

# **What Determines Cash Holdings at Privately Held and Publicly Traded Firms? Evidence from 20 Emerging Markets**

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## **ABSTRACT**

This paper constitutes the first large sample study to examine how firm-level characteristics and national-level institutions affect firms' cash balances. The empirical results support three main findings. First, firms in countries that are more market-oriented and foster entrepreneurship have larger cash reserves. Second, the same determinants of cash balances for public firms also apply for private firms. Third, private firms start to accumulate cash reserves for a level of short term debt over total assets that are on average 65 percent higher than for public firms.

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*Preliminary draft*

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# **What Determines Cash Holdings at Privately Held and Publicly Traded Firms? Evidence from 20 Emerging Markets**

## **1 Introduction**

Many researchers have examined the willingness of firms to hold cash, and the majority of such studies have focused on analysis of large companies listed on stock exchanges. These firms presumably have strong relationships with capital markets, and therefore less need for precautionary balances vis-à-vis small privately held companies. Because financial crises and market imperfections arguably impact small and medium-size enterprises more than large firms, however, it is important to consider whether the factors that affect cash holdings at publicly traded companies also affect cash holdings at non-listed firms. Even less work has been done concerning privately held firms in emerging markets; in those settings, institutional variation at the national level may alter the motivations for firms to hold cash. This paper will examine cash holdings by both listed and privately-held companies in Central and Eastern Europe. We examine a sample of 16,786 listed and unlisted firms from twenty countries for the period 2001 to 2010 (104,605 firm-year observations). This region is ideal for our purposes, because it contains a large number of countries at various stages of financial and institutional development, yet unlike many other emerging market contexts, the countries are advanced enough that consistent and high-quality data on privately held firms exists.

This paper has several objectives: First, we examine whether national-level characteristics (such as the level of development of financial institutions or macroeconomic factors) are related to average levels of cash balances relative to total assets. Second, we test whether the same factors that affect cash balances in large listed firms also apply for small-medium sized firms. Third, because cash can be viewed as “negative debt”, we examine the impact of debt levels on cash balances.

The paper proceeds as follows. Section 2 is dedicated to the literature review and motivates the central hypotheses. Section 3 presents the data sources and discusses sample selection and financial information. In Section 4 the model and variables used in

the empirical analysis to test the effect of firm's characteristics and institutional factors on cash balances are discussed. Results are presented in section 5; section 6 concludes.

## **2. Background on determinants of cash holdings**

Keynes (1936) argued that the desired level of money holdings can be thought of as deriving from either transactions demand (cash is used to reduce transactions costs such as making payroll, paying bills, etc.) or precautionary demand (cash is used as a buffer or insurance to protect the firm in the event of difficult circumstances).

Corporate finance researchers suggest three models that determine main characteristics that influence on a decision of companies to keep cash. The trade-off model (Ferreira and Vilela, 2004) argues that companies set the optimal level of cash reserves comparing marginal benefits and costs of holding cash. The model explains that one of the benefits from cash holding is a decrease of likelihood that a company will be affected by financial distress. The reason to hold cash could be explained as precautionary motives. In this case, companies use cash reserves as insurance in order to survive in a period of uncertainty and unstable situations on the market. Moreover, the model emphasize that using this cash cushion companies can apply an optimal investment policy if they met financial constrains.

Transaction and precautionary demand for cash is studied by Lins (2009), who finds that firms use cash and lines of credit for different purposes. Lines of credit are more used by companies in order to get external financing for future investment opportunities. Excessive cash has the role of the buffer against future financial cataclysms. Sufi (2009) argues that cash represents unconditional liquidity whereas lines of credit are merely conditional. Lins (2009) provides additional reasons, for instance if the firms do not pay dividends, have less agency problems and locate in countries with more developed credit markets.

The pecking order model of Myers and Majluf (1984) states that companies keep cash in order to finance new projects and opportunities. In order to minimize the cost driven by asymmetric information, however, companies use cash as a first available tool; they turn to safe and risky debt and equities only as a last resort. The main idea of this theory

is that companies do not possess a target cash amount, but rather they use cash as a buffer between earnings and investments. This theory is very important for small and medium-size firms because in conditions of asymmetric information they are more affected than large and multinational corporations. As a result, firms with higher levels of information asymmetry should have more cash, *ceteris paribus*. Some studies consider how volatility of cash flows affects firm-level cash holding (Faulkender, 2002; Irvine and Pontiff, 2008; Han and Qiu, 2007, Acharya, 2007; Zhou, 2009).

The free-cash flow model (Jensen 1986) argues that managers of companies create reserves from excessive cash in order to get more assets under their control, in order to increase their power and to be free to accept new projects without a permission of the shareholders. Due to internal financing they can reduce a level of monitoring activity. However, this problem is not serious in privately-held companies because there is more probable that owners execute functions of managers. However, in this situation the companies are more flexible and independent from external credits and debt holders (Berger and Udell, 2003). In this case the level of cash will directly depend on the level of managerial ownership.

Variation in average cash-to-assets ratios can be explained by national-level factors such as macroeconomic performance, corruption, and the legal system characteristics (Pinkowitz et al., 2003, 2007) such as creditor protection afforded by law (Guney et al, 2007). Chen and Chuang (2009) examine how corporate governance affects cash reserves. Dittmar et al. (2003) analyzes cross-country differences relative to amount of cash held by companies. Variation in cash holding is explained by such specific factors as a level of corruption, country risk and a level of protection of shareholders' rights. Inflation represents one of other macroeconomic factors that are very important and influence on companies' cash holdings. Pinkowitz et al. (2003) analyses countries with low growth, less well-developed financial markets and higher macroeconomic volatility. They find that the level of cash reserves is related positively to the level of economic development. The research confirms the theory of Keynes (1936 cited in Zhou, 2009) that explains the reason of cash holding as a transaction demand. That means that companies keep cash as the available at any time buffer in order to pay daily payments and liabilities. It is easier than ask money from credit institutions, in particular, when interest rate is high or the access to capital markets is confined.

Other research examines in depth the relationship between leverage and cash balances. Guney (2007) finds that this relationship is not linear; firms hold more cash when leverage is either very low or very high. The research provided results for the turning point at which negative relationship between debt and cash holdings turns to positive. The findings show “the range of values of leverage from about 39% (for the UK) to about 59% (for Japan). The values for France, The US and Germany are about 48%, 49% and 54%, respectively” (Guney 2007). The results also show that the relationship become stronger “with greater anti-director rights”. Harford (2011) considers how the average maturity of the firm’s debt affects its cash holdings, and these findings are re-examined by Garcia-Teruel and Martinez-Solano (2008).

Firm size has also been identified as a determinant of cash holdings. Ferreira and Vilela (2004) provide two explanations why large companies might hold excessive cash. The first reason is that larger firms have higher number of shareholders that tend them to managerial discretion. The second reason is that large companies keep large amount of cash in order to prevent a takeover. Foley (2007) analyzed cash reserves accumulated by large companies, and finds that tax laws encourage multinational firms to hold more cash. Another finding is that companies that operate abroad have positive tendency between cash holdings and income if they face difficulties to raise capital for foreign operations abroad or capital investment opportunities abroad are bigger or more volatile than domestic opportunities. These findings are examined critically by Duchin (2010) and Irvine and Pontiff (2009). Bates (2009) confirms that the analysis of average cash ratio during recent years shows the strong increase cash reserves as for small and medium companies the same as for largest firms. He finds that cash reserves have grown across the board, but that the extent of its growth is much more significant for smaller and recently listed firms, for firms that do not pay dividends and that operate in industries that experienced higher increases in idiosyncratic volatility.

To summarize, in this paper, we pose three central research questions about firms in Central and Eastern Europe:

- Do national-level institutional characteristics affect firm-level cash holdings (Dittmar, et al, 2003; Pinkowitz et al., 2003, 2007; Chen and Chuang, 2009)?

- Do the factors that determine cash holdings at publicly traded firms also affect cash holdings at privately held firms—does listed status or size matter (Ferreira and Vilela, 2004; Foley, 2007; Duchin, 2010; Irvine and Pontiff, 2009; Bates, 2009)?
- What is the relationship between short-term debt and cash holding (Gurney, 2007)?

### **3 Data and Sample Selection**

The primary accounting and financial data for the sample has been downloaded from ORBIS database. ORBIS is a comprehensive pan-European database with accounting and financial information from both public and private firms across Western, Central and Eastern European Countries. One of the advantages of this database beside the huge amount of information is to provide comparable and uniform format for the balance sheets and financial statements allowing comparison among countries, something that without this harmonization would not be possible due to the differences in accounting procedures across countries. This study comprises an analysis of the determinants of cash holdings using a sample of countries belonging to both Central and Eastern Europe. The database provides initially twenty different countries and 18,685 firms (both private and public). However, for Belarus and Albania there is no accounting and financial information available, which reduced the number of countries to eighteen and the number of firms to 18,167. The eighteen countries by alphabetic order are: Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro Poland, Moldova, Romania, Russia, Serbia, Slovakia, Slovenia and Ukraine. Online version of ORBIS allows only the data collection for the last ten years. Therefore, if one additional year is added to a particular firm the first year is dropped if the firm has more than 10 years of available data. Therefore the time period of this study is from 2001 to 2010. Several additional criteria have been used to obtain the final sample. Moving forward, firm year observations with few available financial information (not allowing to construct the variables), firms in which total assets it is not equal to current liabilities plus noncurrent liabilities plus shareholder's funds (difference permitted 10,000 USD) and firms where balance sheet items present wrongly negative values has been excluded from the sample. The final sample consists of 16,786 firms and 104,605 firm year observations.

Table 1 reports both the number of firms by country in the initial and final sample and the number of firms public and private.

[PLEASE insert Table 1 here]

Russia is by far the country which provides more firms to the final sample used in this study accounting with a total of 5,863 firms (34.9 percent of the whole sample) divided between public and private firms, with 15.8 and 49.7 percent, respectively. Therefore, later an additional analysis for Russia should be undertaken. Other important countries are Poland and Serbia with a total together of around 20 percent of the number of firms in the sample. Less important in our sample are countries such Croatia, Estonia, Latvia, Lithuania, Macedonia, Montenegro and Slovenia which all together account just for 6.39 percent of the sample (1,072 firms). When dividing the sample in terciles, the top and bottom six countries represent 77.2 and 4.51 percent of firms, respectively. Therefore the sample is quite unbalanced in terms of the countries contribution. This is not new and has been reported in several other studies that address cross country analysis. As an example, in Mateus (2006) which investigate sixteen countries in western Europe regarding taxes and corporate debt policy, the top 3 countries in the sample and the last six accounts for the whole sample with 60 and 7 percent of the firms respectively. In terms of private and public firms as reported in figure 1, private firms are in a larger number (56 percent) but due to the poor quality of data provided and collected from private firms, listed firms account for an unusual percentage of the final sample. In terms of listed firms, Romania, Russia and Serbia represent precisely 50 percent of the sub sample for listed firms. Countries such Czech Republic, Estonia, Hungary, Latvia, Lithuania and Slovakia are almost irrelevant in the final sample with just 2.5 percent of the firms. In relation to the set of private firms the scenery do not differ so much since Russia accounts for 49.7 percent of the sample and the eight “smaller” countries only 2.6 percent.

[PLEASE insert Figure1 here]

Table 2 reports the panel data structure for the final sample presenting the number of firm-year observations by country and year.

[PLEASE insert Table 2 here]

Firms are allowed “to leave and enter” the dataset over time. With this procedure the survival bias is reduced and therefore the dataset is unbalanced in the sense that some firms have more observations than others. On average the number of year observations per firm in the sample is six years. Above the average there are eleven of eighteen countries but since Russia is below the average with 5.8 years on average that drops the overall average. The countries with more observations per firm are Serbia, Croatia and Estonia with 8.8, 7.47 and 7.46 years respectively. Nevertheless besides Serbia the other two countries are of less importance in terms of number of firms in the final sample. On the other side are Macedonia and Montenegro with less than 3 years of data per firm, on average. Important as well is the pattern of total number of firm observations per year. In fact, starting in the year of 2002 and until 2007<sup>1</sup> the number of observations has been increasing continuously at an average rate of 5 percent, from 10,212 to 13,053 observations. The years of 2008 and 2009 shows a slight drop to 12,942 and 12,302 observations respectively, maybe due to some extraordinary bankruptcies arise from the financial crisis and/or the reluctance of some firms to provide information, since in the case of private firms they make it available voluntarily. In terms of final number of firm year observations, the top three countries (Russia, Serbia and Romania provide 58,509 observations, 56 percent of the total.

