Determinants of Cash Holdings in Private Firms: The Case of the Slovenian SMEs

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ABSTRACT: *This paper examines the determinants of cash holdings in a large sample of the Slovenian small and medium sized companies in the period 2006-2013. The empirical results provide support for the transactions and precautionary motives in the cash policies of the analysed SMEs. However, we find evidence in favour of the speculative motive as well, by ascertaining that smaller, exporting and more profitable firms hold more cash. The paper also establishes that the net working capital and financial debt can be considered as cash substitutes and that keeping close relationships with banks reduces agency costs and information asymmetries and leads to lower cash levels. In addition, the ability to internally generate funds expressed as higher operating cash flow reduces the amounts of cash held. Finally, evidence shows that longer cash conversion cycles and requirements for mandatory retirement benefit contributions result in higher cash balances, while weaker empirical support is found also for the negative influence of the interest rate level on cash holdings.*

Key words: *cash holdings, liquidity, financial Crisis, SMEs, Panel data*

JEL classification: G10, G32, L25

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1 INTRODUCTION

Managing cash is an important component of a company's financing policy, especially in the case of small businesses, which are often more dependent on short-term financing sources (Peel, Wilson & Howorth, 2000; Walker & Petty, 1978). The old phrase ″cash is king″ is particularly descriptive of small and medium-sized companies, considering they face much more limited access to external financing compared to that which larger companies have access to (Mramor & Valentinčič, 2003). In addition, the recent financial crisis has put cash and its management back in the spotlight. When liquidity is scarce, efficient cash management is vital for ensuring that every spare monetary unit has been fully utilized (Nason & Patel, 2016). Even in good times, an adequate cash policy is crucial for the company as lack of liquidity may result firstly, in the company's inability to settle its liabilities as contracted or as economically efficient, secondly, in its increased costs, and, in

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the worst case, insolvency. As a result, the management of cash holdings often marks the difference between corporate failure and success. Cash holdings in general represent "cash on hand or readily available for investment in physical assets and to distribute to investors" (Gill & Shah, 2012) and it is considered a liquid asset necessary to support the day-to-day operations and the working capital needs of a company.

The purpose of this study is to investigate the determinants of cash holdings in small and medium-sized companies in Slovenia. These are the companies which employ fewer than 250 persons with an annual turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million (European Commission, 2003). We assume that companies behave prudently when it comes to liquidity and postulate that the transactions and precautionary motive prevail when deciding on the level of cash to hold. Based on the that, it is posited that small and medium-sized enterprises (SMEs) tend to lower their costs related to securing liquidity, utilize their cash substitutes at hand and accumulate cash as a buffer against difficult circumstances. The study also seeks to examine the effect of the recent financial crisis and the consequent stringent credit conditions on the cash holdings behaviour of Slovenian SMEs. All the study hypotheses rest on the specific characteristics of SMEs, which are outlined in the following paragraph. A large sample of 27,573 unique small and medium-sized firms during the period 2006-2013 for a total of 170,220 firm-year observations is used.

Small and medium-sized enterprises play a central role in the EU economy as a whole, nevertheless, they represent a sector of even greater importance for the economic development of Slovenia, which makes it a particularly interesting choice of country for the purpose of examining the characteristics of SMEs. According to the Annual Report on the European SMEs 2014/2015 (European Commission, 2015), there were 22.3 million SMEs in the non-financial business sector of the 28 European Union Member states in the year 2014, accounting for 99.8% of all enterprises in this sector, providing 67% of total employment and 58% of the sector's value added (or EUR 3.7 trillion in absolute value). As reported in the 2015 SBA Fact Sheet (European Commission, 2015), it is estimated that in Slovenia the SMEs constituted 99.8% of all non-financial business entities, accounting for circa 73% of employment and providing 63% of the value added in the local non-financial sector in 2014. According to our data analysis, cash holdings represent a significant part of the asset base of the Slovenian SMEs as they average around 18% of their net assets, which is much higher than the average 6% found in Spanish SMEs (García-Teruel & Martínez-Solano, 2008) and the average 5% found in Portuguese SMEs (Pastor and Gama, 2012).

One of the crucial differences between public and private firms is their respective ownership structure. While the ownership of private firms is in the hands of just one or a few owners, public firms' ownership is divided among thousands of shareholders. The coincidence between ownership and control in smaller firms provides managers with greater flexibility in changing the asset base and consequently the risk of the firm (Pettit & Singer, 1985). Furthermore, private businesses are usually characterized by greater informational opacity, which contrasts with the comparable, informationally

transparent publicly listed companies. This fact exacerbates the information asymmetry problems (Berger & Udell, 1998). As a result of the aforementioned characteristics, private businesses face more serious agency costs of debt (Pettit & Singer, 1985), and what is more, it makes smaller firms more susceptible to temporary economic downturns, resulting from the higher transaction costs these firms encounter and the consequently shorter maturity debt they use (Tittman & Wessels, 1988). Finally, smaller firms are challenged with more severe financing constraints, arising from their limited internal finance, the information asymmetry they bear and presumably due to the lack of collateral to support their borrowing (Whited, 1992).

Strong support is established for both the transactions and precautionary motive respectively in the cash policies of the firms studied in our sample, however, there is also evidence found on the presence of the speculative motive. More specifically, the results of our research show that smaller firms tend to hold higher levels of cash, thus mitigating the potential costs for obtaining external finance. In the same vein, we find that keeping close relationships with banks provides a buffer, leading to lower cash levels, and that in addition, cash substitutes such as net working capital and debt are indeed utilized as such. Furthermore, higher ability for generating funds internally, expressed within the research as operating cash flow generated, is negatively related to the amounts of cash held. Weak empirical support for the negative influence of the interest rate level on cash holdings is also established. The reported evidence further shows that longer cash conversion cycles and mandatory retirement benefit contributions requirements result in higher cash balances, implicating that precaution drives the cash policy in financially constrained firms. The finding that exporting and more profitable firms hold more cash implies the speculative motive, rather than the precautionary one, drives the decision to keep the cash holdings "in-house" in order to be able to take advantage of profit-making opportunities.

The results of our research make several contributions to the existing literature on cash holdings. First, our analysis establishes new and so far untested factors as determinants of cash holdings, as among others the export activities and the requirement for mandatory retirement benefit contributions. Furthermore, to our knowledge this is the first paper that addresses the effect of the recently changed interest rate climate on the cash amounts held by companies. Another important contribution of our analysis is that the research focuses on cash holdings of small and medium sized (and generally private) companies, representing a sector that has thus far received relatively little attention by researchers compared to the extensive literature available on cash policies in large companies listed on capital markets. Thus, our paper builds on the existing though limited body of knowledge devoted to a sector of great significance to the global economy. Lastly, no empirical studies regarding determinants in the field of cash holdings for small and medium-sized companies in Slovenia have been carried out so far, despite the fact they constitute the core of the country's economy.

The remainder of this paper is structured as follows. Section 2 provides the theoretical foundations and develops the empirical hypothesis, while Section 3 describes the data

set and the methodology used. In Section 4 results are discussed, in section 5 additional robustness tests are presented, while section 6 provides a conclusion to the research and its findings.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Reasons and motives for holding cash

Firms hold a certain amount of cash holdings on their balance sheets for various reasons and purposes. The two main motives for doing so are indicated in the current literature as the transactions motive and the precautionary motive respectively. The first of the two, the transactions motive, arises from the firm's need of a certain amount of cash balances necessary for covering payments related to their day-to-day business operations. Keynes (1936) defines the transactions motive as "the need of cash for the current transaction of personal and business exchanges". By securing cash for these purposes, the company avoids or reduces transaction costs associated with raising external finance. As shown by Miller and Orr (1966), higher transaction costs prompt firms to hold more liquid assets.

On the other hand, the precautionary motive for holding cash relates to a firm's intention of protecting itself against uncertain future events. To hedge against uncertainty, firms make cash reserves to meet future eventualities which would require sudden spending in times of poor cash flow. Almeida, Campello and Weisbach (2004) demonstrate the precautionary demand for cash is present in financially constrained firms which show significant propensity to save cash out of their cash flows, whereas unconstrained firms do not. Nevertheless, during the financial crisis, both constrained and unconstrained firms demonstrated a significantly increased propensity to save cash (Sun and Wang, 2015). In addition, McLean (2011) finds the precautionary motive significantly increased its presence in general among the American share issuing companies in the period between 1971 and 2008.

