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Impact of Company-Specific Determinants on Corporate Cash Holdings: Evidence from South-East European Countries

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Abstract

This paper investigates the impact of intercompany determinants on corporate cash holdings in South East Europe. We researched a large sample of companies listed on the stock exchanges. We found that SEE companies' cash holdings on average is 6.94% of the total assets, which is lower than in developed countries. Intercompany determinants have a significant impact on the company's cash holdings. Our results suggest that cash holdings are positively affected by the size of the firms, cash flow, cash flow uncertainty, debt maturity, and growth opportunities. Cash holdings are negatively affected by the net working capital, financial leverage, and capital expenditures. SEE companies operate in underdeveloped financial markets with limited access to finances, and their cash holding decisions are mostly determined by the transaction motive. Our findings indicate that companies in SEE do not pursue a cash optimization policy. They largely follow the pecking order pattern and the cash holding of the firm is mostly determined by means of the relationship between the capital investments and internally generated funds.

Introduction

A company's demand for money is determined by several factors that have long been discussed among financial economists. Theories about the motives and determinants of money demand have been developed on company-based research in developed countries. In this paper, we explore the determinants of cash holdings in companies operating in emerging Southeast Europe (SEE) markets. In a perfect capital market, holdings of liquid assets are irrelevant (Opler et al., 1999). In such a world with no liquidity premium, holding liquid assets has no opportunity cost, and the firm can raise external funds with zero cost. However, given the underdeveloped capital market and limited access to finance as the situation is in SEE (OECD, 2021, p. 172; Moder and Bonifai, 2017), managers trying to minimize the cost associated with external financing may find it optimal to maintain sufficient internal financial flexibility. This paper considers the explanation of determining factors of corporate cash holdings in the SEE region.

Conventional financial literature explores three well-known main motives for cash holding: transaction motive, precautionary motive, and speculative motive, but some add to them the tax motive and agency motive (Bates et al., 2009, p. 1988). The three main theories in corporate finance (trade-off theory, the pecking order theory, and the free cash flow theory) give various explanations for the motives for holding cash.

Managers who aim to maximize the company value should optimize the cash holdings and set it at a level where marginal costs are equal to marginal benefits of cash holdings. The cost of holding liquid assets implies the opportunity costs of cash or small returns on cash equivalents, and tax disadvantages (Opler et al., 1999). Holding cash has several benefits such as saving transaction costs for providing cash and utilizing investment opportunities as they arise. Keynes (1936) describes the first benefit as the transaction cost motive for holding cash, and the second one as the precautionary motive, while providing a theoretical foundation for determining the optimal holdings of liquid assets. Implementing an optimal cash policy is in the postulates of the trade-off model.

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Cash optimization based on cost-benefit principles may not be appropriate for companies seeking to grow. Cash should serve as the primary means to meet the firm's capital investment needs. In doing so, companies strive to finance the capital investment in the first order by means of internal funds, then if not sufficient the companies issue safe and risky debt, and finally by issuing equity (Myers, 1984). That is because of the information asymmetries that make outside funds more expensive and the dilution effect. This philosophy is in the postulates of the pecking order theory founded by Myers and Majluf (1984), which indicates the existence of a financing hierarchy. According to this concept, cash is not something that managers primarily focus on trying to optimize, but simply its size is random and depends on the ratio between the capital needed to invest in real investment projects and the size of internal funds of the company. If the internal funds are larger than the investment needs, then the company will have surplus cash that it can use to repay debts. The amount of internal funds that is lower than the required one to invest will encourage the company to provide financing from external sources.

Agency theory also assumes that company managers do not strive to optimize cash holdings based on the cost-benefit principle, but its size is in line with the interests of the managers, even when it is to the detriment of the interests of shareholders (Opler et al., 1999). The relationship between the owners of the company and business management gets complicated when they are not the same people. Managers are agents appointed by the owners to run the company, and their business decisions should be aimed at maximizing the interest of shareholders. Agency problems arise when managers' self-interest conflicts with that of the shareholders. Jensen (1986) explains this in his free cash flow theory based on agency cost. Especially in companies with a widely dispersed shareholder structure, managers have great discretionary power, and hold excess cash. Several reasons are involved for holding excess cash, such as holding a safety reserve, to avoid the market discipline, to avoid monitoring and control in case of external financing particularly in case of debt issuance, having enough cash for capital investments that are in their personal interest and for which the capital market is not interested to provide financing due to low returns, and even for investing in projects with a negative NPV.

The emergence and development of today's dominant theories in corporate finance are based on empirical research in the case of developed capital markets, especially the USA. However, it becomes obvious that this wisdom does not exactly correspond to actuality in the developed countries of continental Europe as well, not to mention the post-transition economies of Central and Eastern Europe (Mramor and Valentinčič, 2001; Peev, 2001; Filatotchev et al., 2003; Yeoh, 2007). The main contribution of this paper is that we conducted our empirical research on the case of underdeveloped emerging markets. Emerging markets have a specific characteristic that differs from developed markets. More specifically, we conducted a study of corporate financial practices of cash management in the case of companies from emerging markets in Southeast Europe. In this research, we considered a large group of ten emerging Southeast European countries (Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey), since most of them started their transition toward a market economy in the 1990s after the fall of socialism. Most of the SEE countries are small and open economies, interdependent with strong trade, capital, and other economic relations. Empirical research on corporate financial practices in the case of individual SEE countries is not attractive and has no basis for making relevant conclusions. Primarily because each of them has a relatively small number of listed companies (except Turkey), an insufficiently large volume of data, and short research series. By extending our field of research to all SEE countries, we expect to obtain an adequately large basis for drawing relevant conclusions. The examined SEE economies have underdeveloped capital markets with a dominant role of banks (OECD, 2019). They are bank-oriented with banking sector assets share in the total assets of the financial sector reaching between 75% and 92.4% (Arsov and Naumoski, 2016), with shallow capital markets, the IPOs being very rare, using corporate bonds for financing. Consequently, the predominant source of external financing for corporate investments are bank loans (OECD, 2019; Arsov and Naumoski, 2016), in a correlation with the retained earnings as a main internal source of financing. Working in underdeveloped financial markets, SEE companies have very little room for action to effectively manage cash. In their stock markets, the segment of secondary stock trading operates on a small scale, and new stock issues are absent or rare. The issuance of short-term and long-term debt securities such as corporate bonds or commercial paper, that allowed cash-deficit companies to raise money and cash-surplus companies to temporarily place excess cash, is insignificant and is completely absent in some countries (OECD, 2019, p. 172). Moreover, derivatives trading is present in only a few of the SEE countries and is not as large as in developed countries (ESMA, 2019). Thus, cash management in SEE companies comes down to efficient management of internally generated funds, whereas cash shortfalls are mainly provided by rising short-term and long-term bank loans, while cash surpluses are largely placed in bank deposits or government bills and bonds.