[PLEASE insert Table 3 here]

Another important and interesting information is the one shown in table 3 referring to the number of firms divided in four different sectors: Manufacturing, Retail, Wholesale and Services. Since the firms could operate in more than a level in the supply chain Orbis database provides this interesting and helpful information and when the firm operates in more than a level it is reported where the firm has its most important activity. This information is relevant for the current research since firms located in Services and Retail should get paid earlier, therefore less cash balances will be required. In our sample for 558 firms this information is not available, mainly to Russia and Poland with 161 and 117 firms, respectively. The sector with more firms is Services which accounts

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<sup>1</sup> The years 2001 and 2010 are not considered since they are marginal years due to the fact that if information for year 2010 is added for a firm the year 2001 information is dropped off.

43 percent being Retail the one with lowest number, 899 firms and 5 percent of the whole sample. Russia is the country with more firms in all different sectors, Serbia is the second country concentrated in manufacturing and retail and Poland in services and wholesales. Figure 2, reports detailed percentages of the different sectors in the sample.

[PLEASE insert Figure 2 here]

Table 4 (panel A to C) reports the average common-size balance sheets scaled by total assets for the year 2008 divided in all sample (12,942 firms, panel A), Listed firms (6,161 firms, panel B) and Private firms (6,781 firms, panel C)<sup>2</sup>. Thirteen countries have more than 70 percent of all firms reported in this year, with just two with less than 20 percent (Macedonia and Montenegro). Therefore, for these two countries the results have to be analyzed carefully. For Panel A (all firms) one can highlight that the amount of fixed assets as a percentage of total assets is between 59 percent (Bosnia Herzegovina) and 82 percent (Montenegro). However the biggest countries (Russia, Serbia, Romania, Poland and Ukraine) have percentages between 54.1 and 71.57 percent where Ukraine is the smallest and Romania is the biggest from this range. In what regards to tangible assets Romania, Serbia and Russia have values between 44.02 and 52.81 percent. Since tangible assets can be and are often used as collateral the countries with higher percentage of this assets can afford higher long term debt, therefore they can have a longer debt maturity. The remaining assets such as stocks and debtors lie between 3 and 11 percent (stocks) and 5 and 20 percent (debtors). These variations are much greater than the ones reported in Mateus [2006] mainly due to more heterogeneity of the countries in this sample. More important is the cash and cash equivalents for this group of countries. In fact besides Poland which account for 8.6 percent, for the other countries the values are between 1.59 and 6.11 percent for Serbia and Check Republic, respectively.

[PLEASE insert Table 4 Panel A here]

On the liability side of the balance sheet excluding four marginal countries the shareholder's funds account between 43.18 and 54.51 percent for Romania and Serbia,

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<sup>2</sup> We choose the year 2008 for being one with highest number of observations and more recent. In fact, 77 percent of the firms reported information in this year.

respectively. The amount of current liabilities ranges from 22-40 percent whereas creditors a very important financing source as reported in Mateus [2006] accounts on average across countries by 9 percent substantially below of the value for south European countries (between 16 and 24 percent).

[PLEASE insert Table 4 Panel B and C here]

Panels B and C on the same table 4 shown the average balance sheets for the year 2008 divided the firms into Public and Private. Some differences among these two groups of firms can be highlighted. The amount of fixed assets as a percentage of total assets are mixed between listed and private firms with 50 percent of countries with higher and 50 percent with lower value for private firms. In 10 of the 18 countries other assets such stocks and debtors are higher to listed compared with private firms. More important the cash holding is on general higher for listed firms in particularly to the country with more firms and observations in the sample. In fact, for Russia cash reserves accounts is double for listed in comparison with private firms. Listed firms seem to have more equity in their capital structure. In Mateus (2006) a mixed result is reported and in Berger and Udell (1998) for a US sample of SMEs the average small firm depend 49.6 percent on equity while in our sample only nine of eighteen countries the average equity is above 45 percent. Therefore, as a first look private firms in Central and Eastern Europe countries look more in debt than the US study but less than in Western Europe as reported in Mateus (2006) where 12 up to 16 countries have a percentage of equity below 40%. As an example, Russia and Romania averages are close to 40 percent where for Serbia is 60 percent. For Listed firms the average value increases to Russia and Romania, 57 and 54, respectively and drops to Serbia to 43 percent. For the other items the results are mixed not offering any particular pattern among Public and Private firms. This could be due to the different sectors in which the firms operates, the different stages of development of the banking system, competition policy, security markets, etc or even the differences between countries that are already part of the European union, the one that want to join and others that do not have plans to do so, for instance as Bosnia Herzegovina, Moldova, Russia, Serbia and Ukraine.

[PLEASE insert Table 5 here]

Table 5 reports for the period 2001-2010 both the average annual unemployment rate percentage defined as the share of the labor force that is without work but available for; seeking employment<sup>3</sup> and transition indicators such as: Large and small scale privatization, enterprise restructuring, price liberalization, trade & Forex system, competition policy, banking reform & interest rate liberalization, securities markets & non-bank financial institutions and overall infrastructure reform<sup>4</sup>. For countries such Bosnia Herzegovina, Montenegro and in some stage Serbia the data regarding inflation rate is not as good as expected. In fact, the number of years with available data are reduced to one, three and six, respectively. In terms of transition indicators the source does not provide figures for both Czech Republic and Macedonia. It can be observed that such indicators does not move independently ones from others since all of them represents the ability of the country to promote the transition to an open market-oriented economy and to foster entrepreneurship. Therefore, an increase of that ability will affect all the indicators, pushing all of them up (higher number refers to be more close to achieve the propose aim). Therefore, as will be explained later the use of all indicators is not appropriate in our analysis because they are highly correlated with each other that create econometric problems in the regressions estimation. Countries such Hungary, Estonia and Lithuania in comparison with Serbia, Moldova and Montenegro show to be more closer to an open market oriented economy and the promotion of entrepreneurship.

#### **4. Model, Variables Specification and Statistics Analysis**

##### **4.1 Model**

The basic empirical model is a multiple variables regression model. As discussed previously this research aims to investigate the factors that affect both cash reserves at both micro and macroeconomic levels. From the rational point of view firms tend to hold cash in order to decrease transaction costs and to create a liquidity shield. In fact firms during the last years as reported in some studies (Opler et al. 1999) increased significantly the proportion of cash holding relative to their assets, due probably market imperfections and internal factors. According to previous literature cash holding of firm  $i$  at time  $t$  it is given by:

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<sup>3</sup> Definitions of labor force and unemployment differ by country. Orgaization source: International Labour Organization, Key Indicators of the Labour Market database.

<sup>4</sup> The annual unemployment rates are obtained by the World Bank website and the transition indicators from the European Bank from Reconstruction and Development, Transition Report 2010 “Recovery and Reform”.

$$\text{CASH}_{it} = \alpha + \beta_{\text{MICRO}} \text{MICRO}_{it} + \beta_{\text{MACRO}} \text{MACRO}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{IND}} \text{IND}_t + \beta_{\text{COUNT}} \text{COUNT}_t + \beta_{\text{IND}} \text{YEARS}_t \quad (1)$$

where, CASH is the observed level of cash holding for firm *i* at time *y*,  $\alpha$  is intercept term, MICRO is a vector of firm's characteristics which includes debt levels, debt maturity, profitability, liquidity, firm independence, size and the disclosure of unconsolidated or consolidated accounts, MACRO is a vector of macroeconomic factors by year and country such as unemployment rate, TRANSITION is a variable that aggregates countries according to their stage of development towards to open market economy and entrepreneurship promotion (different criteria are used), IND is a binary variable for the industry types (manufacturing, wholesale, retail and services), COUNT is a binary variable representing the different countries in the sample and YEARS is a binary variable to control the difference in years.

Equation (1) can be estimated as a "linear model "and the parameters,  $\beta$  are estimated jointly.

## **4.2 Variables Specification and univariate statistics analysis**

In this sub-section the dependent and explanatory variables and their statistical analysis (mean, standard deviation, etc) are presented. The objective is to have a set of explanatory variables that explain the determinants of cash holding for both firm-specific and institutional/macroeconomic factors. The choice between holding more or less cash will depend on the amount of short term debt hold by the firm, the maturity of debt, the situation in terms of liquidity, profitability, size of the firm, etc and macroeconomic/institutional factors such unemployment rate and transition indicators and the specificity of each country, industry and year.

### **4.2.1 The measure of cash holding**

The measure of firm's cash reserves follows the approach used in previous research as cash and cash equivalents over total assets.

[PLEASE insert Table 6 here]

Table 6 reports the mean, median and standard deviation of cash holdings per country and divided in public and private firms.

On average for the whole sample the cash reserves represents 5.66 percent of total assets. When divided among public and private firms there is a higher volume of cash reserves for private compared with public firms, 6.74 and 4.56 percent, respectively. Analyzing by country, Estonia, Czech Republic and Poland have averages above 9 percent. On the other side countries such as Bosnia Herzegovina, Macedonia, Montenegro, Moldova and Serbia report averages below 3 percent. When the evaluation is done public versus private firms per country the scenario does not change. In fact with exception for Montenegro, Poland and Russia all the other countries present lower average cash reserves for public in comparison to private firms. The analysis of the median is quite interesting showing non normality of the sample. The total averages drops significantly from an average of 5.66 percent to 1.50 percent. The same situation happens for both public and private firms with 1.09 and 2.04 respectively. This is could be due to the number of firm-year observations with a value of zero to cash reserves. In terms of the standard deviation, private firms have a higher value compared with public ones 12.48 and 9.65 percent, respectively, with the higher values for public firms to Romania and Poland (above 11 percent) and in the case of private ones to Estonia and Slovakia above 15 percent. This variation among countries and between types of firms is very interesting under the point of view of finding evidence of the determinants of cash reserves.

#### **4.2.2 The Impact of short term debt**

We claim that the relationship between leverage and cash holdings is not linear. Previous research shown that there is no linear relationship (Guney 2007) supporting that until a certain amount of leverage firms tend to reduce cash holdings but when this amount increases substantially firm's tend to begin to accumulate cash reserves to avoid possible financial distress. In this paper the measure of leverage is given by short term bank loans over total assets. The reason to measure as short term and not long or total debt is quite intuitive. In fact short term debt is defined with maturity until one year and in most of the cases is used as an open account that firms can roll over during the years.

In the case of “bad times” financial institutions can claim its total payment at the renewal which can affect the survival of the firm. Therefore we are of the opinion that short term debt should capture better the non-linear relationship with cash reserves, since long term debt is most of the time supplied with collateral (Bartholdy et al. 2010).

#### **4.2.3 Maturity of debt**

The maturity of debt should also influence cash balances. The use of short term debt force firms to periodically renewal and negotiate the conditions of loans with the risk of no refinancing (Guney et al (2007), Ferreira and Vilela 2004, Harford 2011). We measure maturity as noncurrent liabilities over total liabilities and expect a negative relationship with cash balances.

#### **4.2.4 Profitability**

The variable to capture the effect of profitability in cash reserves is defined as profit (loss) before taxation over total assets (collected directly from ORBIS database). More profitable firms are better rated and have more easily access to external finance and at lower cost. Therefore, they tend to accumulate more cash to prevent against earnings volatility or short of liquidity. Consequently a positive relationship between profitability and cash reserves is expected.

#### **4.2.5 The size effect**

Firm size has been documented as a statistical significant variable to explain cash reserves variations. Larger firms are more diversified, can by far get easily bank financing and access to capital markets, can minimize the borrowing cost and less likely to go bankrupt (Foley 2007, Ferreira and Vilela 2004, Opler 1999). For all of this it is expected a negative relationship between firm size measured as natural logarithm of total assets and cash balances.