Another reason for holding cash lies in ensuring flexibility, in other words, it concerns the objective of exploiting unforeseen opportunities. The latter is called the speculative motive, where firms keep speculative cash on their accounts to seize profit-making opportunities in the future, typically resulting from price volatility. What is more, speculative cash balances provide the firm with the possibility to purchase assets at attractive prices at any time (Michalski, 2009). In this respect, it may appear similar to the precautionary motive for holding cash, as both these motives deal with uncertainty, however, there is an important difference. Namely, the precautionary demand for cash arises from uncertainty in the timing of payments and receipts between the current and future purchase or sale of an asset, while the speculative motive relates to the uncertainty in interest rates (Whalen, 1966; Sprenkle, 1969).

An additional motive for holding cash identified by Miller and Orr (1966) is the compensating balance requirement. Namely, firms are required to hold a certain minimum amount of cash on their current accounts, where the amount is not allowed to fall below a certain predefined level, and is used as a form of compensation to the bank instead of the company paying the bank its service charges. More specifically, compensating balances are a form of an agreement between a commercial bank and a business customer in which the bank opens a line of credit in favour of the same customer and in return demands an average minimum cash balance to be maintained in the deposit account of the business customer.

Being able to benefit from trade discounts can also be considered a reason for keeping cash on hand. It is often the case that suppliers offer their clients the option of discounts on early payment of obligations, a situation which would easily be obtainable if there was extra cash deposited in the firm's account (Ehrhardt, 2006). Kling, Paul and Gonis (2014) conclude that cash holdings improve the access to trade credit by sending a positive signal to the suppliers regarding the ability to pay back the trade credit offered.

2.2 Implications of holding cash

Holding cash has its implications, in the form of both benefits and costs. The two main benefits of having cash on hand are tightly linked to the two main motives for holding cash, i.e. the transactions and precautionary motive respectively. With regard to the former motive, it is by holding cash that the firm avoids transaction costs necessary to raise funds for making payments, it avoids the trouble of liquidating assets, issuing debt and/or equity, renegotiating existing financial contracts or cutting dividends (Opler et al., 1999; Ozkan & Ozkan, 2004). Relating to the latter of the two motives, by keeping cash in the company account, the company secures liquid assets to finance its operations or favourable investment projects in cases when other resources are limited, unavailable or too costly to acquire. In other words, cash holdings do not only reduce the possibility of financial distress and the costs associated with it, but also improve the position towards desired investment activities and minimize the costs of being dependent on external funds (Faulkender & Wang, 2006; Gill & Shah, 2012; García-Teruel & Martínez-Solano, 2008). In the light of the foregoing, benefits of cash holdings are especially emphasized in financially constrained firms, i.e. firms facing difficulties in obtaining external financing. Denis and Sibilkov (2009) state that constrained firms place higher value on cash holdings for two reasons, the first of them being (i) because cash holdings enable constrained firms to increase investment, and the second one (ii) because the marginal profitability of an investment project is higher for the constrained firms compared to the unconstrained ones.

The costs associated with holding cash include among others lower rates of return, possible tax disadvantages and agency costs of free cash flow. The most obvious cost of holding cash arises from the fact that cash generates lower return compared to other investments of the

same risk (Dittmar et al., 2003). Consequently, by holding on to its cash, the firm forgoes more productive investments and thus incurs opportunity costs of not investing in some other income earning assets (Whalen, 1966; García-Teruel & Martínez-Solano, 2008). Another view on the opportunity costs of cash provided by Almeida et al. (2004) is that greater cash holdings necessitate reductions in existing, profitable investment projects.

Tax disadvantages might occur as a result of a higher corporate tax rate compared to the personal tax rate levied on interest income. Taking that into account, investors are in a more prosperous position if they hold on to the excess cash instead of the firm (Faulkender & Wang, 2006). In a different view provided by Foley, Hartzell, Titman, and Twite (2007), the American multinationals face tax costs associated with repatriating foreign income which is why they choose to leave the cash abroad and instead accumulate foreign cash holdings in their foreign affiliates.

Holding higher levels of cash in the firm can nevertheless be a trigger for agency costs of managerial discretion due to conflict of interest between shareholders and managers. Namely, managers have the incentive to accumulate cash and channel it for purposes that might be damaging or disadvantageous to the interests of shareholders. This is emphasized especially in cases when the firm generates large free cash flows, defined as "cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital" (Jensen, 1986). In the presence of free cash flows in firms where ownership and control are represented by two distinct bodies, managers might be inclined to hold higher levels of cash on the account of several possible reasons, some of which may be (i) to reduce company risk, or (ii) to pursue their own personal objectives and interests, (iii) to avoid making payouts to shareholders and instead keep the cash in the company. On the contrary, the situation is different in small and medium-sized companies where management and control generally coincide, thus making conflicts among them practically non-existent or seldom (García-Teruel & Martínez-Solano, 2008; Garrod, Kosi & Valentinčič, 2008; Kosi & Valentinčič, 2013; Szczesny & Valentinčič, 2013).

2.3 Empirical studies on determinants of cash holdings

As mentioned in the previous paragraph, the majority of studies on cash holdings deals with the question of determining their factors in the setting of large publicly traded companies, while only a few papers deal with the problem of determinants of cash holdings in private firms and even fewer focus on small and medium-sized businesses (SMEs). The first to fill that void is Faulkender (2002), who studied the cash policies of small businesses and discovered that costs of financial distress and information asymmetries play a significant role in determining the cash positions of American small firms. Among the latter, higher cash balances are found with firms which expect to encounter difficulties in obtaining external funds in the future, in firms which conduct more research, as well as in higher leveraged firms, together providing evidence for the precautionary motive. The last result of the study is however contrary to the finding of Opler et al. for large public companies

(1999), suggesting important differences in the relative costs and benefits of cash balances for these two groups of companies. Furthermore, Faulkender (2002) reasserts the economies of scale in holding cash by observing that cash holdings decrease with firm size, a factor previously established for large public companies only.

In a subsequent study conducted on a sample of Spanish small and medium-sized firms, García-Teruel and Martínez-Solano (2008) show that these firms maintain a target level of cash which is higher for firms with better growth prospects and higher cash flows. In contrast, this target level is lower in times of higher interest rates, increased bank debt and higher liquidity. Interestingly, SMEs demonstrate a higher speed of adjustment towards their optimal cash levels compared to large firms. The reason might lie in the fact that SMEs are subject to greater information asymmetries and agency problems related to debt compared to larger firms, thus the costs of being further away from the optimal cash levels are higher for them as well.

Results similar to the above ones are reported and developed further by Pastor and Gama (2013) by adding the relationship with banks and debt structure as significant factors which influence the cash holdings of Portuguese SMEs. The negative impact of bank relationship on the amount of cash held suggests that maintaining close contact with banks helps lessen the information asymmetry problems regarding the use of financial debt, which is more emphasized in SMEs. Furthermore, long-term debt is associated with lower cash holdings, in this respect giving support to the transaction motive.

Orens and Reheul (2013) report that CEO demographics play an important role in structuring the liquidity policy in Belgian SMEs. Their findings suggest that CEOs who are longer tenured, older and experienced in one industry only, place more emphasis on the precautionary motive and are less concerned with the opportunity cost of cash, which is why they prefer higher cash holdings compared to shorter tenured, younger and diversely experienced CEOs.

Bigelli and Sánchez-Vidal (2012) study the factors that determine the cash holdings of Italian private firms which coincide mainly with the ones of public firms. Similar to Opler et al. (1999), they show that significantly larger cash positions are found in smaller and riskier firms, while less cash is held by firms with more net working capital, viewed as its substitute. In the same vein, lower cash levels are found in firms with a higher proportion of bank debt, as also reported by Ferreira and Vilela for large public European Monetary Union companies (2004). In addition, Bigelli and Sánchez-Vidal (2012) note that firms facing longer cash conversion cycles, lower financing deficits and lower effective tax rates hold significantly higher levels of cash.