In addition to the introductory part, this paper is organized as follows. In section 2 we give a literature review. Firstly, we turn to the theoretical views on the impact of companies' internal determinants on cash holdings. Furthermore, we present the findings of other similar empirical studies. In section 3, we give definitions and measures for the variables that are the subject of this research. In addition, we provide a summary static analysis. In section 4, we regress the cash-to-assets ratio in relation to a set of exogenous variables that represent different characteristics of the internal economy of companies. In section 5, we provide results of the regression analysis and discussion. Finally, section 6 concludes, providing research limitations/implications and recommendations for future research.

Literature Review

Firm's internal specific determinants on the cash holding

Firm size. Trade-off theory assumes that large firms hold less cash, while small firms hold larger amounts of cash. The logic behind this assertion consists of several reasons: i) the simple transaction cost model of money demand considers that there is the economics of scale in cash management (Moller and Orr, 1966; Mulligan, 1997); ii) the costs of raising funds from external sources are fixed and do not depend much on their size (such costs are gross spread, underwriting discount, direct expenses like filing fees, legal fees, and taxes—all reported in the prospectus, indirect expenses, abnormal returns, underpricing, Green shoe option). The fees of borrowing are uncorrelated with the size of the loan (Peterson and Rajan, 2003); similarly, there are large fixed costs in public issuance (Barclay and Smith, 1995). Furthermore, large firms have less information asymmetry than small firms (Brennan and Hughes, 1991; Collins et al., 1981), which makes external funds costlier, and the borrowing is more constrained for small firms (Whited, 1992; Fazzari and Petersen, 1993; Kim et al., 1998). Thus, direct costs as a percentage of gross proceeds for equity in Initial Public Offerings range from 5.5% to 25.22%, in seasonal equity offerings are 3.37% - 35.11%, in context of issuance of straight bonds are 0.15% - 2.4%, while for issuance of convertible bonds are 2.29% - 9.82% (Ross et al., 2019, p. 631); iii) larger firms are more diversified and are less likely to experience financial distress (Titman and Wessels, 1988) since they can sell assets to provide financing sources (Bates et al., 2009). Small firms are more likely to go bankrupt when facing financial distress (Ozkan, 1996). The transaction and precautionary motive state a negative relationship between cash holding and the firm size according to the trade-off model.

The pecking order theory assumes that the size of the firm is positively related to the cash holdings. Larger firms are those that enter the maturity phase of their life cycle, so they are more successful in generating positive operating cash flows, which are much larger than their investment needs, and as a result, they hold more cash (Opler et al., 1999; Ferreira and Vilela, 2004).

Additionally, the positive relationship is also assumed by the free cash flow theory but for a different reason. Since the larger firms have larger shareholder dispersion, their managers have more discretionary power over the firm investment and financial policies. Among other things, this leads to a greater amount of cash holdings by the larger firms. In addition, Opler et al. (1999) argue that firm size is a takeover deterrent. A larger target requires more resources to be husbanded by the bidder, a large firm can more easily use the political arena to its advantage, and finally, we can expect large firms to hold excess cash.

Liquid assets substitutes. The company can provide cash by selling other assets. Net working capital less cash consists of liquid assets that are considered a substitute for cash, since it is common for firms to sell non-core assets in periods of economic distress (Lang et al., 1994) to provide liquidity. Besides this, the cost of converting non-cash liquid assets into cash is much lower as compared with other assets. In the case of cash shortage, firms can provide cash by selling them, rather than raising funds through capital markets. Thus, according to the trade-off theory, we can expect a negative relation between NWC and cash holding.

Leverage. According to the postulates of trade-off theory, the relationship between leverage and cash holding can be both positive and negative, depending on the motive for holding cash. If holding cash is motivated by transaction goals, then the relationship is negative. Namely, the company can provide cash for transactional purposes by means of issuing debt. Leverage can act as a proxy for the firm's ability to raise debt (John, 1993). Nevertheless, the cost of funds used to invest in liquidity increases as the ratio of debt financing increases (Baskin, 1987), leading to decreasing cash holdings with debt increasing. In addition, if the debt is sufficiently constrained, then firms will use the cash to pay the debt (Bates et al., 2009). Holding cash because of precautionary reasons shows a negative relationship between leverage and cash. In this context, firms having higher leverage tend to hold more cash to reduce the probability of financial distress, which is higher for the very indebted companies. According to Acharya et al. (2007) hedging argument, the relation can be positive. By hedging with financial instruments, a firm can avoid situations where it must borrow funds because of random variations in cash flow. Hence, firms for which hedging is expensive are expected to hold more liquid assets. We can see that the trade-off shows the positive and negative relationship, according to the cash-holding motive.

The other two theories assume only a negative relationship between leverage and cash. According to the pecking-order theory, cash is not a target per se but represents a random size, depending on the amount of capital needed to invest. As a firm accumulates internal funds, its leverage falls (Opler, 1999). Cash holdings fall when investment exceeds retained earnings and grow when investment is lower than the retained earnings (Ferreira and Vilela, 2004). Seen from the free-cash-flow theory perspective, the negative relationship means that firms with low debt hold excess cash (Opler, 1999). Managers would prefer having low debt, to avoid monitoring and control by the capital markets, thus providing superior managerial discretion.

Cash flow. Companies that have a positive cash flow from operating activities independently generate cash that they can use for transactional purposes (Kim et al., 1998). Thus, the trade-off model assumes presence of a negative relationship between cash flow and cash holdings from the transaction motive point of view. Another consideration is that firms with higher cash flow can accumulate more cash (Ferreira and Vilela, 2004; Bates, 2009).