#### **4.2.6 Unconsolidated vs. consolidated accounts**

The dataset provides information regarding if the accounts are in the unconsolidated or consolidated format. We use unconsolidated accounts when available and consolidated just in the other cases. Indeed with consolidated accounts it is not possible to categorize precisely the country effect because those firms even if their headquarters are in a specific country operate in a variety of countries. However, in terms of cash balances is

relevant to analyze both cases. As highlighted by Ferreira and Vilela (2004), Foley (2007) and Opler (1999) that multinational firms tend to hold more cash due to tax effects and if they difficulties to raise capital from foreign operations. We use a binary variable quoted one if unconsolidated accounts and zero otherwise expecting a negative correlation with cash balances.

#### **4.2.7 Firm Independence**

Orbis provides information regarding firm's ownership structure though an indicator. This indicator divides the firms in four different categories from A to D. Level A states no shareholder with more than 25 percent direct or total ownership, level B no shareholder recorded with more than 50 percent direct, indirect or total ownership, level C no shareholder recorded with more than 50% direct, indirect or total ownership and finally level D with one shareholder recorded with more than 50% direct ownership. We use a binary variable equal to one if level D (less firm independence) and zero otherwise expecting a positive relationship with cash reserves. In fact firms at level D should have less agency problems due the lack of conflicts between managers and shareholders and as suggested by Jensen (1986) management of companies create excessive reserves from excessive cash in order to get more assets under control. However, shareholders try to overcome that problem by demanding higher dividend payments and issue debt if new projects come under analysis. In private held firms with less agency problems should hold more cash in order to be more flexible and independent from external credits and debt holders.

#### **4.2.8 Transition Indicators**

We aggregate the transition indicators such as: Large and small scale privatization, enterprise restructuring, price liberalization, trade & Forex system, competition policy, banking reform & interest rate liberalization, securities markets & non-bank financial institutions and overall infrastructure reform in a country binary variable to establish the effect on cash holdings due to how much close the country is of promoting the transition to an open market-oriented economy and to foster entrepreneurship. Countries are divided in two groups, quoting one if the country belongs to the 50 percent better ranked and zero otherwise. Additionally, two binary variables were prepared: quoting one if the country is part of the European Union and zero otherwise and quoting one if

the country is not part of the European Union and does not have plans to join and zero otherwise. Finally, the countries are separated in quartiles with the first representing countries that are closer to the open market oriented economy and to promote entrepreneurship and the fourth the countries in the bottom of the scale. The expectation in terms of relationship with cash holdings is mixed. For one side the pursue to open market economy will enable firms to have an easier access to credit, with financial institutions more developed which as a consequence less cash reserves to run the daily activity of the firm. On the other hand, better institutions, and improved rule of law and regulation will drive to a higher level of creditor protection which will increases the likelihood of bankruptcy if a company has financial problems and therefore shareholders might be oriented to choose a more conservative policy and increase cash reserves in order to fill the commitments of the firm.

#### **4.2.9 Liquidity**

Firms have differences between collection and credit periods. In fact firms that have a positive balance between debtors and creditors should have less cash in their balances. These differences could be patterned across industry and within a supply chain, where the linkage among firms helps the propagation of liquidity shocks from downstream to upstream firms. An increase in the level of trade credit granted by wholesalers generates a liquidity cascade throughout the chain (Guedes and Mateus 2008). It is expected a negative relationship between liquidity and cash reserves. We measure liquidity as Debtors minus creditors minus cash over total assets.

#### **4.2.10 Probability of default**

The main theories regarding capital structure suggests alternatives to measure firm's bankruptcy, the collateral value of assets, firm's size, volatility of earnings and bankruptcy probability. Of all these alternatives, the one we found to be more appropriated to measure the impact in cash reserves are the probability of default. Two different scenarios could come from our analysis. If firms are aware of increase in the probability of the default they tend to protect themselves by holding more cash. If that situation comes by "surprise" as it was during the financial crisis that affected all firms independently of their previous situation one can expect a negative relationship. Since our sample covers as well the years 2007-2009 we expect a negative relationship

between increase of probability of default and cash balances. This should be the immediate reaction when the probability of bankruptcy increases. In a second moment firm will start to accumulate more cash. Since the probability of default measure is not lagged we do expect a negative relationship between probability of default and cash reserves. In this paper we use Altman's Z-score as a measure for probability of default. Altman's Z-score is a very well known measure but subject to some criticism if used indistinctly among countries, years and firms. In fact Altman's coefficients were calculated using US data and to listed firms and, later, with different coefficients to private firms. To overcome the problem of having in our sample both listed and private firms we use both equations. Additionally we use a binary variable equal to one if the firm is in a distress zone and zero if it is in a gray or safe zone. Below the equations used for the Altman's Z-score calculations:

$$\text{Zscore}_{\text{PUBLIC FIRMS}} = 1.2 \frac{\text{working Capital}}{\text{Total Assets}} + 1.4 \frac{\text{Retained Earnings}}{\text{Total Assets}} + 3.3 \frac{\text{EBIT}}{\text{Total Assets}} + 0.6 \frac{\text{Market Value of Equity}}{\text{Total Liabilities}} + 0.999 \frac{\text{Sales}}{\text{Total Assets}}$$

and,

$$\text{Zscore}_{\text{PUBLIC FIRMS}} = 0.717 \frac{\text{Current Assets} - \text{Current Liabilities}}{\text{Total Assets}} + 0.847 \frac{\text{Retained Earnings}}{\text{Total Assets}} + 3.10 \frac{\text{EBIT}}{\text{Total Assets}} + 0.420 \frac{\text{Book Value of Equity}}{\text{Total Liabilities}} + 0.998 \frac{\text{Sales}}{\text{Total Assets}}$$

Therefore if the Z-score is below 1.81 and 1.23 for public and private firms respectively the firm is considered to be in a distress zone and quoted as one, and zero otherwise (if in gray or safe zone).

#### **4.2.11 Unemployment rate**

Unemployment rate will have an important role on the proportion of cash reserves held in different countries. If firms have a "captive" labor market it is difficult for people to find jobs elsewhere and they will be more likely to suspend payroll. Thus, firms located in countries with higher unemployment will be less likely to hold cash balances. As a

result cash demand will be higher for countries with lower (structural) unemployment rates.

Table 7 (Panel A to C) reports summary statistics for the variables defined previously and to be used in the regression analysis dividing in values to all sample, public and private firms.

[PLEASE insert Table 7 here]

For the whole sample on average Short term debt accounts for 8.39 percent of total assets, having on average public firms less short term debt than their private counterparts, 5.95 and 10.77 percent, respectively. The maturity of debt is longer to private firms and there are substantially more profitable. Finally, private firms are shorter in liquidity which can explain both the higher maturity and more short term debt. Many companies can issue long-term debt so that they do not have to refinance in what to be considered as “bad times” and this could be principally important for highly levered firms.

[PLEASE insert Table 8 here]

Table 8 describes the variables used in this study and their expected relationship with cash reserves.

[PLEASE insert Table 9 here]

Table 9 presents a correlation matrix for the key variables in the data: *STDEBT*, *MATURITY*, *ROA*, *SIZE*, *UNCONSOLIDATED*, *INDUSTRY*, *CONCENTRATION*, *UNEMPLOYMENT*, *WCAPITAL* AND *DZSCORE*.

Table 9 confirms that multicollinearity is not a problem for this sample of both Public and Private Central and European firms. One can highlight the following correlation among independent variables: i) larger firms are more profitable and less independent, ii) as longer the maturity less short term debt in the capital structure of the firm, iii) higher

liquidity is positively correlated with short term debt, iv) the debt of firms that report unconsolidated accounts has shorter maturity, and v) unemployment rate in the country is negatively correlated with profitability. Additionally, to control if the number of firm-year observations and cash reserves that equal to zero influence on the results obtained, the model 1 for the full sample and for public and private firms was tested<sup>5</sup>. The results did not suffer any significant change in terms of statistical significance and signal of the coefficients. Overall the results seem to be robust.

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<sup>5</sup> 2049 firm-year observations were dropped from the sample.

## 5. Results

### 5.1 Testing for the determinants of cash balances

In section 3 the basic test equation for multiple variable regression analysis is written as follow:

$$\text{CASH}_{it} = \alpha + \beta_{\text{MICRO}} \text{MICRO}_{it} + \beta_{\text{MACRO}} \text{MACRO}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{IND}} \text{IND}_t + \beta_{\text{COUNT}} \text{COUNT}_t + \beta_{\text{IND}} \text{YEARS}_t \quad (2)$$

This equation is estimated using a pooled sample across firms and time periods from 2001 to 2010. The model is estimated in five different specifications for each measure of transition indicators.

[PLEASE insert Table 10 Panel A here]

In table 10 (Panel A), the first group of regressions for the full sample, 104,605 firm-year observations is presented. In each panel five different regressions are estimated with the use of different set of variables. The first column named “*model 1*” presents the results for the variables reported in the previous section: Short term debt (*STDEBT* and *STDEBT*<sup>2</sup>), maturity, profitability (*ROA*), size, unconsolidated, industry concentration (independence), transition indicators, unemployment, liquidity (*WCAPITAL*) and Altman’s *Z*-score (*DZSCORE*). The variable *TRANSITION IA* in panel A refers to the approach discussed previously where the countries are divided into two groups, quoting one if the country belongs to the 50 percent better ranked according to the transition indicators from the European Bank from Reconstruction and Development and zero otherwise. Due to missing information from some firms and years regarding accounting figures to calculate Altman’s *Z*-score and also for countries and years in the case of the variable *UNEMPLOYMENT* the number in the first model is reduced to 55,892 observations. Overall, the variables are statistical significant for one percent level (p-value below 0.001) and with the predicted signs presented previously in table 8. The variable *STDEBT* is U-shaped confirming that the relationship with cash reserves is negative and statistically significant at the one percent level across all countries as well as there is a positive and statistical significant at one percent level for all countries for the “*estimated coefficient*” of the quadratic leverage term. The minimum level of cash reserves is estimated when short term debt is 28.58 percent of total assets. *MATURITY*

is negatively related with cash balances for a one percent significance level, showing that longer debt maturity induce firms to hold less cash reserves. In terms of transition indicators the results support the hypothesis that more developed countries, with better institutions, improved rule of law and regulation and as a consequence enhanced creditor's protection, shareholders would be oriented to choose a more conservative policy with inevitable increase of cash reserves. Firm's with unconsolidated accounts shows on average less cash reserves in comparison with the consolidated counterparts. In fact as stated by Ferreira and Vilela (2004), Foley (2007) and Opler (1999) multinational firms tend to hold more cash due to tax effects and if they have difficulties to raise capital from foreign operations, which could be the case for this sample of firms in Central and Eastern Europe. In terms of independence indicator, less independent firms tend on average to have more cash reserves. Size as discussed in Foley (2007), Ferreira and Vilela (2004) and Opler (1999) has negative relationship with cash reserves. On average a one percent increase in size (measured by natural logarithm of total assets) will have an impact of 0.51 percent reduction in cash reserves. Finally, manufacturing firms are more likely to have larger cash balances than retail, wholesale and services firms; an increase in liquidity have a negative impact in cash reserves, firm's in countries with higher unemployment rate have less cash reserves and an increase in the probability of financial distress is associated with less cash reserves. Overall, the model has adjusted R-squared of 0.3032 which is good fit for a panel data analysis.

Column 2 in table 10 panel A (model 2), reports the results but when the variable Altman's Z-score is dropped from the analysis. The reason is to include more firm-year observations in the analysis and therefore to control if the results will change due to that fact. The number of firm-year observations increased substantially but the statistical significance and the sign of the coefficients did not changed. The adjusted R-squared marginally declines to 0.2941 but showing the relevance of the Altman's Z-score as a good predictor of cash reserves. Model 3 (third column) adjust the number of variables, eliminating now the variable unemployment. The reason is the same as the one presented previously and with that procedure the number of firm-year observations increased again with no significant change in the significance and sign for independent variables coefficients. Finally, for the last two columns country and year binary variables are included excluding the variable *TRANSITION* due multicollinearity

problems.<sup>6</sup> Once again the results have not changed in terms of significance and the variables relationship with cash reserves.

