.R. (2009). Why Do U.S. Firms Hold So Much More Cash than They Used To? *The Journal of Finance*, 64 (5), 1985-2021.

Bigelli, M., &Sanches – Vidal, J. (2012). Cash holdings in private firms. *Journal of Banking & Finance*, 36 (1), 26-35.

Chauhan, Y., Pathak, R., & Kumar, S. (2018). Do bank-appointed directors affect corporate cash holding? *International Review of Economics & Finance*, 53, 39-56

Chen, YR. (2008). Corporate Governance and Cash Holdings: Listed New Economy versus Old Economy Firms. *Corporate governance,* 16(5), 430-442. https://doi.org/10.1111/j.1467-8683.2008.00701.x

D'Mello, R., Krishnaswami, S., & Larkin, P.J. (2008). Determinants of corporate cash holdings: Evidence from spin-offs. *Journal of Banking & Finance*, 32(7), 1209-1220.

Deloof, M. (2001). Belgian intragroup relations and the determinants of corporate liquid reserves. *European Financial Management*, 7(3), 375-392.

Dittmar, A., Mahrt-Smith, J., &Servaes, H. (2003). International corporate governance and corporate cash holdings. *Journal of Financial and Quantitative analysis*, 38(1), 111-133.

Drobetz, W., & Gruninger, M. C. (2007). Corporate cash holdings: evidence from Switzerland. *Financial Markets and Portfolio Management*, 21, 293–324. *Journal of Financial Economics*, 83, 599–634.

Duchin, R. (2010). Cash holdings and corporate diversification. *The Journal of Finance*, 65(3), 955-992.

Ferreira, M. A.,& Vilela, A. S. (2004). Why do firms hold cash? Evidence from EMU countries.*European Financial Management,* 10, 295–319.

García-Teruel, P. J., Martínez-Solano, P., & Sánchez-Ballesta, J. P. (2009). Accruals quality and corporate cash holdings. *Accounting & Finance*, 49(1), 95-115.

Gill, A., & Shah, C. (2012). Determinants of corporate cash holdings: Evidence from Canada. *International Journal of Economics and Finance*, 4(1), 70-79.

Guney, Y., Ozkan, A., &Ozkan, N. (2003). Additional international evidence on corporate cash holdings. Working Paper, University of York.

Harford, J., Mansi, S. A., & Maxwell, W. F. (2008). Corporate governance and firm cash holdings in the US. *Journal of financial economics,* 87(3), 535-555.

Islam, S. (2012). Manufacturing firms' cash holding determinants: Evidence from Bangladesh. *International Journal of Business and Management,* 7(6), 172-184.

John, T. A. (1993). Accounting measures of corporate liquidity, leverage, and costs of financial distress. *Financial Management,* 91-100.

Kim, CS, Mauer, C.D., and Sherman, E.A. (1998). The Determinants of Corporate Liquidity: Theory and Evidence. *The Journal of Financial and Quantitative Analysis*, 33(3), 335-359.

Kim, J., Kim, H. & Woods, D. (2011). Determinants of corporate cash-holding levels: an empirical examination of the restaurant industry.*International Journal of Hospitality Management*, 30, 568–74.

Maheshwari, Y., & Rao, K. V. (2017). Determinants of Corporate Cash Holdings. *Global Business Review,* 18(2), 416-427.

Miller, M., & Orr, D. (1966). A Model of the Demand for Money by Firms. *The Quarterly Journal of Economics,* 80 (3), 413-435.

Mugumisi, N. & Mawanza, W. (2014). Corporate cash holding under liquidity crisis: A Panel analysis of Zimbabwean firms. *Research Journal of Economics & Business Studies*, 3(3), 66-76.

Nyborg, K. G., & Wang, Z. (2014). Stock liquidity and corporate cash holdings: Feedback and the Cash as Ammunition Hypothesis. *Swiss Finance Institute Research Paper,* 13-36.

Ogundipe, L. O., Ogundipe, S. E., & Ajao, S. K. (2012). Cash holding and firm characteristics: Evidence from Nigerian emerging market. *Journal of Business Economics and Finance*, 1(2), 45-58

Opler, T., Pinkowitz, L., Stulz, R.M., & Williamson, R. (1999). The determinants and implications of corporate cash holdings.*Journal of Financial Economics*, 52 (1), 3–46.

Ozkan, A., & Ozkan, N. (2004). Corporate cash holdings: anempirical investigation of UK companies.*Journal of Banking and Finance*, 28, 2103–34

Subramaniam, V., Tang, T.T., Yue, H., & Zhou, X. (2011). Firm structure and corporate cash holdings. *Journal of Corporate Finance*, 17(3), 759-773.

Uyar, A., & Kuzey, C. (2014). Determinants of corporate cash holdings: evidence from the emerging market of Turkey. *Applied Economics*, 46(9), 1035-1048.

Wang, Y., Ji, Y., Chen, X., & Song, C. (2014). Inflation, operating cycle, and cash holdings. *China Journal of Accounting Research*, 7(4), 263-276.

Wasiuzzaman, S. (2014). Analysis of corporate cash holdings of firms in Malaysia. *Journal of Asia Business Studies*, 8(2), 118-135. https://doi.org/10.1108/JABS-10-2012-0048