Such firms might have better investment opportunities, but this is controlled through other variables. From a precautionary point of view, the pecking-order theory states a positive relationship.

Cash flow uncertainty. The instability of operating cash flows makes its own generated funds an unreliable source of funding. The greater the variability of cash flows, the more likely the company would be in cash shortage situations (Ozkan and Ozkan, 2004). In this case, the precautionary motive stimulates managers to hold cash to meet liquidity needs. Therefore, the trade-off theory assumes a positive relationship between cash flow uncertainty and cash balance based on a precautionary motive. The costs of cash shortage are the missed benefits of not being able to undertake valuable investment opportunities. An expected positive relationship between cash holding and cash flow uncertainty is also argued by Ferreira and Vilela (2004) and Bates (2009), but Ozkan and Ozkan (2004) did not find any evidence to support the view that firms with more volatile cash flows hold more cash.

Cash conversion cycle (CCC). CCC shows the length of time a company's cash is tied up in working capital before that money is finally returned when customers pay for the products sold or services rendered (Hutchison et al., 2007). Mathematically, CCC can be calculated as the difference between the operating cycle (that is inventories' period in days plus the account receivables collection period in days) minus the account payables payment period in days. Theoretically, if the company manages to get suppliers to pay them when it collects the receivables, i.e., the period of payment of accounts payables to be equal to the operating cycle, the cash holding for transaction purposes will be minimized. According to Opler (1999), the firms with short CCC should have fewer liquid assets, so the trade-off theory states a positive relationship between cash holdings and CCC.

Debt maturity. According to Ferreira and Vilela (2004), a negative relationship between cash holdings and debt maturity exists. They claim this because firms that rely on short-term debt financing, when renegotiating the credit terms can face constraints for the renewal of the credit lines. Companies' access to debt sources largely depends on their creditworthiness. Thus, companies with better credit ratings issue debt more easily than companies with higher credit risks. Therefore, it is expected that these firms will hold less cash for precautionary reasons, which would cause debt maturity to be positively related to cash holdings. Even more given that, the firms, which have already accessed the capital markets, are expected to have a lower transaction cost. Hence, Opler et al. (1999) states that the static trade-off model implies that firms with a higher debt rating hold less cash, whereas the financing hierarchy model implies the contrary, since firms that have done well have less debt and hence a higher bond rating.

Capital expenditures. The capital investments of the company lead to the creation of new tangible and intangible assets. These assets can be used by the company as collateral for new borrowings, which in turn are a substitute for cash (Bates et al., 2009). Hence, capital investments have a negative relationship with cash holdings. Increased investment by the company can lead to less saving and lower cash holdings, which eventually means a negative relationship (Riddick and Whited, 2009). According to Bates (2009), capital expenditures could proxy for financial distress costs and/or investment opportunities, in which case they would be positively related to cash. The former arguments state a positive and negative relationship between CAPEX and cash holdings. Per the static trade-off theory, firms with more capital expenditures have more liquid assets (Opler, 1999). In contrast, the pecking order theory suggests that cash balances result from the firm's investment decisions (Dittmar et al., 2003). Consequently, cash holding is negatively correlated with capital expenditures, which means the increase in capital expenditures reduces cash holdings (Dittmar et al., 2003; Bates et al., 2009).

Investment opportunity. The precautionary motive encourages managers to hold cash to not miss out on good investment opportunities with a positive NPV. Omitted returns from missed investment represent opportunity costs for the company. Firms with greater growth opportunities are expected to incur higher bankruptcy costs (Williamson, 1988; Harris and Raviv, 1990; Shleifer and Vishny, 1992). In the event of a company going bankrupt, the value of the investment opportunity is greatly reduced. Consequently, managers are encouraged to hold cash to avoid financial distress. Following this logic, the trade-off theory states that cash holding has a positive relationship with the investment opportunity set (Ferreira and Vilela, 2004). Following another economic logic, the pecking-order theory also assumes a positive relationship. Here, raising capital from external sources, especially by issuing shares, is costly due to asymmetric information and adverse selection problem. It also encourages managers to hold more cash as internally generated available resources, in order not to miss out on valuable investment opportunities, and the opportunity costs that result from it (Ferreira and Vilela, 2004). Myers (1977) finds that these costs are present in growing firms that use risky debt. In the case of great agency cost of debt, external financing is expensive, and firms should hold liquid assets to avoid the cost of cash shortfalls. Contrary to these two views, the free-cash-flow theory sets a negative relationship between holding cash and investment opportunities. Managers had discretionary power and made decisions that do not benefit shareholders. Sometimes they invest in projects that have negligible returns and even a negative NPV. Managers may use the free cash flow to undertake negative NPV projects in their own best interest (Jensen, 1986), which is known as the overinvestment problem. The capital market is not interested in securing financing for such projects, so managers have an incentive to hold cash.

Review of the most recent empirical findings

The research on the determinants of corporate cash holdings has a great interest in the empirical literature of corporate finance both in developed and in the case of underdeveloped countries and emerging markets. The focus of the research of this paper is the determinants of cash holding in emerging markets. Among the first papers to investigate the determinants of cash holdings is that of Nadiri (1969). He concluded that real cash balances of the manufacturing sector are sensitive to changes in the general price level, movements of factor prices, long-term interest rate, and the change in the interest rate. Opler et al. (1999) have evidence that US firms with strong growth opportunities and riskier cash flows have relatively high cash holdings, unlike the firms that have the greatest access to the capital markets, such as large firms and those with high credit ratings which tend to hold lower cash ratios. The double increase in the cash to total assets ratio of the US companies resulted from riskier cash flow encouraging companies to hold more cash for precautionary motives in the 1980–2006 period (Bates et al., 2009). Ferreira and Vilela (2004) show that in the EMU countries cash holdings are positively affected by the investment opportunity set and cash flows, and negatively affected by assets liquidity, leverage, and size. Companies in Turkey apply targeted cash level, which is positively influenced by cash flow and growth opportunities and negatively related by capital expenditures, cash substitutes, assets tangibility, financial debt ratio, and leverage (Uyar and Kuzey, 2014). In their research, Brown and Peterson (2011) focus on the impact of R&D costs on the cash holding of US companies. They found that firms that are most likely to face financing frictions rely extensively on cash holdings to smooth R&D, especially young companies relied on cash holdings during the high volatility of the stock market and the possibility of new equity issues.