Gao, Harford and Li (2013) conducted a large sample comparison of cash policies between public and private American firms to find that private firms hold approximately half as much cash compared to public firms, owing to the greater agency problems present in

the latter group of firms. In contrast, Hall, Mateus and Bezhentseva Mateus (2014) find the opposite situation when they compare public and private firms in Central and Eastern Europe. They find that privately held companies maintain higher levels of cash, most probably due to the precautionary motive. As private firms have limited access to capital markets, they hold on to higher cash levels as a buffer against future financial distress.

2.4 Research questions

The motives and implications for holding cash are the starting point in devising the research questions of this study. In addition, the hypothesis development rests on a number of previously established explanations on the level of cash held in companies. The following paragraphs elaborate on the firm characteristics which have already been recognised as determinants of cash holdings in previous literature, and are further complemented in the survey by introducing certain novel explanatory variables.

Firm size has been determined in a considerable amount of research as a significant factor that affects the cash level. As there are transaction costs related to raising funds from external sources, which are fixed no matter the amount borrowed, it is assumed that there are economies of scale in raising funds (Faulkender, 2002). It is therefore relatively costlier for smaller firms to obtain funds from external sources, which can be a cause for retaining more cash in their accounts. In the case of small and medium-sized companies, several other factors related to their size need to be considered, as indicated by García-Teruel and Martínez-Solano (2008). Namely, SMEs are subject to more serious information asymmetries, face more financial constraints and are more susceptible to financial distress, all of which lead to fixed costs relatively higher for smaller firms than for the large ones. As a consequence, an inverse relationship between size and cash holdings is expected, taking into account both the transactions and precautionary motives.

Another firm characteristic influencing the amount of cash holdings is the cash flow generated by the company. There are two opposing explanations regarding the effect of the cash flow magnitude on cash levels. According to the financing hierarchy model presented by Myers and Majluf (1984), firms with high cash flows will hold more cash because they prefer to fund profitable investment projects with internally generated funds rather than raising external capital due to information asymmetries. This is contrary to Kim et al. (1998), who see a negative relation between cash flow and cash holdings in the sense that cash flow presents a ready source of liquidity. Therefore, if the transaction motive prevails, we hypothesize that higher cash flows lead to lower cash levels. On the other hand, where the precautionary motive is the main cash decision driver, we hypothesize a positive relation between these two variables.

The speculative motive brings about the question on how growth opportunities influence the level of cash retained in the company's accounts. If a company foresees profitable investment projects, then it will do its best not only to avoid cash shortages, but also to

have enough resources to fund those projects when the moment to invest comes. This is even more emphasized for small firms as their access to external financing is more limited and can also be assigned to the precautionary motive. For this reason, it is expected that stronger growth opportunities result in higher cash holdings, as shown in various empirical studies (Opler et al., 1999; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004).

Leverage can be considered as an indicator of a firm's ability to generate external funds, but it can also be seen as a cash substitute. A significant negative effect on the cash holding on the United Kingdom SMEs is documented by Belghitar and Khan (2013). Since debt can serve as an alternate source of liquidity for firms with access to borrowing capacities, an inverse relation between leverage and cash holdings is assumed, giving rise to the transactions motive.

A different channel through which debt is expected to manifest its influence on the level of cash is its maturity structure. Namely, when a company uses short-term financing, it is obligated to periodically renegotiate and renew its credit terms, thus facing refinancing risk (Ferreira & Vilela, 2004). Consequently, if the majority of debt in a firm is constituted of short-term borrowing facilities, it is expected that such firm will hold on to higher cash levels in order to secure a buffer against financial distress in case the loan is not prolonged (García-Teruel & Martínez-Solano, 2008). Considering the precautionary motive, we therefore expect shorter debt maturities to result in higher cash holdings and vice versa, i.e. longer maturities to result in lower cash levels.

Petersen and Rajan (1994) report that maintaining a close relationship with financial institutions brings benefits to the borrower as it increases the availability of credit. They also find a small piece of evidence that building relationships with lenders reduces the price of credit. This might come as a result of mitigating the informational opacity and agency costs of debt by disclosing internal information, which is accumulated by lenders when relationships last longer. These findings are further corroborated by Nakajima and Sasaki (2016), who argue that bank-dependent firms accumulate cash to foster better relationships with banks. Considering these effects, it is assumed that stronger firm-bank relationships lead to lower cash levels, because they offer a certain financial buffer to the firm.

Net working capital can be considered as a cash substitute, in terms of bank lines of credit or certain non-cash liquid assets which can readily be converted to cash. In the case of small and medium-sized companies, this mostly applies to selling accounts receivable to a third party. As with all variables representing cash substitutes, a negative relation between net working capital and cash is expected, considering the transactions motive (Bigelli & Sánchez-Vidal, 2012).

Another factor that can affect the liquidity of the firm is the cash conversion cycle. This measure expresses the number of days it takes for a company to convert the resources

invested in inputs into cash. The longer the cash conversion cycle, the longer the liquid assets are tied up in operations. Taking into account the precautionary motive, we would expect that companies with longer cash conversion cycles, that is, with a weaker ability to generate cash from ongoing operations, will exhibit higher cash balances. Bigelli and Sánchez-Vidal (2012) show supporting evidence of this among Italian SMEs.

One of the novel determinants to be tested in this empirical analysis is the requirement for compulsory retirement benefit contributions. According to the Slovenian pension system, employers are obliged to pay certain prescribed amounts as mandatory benefit contributions to the Institute of Pension and Invalidity Insurance of Slovenia (Pension and Disability Insurance Act, 2012, Official Gazette of the RS, No. 96/2012 and the subsequent amendments; Social Security Contributions Act, 1996, Official Gazette of the RS, No. 5/1996 and the subsequent amendments). The literature provides evidence that legally prescribed retirement contributions have negative impact on firm liquidity, especially in the case of financially constrained firms, a characteristic common to small private companies (Phan & Hedge, 2013; Rauh, 2006). Based on the above, the requirement for mandatory pension insurance is expected to demonstrate a negative impact on cash balances. On the other hand, the literature suggests that financially constrained firms pose positive cash flow sensitivities of cash due to the precautionary motive (Almeida et al., 2004). Therefore, a positive relation between these obligations and cash levels is expected.

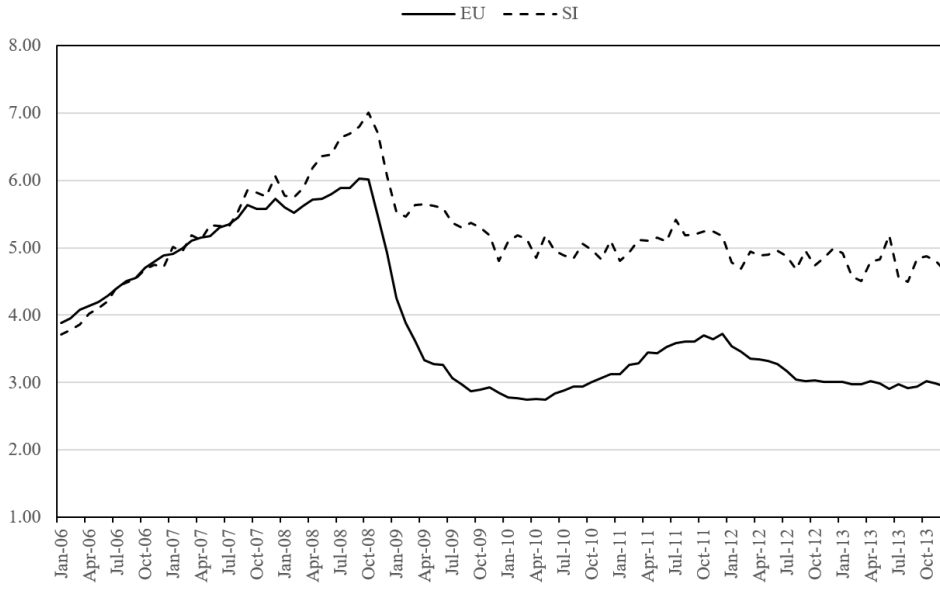
The next determinant introduced in the research is the exports volume. It has been shown that more liquid companies are more likely to export (Greenaway, Guariglia and Kneller, 2007). Looking at this relationship from the opposite side, the question arises whether a reciprocal effect of export activities on firm's liquidity exists. If the company is capable of generating cash from ongoing operations, then the need for precautionary cash accumulation is lower and we can assume a negative relation between sales generated abroad and cash holdings.