[PLEASE insert Table 10 Panel B and C here]

Panels B and C of table 10 shows the same five models presented previously but for the case where the “transition indicators” are defined in a different way. In panel B two binary variables are built *TRANSITION 1B* for countries that are part of European Union such as: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia and *TRANSITION 2B* for countries that are not part and do not plan to be such as: Bosnia Herzegovina, Moldova, Russia, Serbia and Ukraine. The results and statistical significance do not differ when this approach for country divisions is used. As for the previous panel the other variables do not change in terms of significance and relation with cash reserves. Finally, for panel C the approach is to divide the countries by quartiles. The first quartile is defined as the group of countries in the top of the hierarchy of development according transition indicators from the European Bank from Reconstruction and Development. The fourth quartile shows the countries in the bottom of the scale. The countries are Estonia, Hungary, Poland, Slovakia and Bosnia Herzegovina, Macedonia and Serbia for the first and fourth quartile, respectively. More important in all the analysis is that nevertheless the model used or the approach in terms of dividing the countries in more or less close of promoting the transition to an open market-oriented economy and to foster entrepreneurship, the variables are all significant and with the expected relation with cash reserves. However, one of the approaches have to be chosen in terms how to divide the countries, the separation among countries that belong to European union and the ones that does not, shows the better fit in terms of R-squared.

[PLEASE insert Table 11 Panel A to C here]

Table 11 and 12 (panels A to C) present the same methodology used in table 10 (again five models) but dividing in private (table 11) and public firms (table 12).

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<sup>6</sup> For the countries Russia is the basis case and for the year 2008.

[PLEASE insert Table 12 Panel A to C here]

The first result to be presented is the significance and expected signs of the coefficients in the different approaches to categorize the countries and for the different models presented. However, the fit of the models are better for private than public firms, even though the number of observations in both sub-samples is very similar, 52,821 and 51,784 for private and public firms, respectively. In terms of the independent variables, the results show a higher effect of the increase of maturity on cash reserves decline for public firms, a very similar impact of profitability and a more evident cause of increase in size and decrease in cash reserves for private firms. This could be due the fact that size is not so important for public firms since they have access to alternative source of financing just by the simple fact of being listed. In the case of private firms, the “too big to fall’ might apply more significantly, and in that sense as they become bigger the concerns about financial distress and bankruptcy are less. Additionally, less independent firms at public level have a higher impact in cash reserves. As a summary, the results overall shows the significance of the variables analyzed in the multiple regressions undertaken.

## **5.2 The Short term debt turning point**

The U-shaped pattern verified in short term debt in relation to cash reserves should be analyzed in more detail.

[PLEASE insert Table 13 here]

According to Guney (2007) the results for the “*turning point*” in debt are between 39 and 54 percent when analyzed countries such UK, Japan, France USA and Germany. However, an interesting analysis will be to control the existence of differences in the “*turning point*” among public and private firms in Central and Eastern Europe. Results are presented in Table 13 for the “*turning point*” for the whole 45 regressions from tables 10 to 12. Overall it is shown that independently of the model and the approach used to divide countries in the ones more close to promoting the transition to an open market-oriented economy and to foster entrepreneurship for others more far of that objective. Private firms across the different countries and for the time period 2001-2010 decrease their cash reserves until a level of short term debt that is much higher than for

public firms. Across the sample, private firms start to accumulate cash reserves for a level of short term debt over total assets that are on average 65 percent higher than the one for the public firms. In summary, public firms start to accumulate cash reserves for a level of short term debt that is much smaller than their private counterpart.

## 6. Conclusions

This paper has investigated the factors that influence cash balances for a sample of firms during the period 2001- 2010 using a rich data set of Central and Eastern European firms that includes over 104,605 firm-year observations. The paper set out to address three research questions: Does the level of financial institution development and macroeconomic factors play an important role in determining cash balances? Second, do the same factors determining cash balances for large listed firms also apply to small-medium sized firms? Third, how do debt levels affect on cash balances?

The empirical results support three main findings. First, firms in countries that are more market-oriented and that foster entrepreneurship have *larger* cash reserves, despite a presumably stronger precautionary motive for cash holdings in countries with less market orientation. Second, the same determinants of cash balances for public firms apply for private firms. Third, private firms start to accumulate cash reserves for a level of short term debt over total assets that are on average 65 percent higher than the one for public firms.

Further research could extend the analysis to Western European countries and to analyze the short term debt turning point across industries, differentiating for example manufacturing, wholesale, retail or services companies.

## References

1. ACHARYA V.V. ET AL. (2007) "Is cash negative debt? A hedging perspective on corporate financial policies" The Journal of Financial Intermediation, Volume 16, Issue 4, October PP. 515-554 [Online] Available from : <http://www.sciencedirect.com/science/article/pii/S1042957307000186>, [Accessed: 2 July 2011].
2. BARTHOLDY J. ET AL. (2010) "Financing of SMEs: Do they match their assets with liabilities" Working paper [Online] Available from: [http://www.rcfea.org/papers\\_sme/paper\\_Bartholdy\\_Mateus\\_Olson.pdf](http://www.rcfea.org/papers_sme/paper_Bartholdy_Mateus_Olson.pdf), [Accessed: 5 July 2011].
3. BATES T.W. ET AL. (2009) "Why Do U.S. Firms Hold So Much More Cash than They Used To?" The Journal of Finance VOL. LXIV, NO. 5 October [Online] Available from: [http://www.cob.ohio-state.edu/fin/faculty/stulz/publishedpapers/jofi\\_1492.pdf](http://www.cob.ohio-state.edu/fin/faculty/stulz/publishedpapers/jofi_1492.pdf), [Accessed: 29 March 2011]
4. BERGER A. AND UDELL G. (1998) "The economics of small business finance: the roles of private equity and debt markets in the financial growth cycle" The Journal of Banking and Finance, Volume 22 (6/8), PP. 613-673 [Online] Available from: <http://www.sciencedirect.com/science/article/pii/S0378426698000387>, [Accessed: 29 March 2011].
5. BERGER A. AND UDELL G. (2005) "Small Business and Debt Finance" Handbook of Entrepreneurship Research International Handbook Series on Entrepreneurship, Volume 1, Part 5, 299-328 [Online] Available from: <http://www.springerlink.com/content/n147624212w8156v/>, [Accessed: 29 March 2011].
6. BOOT A. (2000) "Relationship banking: What do we know?" The Journal of Financial Intermediation, Volume 9, Issue 1, January, PP. 7-25 [Online] Available from: [http://www1.fee.uva.nl/fm/PAPERS/Awaboot/english/Relationship\\_banking\\_know\\_JFI.pdf](http://www1.fee.uva.nl/fm/PAPERS/Awaboot/english/Relationship_banking_know_JFI.pdf), [Accessed: 28 March 2011].
7. BRUNNERMEIER M.K. AND YOGO M. (2009) "A Note on Liquidity Risk Management" American Economic Review, American Economic Association Volume 99, Issue 2, May, PP. 578-583 [Online] Available from: [https://hq.ssrn.com/login/pubSignInJoin.cfm?nber\\_id=w14727](https://hq.ssrn.com/login/pubSignInJoin.cfm?nber_id=w14727), [Accessed: 15 July 2011].
8. CHEN Y. AND CHUANG W. (2009) "Alignment or entrenchment? Corporate governance and cash holdings in growing firms" Journal of Business Research Volume 62, Issue 11, November 2009, pp. 1200-1206 [Online] Available from: <http://www.sciencedirect.com/science?ob=MImg&imagekey=B6V7S-4T1SFM4-2-1&cdi=5850&user=634187&pii=S0148296308001392&origin=gateway&coverD>

[ate=11%2F30%2F2009&\\_sk=999379988&view=c&wchp=dGLbVIW-zSkzS&md5=353d090b958bff8e21ff6de21c443df2&ie=/sdarticle.pdf](http://www.afajof.org/afa/forthcoming/5254.pdf), [Accessed: 29 March 2011].

9. DITTMAR A. ET AL. (2003) “International Corporate Governance and Corporate Cash Holdings” *The Journal of Financial and Quantitative Analysis*, Volume 38, Number 1, March PP. 111-133 [Online] Available from: <http://webuser.bus.umich.edu/adittmar/Research/JFOA-2003.pdf>, [Accessed: 3 July 2011].

10. DUCHIN R. (2010) “Cash Holdings and Corporate Diversification” *The Journal of Finance*, Volume 65, Issue 3, June PP. 955-992 [Online] Available from: <http://www.afajof.org/afa/forthcoming/5254.pdf>, [Accessed: 30 July 2011].

11. FAULKENDER M. W. (2002) “Cash Holdings Among Small Businesses” SSRN Working paper, March [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=305179](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=305179), [Accessed: 25 July 2011].

12. FERREIRA M.A.AND VILELA A.S. (2004) “Why Do Firms Hold Cash? Evidence from EMU Countries” *European Financial Management*, Vol. 10, No. 2, 295–319 [Online] Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1354-7798.2004.00251.x/pdf>, [Accessed: 29 March 2011].

13. FOLEY C.F. ET AL. (2007) “Why do firms hold so much cash? A tax-based explanation” *The Journal of Financial Economics*, Volume 87, Issue 3, December, PP. 579-607 [Online] Available from: <http://www.people.hbs.edu/ffoley/Cash.pdf>, [Accessed: 20 July 2011].

14. GARCIA-TERUEL P.J. AND MARTINEZ-SOLANO P. (2008) “On the Determinants of SME Cash Holdings: Evidence from Spain” *Journal of Business Finance & Accounting*, 2008-01, vol. 35, issue 1-2, pp. 127-149 [Online] Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-5957.2007.02022.x/pdf>, [Accessed: 29 March 2011].

15. GUEDES J.C. AND MATEUS C. (2008) “Trade Credit Linkages along a Supply Chain: Evidence for the Italian textile sector” SSRN Working paper [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1308189](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1308189), [Accessed: 1 July 2011].

16. GUNNEY ET AL. (2007) “International Evidence on the Non-Linear Impact of Leverage on Corporate Cash Holdings” *Journal of Multinational Financial Management* Vol. 17 No. 1 [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1517110](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1517110), [Accessed: 29 March 2011].

17. HAN S. AND QIU J. (2007) “Corporate precautionary cash holdings” *The Journal of Corporate Finance*, Volume 13, Issue 1, March PP.43-57 [Online] Available

from: <http://www.sciencedirect.com/science/article/pii/S0929119906000253>, [Accessed: 30 July 2011].

18. HARFORD J. ET AL. (2011) “Refinancing Risk and Cash Holdings” SSRN Working paper, August [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1810199&download=yes](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1810199&download=yes), [Accessed: 21 July 2011].

19. IRVINE P.J. AND PONTIFF J. (2009) “Idiosyncratic Return Volatility, Cash Flows, and Product Market Competition” The Review of Financial Studies Volume 22, Issue 3, PP. 1149-1177 [Online] Available from: [https://www2.bc.edu/~pontiff/Documents/12\\_idio-rfs.pdf](https://www2.bc.edu/~pontiff/Documents/12_idio-rfs.pdf), [Accessed: 2 July 2011].

20. JENSEN M. C. (1986) “Agency costs of free cash flow, corporate financing and takeovers” The American Economic Review, Volume 76, Number 2, PP. 323-329 [Online] Available from: <http://www.sml.hw.ac.uk/ms75/GP%20Papers/G32.pdf>, [Accessed: 2 July 2011].

21. LINS K.V. ET AL. (2010) “What Drives Corporate Liquidity? An International Survey of Cash Holdings and Lines of Credit” The Journal of Financial Economics, Volume 98, Issue 1, October, PP. 160-176 [Online] Available from: <http://www.sciencedirect.com/science/article/pii/S0304405X10001078>, [Accessed: 21 July 2011].

22. MATEUS C. (2006) “Taxes and Corporate Debt Policy : Evidence for unlisted firms of sixteen European Countries” Working paper [Online] Available from: [http://www.efmaefm.org/efma2006/papers/650123\\_full.pdf](http://www.efmaefm.org/efma2006/papers/650123_full.pdf), [Accessed: 2 July 2011].