Corporate governance characteristics such as managerial ownership, board structure, and ultimate controllers of companies are considered very important for corporate cash holdings. Other researchers have investigated the agency costs of managerial discretion, initially examined by Jensen and Meckling (1976) and Jensen (1986), on the corporate cash holdings. The results are mixed where some have evidence that entrenched managers hold less cash (Harford et al., 2008), more cash (Yun, 2009), but Bates, Kahle and Stulz (2009) and Lie and Yang (2018) find no evidence that corporate governance affects cash holdings. Ozkan and Ozkan (2004) found a non-monotonic relationship between managerial ownership and cash holdings, whereas as managerial ownership grows, cash first falls, then grows, and begins to decline again on a very high level of concentration of the ownership. They also provide evidence that firms controlled by families hold higher levels of cash and marketable securities. According to Ferreira and Vilela (2004), in countries with superior investor protection and concentrated ownership, firms hold less cash, supporting the role of managerial discretion agency costs in explaining cash levels. Board reforms improve corporate governance, which decreases the risk that entrenched managers will use cash to expropriate value for private benefit. After board reforms, firms significantly reduce their cash holdings and are more likely to spend cash on R&D, dividend pay-outs, and share repurchases but are less likely to spend cash on capital and acquisition expenditures, while the improvements in corporate governance following board reforms increase the value of cash (Chen et al., 2020).

Several studies investigate the impact of the 2008-09 global financial crisis on corporate cash holdings. Financially constrained firms restricted their corporate spending during the credit crisis with cuts in tech spending, employment, and capital spending; also, they burned through more cash, drew more heavily on lines of credit for fear banks would restrict access in the future, and sold more assets to fund their operations (Campello, 2010). Cuts to fixed investment in the crisis were typically far more severe than cuts to R&D and firms allocate cash reserves to buffer R&D but do not use cash to protect fixed investment (Brown and Petersen, 2015). The financial crisis has forced companies in China to hold more cash (Lian et al, 2011), with more cash being immanent for companies with lower leverage, less net working capital, and lower capital expenditures. Cash holdings during the pre-crisis period and the post-crisis period followed the different patterns of Jordanian companies, and the precautionary motive was the most important motive for the Jordanian firms to hold cash (Al-Amarneh, 2015). Generally, cash flow, liquid assets substitutes, degree of financial leverage, and dividend payment policy are the most important determinants of corporate cash holdings in Jordan. Firm-level determinants of cash holdings significantly differ during pre- and post-crisis periods, while the adjustment toward the optimal cash level is lower in the post-crisis period in the case of East-European companies (Batuman et al., 2021). Managers are more likely to expropriate shareholders through corporate liquidity policy during a financial crisis since the controlling effect of shareholder protection on corporate cash holdings has been mitigated, especially with financially constrained firms (Tran, 2020).

Corporate behavior and corporate financial policy are influenced by the regulatory and legal determinants. Under the postulates of the "theory of law and finance," the law system affects the corporate cash holdings through the regulatory requirements, channels of economic development, shareholder protection, etc. Firms operating in civil law systems hold significantly higher cash as compared to their peers from common law systems (Gupta and Pathak, 2021). Industry-specific regulations can affect cash holdings. Energy firms in Northern and Western Europe increased their cash holdings as a buffer against the unexpected cash shortages with the implementation of the EU energy directives but this did not cause the effect in the UK and Eastern Europe (Yildiz and Karan, 2020).

Living in a climate-changing world, the latest research seeks to find a link between the environmental aspects and the cash holding by companies. In research on Chinese companies, it is found that air pollution increases the level

of enterprise cash holdings regardless of the level of regional financial development in nonstate-owned enterprises (Li et al., 2021).

Data description

The data for the empirical research are taken from the financial statements of publicly traded companies in the SEE countries in the period 2013-2019, obtained from the Thomson Reuters Eikon and Datastream database. The reason we focus on listed companies only is that they have special obligations to meet the criteria for listing on stock exchanges, especially in terms of auditing and transparency of financial statements, which we consider more reliable. Our analysis covers the widest scope of SEE countries: Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey. When designing the sample, we excluded financial firms (because their business involves inventories of marketable securities that are included in cash and because they are required to meet statutory capital requirements), utilities (since their cash holdings can be subject to regulatory supervision), and firms with missing observation for any variable. We applied other filters to have as consistent data as possible: we excluded the upper and lower 5%, excluded all companies that had negative values of the accounts collection period, inventory period, account payable payment period, negative operating cycle, negative sales, and assets. These criteria have provided us with a total of 6,101 firm-year observations.

Measure of cash holdings

Cash in this research is broadly defined, whereby cash means the amount of cash held by the company plus cash equivalents. Cash equivalents are items that can be converted into cash immediately. Cash equivalents usually include bank account deposits and marketable securities. Marketable securities and money market holdings are considered cash equivalents because they are liquid and not subject to material fluctuations in value.

Following Bates et al. (2009) and Ozkan and Ozkan (2004), the primary dependent variable used in the analysis below is the Cash to Assets Ratio measured as Cash and Short-Term Investments divided by Total Assets. Other studies employ several alternative definitions of the cash ratio, including (1) cash to net assets (where net assets equal total assets minus cash and equivalents) (Opler et al., 1999; Ferreira and Vilela, 2004), (2) log of cash to net assets (Foley et al. 2007), and cash to sales (Bates et al., 2009). We focus only on the cash to assets ratio as an established and most reliable representative of cash holdings. For example, the cash to net assets ratio generates extreme outliers for firms with most of their assets in cash, as is the case here. Foley et al. (2007), try to overcome this problem of extreme outliers by using Ln(Cash/Net Assets).

The summary statistics of the cash holding for the whole sample, as well as by individual countries, are shown in Table 1. The average amount of cash held by companies in SEE is 6.94% of total assets. Previous studies of developed countries show that this amount concerning UK companies is 9.9% (Ozkan and Ozkan, 2004, p. 2117), and 7.2% concerning USA companies (Bates et al., 2009).