The research paper tests the relationship between cash levels and profitability, which has seldom been used in previous studies on determinants of cash holdings (e.g. Faulkender & Wang, 2006; Kling et al., 2014). There can be two channels through which a causal connection might be expected. The first causal relation is expected because profitability is considered a proxy for the operating performance of a company. In such case, it can be assumed that more profitable, that is more operationally efficient companies are more capable of internally generating cash. Therefore, it might be anticipated that higher profitability is associated with lower cash levels as the precautionary demand is lower. The second channel relates to cash being the least profitable liquid asset associated with opportunity costs, which might negatively influence a firm's profitability, making the company opt for lower levels.

The study also investigates the impact of interest rates on the amount of cash maintained in a company. The sample is constructed in a way that the years before and during the

recent financial crisis are included with the purpose to study the influence of the recent low interest rate environment. Figure 1 shows the movement of the composite cost-of-borrowing indicator which combines Monetary financial institutions' (MFIs) interest rates on all loans to corporations (European Central Bank, 2013) in the Euro zone and Slovenia in the period preceding and during the economic downturn. It is evident from Figure 1 that after the peak, reached just before the outburst of the financial crisis, the generally low level of interest rates persists throughout the sample period used in the research.

Figure 1. *Composite Cost of Borrowing Indicator in Eurozone and Slovenia over the sample period, 2006-2013*



Source: European Central Bank Statistical Data Warehouse

In such an environment, where funds from external sources are more affordable and cash deposits bring even lower earnings, it would be expected that firms reduce their cash holdings. On the other hand, the overall economic uncertainty accompanied by the reluctance of banks to grant loans might have a prevailing impact and drive companies to hold higher levels of cash as a precaution. Campello, Graham and Harvey (2010) report that financially constrained firms in the United States, Europe, and Asia were forced to reduce their cash holdings by sizeable amounts during the crisis, while the unconstrained firms' cash levels remained unaffected. Song and Lee (2012) identify a systematic change in the cash holding policies of East Asian firms, caused by the crisis of 1997-1998. They determine that the cause for the long-term increase in the demand for cash is a result of the precautionary motive in that these firms become more conservative in investing and more sensitive to cash flow risk. Sun and Wang (2015) find evidence of corporate

precautionary savings during the financial crisis. They report a decrease in cash holdings among constrained and unconstrained firms in the first year of the crisis when the sources of external finance are tightened, and an increase in holdings afterwards when the precautionary demand prevails. It is therefore unclear at this point whether an opposite or a correlated relationship between interest rates and cash holdings is to be expected.

3 METHOD

3.1 Sample and variables definition

This study uses financial data on Slovenian small and medium-sized companies (SMEs) for the years 2006-2013 from the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES). AJPES maintains a central database, which publishes financial information on all business entities based on the territory of the Republic of Slovenia, derived from their annual reports and other corporate data, according to Article 11 of the Companies Act (Official Gazette of the RS, No. 65/2009, and the subsequent amendments) and Article 71 of the Payment Transactions Act (Official Gazette of the RS, No. 110/2006, and the subsequent amendments).

The period between the years 2006 and 2013 is primarily chosen to gauge the effects of the financial crisis on the cash policies of the Slovenian SMEs. Even though data are available for the years before 2006, they are excluded from the analysis in order to achieve consistency and comparability among the financial statements across the stated years. Slovenia revised its accounting standards which are effective as of January 1st 2006.[3]

What SMEs are is defined by the EU recommendation 2003/361. In accordance with the latter, an SME is a company that meets the following main criteria: a) has less than 250 employees; b) realizes an annual turnover of less than or equal to EUR 50 million; and c) its balance sheet assets are less than or equal to EUR 43 million. The initial sample is the set of all the Slovenian SMEs provided by AJPES.

The initial sample was refined prior to analysing the collected data by applying several criteria. First, financial firms were excluded. Then, firm-year observations with missing values or errors in the accounting data were eliminated. The variables required to be positive are assets, sales and equity. To minimize the effect of outliers, 1% of the extreme values of the variables for cash, cash flow magnitude, leverage, liquidity, cash conversion cycle, profitability and growth were dropped. This left an unbalanced panel of 27,573 unique firms with an average of 6.2 years per company, leading to an aggregate sample of 170,220 firm-year observations. The sample is made up of 24% wholesale and retail trade companies, 22% companies involved in professional, scientific and technical activities, 17%

3 See Valentinčič, Novak & Kosi (2017) for a detailed overview of the historic development of accounting standards in Slovenia, including an empirical investigation of the properties of accounting constructs.

manufacturing companies, 11% transporting companies, with the rest of the companies dispersed.

The dependent variable *CASH*, expressing the level of cash holdings, is measured as the ratio of cash to total assets minus cash, as cited in Opler et al. (1999). Following their logic, the natural logarithm of the book value of assets is used as a proxy for firm size (*SIZE*). The ability of the firm to generate cash or the cash flow magnitude (*CF*) is presented by the ratio of pretax profit plus depreciation to sales. The variable for growth (*GROW*) is approximated by the ratio of sales generated in the current year to sales from the previous year. Following García-Teruel & Martínez-Solano (2008), the variable for leverage (*LEV*) is calculated as total debt over equity. The debt maturity structure (*DEBTM*) is defined as long-term debt over total debt. The financial statements available for this research provide information on short and long-term debt maintained with banks as two separate lines within the liabilities' side of the balance sheet. Therefore, to approximate the relationship with financial institutions, the ratio of total bank debt to total debt (*BANKR*) is used in the research.

Following Bigelli and Sánchez-Vidal (2012), the variable for liquidity (*LIQ*) is calculated as net working capital less cash divided by net assets. The cash conversion cycle (*CCC*) is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable.

The financial data available for this research provide information on annual pension insurance costs, however, these include payments for both mandatory and voluntary pension insurance, while our aim is to test the effect of the mandatory part of the costs, as suggested by Phan and Hedge (2013). Nevertheless, the total expenses for pension insurance are very indicative of the amounts paid as mandatory, thus the ratio of total pension insurance costs to sales is used to approximate the variable for compulsory retirement benefits (*RET*). To test the robustness of the results, an alternative variable is used and that is the number of employees, considering that the impact of compulsory pension insurance on cash holdings might be effectuated through the number of people working in a company. The variable for the number of employees (*EMP*) is derived from the average number of employees based on hours worked in the accounting period.

To capture the relationship between export activities and cash levels and test the robustness of the regression results, two alternative variables are used: one variable expressing the magnitude of exports volume, calculated as revenues generated abroad over total sales (*EXPO*), and the other alternative being a dummy variable set to one for the firm-year observations where exports occur, and the value zero otherwise (*EXPOD*). Profitability is expressed as the profit margin (*PROFM*).

Interest revenues earned on bank deposits are not separately shown in the non-operating revenue section of the income statement, while interest expense on bank loans is a separate

line. Therefore, the interest expense to debt ratio is applied as an estimate of the interest rate a company is paying on its outstanding debt (*INT*) as is stated in the existing literature (e.g. Karjalainen, 2011).

The model for investigating the relation between cash holdings and the explanatory variables is specified as follows:

$$CASH = \alpha + \beta_1 SIZE_i + \beta_2 CF_i + \beta_3 GROW_i + \beta_4 LEV_i + \beta_5 DEBTM_i + \beta_6 BANKR_i + \beta_7 LIQ_i + \beta_8 CCC_i + \beta_9 RET_i + \beta_{10} EXPO_i + \beta_{11} PROF_i + \beta_{12} INT_i + \varepsilon \quad (1)$$

where i represents the firm and α the regression constant, while β_i (i = 1,...,12) stands for the regression coefficients and ε for the error term.