23. MYERS S.C AND MAJLUF N.S. (1984) “Corporate financing and investment decisions when firms have information that investors do not have” The Journal of Financial Economics, Volume 13, Issue 2, June, PP. 187-221 [Online] Available from: <http://www.sciencedirect.com/science/article/pii/0304405X84900230>, [Accessed: 30 July 2011].

24. OPLER T. ET AL. (1999) “The determinants and implications of corporate cash holding” Journal of Financial Economics 52 3-46 [Online] Available from: [http://www.cob.ohio-state.edu/fin/faculty/stulz/publishedpapers/Determinants\\_cash%20holdings.pdf](http://www.cob.ohio-state.edu/fin/faculty/stulz/publishedpapers/Determinants_cash%20holdings.pdf), [Accessed: 29 March 2011].

25. PINKOWITZ L. ET AL. (2003) “Do firms in countries with poor protection of investor rights hold more cash?” Dice Center Working Paper № 2003-29 November [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=476442](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=476442), [Accessed: 29 March 2011].

26. PINKOWITZ L. ET AL. (2007) “Cash Holdings, Dividend Policy, and Corporate Governance: A Cross-Country Analysis” Journal of Applied Corporate

Finance, Vol. 19, Issue 1, pp. 81-87 [Online] Available from: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1090700](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1090700), [Accessed: 29 March 2011].

27. RAMIRES A. AND TADESSE S. (2009) "Corporate cash holdings, uncertainty avoidance, and the multinationality of firms" International Business Review Volume 18, Issue 4, August pp.387-403 [Online] Available from: [http://www.sciencedirect.com/science?\\_ob=MIimg&\\_imagekey=B6VVGK-4W232BR-1-1&\\_cdi=6041&\\_user=634187&\\_pii=S0969593109000328&\\_origin=gateway&\\_coverDate=08%2F31%2F2009&\\_sk=999819995&\\_view=c&\\_wchp=dGLzVlb-zSkWb&\\_md5=aa5fa605525515ad3e64073bd9ab068d&\\_ie=/sdarticle.pdf](http://www.sciencedirect.com/science?_ob=MIimg&_imagekey=B6VVGK-4W232BR-1-1&_cdi=6041&_user=634187&_pii=S0969593109000328&_origin=gateway&_coverDate=08%2F31%2F2009&_sk=999819995&_view=c&_wchp=dGLzVlb-zSkWb&_md5=aa5fa605525515ad3e64073bd9ab068d&_ie=/sdarticle.pdf), [Accessed: 29 March 2011].

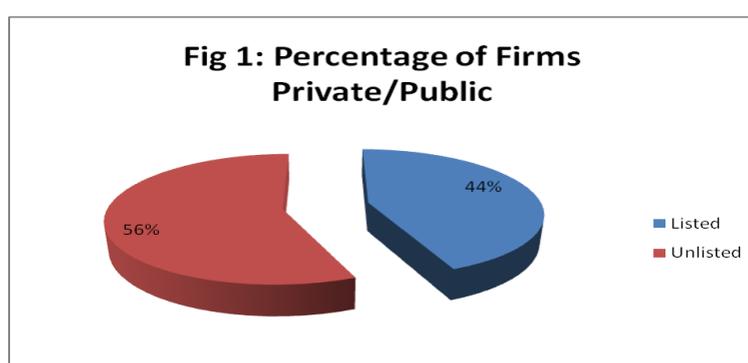
28. SUFI A. (2009) "Bank Lines of Credit in Corporate Finance: An Empirical Analysis" The Review of Financial Studies, Volume 22, Issue 3, PP. 1057-1088 [Online] Available from: [http://fdic.gov/bank/analytical/cfr/2005/sept/workshop\\_Asufi.pdf](http://fdic.gov/bank/analytical/cfr/2005/sept/workshop_Asufi.pdf), [Accessed: 30 July 2011].

29. ZHOU J. (2009) "Increase in Cash Holdings: Pervasive or Sector-Specific?" University of Toronto [Online] Available from: [http://69.175.2.130/~finman/Reno/Papers/increaseincashholdings\\_Jan152009\\_fma09.pdf](http://69.175.2.130/~finman/Reno/Papers/increaseincashholdings_Jan152009_fma09.pdf), [Accessed: 29 March 2011].

## Appendices

**Table 1: Number of Firms by country**

<i>Countries</i>	Full Sample		Listed		No-Listed	
	Initial	Final	Initial	Final	Initial	Final
Albania	5	0	0	0	5	0
Belarus	513	0	0	0	513	0
Bosnia Herzegovina	893	889	884	881	9	8
Bulgaria	598	535	384	371	214	164
Croatia	318	315	194	194	124	121
Czech Republic	867	715	19	17	848	698
Estonia	66	66	15	15	51	51
Hungary	571	517	39	32	532	485
Latvia	106	105	35	35	71	70
Lithuania	110	79	35	33	75	46
Macedonia	242	206	192	187	50	19
Montenegro	214	212	211	209	3	3
Poland	1969	1866	578	550	1391	1316
Moldova	649	647	643	641	6	6
Romania	1405	1405	1001	1001	404	404
Russian Federation	5934	5863	1179	1157	4755	4706
Serbia	1624	1624	1503	1503	121	121
Slovakia	466	341	152	135	314	206
Slovenia	116	89	68	50	48	39
Ukraine	2019	1312	324	311	1695	1001
<b>TOTAL</b>	<b>18685</b>	<b>16786</b>	<b>7456</b>	<b>7322</b>	<b>11229</b>	<b>9464</b>



**Table 2: The Structure of Panel Data**

The table below presents the number of observations by year and country.

**Panel A: Number of firm-year observations by country (Total)**

<b>Years</b>	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	Average per country
<b>Countries</b>												
Bosnia-Herzegovina	126	634	643	654	807	832	819	777	581	1	5874	587.4
Bulgaria	353	306	351	345	379	445	466	461	439	246	3791	379.1
Croatia	237	254	258	263	268	253	265	263	250	41	2352	235.2
Czech	379	395	436	439	447	453	473	501	489	53	4065	406.5
Estonia	39	48	53	54	58	56	59	61	57	19	504	50.4
Hungary	167	171	195	328	331	269	327	258	278	39	2363	236.3
Latvia	51	49	54	65	71	75	80	84	78	36	643	64.3
Lithuania	19	46	56	64	70	70	70	71	68	55	589	58.9
Macedonia	144	38	31	55	45	45	45	13	34	4	454	45.4
Montenegro	205	3	10	16	73	75	40	43	12	1	478	47.8
Poland	790	729	784	822	893	1173	1342	1420	1449	422	9824	982.4
Moldova	1	581	548	579	554	594	451	417	395	0	4120	412
Romania	1102	1173	1108	1101	1110	959	1292	1260	1230	3	10338	1033.8
Russia	2875	3123	3138	3374	3902	4135	4407	4456	4310	212	33932	3393.2
Serbia	1462	1471	1554	1558	1543	1574	1588	1581	1387	521	14239	1423.9
Slovakia	125	168	173	186	193	201	200	154	150	5	1555	155.5
Slovenia	12	61	66	70	69	79	79	79	74	31	620	62
Ukraine	894	962	941	971	969	1012	1050	1043	1021	1	8864	886.4
<b>TOTAL</b>	<b>8981</b>	<b>10212</b>	<b>10399</b>	<b>10944</b>	<b>11782</b>	<b>12300</b>	<b>13053</b>	<b>12942</b>	<b>12302</b>	<b>1690</b>	<b>104605</b>	<b>10460.5</b>

**Panel B: Number of firm-year observations by country (Public firms)**

<b>Years</b>	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	Average per country
<b>Countries</b>												
Bosnia-Herzegovina	125	630	639	649	802	825	812	769	574	1	5826	582.6
Bulgaria	249	227	251	233	266	314	332	332	313	243	2760	276
Croatia	144	153	153	157	160	150	158	162	153	33	1423	142.3
Czech	14	9	10	10	10	10	8	9	9	4	93	9.3
Estonia	5	8	9	9	12	12	13	14	15	15	112	11.2
Hungary	16	14	17	24	25	23	26	27	25	10	207	20.7
Latvia	22	16	18	25	30	28	30	31	31	29	260	26
Lithuania	4	15	22	26	30	30	29	30	30	31	247	24.7
Macedonia	127	38	31	54	42	42	43	13	33	4	427	42.7
Montenegro	202	3	9	15	72	74	39	43	12	1	470	47
Poland	111	97	126	138	157	236	327	408	473	370	2443	244.3
Moldova	0	577	545	576	553	593	447	413	394	0	4098	409.8
Romania	894	916	885	880	885	687	946	931	897	3	7924	792.4
Russia	816	842	765	828	916	1025	1094	1090	1092	204	8672	867.2
Serbia	1401	1411	1473	1465	1445	1471	1483	1476	1286	429	13340	1334
Slovakia	68	92	83	87	82	91	88	62	65	5	723	72.3
Slovenia	8	34	37	38	40	45	45	45	43	18	353	35.3
Ukraine	232	236	239	250	261	280	300	306	301	1	2406	240.6
<b>TOTAL</b>	<b>4438</b>	<b>5318</b>	<b>5312</b>	<b>5464</b>	<b>5788</b>	<b>5936</b>	<b>6220</b>	<b>6161</b>	<b>5746</b>	<b>1401</b>	<b>51784</b>	<b>5178.4</b>

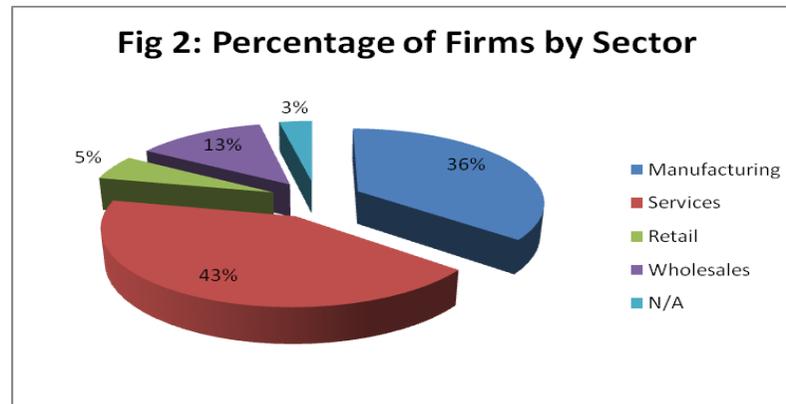
**Panel C: Number of firm-year observations by country (Private firms)**

<b>Years</b>	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	Average per country
<b>Countries</b>												
Bosnia-Herzegovina	1	4	4	5	5	7	7	8	7	0	48	4.8
Bulgaria	104	79	100	112	113	131	134	129	126	3	1031	103.1
Croatia	93	101	105	106	108	103	107	101	97	8	929	92.9
Czech	365	386	426	429	437	443	465	492	480	49	3972	397.2
Estonia	34	40	44	45	46	44	46	47	42	4	392	39.2
Hungary	151	157	178	304	306	246	301	231	253	29	2156	215.6
Latvia	29	33	36	40	41	47	50	53	47	7	383	38.3
Lithuania	15	31	34	38	40	40	41	41	38	24	342	34.2
Macedonia	17	0	0	1	3	3	2	0	1	0	27	2.7
Montenegro	3	0	1	1	1	1	1	0	0	0	8	0.8
Poland	679	632	658	684	736	937	1015	1012	976	52	7381	738.1
Moldova	1	4	3	3	1	1	4	4	1	0	22	2.2
Romania	208	257	223	221	225	272	346	329	333	0	2414	241.4
Russia	2059	2281	2373	2546	2986	3110	3313	3366	3218	8	25260	2526
Serbia	61	60	81	93	98	103	105	105	101	92	899	89.9
Slovakia	57	76	90	99	111	110	112	92	85	0	832	83.2
Slovenia	4	27	29	32	29	34	34	34	31	13	267	26.7
Ukraine	662	726	702	721	708	732	750	737	720	0	6458	645.8
<b>TOTAL</b>	<b>4543</b>	<b>4894</b>	<b>5087</b>	<b>5480</b>	<b>5994</b>	<b>6364</b>	<b>6833</b>	<b>6781</b>	<b>6556</b>	<b>289</b>	<b>52821</b>	<b>5282.1</b>