Table 1. Cash ratio by country, 2013–2019 period.

Country	Mean	25th percentile	Median	75th percentile	Standard deviation	Number of observations
Bosnia and Herzegovina	0.0366	0.0031	0.0158	0.0482	0.0579	382
Bulgaria	0.0487	0.0050	0.0179	0.0512	0.0823	964
Croatia	0.0598	0.0083	0.0276	0.0663	0.0908	510
Greece	0.0727	0.0165	0.0416	0.1011	0.0842	1,308
Montenegro	0.0398	0.0029	0.0096	0.0261	0.0668	98
North Macedonia	0.0485	0.0035	0.0188	0.0568	0.0748	224
Romania	0.0773	0.0084	0.0334	0.0958	0.1099	661
Serbia	0.0643	0.0073	0.0297	0.0934	0.0820	410
Slovenia	0.0527	0.0103	0.0283	0.0674	0.0659	189
Turkey	0.0993	0.0159	0.0619	0.1487	0.1071	1,355
SEE	0.0694	0.0090	0.0318	0.0941	0.0927	6,101

Differences in the average amount of cash held by companies in individual countries are evident. Companies in Bosnia and Herzegovina hold the lowest level of cash at only 3.66% of total assets, while companies in Turkey hold as much as 9.93% of total assets in cash. The differences in the average amount of cash in individual countries are due to the specific domestic environment in which companies operate, such as different institutional environments, differences in functionality of financial markets and access to financial instruments, taxation law, bankruptcy laws, patterns of corporate governance, the level of economic development of the countries, the inflows

of foreign and portfolio investments. Even though common to all is operating in conditions of underdeveloped financial markets. Short-term investments in companies' balance sheets are primarily bank deposits and to a lesser extent investment in treasury bills. Most of the cash held by companies in SEE is in the form of bank accounts and deposits.

Exogenous variables

Explanatory variables of corporate cash holdings are per the explanations of the transaction, precautionary, speculative, and agency motive of cash holdings derived from the postulates of the trade-off, pecking order, and free-cash-flow theory. The variables used here are as follows:

(1) Non-cash liquid assets. We consider the net working capital as a cash substitute since it consists of current assets that convert into cash in a short-term period. We employ the Net Working Capital Ratio as a measure for non-cash liquid assets substitutes. We measure the NWC ratio as (total current assets minus total current liabilities minus cash and short-term investments) divided by total assets.

(2) Leverage. We measure the Leverage Ratio as total debt (long-term plus short-term debt) divided by total assets.

(3) Firm size. The size of the firm is measured as a natural logarithm of total assets in euros, in constant year 2019. Consumer Price Index is applied for all countries in the sample, transformed to shift the base year to 2019. Firstly, we converted the amounts of the total assets of the companies into the same currency Euro using the historical exchange rate on the date of the financial statement. Already in the next step, we calculated ln(total assets).

(4) Cash flow. We employ the Cash Flow Ratio, which we measure as cash flow divided by total assets. The cash flow is measured as earnings before taxation plus depreciation (Ozkan and Ozkan, 2004). Other authors propose different measures for cash flow, where Opler et al. (1999) and Bates et al. (2009) assess cash flow as earnings after interest, dividends, and taxes plus depreciation.

(5) Cash flow uncertainty. We measure the cash flow volatility with the standard deviation of the firm's cash flows divided by the total assets, using similar procedure suggested in Opler et al. (1999) and Ferreira and Vilela (2004). For each firm we compute the cash ratio standard deviation for the 7 years of the sample. We then take the average across the Datastream industry classification.

(6) Cash conversion cycle. We calculate CCC as the account receivables collection period plus inventory's conversion period minus the account payables period.

(7) Debt maturity. According to Ferreira and Vilela (2004), debt maturity is measured as total debt minus debt repayable in less than one year divided by total debt.

(8) Capital expenditures. We employ the CAPEX Ratio that we measured as capital expenditures divided by the total assets.

(9) Growth opportunities. The widely used measure for growth opportunities is the Tobin Q. We consider this measure acceptable only for the research conducted in the case of a developed efficient capital market. For the SEE emerging capital markets that are inefficient, and less liquid, where share valuations are doubtful and the companies' R&D investments are negligible, a more appropriate proxy could be the change in the log of total assets (Titman and Wessels, 1988). Danbolt et al. (2011) on research on the efficient market have proven that Tobin's Q is a very poor measure of growth opportunities and suggest seven other alternative measures that work better. All of them are based on using stock price and none of them is suitable for low-performing inefficient emerging SEE markets. Arsov and Naumoski (2016) use the ratio between the cumulative three-year amount of fixed capital investments from the cash-flow statements and the total assets in the last year of the respective three-year period. We measure the growth opportunities as the change in the log of total assets in the same way as Naumoski et al. (2022).

Summary statistics of the exogenous variables are provided in Table 2 for the whole sample, and in Table 3 by country.

The leverage ratio shows the extent to which the companies rely on debt financing as an external source. The total debt includes the short-term and the long-term debt. This debt is owed to the banks in the first place, given that companies in SEE do not issue short-term commercial and long-term debt instruments. The total debt ratio shows that 25.2% of the sources of financing for the SEE companies are from debts. The short-term debt amounts to 13.9% of the total assets, while the long-term debt amounts to 11.3% of the total assets. This finding is similar to Botoc and Anton (2017) who found that total debt is 23.8% of total assets in the case of the broad set of companies from Central, Eastern, and Southeast Europe from 2006 to 2015. The companies in Bosnia and Herzegovina have the lowest share of debts in the sources of financing at only 15.6%, while the largest share is shown by the Greek

companies at 40%. Also, additional analysis shows that total liabilities over the total assets for the whole sample of the SEE companies amount to 54%, and the share of equity is 46%.

The NWC ratio amounts to only 0.55% of the total assets of the whole sample, and the picture by country shows that in some countries it is even negative, especially in Montenegro. Thus, the non-cash liquid assets are not a reliable source of cash substitute in SEE countries.

Table 2. Summary statistics of exogenous variables.