4 RESULTS

4.1 Summary statistics

Table 1 illustrates some of the main characteristics of the firms included in the sample. It reveals a quite dispersed ratio of cash to assets. While on average Slovenian SMEs hold 18% of cash relative to non-cash assets, the median firm holds approximately 5% in cash. This is much higher than the average 6% and 5% found in their Spanish and Portuguese counterparties respectively (García-Teruel & Martínez-Solano, 2008; Pastor & Gama, 2012). The sample is indeed made up of small entities considering that the mean and median firms have an asset base of approximately EUR 160,000 and they employ an average of about eight people. The firms are highly leveraged, with total debt 2.43 times their equity. Bank debt represents 16% of their total debt, which is mostly short-term considering that long-term debt represents only 18% of their total external financing. Table 1 also shows that the firms in the sample are not very export oriented, with their exports volume making up only 10% of total revenues. Finally, the figures clearly show weak operating efficiency and performance of Slovenian SMEs, turning only 1.3% of revenues into profit.

Table 1: *Descriptive statistics of variables for the 2006-2013 sample (pooled)*

	Observations	Mean	25th Percentile	Median	75th Percentile	Standard Deviation
CASH	170,220	0.1806	0.0081	0.0471	0.1777	0.3580
SIZE	170,220	11.9983	10.7324	11.9271	13.1902	1.7889
CF	170,220	0.0706	0.0195	0.0563	0.1180	0.1338
GROW	170,220	1.1448	0.8590	1.0164	1.2103	0.6881
LEV	170,220	2.4327	0.3867	1.1711	2.9761	5.9372
DEBTM	170,220	0.1820	0.0000	0.0000	0.3284	0.2615
BANKR	170,220	0.1582	0.0000	0.0000	0.2729	0.2384
LIQ	170,220	0.0346	-0.1364	0.0658	0.2925	0.4534
CCC	170,220	-47.3178	-79.0131	-4.8459	54.4380	301.5106
RET	170,220	0.0171	0.0039	0.0122	0.0241	0.0199
EMP	170,220	7.6665	1.0000	2.2000	6.2000	18.1670
EXPO	170,220	0.1007	0.0000	0.0000	0.0325	0.2378
PROFM	170,220	0.0127	0.0018	0.0156	0.0514	0.1228
INT	170,220	0.1132	0.0000	0.0000	0.0408	7.1642

Note: ***CASH*** is the ratio of cash to total assets minus cash. ***SIZE*** is the natural logarithm of total assets. ***CF*** is the ratio of pretax profit plus depreciation to sales. ***GROW*** is the ratio of sales in the current year to sales from the previous year. ***LEV*** is total debt over equity. ***DEBTM*** is the ratio of long-term debt over total debt. ***BANKR*** is the ratio of total bank debt to total debt. LIQ is net working capital less cash divided by net assets. ***CCC*** is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable. ***RET*** is the ratio of total pension insurance costs to sales. ***EMP*** is the average number of employees based on hours worked. ***EXPO*** is the ratio of revenues generated abroad to total sales. ***PROFM*** is net income over sales. ***INT*** is interest expense to debt ratio.

Table 2 reports bivariate Pearson's correlation coefficients of the variables. Overall, the correlations between the variable CASH and the explanatory variables show the expected relation directions, except for the variables for the cash conversion cycle, employees and profitability margin respectively. Furthermore, the correlation between CASH and EXPO is not statistically significant. The majority of bivariate correlations are not particularly high, except for the case of CF and PROFM with a correlation coefficient of 0.78.

Table 2: *Correlation matrix*

	CASH	SIZE	CF	GROW	LEV	DEBTM	BANKR	LIQ	CCC	RET	EMP	EXPO	PROFM
SIZE	-0.240**												
CF	0.010**	0.140**											
GROW	0.036**	-0.061**	0.071**										
LEV	-0.083**	0.143**	0.013**	0.052**									
DEBTM	-0.209**	0.325**	0.177**	-0.021**	0.130**								
BANKR	-0.240**	0.384**	0.078**	-0.048**	0.118**	0.463**							
LIQ	-0.160**	0.090**	0.099**	-0.054**	-0.051**	0.036**	*-0.015***						
CCC	-0.040**	0.074**	-0.092**	-0.037**	-0.024**	0.028**	*0.081***	*0.316***					
RET	0.026**	-0.121**	-0.158**	-0.087**	-0.061**	-0.043**	*-0.037***	*-0.031***	*-0.184***				
EMP	-0.103**	0.501**	-0.010**	-0.027**	0.031**	0.080**	*0.187***	*0.025***	*0.047***	*0.052***			
EXPO	-0.003	0.212**	-0.003	0.033**	0.031**	0.022**	*0.045***	*0.027***	*0.047***	*-0.060***	*0.195***		
PROFM	0.078**	0.118**	0.780**	0.128**	0.020**	0.008**	*0.026***	*0.192***	*0.007***	*-0.155***	*0.026***	*0.030***	
INT	-0.007**	0.007**	0.004	-0.002	0.007**	0.006*	*-0.006**	*0.000*	*-0.001*	*-0.005*	*-0.001*	*-0.002*	*0.002*

* Correlation is significant at the 5% level. **Correlation is significant at the 1% level. (two-tailed).

Note: ***CASH*** is the ratio of cash to total assets minus cash. ***SIZE*** is the natural logarithm of total assets. ***CF*** is the ratio of pretax profit plus depreciation to sales. ***GROW*** is the ratio of sales in the current year to sales from the previous year. ***DEBTM*** is the ratio of long-term debt over total debt. ***LEV*** is total debt over equity. ***BANKR*** is the ratio of total bank debt to total debt. ***LIQ*** is net working capital less cash divided by net assets. ***CCC*** is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable. ***RET*** is the ratio of total pension insurance costs to sales. EMP is the average number of employees based on hours worked. ***EXPO*** is the ratio of revenues generated abroad to total sales. PROFM is net income over sales. ***INT*** is interest expense to debt ratio.

4.2 Univariate analysis

The size of a firm is an important factor that influences different aspects of the firm, from its profitability, riskiness, to access to external financing and the like, all of which are expected to have a certain level of impact on the level of cash within a firm. Based on this, a univariate analysis was performed to establish whether significant differences exist between smaller and larger SMEs. The sample is put together according to the variable *SIZE* and is ranked in size-deciles. Table 3 reports the results for the characteristics of the 1st and 10th decile firms, based on which a significant difference between these firms can be established.

Table 3: *Characteristics of smaller versus larger SMEs*

	1st decile firms by size		10th decile firms by size		Mean difference	*t*-value
	Mean	Median	Mean	Median		
CASH	0.33941	0.13930	0.06425	0.01220	0.27516	66.9***
SIZE	9.01316	9.20019	15.25310	15.09172	-6.23994	-603.1***
CF	0.03025	0.03217	0.09148	0.06860	-0.06123	-39.37***
GROW	1.25795	1.02969	1.09911	1.02964	0.15884	19.31***
LEV	0.90324	0.41552	3.40767	1.63745	-2.50443	-39.26***
DEBTM	0.04009	0.00000	0.30076	0.25256	-0.26067	-108.30***
BANKR	0.02868	0.00000	0.32693	0.29828	-0.29825	-128.24***
LIQ	-0.07101	0.08815	0.08190	0.06151	-0.15291	-24.76***
CCC	-78.10286	-22.58997	-1.26703	26.64490	-76.83583	-22.46***
RET	0.02039	0.01096	0.01275	0.00954	0.00765	32.22***
EMP	0.93912	1.00000	37.28030	22.46500	-36.34118	-116.53***
EXPO	0.04509	0.00000	0.22438	0.04359	-0.17929	-64.64***
PROFM	-0.02157	0.00744	0.02820	0.02109	-0.04977	-34.67***
INT	0.02116	0.00000	0.09058	0.03867	-0.06942	-3.82***

Note: ***CASH*** is the ratio of cash to total assets minus cash. ***SIZE*** is the natural logarithm of total assets. ***CF*** is the ratio of pretax profit plus depreciation to sales. ***GROW*** is the ratio of sales in the current year to sales from previous year. ***DEBTM*** is the ratio of long-term debt over total debt. ***LEV*** is total debt over equity. ***BANKR*** is the ratio of total bank debt to total debt. ***LIQ*** is net working capital less cash divided by net assets. ***CCC*** is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable. ***RET*** is the ratio of total pension insurance costs to sales. ***EMP*** is the average number of employees based on hours worked. ***EXPO*** is the ratio of revenues generated abroad to total sales. ***EXPOD*** is a dummy variable set to one for firm-year observations where exports occur, and zero otherwise. ***PROFM*** is net income over sales. ***INT*** is interest expense to debt ratio.
*** Difference significant at 1%.