**Table 3: Number of Firms by country/sector**

<i>Sector</i>	Manufacturing	Services	Retail	Wholesales	N/A	TOTAL
<i>Countries</i>						
Bosnia Herzegovina	369	380	66	49	25	889
Bulgaria	192	295	16	28	4	535
Croatia	109	153	18	32	3	315
Czech Republic	257	282	51	113	12	715
Estonia	12	42	6	5	1	66
Hungary	158	245	30	72	12	517
Latvia	33	50	6	13	3	105
Lithuania	30	28	5	15	1	79
Macedonia	116	59	8	15	8	206
Montenegro	67	97	15	25	8	212
Poland	605	820	78	246	117	1866
Moldova	265	261	65	43	13	647
Romania	566	594	66	112	67	1405
Russian Federation	1825	2511	280	1086	161	5863
Serbia	658	648	103	129	86	1624
Slovakia	165	121	18	25	12	341
Slovenia	42	37	5	5	0	89
Ukraine	536	519	63	169	25	1312
<b>TOTAL</b>	<b>6005</b>	<b>7142</b>	<b>899</b>	<b>2182</b>	<b>558</b>	<b>16786</b>

**Fig 2: Percentage of Firms by Sector**



**Table 4: Average Balance Sheets Item as a Fraction of Total Assets**  
**Panel A: Total Firms Year 2008 (12,942firms)**

Countries																		
Number of Firms	777	461	263	501	61	258	84	71	13	43	1420	417	1260	4456	1581	154	79	1043
<b>Assets</b>																		
<b>Fixed Assets</b>	<b>58.96%</b>	<b>68.04%</b>	<b>73.03%</b>	<b>62.27%</b>	<b>64.31%</b>	<b>64.72%</b>	<b>72.50%</b>	<b>67.76%</b>	<b>57.96%</b>	<b>81.99%</b>	<b>63.89%</b>	<b>62.81%</b>	<b>71.57%</b>	<b>60.93%</b>	<b>71.40%</b>	<b>72.60%</b>	<b>73.03%</b>	<b>54.10%</b>
Intangible assets	18.60%	3.80%	4.72%	1.67%	2.32%	10.67%	1.31%	2.58%	0.75%	1.68%	3.09%	41.79%	15.42%	1.62%	2.63%	0.90%	5.26%	1.53%
Tangible Assets	33.87%	47.59%	59.27%	50.72%	43.18%	40.27%	49.80%	49.51%	54.78%	78.01%	49.00%	4.57%	51.08%	44.02%	52.81%	67.09%	53.24%	39.63%
Other Fixed Assets	6.50%	16.65%	9.03%	9.89%	20.21%	13.89%	21.39%	15.68%	7.01%	2.30%	12.07%	16.45%	5.07%	15.00%	15.96%	4.62%	14.54%	12.57%
<b>Current Assets</b>	<b>40.96%</b>	<b>31.96%</b>	<b>26.97%</b>	<b>37.73%</b>	<b>35.69%</b>	<b>33.77%</b>	<b>27.50%</b>	<b>32.24%</b>	<b>42.04%</b>	<b>18.01%</b>	<b>36.08%</b>	<b>37.19%</b>	<b>28.43%</b>	<b>39.07%</b>	<b>28.60%</b>	<b>27.40%</b>	<b>26.97%</b>	<b>45.89%</b>
Stocks	3.28%	8.50%	6.16%	6.94%	4.80%	8.70%	7.24%	7.70%	15.96%	3.15%	9.37%	11.61%	8.10%	7.93%	8.17%	6.38%	7.66%	9.94%
Debtors	5.34%	15.93%	11.50%	11.53%	12.53%	6.56%	5.55%	6.06%	16.46%	11.53%	13.78%	19.52%	13.79%	9.12%	12.17%	9.21%	11.74%	14.60%
Other Current Assets	32.41%	7.52%	9.27%	19.27%	18.36%	18.52%	14.70%	10.39%	9.31%	3.33%	13.02%	6.06%	6.54%	20.97%	8.26%	11.81%	7.56%	21.35%
Cash and Cash Equivalentents	<b>2.03%</b>	<b>4.91%</b>	<b>3.48%</b>	<b>6.11%</b>	<b>5.22%</b>	<b>3.92%</b>	<b>5.17%</b>	<b>2.15%</b>	<b>6.31%</b>	<b>2.66%</b>	<b>8.61%</b>	<b>1.45%</b>	<b>5.19%</b>	<b>5.58%</b>	<b>1.59%</b>	<b>5.35%</b>	<b>2.92%</b>	<b>4.00%</b>

<b>Shareholders' Funds and Liabilities</b>																			
<b>Shareholders' Funds</b>	<b>51.33%</b>	<b>53.07%</b>	<b>49.75%</b>	<b>51.01%</b>	<b>42.82%</b>	<b>36.37%</b>	<b>41.91%</b>	<b>49.76%</b>	<b>57.74%</b>	<b>78.55%</b>	<b>47.30%</b>	<b>63.33%</b>	<b>43.18%</b>	<b>48.22%</b>	<b>54.51%</b>	<b>52.86%</b>	<b>32.19%</b>	<b>41.16%</b>	
Capital	36.95%	19.80%	38.65%	25.96%	16.66%	13.17%	17.33%	21.38%	42.62%	1.37%	23.16%	22.11%	14.99%	11.36%	49.26%	35.16%	7.76%	14.18%	
Other Shareholder's Funds	14.38%	33.27%	11.10%	25.05%	26.16%	22.13%	23.96%	28.38%	15.12%	8.64%	24.15%	41.22%	28.20%	36.86%	5.49%	17.26%	24.43%	27.16%	
<b>Liabilities</b>	<b>48.67%</b>	<b>46.93%</b>	<b>50.25%</b>	<b>48.99%</b>	<b>57.18%</b>	<b>63.63%</b>	<b>58.09%</b>	<b>50.24%</b>	<b>42.26%</b>	<b>21.45%</b>	<b>52.70%</b>	<b>36.67%</b>	<b>56.82%</b>	<b>51.78%</b>	<b>45.49%</b>	<b>47.14%</b>	<b>67.81%</b>	<b>58.84%</b>	
<i>Non Current Liabilities</i>	<b>8.64%</b>	<b>22.43%</b>	<b>23.27%</b>	<b>16.67%</b>	<b>26.47%</b>	<b>29.44%</b>	<b>35.60%</b>	<b>15.16%</b>	<b>12.37%</b>	<b>8.91%</b>	<b>21.59%</b>	<b>8.75%</b>	<b>32.53%</b>	<b>20.94%</b>	<b>16.83%</b>	<b>21.53%</b>	<b>35.35%</b>	<b>18.29%</b>	
Long Term Debt	4.82%	20.66%	21.32%	8.85%	16.62%	49.24%	21.99%	10.38%	11.50%	6.30%	8.75%	6.33%	NA	13.93%	11.62%	4.32%	21.93%	9.51%	
Other Non Current Liabilities	3.82%	1.82%	1.95%	7.82%	9.85%	30.65%	14.92%	6.61%	1.88%	2.61%	13.79%	2.43%	NA	7.01%	5.20%	17.21%	14.34%	8.38%	
Provisions	2.05%	0.00%	1.20%	1.86%	0.04%	11.38%	2.69%	0.07%	0.80%	0.00%	6.01%	0.00%	NA	1.93%	0.67%	65.45%	4.98%	2.40%	
<i>Current Liabilities</i>	<b>40.03%</b>	<b>24.50%</b>	<b>26.98%</b>	<b>32.32%</b>	<b>30.71%</b>	<b>34.18%</b>	<b>22.49%</b>	<b>35.08%</b>	<b>29.89%</b>	<b>12.54%</b>	<b>31.11%</b>	<b>27.92%</b>	<b>24.29%</b>	<b>30.84%</b>	<b>28.66%</b>	<b>25.62%</b>	<b>32.46%</b>	<b>40.56%</b>	
Loans	3.08%	6.26%	3.66%	4.08%	15.91%	6.88%	3.92%	3.09%	7.20%	7.06%	3.97%	3.10%	NA	7.59%	8.60%	5.42%	8.31%	9.31%	
Creditors	5.93%	8.61%	8.84%	10.81%	5.20%	6.32%	5.77%	8.01%	8.68%	1.89%	10.66%	14.22%	NA	9.29%	13.05%	9.88%	11.37%	15.69%	
Other Current Liabilities	31.02%	9.63%	14.48%	17.43%	10.12%	18.36%	12.80%	6.87%	15.11%	3.58%	16.59%	10.60%	NA	13.07%	7.01%	10.35%	12.78%	15.55%	

**Table 4: Average Balance Sheets Item as a Fraction of Total Assets  
Panel B: LISTED Firms Year 2008 (6,161 firms)**

Countries	769	332	162	9	14	27	31	30	13	43	408	413	931	1090	1476	62	45	306
<b>Assets</b>																		
<b>Fixed Assets</b>	<b>68.14%</b>	<b>66.71%</b>	<b>63.41%</b>	<b>74.62%</b>	<b>75.27%</b>	<b>68.91%</b>	<b>73.52%</b>	<b>74.75%</b>	<b>57.96%</b>	<b>81.99%</b>	<b>66.15%</b>	<b>55.55%</b>	<b>68.51%</b>	<b>69.06%</b>	<b>55.23%</b>	<b>62.38%</b>	<b>71.90%</b>	<b>50.53%</b>
Intangible assets	3.35%	1.42%	2.72%	6.23%	6.92%	10.65%	2.35%	3.02%	0.75%	1.68%	6.81%	28.92%	2.17%	2.84%	1.17%	3.23%	7.09%	0.29%
Tangible Assets	59.58%	41.59%	52.84%	61.48%	70.05%	48.65%	55.93%	65.72%	54.78%	78.01%	49.83%	4.32%	54.73%	54.16%	46.62%	54.01%	46.24%	41.56%
Other Fixed Assets	5.21%	23.70%	7.86%	6.92%	4.42%	9.61%	15.24%	6.01%	7.01%	2.30%	9.74%	22.31%	11.60%	12.18%	7.44%	5.14%	18.57%	8.48%
<b>Current Assets</b>	<b>31.71%</b>	<b>33.29%</b>	<b>36.58%</b>	<b>25.38%</b>	<b>24.73%</b>	<b>31.09%</b>	<b>26.48%</b>	<b>25.25%</b>	<b>42.04%</b>	<b>18.01%</b>	<b>33.84%</b>	<b>44.45%</b>	<b>31.49%</b>	<b>30.94%</b>	<b>44.77%</b>	<b>37.62%</b>	<b>28.10%</b>	<b>49.47%</b>
Stocks	6.07%	11.52%	9.13%	2.66%	9.77%	6.80%	11.76%	7.14%	15.96%	3.15%	11.39%	15.44%	12.46%	6.98%	15.49%	13.06%	7.73%	11.04%
Debtors	9.54%	15.22%	13.63%	8.52%	5.19%	12.85%	5.52%	8.07%	16.46%	11.53%	10.71%	23.99%	12.49%	6.50%	16.81%	12.22%	11.40%	19.08%
Other Current Assets	16.24%	6.55%	13.83%	14.20%	9.77%	14.37%	9.20%	10.05%	9.31%	3.33%	11.82%	5.02%	6.54%	17.44%	12.47%	12.33%	8.97%	19.34%
Cash and Cash Equivalents	<b>3.05%</b>	<b>4.85%</b>	<b>7.10%</b>	<b>12.38%</b>	<b>6.04%</b>	<b>8.59%</b>	<b>3.69%</b>	<b>4.58%</b>	<b>6.31%</b>	<b>2.66%</b>	<b>7.47%</b>	<b>1.41%</b>	<b>4.68%</b>	<b>7.93%</b>	<b>1.83%</b>	<b>4.66%</b>	<b>2.43%</b>	<b>2.86%</b>