	Mean	25th percentile	Median	75th percentile	Standard deviation
Net working capital ratio	0.0055	-0.0793	0.0328	0.1601	0.3358
Leverage	0.2515	0.0470	0.2020	0.3832	0.2786
Firms size	17.9	16.8	17.9	19.0	1.8
Cash flow ratio	0.0317	-0.0039	0.0384	0.0846	0.1968
Cash flow uncertainty	0.0776	0.0299	0.0503	0.0849	0.1176
Cash conversion cycle	126.8	4.4	76.9	188.6	902.2
Debt maturity	0.3747	0.0000	0.3354	0.6786	0.3417
Capital expenditures ratio	0.0368	0.0031	0.0176	0.0466	0.0638
Growth opportunities	0.9999	0.9956	0.9995	1.0039	0.0129
Inventory period	227.5	38.3	87.0	185.5	728.4
Accounts receivable period	136.9	38.6	72.5	132.0	355.4
Accounts payables period	237.6	50.3	88.6	171.0	693.7
Operating cycle	364.4	107.6	183.8	327.2	897.2

The average cash flow ratio for the whole sample amounts to 3.17% having large differences in various countries. The cash flow volatility amounts to 7.76% for the whole sample and shows the great similarity between countries.

The average debt maturity shows that 37.5% of the total debt matures in a period longer than one year, and even 62.5% is a short-term debt.

Table 3. Exogenous variables' averages by country, 2013 – 2019 period – I. part.

	Net working capital ratio	Leverage	Firms' size	Cash flow ratio	Cash flow uncertainty
Bosnia and Herzegovina	0.0273	0.1561	17.732	0.0346	0.0366
Bulgaria	0.0635	0.1703	16.261	0.0198	0.0931
Croatia	-0.0257	0.2467	18.668	0.0373	0.0630
Greece	-0.0584	0.4006	18.604	-0.0080	0.0777
Montenegro	-0.1637	0.2503	17.257	0.0074	0.0904
North Macedonia	0.0654	0.1975	16.835	0.0328	0.0545
Romania	0.0218	0.1694	17.395	0.0393	0.0764
Serbia	0.0243	0.2094	17.237	0.0203	0.0721
Slovenia	-0.0079	0.2974	18.472	0.0527	0.0765
Turkey	0.0223	0.2495	18.888	0.0738	0.0891

The average cash conversion cycle for the whole sample is period of 126.8 days. It is determined by the inventory period, account receivable, and account payable period. On average, SEE companies settle their account payables in period of 237.6 days, and collect their account receivables in period of 136.9 days. The account receivables collection period is much shorter than the account payables payment period, leading to lower CCC and thus a lower need for cash holdings. If companies manage to equate the operating cycle (inventory period plus account receivable period) with the account payables payment period, they will minimize the cash needed for transactional purposes.

The cash conversion cycle shows great divergences among the different countries. In Croatia, it is negative and amounts to -22.1 days, because the account payables period amounts to 172.5 and is much longer than the account receivables collection period of 61.5 days, with inventory period of 88.9. The largest account payables period is shown in Bulgaria with 475.9 days versus account receivables collection period of 187.2 days and cash

conversion cycle of 196.5 days, since the average inventory period is also very large and amounts to 485.2 days. It is obvious that almost all SEE countries have abnormally large number of days of accounts receivable, accounts payable and inventory holding days. It indicates presence of a problem with inefficient working capital management. Slovenia is exception where these amounts are low. Companies in Slovenia have the lowest average operating cycle of 104.7 days, which results from the sum of inventory period of 51.1 days and account receivables period of 53.6 days. With the account payables of 73.6, the cash conversion cycle amounts to 31.1 days, leading to low cash holding of 5.27%.

Table 3. Exogenous variables' averages by country, 2013 – 2019 period – II. part.

	Cash conversion cycle	Debt maturity	Capital expenditures ratio	Growth opportunities
Bosnia and Herzegovina	142.2	0.5151	0.0304	1.001
Bulgaria	196.5	0.3568	0.0252	0.999
Croatia	-22.1	0.5046	0.0426	0.999
Greece	109.5	0.3990	0.0333	0.997
Montenegro	57.8	0.2821	0.0192	1.000
North Macedonia	254.3	0.3834	0.0294	1.000
Romania	216.4	0.2790	0.0309	1.000
Serbia	156.9	0.3709	0.0210	0.999
Slovenia	31.1	0.4517	0.0463	0.999
Turkey	90.3	0.3180	0.0569	1.003

Table 4 shows the correlation analysis using Pearson coefficients. The correlation between exogenous variables is low, which is the first indicator that there is no problem with the multicollinearity of regression. Cash to Assets Ratio shows a low correlation with other exogenous variables. It is positively correlated with the net working capital ratio, firms' size, cash flow ratio, cash conversion cycle, capital expenditures ratio, and the growth opportunities, and is negatively correlated with leverage, cash flow uncertainty, and debt maturity.

Table 4. Correlation analysis.

	Cash & cash equivalents / Total assets	Net working capital ratio	Leverage	Firms size	Cash flow ratio	Cash flow uncertainty	Cash conversion cycle	Debt maturity	Capital expenditures ratio	Growth opportunities
Cash & cash equivalents / Total assets	1									
Net working capital ratio	0.0884	1								
Leverage	-0.1664	-0.6268	1							
Firms size	0.1538	-0.0982	0.1691	1						
Cash flow ratio	0.1721	0.2885	-0.2030	0.1019	1					
Cash flow uncertainty	-0.0366	-0.4333	0.3368	-0.1471	-0.2317	1				
Cash conversion cycle	-0.0171	0.2280	-0.0152	-0.0548	0.0078	-0.0624	1			
Debt maturity	-0.0779	0.0752	0.1739	0.2243	0.0394	-0.1026	0.0250	1		
Capital expenditures ratio	0.0525	-0.0194	0.0516	0.2034	0.0676	0.0502	-0.0725	0.1005	1	
Growth opportunities	0.0793	0.1402	-0.0982	0.1308	0.2846	-0.2714	-0.0128	0.0694	0.1173	1

Regression of cash holdings on firms' characteristics

We employed a panel regression model to investigate the determinants of corporate cash holdings of the companies in Southeast European countries. We regressed the Cash to Asset Ratio against the exogenous variables that are firm-specific determinants as described above. Specifically, we estimate the following equation:

$$CR_t = \alpha + \beta_1\,NWCR_t + \beta_2\,LEVERAGE_t + \beta_3\,SIZE_t + \beta_4\,CFR_t + \beta_5\,CFU_t + \beta_6\,CCC_t + \beta_7\,MATURITY_t + \beta_8\,CAPEX_t + \beta_9\,GROWTH_t \tag{1}$$

where

NWCR is Net Working Capital Ratio;
LEVERAGE is Leverage Ratio;
SIZE is the natural logarithm of the total assets of the firm;
CFR is Cash Flow Ratio;
CFU is Cash flow uncertainty;

CCC is the Cash Conversion Cycle;
MATURITY is Debt Maturity;
CAPEX is Capital Expenditures Ratio;
GROWTH is the change in the log of total assets.