Comparing the 1st and 10th decile firms in terms of size, a significant difference between the two can be observed. As expected, the results show that smaller firms have significantly higher cash holdings. In addition, these firms pose a lower level of overall leverage and

bank debt, which confirms that their higher riskiness limits the access to external sources. Furthermore, smaller firms are less liquid, as seen from the negative net working capital and cash conversion cycle respectively, which indicates that they do not pay their suppliers until payments from their customers are settled. Based on the results in Table 3, it can be concluded that despite the fact that smaller firms show higher growth, they are nevertheless less profitable and in the end generate lower cash flows.

4.3 Regression results

The nature of the data set, that is an unbalanced panel data, determined the application of the Fama-MacBeth method (Fama & MacBeth, 1973) in order to empirically estimate the model presented in section 3.1. The Fama-MacBeth regression approach is used to remove the problem of correlated residuals across time, an issue that might otherwise be present in panel data sets. If residuals are correlated, then the standard errors of the coefficient estimates can be biased, which in turn clouds the usefulness of the regression model. And this is the reason for the application of the Fama-MacBeth procedure. The latter consists of two steps, where in the first step, a cross-sectional regression is run for each time period. In the second step, the estimates for the parameters are obtained by averaging the coefficients of each cross-sectional regression. The time-series standard errors of the average coefficients are used to draw inferences. More specifically, the standard errors are calculated as the times-series standard deviation of the regression coefficients divided by the square root of the number of years (Fama & French, 2002).

In the continuation, in Table 4 the results of the Fama-MacBeth regressions are presented, using alternative proxies for some of the variables explained in the previous section with the purpose to evaluate the robustness of the regression results. The *t*-statistics are shown in brackets, while columns 1 and 2 show the results using the proxy for the mandatory retirement benefits expressed as the ratio of pension insurance costs to sales (*RET*) combined with the two alternatives for the export variable, namely exports as their ratio to sales (*EXPO*) and the dummy variable for the firm-year observations where exports occur (*EXPOD*). Columns 3 and 4 present the results using the variable for the mandatory retirement benefits approximated by the number of employees (*EMP*) with the same combination of the export variables. The results obtained with all four regression models are consistent. All variables are significant at the 1% level, except for the variable expressing the level of interest rates (*INT*) and the growth variable (*GROW*) which is statistically insignificant.

Table 4: *Determinants of cash holdings in SMEs*

	Predicted sign	1	2	3	4
(Constant)		0.6963***	0.6916***	0.7265***	0.7274***
		(30.41)	*(27.99)*	*(28.74)*	*(27.04)*
SIZE	-	-0.0379***	-0.0375***	-0.0404***	-0.0405***
		(-17.08)	*(-15.08)*	*(-16.21)*	*(-14.74)*
CF	+/-	-0.2062***	-0.2070***	-0.2054***	-0.2048***
		(-16.38)	*(-17.30)*	*(-17.10)*	*(-17.79)*
GROW	+	-0.0038	-0.0028	-0.0042	-0.0032
		(-1.57)	*(-1.24)*	*(-1.69)*	*(-1.39)*
LEV	-	-0.0026***	-0.0026***	-0.0026***	-0.0025***
		(-18.12)	*(-17.84)*	*(-18.50)*	*(-18.02)*
DEBTM	-	-0.0803***	-0.0808***	-0.0778***	-0.0777***
		(-24.58)	*(-23.28)*	*(-22.26)*	*(-21.00)*
BANKR	-	-0.2169***	-0.2183***	-0.2169***	-0.2184***
		(-31.36)	*(-31.04)*	*(-31.78)*	*(-31.36)*
LIQ	-	-0.1561***	-0.1562***	-0.1553***	-0.1554***
		(-8.76)	*(-8.79)*	*(-8.65)*	*(-8.67)*
CCC	+	0.00004***	0.00004***	0.00004***	0.00004***
		(6.21)	*(6.31)*	*(5.52)*	*(5.64)*
RET	+	0.1893***	0.1895***	-	-
		(3.90)	*(4.05)*	-	-
EMP	+	-	-	0.0004***	0.0005***
		-	-	*(7.42)*	*(10.16)*
EXPO	-	0.0665***	-	0.0639***	-
		(16.25)	-	*(15.15)*	-
EXPOD	-	-	*0.0149****	-	*0.0144****
		-	*(5.58)*	-	*(5.22)*
PROFM	-	0.6117***	0.6124***	0.6099***	0.6102***
		(16.74)	*(17.35)*	*(16.53)*	*(17.05)*
INT	+/-	-0.0012	-0.0012	-0.0012	-0.0012
		(-2.17)	*(-2.17)*	*(-2.17)*	*(-2.17)*
R2		*0.145*	*0.143*	*0.145*	*0.143*
Observations		*170,220*	*170,220*	*170,220*	*170,220*

Note: ***CASH*** is the ratio of cash to total assets minus cash. ***SIZE*** is the natural logarithm of total assets. ***CF*** is the ratio of pretax profit plus depreciation to sales. ***GROW*** is the ratio of sales in the current year to sales from the previous year. ***DEBTM*** is the ratio of long-term debt over total debt. ***LEV*** is total debt over equity. ***BANKR*** is the ratio of total bank debt to total debt. ***LIQ*** is net working capital less cash divided by net assets. ***CCC*** is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable. ***RET*** is the ratio of total pension insurance costs to sales. ***EMP*** is the average number of employees based on hours worked. ***EXPO*** is the ratio of revenues generated abroad to total sales. ***EXPOD*** is a dummy variable set to one for firm-year observations where exports occur, and zero otherwise. ***PROFM*** is net income over sales. ***INT*** is interest expense to debt ratio.

***Significant at 1%.

In Table 4, not only are the coefficients statistically significant, but what is more, in most cases they are also economically significant. One exception is the variable *GROW*, as due to its statistical and economic insignificance it does not allow drawing any conclusions about the relation between growth and cash holdings. It seems that growth opportunities do not play a significant role in deciding on the level of cash to be held in the Slovenian SMEs. To gauge the economic importance of the influence of the explanatory variables on the dependent variable, the principle of Kim et al. (1998) is followed. Namely, the economic impact is evident in the percentage change over the mean value of the dependent variable, which is the result of a one-standard deviation change in the explanatory variable, while all other values are equal.

The signs of the estimated coefficients are generally in favour of the expectations outlined in the previous section, thus supporting our hypothesis that the main motives behind the cash policies of Slovenian SMEs are the transactions and precautionary ones. The notable exceptions to our expectations are the coefficients of the variables representing exporting activities and profitability, which provide support for the speculative motive. With regards to the effect of exporting activities, the coefficients for these variables suggest exporting firms are more liquid and higher sales generated abroad lead to higher cash holdings. Viewed through the logic of the precautionary demand, if the company is capable of generating cash internally, then the need for precautionary balances is lower and should therefore lead to lower cash holdings, which is however contrary to our results. The fact that exporting firms maintain more cash might better be explained by the speculative motive. Namely, the presence of a firm on foreign markets may lead to more growth or investments possibilities. In order to be able to take advantage of positive investments, which are currently unkown, the companies instead decide to maintain higher cash levels in their accounts. The same implication is provided by the positive sign of the coefficient for profitability. Particularly, the results demonstrate that more profitable firms are more capable of generating funds, maintained in their accounts, internally. More profitable or more operationally efficient firms have higher probability to reap the benefits of positive investment opportunities, and this is the reason they hold on to their funds in order to be able to take on profitable projects once they arise. The variable *PROFM* is also the one with the most important economic significance, as an increase of one standard deviation leads to an average 41.5% increase in cash.

The estimated regression coefficient of the size variable implies that firm size does in fact matter in making a decision on the level of cash holdings. The coefficient for *SIZE* in this research is negative and statistically significant. A similar result is also found by Bigelli and Sánchez-Vidal for Italian SMEs (2012), and Pastor and Gama (2012) for Portuguese SMEs. The size of the coefficient suggests a substantial economic impact, as an increase of one standard deviation of *SIZE* produces a decrease in the cash held by between -37.1% and -40.1%. This finding indicates there are economies of scale in raising funds from external sources. Given that small firms suffer from severe exposure to informational asymmetries (Berger & Udell, 1998), they do not only face more severe borrowing constraints and higher costs of external financing (Kim et al., 1998), but are also more susceptible to financial

distress (Titman & Wessels, 1988). The listed characteristics can induce higher fixed costs of holding cash, where it is these relatively higher costs that prompt smaller firms to retain more cash in their accounts for transactions and precautionary reasons.