<b>Shareholders' Funds and Liabilities</b>																			
<b>Shareholders' Funds</b>	<b>56.14%</b>	<b>51.07%</b>	<b>52.38%</b>	<b>46.91%</b>	<b>40.21%</b>	<b>47.58%</b>	<b>61.60%</b>	<b>61.53%</b>	<b>57.74%</b>	<b>78.55%</b>	<b>50.30%</b>	<b>56.37%</b>	<b>54.25%</b>	<b>57.42%</b>	<b>43.06%</b>	<b>64.72%</b>	<b>40.64%</b>	46.06%	
Capital	58.94%	17.14%	34.67%	18.61%	22.11%	6.80%	21.77%	22.80%	42.62%	1.37%	10.53%	21.95%	21.70%	9.23%	35.91%	34.75%	8.28%	13.00%	
Other Shareholder's Funds	-2.80%	33.94%	17.71%	28.31%	18.10%	40.78%	39.84%	38.72%	15.12%	8.64%	39.77%	34.42%	32.55%	48.19%	7.46%	29.90%	32.36%	33.27%	
<b>Liabilities</b>	<b>43.86%</b>	<b>48.93%</b>	<b>47.62%</b>	<b>53.09%</b>	<b>59.79%</b>	<b>52.42%</b>	<b>38.40%</b>	<b>38.47%</b>	<b>42.26%</b>	<b>21.45%</b>	<b>49.70%</b>	<b>43.63%</b>	<b>45.75%</b>	<b>42.58%</b>	<b>56.94%</b>	<b>35.28%</b>	<b>59.36%</b>	<b>53.94%</b>	
<i>Non Current Liabilities</i>	13.41%	24.23%	16.82%	24.80%	40.02%	28.58%	21.78%	16.42%	12.37%	8.91%	21.83%	10.00%	19.41%	19.90%	17.34%	6.86%	23.88%	15.60%	
Long Term Debt	8.30%	22.91%	13.66%	11.26%	39.18%	33.00%	16.09%	6.45%	11.50%	6.30%	11.13%	8.05%	NA	12.39%	11.27%	2.23%	19.86%	9.43%	
Other Non Current Liabilities	5.11%	1.32%	3.16%	13.55%	0.83%	14.74%	8.03%	9.96%	1.88%	2.61%	12.18%	1.96%	NA	7.52%	6.08%	4.63%	5.13%	6.47%	
Provisions	1.50%	0.02%	2.65%	6.16%	0.07%	6.57%	0.83%	0.12%	0.80%	0.00%	6.02%	0.00%	NA	6.10%	0.74%	8.69%	6.37%	1.40%	
<i>Current Liabilities</i>	<b>30.45%</b>	<b>24.70%</b>	<b>30.80%</b>	<b>28.28%</b>	<b>19.77%</b>	<b>23.84%</b>	<b>16.61%</b>	<b>22.06%</b>	<b>29.89%</b>	<b>12.54%</b>	<b>27.88%</b>	<b>33.63%</b>	<b>26.34%</b>	<b>22.68%</b>	<b>39.59%</b>	<b>28.42%</b>	<b>35.48%</b>	<b>38.34%</b>	
Loans	5.20%	6.29%	3.66%	0.75%	4.49%	5.34%	1.03%	4.43%	7.20%	7.06%	1.97%	3.29%	NA	4.38%	14.02%	0.67%	6.62%	9.12%	
Creditors	10.40%	9.83%	12.14%	8.26%	5.78%	9.76%	6.30%	7.19%	8.68%	1.89%	7.54%	17.21%	NA	5.90%	17.15%	16.51%	10.80%	15.55%	
Other Current Liabilities	14.85%	8.58%	15.00%	19.27%	10.14%	15.98%	9.29%	10.44%	15.11%	3.58%	18.40%	13.13%	NA	12.41%	8.42%	11.24%	18.06%	13.66%	

**Table 4: Average Balance Sheets Item as a Fraction of Total Assets  
Panel B: PRIVATE Firms Year 2008 (6,781 firms)**

Countries																			
Number of Firms	8	129	101	492	47	231	53	41	0	0	1012	4	329	3,366	105	92	34	737	
<b>Assets</b>																			
<b>Fixed Assets</b>	<b>50.02%</b>	<b>68.56%</b>	<b>76.77%</b>	<b>59.45%</b>	<b>60.41%</b>	<b>63.67%</b>	<b>72.21%</b>	<b>64.91%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>62.95%</b>	<b>80.08%</b>	<b>72.35%</b>	<b>53.68%</b>	<b>79.07%</b>	<b>73.42%</b>	<b>74.16%</b>	<b>55.50%</b>	
Intangible assets	33.45%	4.71%	5.51%	0.63%	0.81%	10.61%	1.01%	2.40%	0.00%	0.00%	1.56%	72.39%	18.77%	0.53%	3.32%	0.71%	3.44%	2.02%	
Tangible Assets	8.83%	49.88%	61.77%	48.26%	34.44%	38.00%	48.07%	42.88%	0.00%	0.00%	48.65%	5.19%	50.15%	35.01%	55.75%	68.15%	60.18%	38.88%	
Other Fixed Assets	7.75%	13.96%	9.49%	10.56%	25.16%	14.89%	23.13%	19.63%	0.00%	0.00%	13.05%	2.51%	3.42%	17.53%	19.99%	4.58%	10.54%	14.17%	
<b>Current Assets</b>	<b>49.98%</b>	<b>31.44%</b>	<b>23.23%</b>	<b>40.55%</b>	<b>39.59%</b>	<b>34.41%</b>	<b>27.79%</b>	<b>35.09%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>37.02%</b>	<b>19.92%</b>	<b>27.65%</b>	<b>46.32%</b>	<b>20.93%</b>	<b>26.58%</b>	<b>25.84%</b>	<b>44.49%</b>	
Stocks	0.56%	7.34%	5.00%	7.91%	3.04%	9.10%	5.97%	8.11%	0.00%	0.00%	8.52%	2.50%	7.00%	8.78%	4.70%	5.84%	7.59%	9.51%	
Debtors	1.26%	16.20%	10.67%	12.21%	15.13%	5.10%	5.56%	5.28%	0.00%	0.00%	15.06%	8.91%	14.12%	11.44%	9.97%	8.97%	12.09%	12.84%	
Other Current Assets	48.16%	7.90%	7.49%	20.43%	21.42%	19.51%	16.25%	10.53%	0.00%	0.00%	13.53%	8.52%	6.53%	24.11%	6.26%	11.77%	6.16%	22.14%	
Cash and Cash Equivalentents	<b>1.04%</b>	<b>4.93%</b>	<b>2.07%</b>	<b>4.68%</b>	<b>4.92%</b>	<b>2.79%</b>	<b>5.59%</b>	<b>1.16%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>9.09%</b>	<b>1.55%</b>	<b>5.32%</b>	<b>3.49%</b>	<b>1.48%</b>	<b>5.41%</b>	<b>3.40%</b>	<b>4.44%</b>	

<b>Shareholders' Funds and Liabilities</b>	<b>46.64%</b>	<b>53.83%</b>	<b>48.73%</b>	<b>51.95%</b>	<b>43.74%</b>	<b>33.65%</b>	<b>36.34%</b>	<b>44.95%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>46.06%</b>	<b>79.88%</b>	<b>40.38%</b>	<b>40.01%</b>	<b>59.94%</b>	<b>51.90%</b>	<b>23.80%</b>	<b>39.24%</b>
<b>Shareholders' Funds</b>	15.53%	20.83%	40.21%	27.64%	14.72%	14.72%	16.08%	20.80%	0.00%	0.00%	28.42%	22.49%	13.29%	13.26%	55.59%	35.19%	7.24%	14.64%
Capital	31.11%	33.01%	8.53%	24.31%	29.02%	17.58%	19.46%	24.14%	0.00%	0.00%	17.64%	57.39%	27.09%	26.76%	4.55%	16.23%	16.55%	24.77%
Other Shareholder's Funds	46.64%	53.83%	48.73%	51.95%	43.74%	33.65%	36.34%	44.95%	0.00%	0.00%	46.06%	79.88%	40.38%	40.01%	59.94%	51.90%	23.80%	39.24%
<b>Liabilities</b>	53.36%	46.17%	51.27%	48.05%	56.26%	66.35%	63.66%	55.05%	0.00%	0.00%	53.94%	20.12%	59.62%	59.99%	40.06%	48.10%	76.20%	60.76%
<b>Non Current Liabilities</b>	4.00%	21.75%	25.78%	14.81%	21.65%	29.65%	39.51%	14.64%	0.00%	0.00%	21.49%	5.78%	35.85%	21.87%	16.58%	22.72%	46.74%	19.34%
Long Term Debt	1.44%	19.89%	24.31%	8.31%	8.60%	34.81%	23.10%	12.98%	0.00%	0.00%	7.79%	2.23%	NA	15.30%	11.79%	4.48%	23.75%	9.54%
Other Non Current Liabilities	2.57%	2.02%	1.47%	6.51%	13.05%	39.18%	16.41%	5.20%	0.00%	0.00%	14.45%	3.55%	NA	6.56%	4.79%	18.23%	22.98%	9.12%
Provisions	2.39%	0.00%	0.64%	0.54%	0.03%	0.00%	2.61%	0.05%	0.00%	0.00%	6.03%	0.00%	NA	0.28%	0.63%	92.66%	2.34%	2.78%
<b>Current Liabilities</b>	49.35%	24.42%	25.49%	33.24%	34.60%	36.69%	24.15%	40.41%	0.00%	0.00%	32.45%	14.34%	23.77%	38.12%	23.47%	25.39%	29.46%	41.43%
Loans	1.02%	6.25%	3.66%	4.84%	19.49%	6.30%	4.74%	2.54%	0.00%	0.00%	4.82%	2.64%	NA	10.47%	6.03%	5.84%	9.99%	9.38%
Creditors	1.58%	8.14%	7.55%	11.39%	5.00%	5.54%	5.62%	8.54%	0.00%	0.00%	11.96%	7.13%	NA	12.32%	11.11%	9.37%	11.94%	15.74%
Other Current Liabilities	46.76%	10.03%	14.28%	17.01%	10.12%	15.37%	13.79%	5.39%	0.00%	0.00%	15.83%	4.58%	NA	13.67%	6.34%	10.28%	7.53%	16.30%

**Table 5: Unemployment percentage rate (period average) and Transition Indicators**

	Unemployment Rate % (average)	Large scale privatization	Small scale privatization	Enterprise restructuring	Price liberalization	Trade & Forex system	Competition Policy	Banking reform & interest rate liberalization	Securities markets & non-bank financial institutions	Overall infrastructure reform
<i>Countries</i>										
Bosnia Herzegovina	28.49	3.00	3.00	2.00	4.00	4.00	2.00	3.00	1.67	2.33
Bulgaria	11.35	4.00	4.00	2.67	4.33	4.33	3.00	3.67	3.00	3.00
Croatia	12.66	3.33	4.33	3.00	4.00	4.33	3.00	4.00	3.00	3.00
Czech Republic	6.99	NA	NA	NA	NA	NA	NA	NA	NA	NA
Estonia	8.93	4.00	4.33	3.67	4.33	4.33	3.67	4.00	3.67	3.33
Hungary	7.04	4.00	4.33	3.67	4.33	4.33	3.33	4.00	4.00	3.67
Latvia	10.36	3.67	4.33	3.00	4.33	4.33	3.33	3.67	3.00	3.00
Lithuania	10.21	4.00	4.33	3.00	4.33	4.33	3.33	3.67	3.33	3.00
Macedonia	34.49	NA	NA	NA	NA	NA	NA	NA	NA	NA
Moldova	6.71	3.00	3.67	2.00	4.00	4.00	2.00	3.00	1.67	2.33
Montenegro	30.30	3.33	4.33	3.67	4.33	4.33	3.33	3.67	3.67	3.33
Poland	14.81	3.00	4.00	2.00	4.00	4.33	2.33	3.00	2.00	2.33
Romania	6.98	3.67	3.67	2.67	4.33	4.33	2.67	3.33	3.00	3.33
Russian Federation	7.50	3.00	4.00	2.33	4.00	3.33	2.33	2.67	3.00	2.67
Serbia	18.08	2.67	3.67	2.33	4.00	4.00	2.00	3.00	2.00	2.33
Slovakia	15.08	4.00	4.33	3.67	4.33	4.33	3.33	3.67	3.00	3.33
Slovenia	5.83	3.00	4.33	3.00	4.00	4.33	2.67	3.33	3.00	3.00
Ukraine	8.19	3.00	4.00	2.33	4.00	4.00	2.33	3.00	2.67	2.33

**Table 6: Summary Statistics for Cash Holdings (Average 2001-2010)**

The sample consists of 104,605 observations for firms on ORBIS database over the period 2001-2010.