At the very beginning, we test for multicollinearity among independent variables. The high correlation among the independent variables may affect the efficiency of the estimated coefficients in the regression and will result in less reliable statistical inferences. Multicollinearity exists in the model when the explanatory variables are strongly related to each other. The correlations among the independent variables are reported in Table 4. Almost all are very low and are near 0, suggesting that collinearity is not a problem. Furthermore, the variance impact factors (VIF) were calculated for all independent variables, while the results confirmed that there is no problem with multicollinearity.

Using the Hausman test, we examined which regression model was most appropriate, the fixed or random effect OLS model. The results showed that the fixed effects model is best for the given data sample. According to Deloof (2003), fixed effects estimation assumes firm-specific intercepts, which capture the effects of those variables that are particular for each firm and that are constant over time. A disadvantage of fixed effects estimation is that it eliminates anything that is time-invariant from the model.

Results and discussion

The results of the regression analysis are shown in Table 5. Almost all exogenous variables are statistically significant, with varying levels of significance, but most are significant at the 1% level. The adjusted R2 coefficient of determination is at a highly satisfactory level, which indicates that the selected internal company determinants largely explain the cash holding in SEE companies.

Non-cash liquid assets have a negative relationship with the cash holdings, where for every 1% increase of NWC less cash & cash equivalents, the cash holdings decrease by 5.14%. This was expected according to the postulates of the trade-off theory. The non-cash liquid assets are measured when we subtract the current liabilities and cash & cash equivalents from the current assets. That is the excess current assets (inventories and receivables) over the current liabilities and cash & cash equivalents that can serve as a cash substitute for purposes other than transaction needs. This means that companies in conditions of cash shortage, could dispose of these current liquid assets due to lower transaction costs and convert them into cash. This conclusion holds for the sample, since the NWC ratio for the whole sample is positive at 0.55%. But some countries are exceptions, e.g., Montenegro, where the NWC is quite negative -16.37%, and companies do not have reliable non-cash liquid assets substitutes.

Table 5. Results from the regression analysis.

Variables	Coefficient	Standard Error
Intercept	-0.2806***	0.0743
Net working capital ratio	-0.0514***	0.0050
Leverage	-0.0621***	0.0066
Firm size	0.0146***	0.0036
Cash flow ratio	0.0208***	0.0043
Cash flow uncertainty	0.0303**	0.0137
Cash conversion cycle	0.000001	0.000001
Debt maturity	0.0079**	0.0034
Capital expenditures ratio	-0.0438***	0.0161
Growth opportunities	0.0988*	0.0627
R^2	0.7477	
Adjusted R^2	0.7049	

Note: CASH RATIO (dependent variable) = Cash & Cash equivalents/Total assets; *** means significant at 1%, ** significant at 5%, * significant at 10%

We find SEE companies moderately indebted since the total liabilities over the total assets for the whole sample amounts to 54%. Since they operate in underdeveloped financial markets where the new issuance of shares is rare (in some countries, even absent), bank lending is the most important external source of financing in addition to internally generated funds. They borrow from banks if the internal resources are not sufficient for investment, as well as for meeting the short-term liquidity needs, indicating that they follow the pecking-order pattern. The total debt amounts to 25.2% of the total assets, where the short-term debt amounts to 13.9% of the total assets, while the long-term debt amounts to 11.3% of the total assets. These findings show that SEE companies have more

short-term than long debt, and they raise cash through borrowing in the case of liquidity shortfalls, so the borrowing can be seen as a substitute for cash holding. This negative relationship between cash holding and debt is predicted by the trade-off theory, from the transaction motive perspective. This postulate holds because the SEE companies are moderately indebted. Regression analysis shows that there is a clear negative relationship between debt and cash holdings in the case of SEE companies, where for every 1% increase in debt, the cash holdings declined by 6.21%. The transaction motive explanation of the trade-off theory holds for the SEE companies. Since the SEE companies borrow funds to finance investments when the investments surpass internal funds, this negative relationship is also explained by the pecking-order theory. As we state above, according to the pecking-order theory, cash holdings fall when investment exceeds internal funds and grow when investment is smaller than internal funds. Also, the negative relationship is predicted by the free cash flow theory, where it is explained by the managerial interests and the levered firm has lower cash levels, since the borrower imposes prevention from superior managerial discretion.

The size of the company has a positive relationship with the cash holdings in the case of SEE companies. We consider that the most relevant explanation for this positive relationship is according to the pecking-order theory, since large companies are the ones who enter a mature stage in which they generate cash from their earnings more than they need to invest. But also, the positive relationship explanation of the free cash theory is relevant, according to which managers of large firms have more discretionary power over the firm's investment and financial policies, leading to a greater amount of cash holdings.

The cash flow of the companies in SEE has a positive relationship with the cash holdings. We accept that the pecking-order theory explains this, as companies that generate positive cash flows accumulate more cash.

Cash flow volatility has a positive relationship with cash holding. This is in line with the explanations of trade-off theory. Companies that experience volatility in cash flows from operating activities face the risk of cash shortfall and inability to meet transaction needs, investment opportunities, and other precautionary needs. Therefore, they are focused on accumulating cash to avoid the risk of cash shortage. Indeed, SEE companies operating in underdeveloped financial markets are unable to provide alternative ways to meet their cash needs. Therefore, holding cash because of cash flows volatility leads to the existence of a positive relationship.