The negative sign of the *CFLOW* coefficients supports the idea that cash flow represents a ready source of liquidity, a finding contrary to the situation in Spanish (García-Teruel & Martínez-Solano, 2008) and Portuguese SMEs (Pastor & Gama, 2012), where firms show a preference for internally generated funds where information asymmetries exist. In our case, the ability to generate funds internally lowers the need for precautionary balances, meaning the firm's cash holdings are used for current transactions.

All variables related to debt provide support for their expected influence on cash holdings. The negative sign of the variable *LEV* implies that operating and financial debt can be an alternative source of liquidity, albeit one with a relatively small economic impact, as the increase of one standard deviation decreases the level of cash by an average -8.4%. Given that leverage can be viewed as a cash substitute and as a proxy for the firm's ability to generate external finance (Belghitar & Khan, 2013), we might conclude that these external resources are used for satisfying the transactions demand for liquid assets as well. The negative sign of *DEBTM* is in line with the hypothesis that when long-term debt prevails in the debt structure of a firm, the need for securing a financial buffer is less emphasized, thus firms tend to hold lower amounts of cash, a finding consistent with García-Teruel & Martínez-Solano (2008), and Pastor & Gama (2012). Looking at the other side of the coin, short-term debt financing means higher risk, such that the company which uses short-term finance has to renegotiate and renew its credit lines, which causes uncertainty and incurs costs. Therefore, a company chooses to retain more cash holdings in order to secure a certain buffer for precautionary reasons. Our findings are consistent with Kling et al. (2014), who observe a significant decline of short-term bank finance among United Kingdom listed companies, followed by an accumulation of cash. They explain this relationship by banks denying access to short-term finance, inducing companies to hold cash as an alternative funding source. Finally, the coefficient of the variable *BANKR* provides evidence that information asymmetries are reduced by maintaining a close relationship with banks. It thus increases the company's ability to generate external funds and reduces the precautionary demand for cash. As expected, firms with a higher ratio of bank debt to total debt hold lower levels of cash, which is also the case with Portuguese and Spanish SMEs. Furthermore, the economic importance of this variable is rather high, as an increase in *BANKR* of one standard deviation brings about a reduction in cash holdings of an average -28.7%, ceteris paribus.

Liquidity is one of the determinants with the highest economic significance resulting in a 39% decrease in the level of cash for an increase of one standard deviation in the variable *LIQ*. This supports strongly the fact that other liquid assets may be used as a substitute for cash, consistent with the findings of García-Teruel & Martínez-Solano (2008), Bigelli & Sánchez-Vidal (2012,) and Pastor & Gama (2012). By having cash substitutes at disposal, the company reduces its precautionary demand for cash and maintains lower levels.

The results obtained for the cash conversion cycle are very indicative of the precautionary behaviour of the SMEs in our sample, as we find that firms with longer cash conversion periods maintain higher cash holdings. From the positive effect of the length of the cash conversion cycle on cash levels, we might conclude that companies with weaker ability to generate cash from ongoing operations decide to keep higher cash balances, in order to hedge against uncertainty when cash turnover is low. Such results were obtained also for Italian SMEs (Bigelli & Sánchez-Vidal, 2012). The economic impact of this variable is relatively small, resulting in an average 7.2% decrease in cash levels for a one standard deviation increase in *CCC*.

Turning to the proxies for the compulsory retirement benefit contributions (*RET* and *EMP*), a positive influence on cash holdings is observed, providing further support for the precautionary motive. Contrary to the previous findings that legally required retirement contributions negatively influence the liquidity of a firm, the results of this research suggest that Slovenian SMEs hold higher cash levels associated with higher pension costs. We can say that the firms in our sample act prudently and cautiously in that they accumulate cash in order to be able to meet future known obligations. Nevertheless, the economic impact of this effect is rather small. An increase of one standard deviation of the variables *RET* or *EMP* results in an increase in cash balances by 2.1% and 4.7% respectively.

Finally, limited evidence is found to support the theoretical expectation for the effect of the recently changed interest rate climate on the cash amounts held by companies. The coefficient's sign is negative, suggesting that in the period of falling interest rates, i.e. more affordable external financing and lower earnings on deposits, firms are inclined to increase their cash holdings, presumably due to precautionary reasons. This is partially in line with the finding of Sun and Wang (2015) who observe a decline in cash holdings, but only in the first year of the crisis, after which cash holdings resumed growth. The relation between interest rates and cash holdings is, however, not statistically significant and even if it were, its economic impact would be insignificant.

5 ROBUSTNESS AND ADDITIONAL TESTS

In order to evaluate the robustness of our results, additional analyses are conducted. For the sake of brevity, the tabulated regression results of many of these analyses are not presented in this paper, but are instead available directly from the authors upon request.

Our attention is first turned to the interest rate environment and its relation to cash holdings. As outlined in section 2.4, one of the objectives of this study is to analyse the impact of the changes in interest rates on the level of cash held. The effect is observed based on the average cross-sectional coefficients that span the period before, during and after the global financial crisis, which can average out their effect. Therefore, a subsample analysis is conducted by splitting the sample into different time periods, namely (i) pre-crisis period between the years 2006 and 2008, (ii) crisis period between the years 2009 and

2012, and (iii) after-crisis period in the year 2013. Pooled cross-section regression analyses for each period are performed with the same variable combinations as the original model.

Almost all regression coefficients have the same sign as the original regression model, with the exception of the coefficient for the variable *GROW*, which has a positive sign in three of the four regression models in the period before the crisis. Nevertheless, this variable is not statistically significant in this period, whereas it becomes significant at $p = 0.05$ in the period 2009-2012. The most noteworthy difference is the fact that the interest rate variable is not statistically significant in the periods before and after the crisis, while in the crisis period it approaches significance with an even smaller economic impact than in the original model. More precisely, an increase of one standard deviation of *INT* causes a decrease in cash holding of only -1.24% on average. The number of employees does not seem to have any effect on the small and medium-sized enterprises (SMEs) cash levels before the crisis, as this variable is statistically insignificant in the period 2006-2008. This is also the case for the third regression model in 2013, whereas the latter becomes significant at $p = 0.05$ level in the fourth model in 2013. Finally, as regards the export dummy variable, it proves not to be statistically significant in the 2013 regression models.

Next, the difference in cash management policies between zero bank debt companies and indebted companies is analysed in order to assess the robustness of the conclusions based on leverage related items. For that purpose, we define two subsamples based on the ratio of bank debt to total debt (variable *BANKR*), for which some descriptive statistics are presented and separate pooled cross-section regression analyses performed. As can be seen from Table 5, these two groups of companies differ mostly with regard to the amount of cash they bear and the number of employees they have. The results show that companies with zero bank debt keep 28% of their assets in cash and employ 4 people on average, while indebted companies keep on average only 5% of their assets in cash and have around 12 employees.