The relationship between the cash conversion cycle and the cash holdings is positive as it was expected, but the coefficient is not statistically significant. Nevertheless, the sign of the cash conversion cycle is positive. The CCC is a synthetic measure of working capital management. The company should attempt to have a shorter-period account receivables collection than the account payables period, i.e., the case in most SEE companies. The shorter the cash conversion cycle, the smaller is the need to hold cash for transactional purposes. This is explained according to the postulates of the trade-off theory.

Debt maturity is the percentage of debts due in a period longer than one year of the total debts. That percentage in the case of the entire sample of SEE companies is 37.47%. This means that companies in SEE are highly dependent on short-term debt (accounting for 13.9% of total assets to which the current portion of long-term debt is added). The positive relationship between debt maturity and the cash holdings in the SEE companies can be explained by the pecking-order theory. If we consider that firms with the highest credit rating have better access to borrowing, it is expected that these firms will hold less cash for precautionary reasons, which would cause debt maturity to be positively related to cash holdings.

The negative relationship between the capital expenditures and cash holdings, which exist in SEE companies, can be explained by the pecking-order theory postulates. According to this theory, companies do not optimize cash, but the size of cash depends solely on the interrelations between capital investments and internal sources. SEE companies seem to follow that pattern. There are objective circumstances for that. Namely, due to the underdevelopment of the financial markets, they do not have the opportunity to temporarily invest short-term cash surpluses except in bank deposits and possibly government bonds, and to issue short-term debt instruments to meet cash deficits. So, if the capital investments exceed internally generated funds, they will have a cash shortage and vice versa.

The relationship between the investment opportunity set and the cash holdings in the case of SEE companies is positive as it was expected. If the companies have valuable investment opportunities, they need more cash. This positive relationship is stated by the trade-off theory where the company attempts to maximize the marginal benefits and minimize the marginal cost of cash holdings. If the company dismisses the opportunity to invest in a positive NPV project, it is very exposed to the risk of financial distress. Firms having better investment opportunities will keep higher cash levels to avoid financial distress. The pecking-order theory also assumes a positive relationship, so companies that do not want to miss good investment opportunities, unless they are ready to make a new issue of stocks, must hold more cash.

Conclusion

Cash and cash equivalents are the company's most liquid assets. Financial economists have long researched the determinants of cash holding to recommend best practices to managers. Managers focused on maximizing

shareholder wealth must effectively and efficiently manage cash. This means that the level of cash should be set where the marginal benefits and marginal costs of holding cash are equal. But empirical research on company practices shows that this is not the case not only for the undeveloped and emerging markets, but also for developed countries either. The costs and benefits from a managerial perspective are quite different from a shareholder's perspective. The conflict between the interests of the shareholders who own the company and the managers who are their agents, leads many companies to keep high amounts of cash in their balance sheets. Thus, they experience opportunity costs and low returns. The inability to conduct a cash optimization policy according to the cost-benefit principle is due to the presence of a financing hierarchy. Namely, the company's growth mostly relies on its own internally generated funds. Financing of capital investments in the first place is from internal funds, and if they are not enough, the companies should collect finances from external sources, in the first line from borrowing, and finally issue shares. According to this concept, the cash balance in the balance sheet is a random size that depends on the difference between the required capital for investments and the internally generated funds. According to the concepts proposed by the three theories (trade-off, pecking order, and free cash flow theory), effective and efficient cash management is a rather very complex, not an unimportant issue as it might seem.

Cash management by companies in transition countries is even more complex. This is the case for companies in emerging markets in SEE. In these countries, companies operate in conditions of underdeveloped financial markets and do not have the opportunities to cover cash deficits and to place the surplus cash available to companies in developed countries. Company-bank relations are almost the only perspective for cash management.

In this paper, we investigate how internal company determinants affect cash holdings in the case of companies from ten emerging South-East European countries (Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey). We conducted the research using the data from their financial statements for the 2013-2019 period. The large sample allows us to draw clear conclusions about the determinants of cash holding for emerging market companies. Thus, we believe that this research will give a strong impact on the world literature in this field. Our analyses were performed both at the level of the whole sample and the level of individual countries.

We found that the average amount of cash at companies in SEE is 6.94% of total assets. Internal company determinants have a strong and significant impact on cash holding. We found that cash holdings are positively related to the size of the firms, cash flow, cash flow uncertainty, debt maturity, and growth opportunities, and are negatively related to the net working capital, leverage, and capital expenditures. The relationship of the cash holding with the cash conversion cycle is positive but statistically insignificant. SEE companies adjust cash balances largely according to transaction motives. To a lesser extent, they adjust cash balances according to the cost-benefit principle. First, this is because they do not have many opportunities to manage cash in conditions of underdeveloped financial markets. Cash holdings in SEE companies move randomly. The size of cash depends on the interrelation between the capital investments needs and the internally generated funds, in line with the pecking order theory which presumes that there is hierarchy in company's financing. These conclusions show great similarity with the findings of the research in developed countries (Opler et al., 1999; Bates et al., 2009; Ferreira and Vilela, 2004; Ozkan and Ozkan, 2004) and other emerging markets (Uyar and Kuzey, 2014; Al-Najjar, 2013; Maheshwari, and Vigneswara Rao, 2017; Ahmed et al., 2018; Le et al., 2018; Jebran et al., 2019; Vuković et al., 2022; Alnori et al., 2022).

Finally, we would like to point out research limitations/implications and give recommendations for further research. The research conducted in this paper, although complex, still has some limitations. Future studies may investigate the optimal levels of cash holdings and compare the adjustment speeds toward target cash holdings. This paper is entirely focused on investigating the impact of internal company factors that have an impact on cash holdings. But it ignores the impact of macroeconomic factors. Further research should consider impact of macroeconomic factors on cash holdings. There is no doubt that features of the corporate governance system can have huge impact on cash holding. These features may contribute to a high degree of managerial discretion, which may eventually influence the relationship between managerial ownership and cash holdings. Also, the cash holdings can be under the influence of institutional shareholders and board composition, and the role of regulation. Given that there are no indicators for corporate governance for SEE countries, it represents a limitation for this kind of analysis. As well as specifics of individual companies, the phase of company life cycle, individual business characteristics can also have significant impact on corporate cash holdings that can be research further on a firm level.

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