Table 5: *Descriptive statistics of SMEs with zero and positive bank debt*

	Zero bank debt SMEs			SMEs with bank debt				
	Mean	**Median**	**Standard Deviation**	**Mean**	**Median**	**Std. Deviation**	**Mean difference**	**t-stat.**
CASH	0.28249	0.11342	0.44260	0.05665	0.01459	0.13349	*-0.22584*	*-147.97****
SIZE	11.28473	11.17303	1.62291	12.86594	12.80840	1.58645	*1.58121*	*202.52****
CF	0.06548	0.05178	0.14495	0.07678	0.06067	0.11854	*0.01130*	*17.70****
GROW	1.17635	1.01601	0.77031	1.10653	1.01683	0.57013	*-0.06982*	*-21.46****
LEV	1.64323	0.67048	5.47078	3.39251	1.90638	6.32775	*1.74928*	*60.30****
DEBTM	0.09416	0.00000	0.21999	0.28885	0.23474	0.26803	*0.19469*	*161.50****
BANKR	0.00000	0.00000	0.00000	0.35051	0.31198	0.24193	*0.35051*	*401.55****
LIQ	0.04852	0.11747	0.54151	0.01772	0.02886	0.31384	*-0.03080*	*-14.65****
CCC	-67.01304	-13.31384	324.66207	-23.37291	4.81291	268.77488	*43.64013*	*30.34****
RET	0.01835	0.01269	0.02247	0.01555	0.01181	0.01604	*-0.00280*	*-29.92****
EMP	4.19438	1.50000	11.74231	11.88776	4.39000	23.04748	*7.69338*	*83.99****
EXPO	0.08876	0.00000	0.23393	0.11519	0.00000	0.24154	*0.02643*	*22.78****
PROFM	0.01060	0.01617	0.13697	0.01517	0.01502	0.10304	*0.00457*	*7.85****
INT	0.00603	0.00000	1.38635	0.24348	0.04615	10.55269	*0.23744*	*6.19****
Observations		93,398			76,822			

Note: Zero bank debt companies are defined as the companies with ratio of bank debt to total debt equal to zero. Positive bank debt companies are the SMEs with ratio of bank debt to total debt higher than zero. ***CASH*** is the ratio of cash to total assets minus cash. SIZE is the natural logarithm of total assets. ***CF*** is the ratio of pretax profit plus depreciation to sales. ***GROW*** is the ratio of sales in the current year to sales from the previous year. ***DEBTM*** is the ratio of long-term debt over total debt. ***LEV*** is total debt over equity. ***BANKR*** is the ratio of total bank debt to total debt. ***LIQ*** is net working capital less cash divided by net assets. ***CCC*** is the sum of the average inventory conversion period and the receivables collection period less the average payment period for accounts payable. ***RET*** is the ratio of total pension insurance costs to sales. ***EMP*** is the average number of employees based on hours worked. ***EXPO*** is the ratio of revenues generated abroad to total sales. ***EXPOD*** is a dummy variable set to one for firm-year observations where exports occur, and zero otherwise. ***PROFM*** is net income over sales. ***INT*** is interest expense to debt ratio.
*** Difference significant at 1%.

Most of the coefficients from the subsample regression analyses have the same sign as in the initial model, except for the negative sign of the variable *EMP* in zero debt *SMEs*, and the positive sign of *GROW* together with the negative sign of *EXPOD* in indebted SMEs. What is interesting is that the variable *GROW* is statistically significant in both subsample analyses, however with a rather small economic impact and with an opposite

effect between the subsamples. Namely, it has a negative impact on cash holdings in zero debt SMEs, which is contrary to our expectations that future profitable investment opportunities urge companies to keep cash in their accounts to be able to fund them. Therefore, neither the precautionary nor the speculative motive are particularly strong in these companies. The situation is opposite with the SMEs that carry bank debt on their balance sheets, which show signs of precaution and possibly speculation by maintaining more cash in their accounts associated with sales growth. We also find that the variable *INT* is not statistically significant in any of the regression models. Therefore, we cannot make any inferences about the effect of the interest rate climate on cash holdings for both groups od SMEs. Furthermore, mandatory retirement benefit contributions do not seem to influence the level of cash in leveraged SMEs, as both *RET* and *EMP* variables are not statistically significant for this group of companies. On the other hand, the variable *RET* has a positive impact on the cash holdings in the SMEs with zero debt, while the higher number of employees is associated with lower cash holdings in these companies. This suggests that the number of employees might not be a good approximation of the requirements for mandatory retirement benefits. The negative impact of *RET* on cash holdings points to the precautionary motive, while the negative impact of *EMP* points to the transactions motive. Liquidity and profitability are again the determinants with the highest economic significance. Namely, an increase of one standard deviation in the variable *LIQ* or *PROFM* results in a decrease in the level of cash by 35% and an increase of 36% for the zero bank debt SMEs respectively, and in a decrease of 46% and an increase of 47% in the level of cash in the leveraged SMEs respectively.

Next, for the purpose of controlling micro companies, the sample is divided into two subsamples, one consisting of companies with zero or one employee, and the other one consisting of companies with more than one employee. The results are similar with the initial model, with minor exceptions only. The variables approximating mandatory retirement benefit contributions are statistically insignificant in three out of the four regression models for the micro companies. A possible explanation for this might be the fact that these are indeed micro companies and hence have very low expenditures related to mandatory benefit contributions. In the other group of companies, however, only the variable *EMP* is not statistically significant, which is another sign that it might not be a good approximation for mandatory retirement benefit contributions. In addition, exporting and non-exporting firms are analysed separately, nevertheless, a result similar to that of the Fama-MacBeth regressions is obtained, with just one exception and that is the negative sign of the variable for the number of employees in non-exporting firms.

Finally, industries are controlled for and a pooled cross-section regression analysis performed, using dummy variables at the two-digit industry classification code level. The Slovenian classification of economic activities is adjusted to the Statistical classification of economic activities in the European Community, abbreviated as NACE. These regressions lead to the same results as the Fama-MacBeth regressions, based on which it can be concluded that industry does not play an important role in the cash management policies of Slovenian SMEs.

6 CONCLUSION

The purpose of this study is to examine the determinants of cash holdings in small and medium-sized companies. In order to do so, a large sample of Slovenian firms is used. The panel data consist of 170,220 firm-year observations corresponding to 27,573 firms in the period between 2006 and 2013. Slovenia is a particularly interesting choice of country in which to examine the characteristics of SMEs, since they constitute the majority of all non-financial business entities in the territory of the Republic of Slovenia and provide a significant economic value.

In the research, it is observed that the cash policies of Slovenian SMEs are generally driven by the transactions and precautionary motive respectively, however, we also find evidence for the speculative motive. Our results show that smaller firms opt for higher cash holdings out of precaution and due to transaction needs, as there are economies of scale in raising funds from external sources. The precautionary demand for cash prevails in firms with longer cash conversion cycles and higher retirement benefit obligations, where higher cash balances are recorded. Firms that are facing poor cash turnover and higher expenditures tend to hold on to higher cash balances in order to secure funds for unexpected needs. In addition, when short-term debt dominates the debt structure of a firm, it causes uncertainty arising from the ability to prolong the loans. Consequently, such firms need more financial buffer and for that reason maintain higher cash balances.

On the other hand, firms that have cash substitutes at disposal, such as other liquid assets and debt, do tend to use them as such and thus keep lower cash balances in their accounts. Lower cash amounts are found in companies with higher cash flows as well. Keeping close relationship with banks reduces agency costs and information asymmetries among lenders and borrowers, which results in lower costs of external financing and better access to the latter. These companies, which are more capable of generating either internal or external funds, pose lower need for precautionary balances and use up their cash for transaction purposes. Little empirical support is found for the direct negative influence of the interest rate level on cash holdings, suggesting that the overall economic uncertainty accompanied with tightening credit conditions, might induce firms to increase their cash holdings, due to precautionary reasons.

The finding that exporting and more profitable firms hold more cash than others provides support for the speculative motive. These firms have a higher probability of taking advantage of positive growth or investment projects, so they decide to hold on to their funds in order to be able to seize profitable opportunities when they arise.

This paper contributes to the existing literature on cash holdings decisions on several grounds. First, it expands the scarce literature on the determinants of cash holdings in small and medium-sized companies, a sector of great importance for the economy in general. Second, it focuses on a large sample of Slovenian SMEs, a country where no

such research has been conducted so far. Third, it brings new evidence on the factors that influence the levels of cash by investigating so far untested determinants and by validating previous results. Lastly, it is the first paper that analyses the effect of the low interest rate environment on cash holdings of SMEs.

Even though this study makes a contribution towards better understanding of cash policies of SMEs, we acknowledge some limitations which we hope will serve as a prompt for future research. As the empirical investigation is based on a large sample of Slovenian SMEs, the study could only be generalized to firms similar to those included in our research. In order to be able to apply the findings of our research to SMEs in other countries, a comparison of their characteristics and cash policies would need to be conducted. Another possible direction for further research is that our empirical results show that SMEs hold large proportion of assets as cash. It would be interesting to examine the evolution of cash holdings in SMEs through time and the reasons thereof. Furthermore, it would be valuable to study the effect of cash holdings on SME performance, taking into account that SMEs are more financially constrained and have limited access to external finance.

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