The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. Cash is Cash and cash equivalents over Total Assets.

<i>Statistics</i> <i>Cash Holdings</i>	<i>Mean</i>			<i>Median</i>			<i>Std. Deviation</i>		
	All	Listed	No- Listed	All	Listed	No- Listed	All	Listed	No- Listed
<b><i>Countries</i></b>									
Bosnia Herzegovina	0.0230	0.0229	0.0351	0.0032	0.0032	0.0136	0.0678	0.0679	0.0480
Bulgaria	0.0843	0.0780	0.1012	0.0261	0.0211	0.0473	0.1479	0.1508	0.1384
Croatia	0.0359	0.0264	0.0505	0.0107	0.0070	0.0184	0.0771	0.0568	0.0989
Czech Republic	0.0940	0.0720	0.0945	0.0429	0.0526	0.0424	0.1424	0.0774	0.1435
Estonia	0.0982	0.0873	0.1013	0.0423	0.0586	0.0347	0.1428	0.0817	0.1559
Hungary	0.0682	0.0715	0.0679	0.0286	0.0414	0.0268	0.1167	0.0832	0.1194
Latvia	0.0897	0.0667	0.1053	0.0412	0.0265	0.0470	0.1388	0.0842	0.1642
Lithuania	0.0433	0.0399	0.0457	0.0212	0.0182	0.0235	0.0616	0.0610	0.0620
Macedonia	0.0163	0.0162	0.0186	0.0014	0.0014	0.0016	0.0386	0.0385	0.0405
Montenegro	0.0200	0.0202	0.0099	0.0025	0.0025	0.0073	0.0546	0.0550	0.0082
Poland	0.0929	0.0993	0.0977	0.0461	0.0526	0.0488	0.1218	0.1245	0.1252
Moldova	0.0271	0.0271	0.0291	0.0058	0.0058	0.0049	0.0604	0.0605	0.0461
Romania	0.0704	0.0658	0.0854	0.0255	0.0222	0.0392	0.1157	0.1116	0.1269
Russian Federation	0.0590	0.0611	0.0581	0.0153	0.0166	0.0138	0.1222	0.1226	0.1247
Serbia	0.0263	0.0257	0.0345	0.0057	0.0053	0.0142	0.0612	0.0613	0.0587
Slovakia	0.0725	0.0610	0.0824	0.0272	0.0234	0.0334	0.1332	0.1057	0.1525
Slovenia	0.0359	0.0284	0.0458	0.0093	0.0091	0.0096	0.0830	0.0522	0.1107
Ukraine	0.0424	0.0380	0.0440	0.0085	0.0074	0.0090	0.1037	0.1090	0.1016
<b>TOTAL</b>	<b>0.0566</b>	<b>0.0456</b>	<b>0.0674</b>	<b>0.0150</b>	<b>0.0109</b>	<b>0.0204</b>	<b>0.1122</b>	<b>0.0965</b>	<b>0.1248</b>

**Table 7: Summary Statistics for the independent variables****Panel A: ALL SAMPLE**

<i>Variables</i>	Statistics	Mean	Median	Std Dev.
<i>STDEBT</i>		0.0839	0.0071	0.1602
<i>MATURITY</i>		0.1899	0.0576	0.2795
<i>ROA</i>		3.2403	1.55	15.7260
<i>SIZE</i>		9.6450	9.8552	2.4846
<i>UNEMPLOYMENT</i>		10.1014	7.8598	5.5392
<i>WCAPITAL</i>		0.08475	0.0618	0.4852

**Panel B: Public Firms**

<i>Variables</i>	Statistics	Mean	Median	Std Dev.
<i>STDEBT</i>		0.0595	0.0040	0.1144
<i>MATURITY</i>		0.1885	0.0664	0.2436
<i>ROA</i>		0.2819	0.3500	14.5873
<i>SIZE</i>		8.5804	8.4815	2.3367
<i>WCAPITAL</i>		0.1034	0.0735	0.5436

**Panel C: Private Firms**

<i>Variables</i>	Statistics	Mean	Median	Std Dev.
<i>STDEBT</i>		0.1077	0.0122	0.1918
<i>MATURITY</i>		0.1912	0.0499	0.3107
<i>ROA</i>		6.1573	3.2100	16.2545
<i>SIZE</i>		10.6886	10.8371	2.1615
<i>WCAPITAL</i>		0.6647	0.0493	0.4193

**Table 8: Variables Definition and expected relationship with Cash holdings**

Variables	Definition	Expected relationship with Cash Holdings
Cash	Cash and Cash Equivalents / Total Assets	----
STdebt	Short Term Bank Loans / Total Assets	U shaped
Maturity	Debt maturity = non current liabilities / total debt	Negative
ROA	Return on Total Assets = Profit (loss) before taxation / Total Assets	Positive
Size	Natural logarithm of Total Assets	Negative
Unconsolidated	Dummy variable equal to one if unconsolidated accounts and zero otherwise	Negative
Concentration	Equal to one if there is a recorded shareholder with more than 49.9% equity capital and zero otherwise	Positive
Unemployment	Total Unemployment = Percentage of total labor force	Negative
Wcapital	Working Capital = Stocks + Debtors - Creditors	Negative
DZscore	Binary variable for Bankruptcy Prediction equal to 1 if distress zone and zero if safe or gray zone	Negative
Transition 1A	Binary variable equal to 1 if Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia and zero otherwise.	+/-
Transitions 1B	Binary variable equal to 1 if Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia and zero otherwise	+/-
Transition 2B	Binary variable equal to 1 if Bosnia Herzegovina, Moldova, Russia, Serbia and Ukraine and zero otherwise	-/+
Transition 1C	Binary variable equal to 1 if Estonia, Hungary, Poland and Slovakia and zero otherwise	+/-
Transition 2C	Binary variable equal to 1 if Bosnia Herzegovina, Macedonia, Moldova and Serbia and Zero otherwise.	-/+
Country	Binary variable per country	----
Sector	Binary variable per industry type: Manufacturing, Retail, Wholesale and Services	----
Year	Binary variable per year	----

**Table 15: Correlation Matrix**

	<i>STDEBT</i>	<i>MATURITY</i>	<i>ROA</i>	<i>SIZE</i>	<i>UNCONSOLIDATED</i>	<i>INDUSTRY</i>	<i>CONCENTRATION</i>	<i>UNEMPLOYMENT</i>	<i>WCAPITAL</i>	<i>DZSCORE</i>
<i>STDEBT</i>	1.0000									
<i>MATURITY</i>	-0.1206	1.0000								
<i>ROA</i>	-0.0934	-0.0384	1.0000							
<i>SIZE</i>	0.0188	0.2639	0.1245	1.0000						
<i>UNCONSOLIDATED</i>	0.0541	-0.1498	-0.0555	-0.3354	1.0000					
<i>INDUSTRY</i>	-0.0553	0.0091	-0.0157	-0.0614	0.0194	1.0000				
<i>CONCENTRATION</i>	0.0072	0.0355	0.0565	0.2278	0.0341	-0.0061	1.000			
<i>UNEMPLOYMENT</i>	0.0356	-0.0183	-0.1551	-0.1442	0.0662	0.0108	-0.0575	1.0000		
<i>WCAPITAL</i>	0.1264	-0.0188	0.0661	-0.0599	0.0209	-0.2055	-0.0234	-0.0572	1.0000	
<i>DZSCORE</i>	-0.0132	-0.0178	0.0042	-0.0077	-0.0090	0.0190	-0.0171	-0.0150	-0.0223	1.0000

**Table 10: Multiple Variable Regressions (Full sample)**  
**PANEL A: Developed vs. Developing Countries**

The sample consists of 104,605 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{CRISIS}} \text{CRISIS}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{it} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>t</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>t</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*), and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.1430* (-13.1311)	-0.0760* (-9.4288)	-0.08067* (-6.9131)	-0.0727* (-5.2385)	-0.0766* (-5.5132)
STDEBT^2	0.2304* (18.6100)	0.0804* (9.1051)	0.0942* (8.3624)	0.07229* (5.5015)	0.0739* (5.6300)
MATURITY	-0.0251* (-13.3691)	-0.0295* (-20.7842)	-0.0287* (-17.1061)	-0.02171* (-13.8753)	-0.0234* (-14.8014)
ROA	0.0015* (34.5648)	0.0014* (36.2211)	0.0015* (29.8000)	0.0012* (26.4854)	0.0013* (26.6326)
SIZE	-0.0051* (-15.6185)	-0.0072* (-26.4805)	-0.0056* (-22.4669)	-0.0076* (-28.7461)	-0.0082* (-30.6068)

UNCONSOLIDATED	-0.0239* (-17.7788)	-0.0266* (-17.6077)	-0.0279* (-18.6687)	-0.0262* (-16.2208)	-0.0251* (-15.6856)
INDUSTRY	0.0095* (4.1673)	0.0081* (4.7543)	0.01089* (4.5468)	0.0092* (3.8124)	0.0084* (3.5063)
CONCENTRATION	0.0046 (6.3070)	0.0062* (9.1877)	0.0081* (11.7847)	0.0036* (4.8335)	0.0037 (4.9450)
TRANSITION 1A	0.0330* (33.9384)	0.0396* (43.6820)	0.0375* (41.6497)	----	----
UNEMPLOYMENT	-0.0010 (-12.6348)	-0.0019* (-27.0203)	----	----	----
WCAPITAL	-0.1511 (-7.7857)	-0.1672 (-12.3330)	-0.14471* (-7.2205)	-0.1489* (-7.0213)	-0.1488* (-7.0250)
DZSCORE	-0.0207* (-11.1162)	----	----	----	----
<i>Constant</i>	0.1468* (20.7769)	0.1736* (36.1283)	0.1324* (29.6670)	0.1659* (40.0654)	0.1781* (42.3622)
Nr observations	55,892	85,547	95,016	95,016	95,106
Adjusted R-squared	0.3032	0.2941	0.2617	0.2873	0.2912
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 10: Multiple Variable Regressions (Full sample)**  
**PANEL B: European Union vs. No-European Union Countries**

The sample consists of 104,605 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{CRISIS}} \text{CRISIS}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_t + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>t</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>t</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*) and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.1169* (-10.4041)	-0.05385* (-6.1480)	-0.0600* (-4.7051)	-0.0727* (-5.2385)	-0.0766* (-5.5132)
STDEBT^2	0.2045* (16.5698)	0.0611* (6.6170)	0.07471* (6.2299)	0.07229* (5.5015)	0.0739* (5.6300)
MATURITY	-0.0249* (-13.9299)	-0.0288* (-20.4384)	-0.0279* (-16.1715)	-0.02171* (-13.8753)	-0.0234* (-14.8014)
ROA	0.0016* (34.6376)	0.0015* (36.0336)	0.0015* (29.0676)	0.0012* (26.4854)	0.0013* (26.6326)
SIZE	-0.0041* (-10.8243)	-0.0061* (-22.2561)	-0.0048* (-19.2799)	-0.0076* (-28.7461)	-0.0082* (-30.6068)

UNCONSOLIDATED	-0.0236 (-17.6072)	-0.0258* (-17.0418)	-0.0264* (-16.9975)	-0.0262* (-16.2208)	-0.0251* (-15.6856)
INDUSTRY	0.0098* (4.0033)	0.0088* (4.9766)	0.0113* (4.5449)	0.0092* (3.8124)	0.0084* (3.5063)
CONCENTRATION	0.0030* (4.1061)	0.0052* (7.6873)	0.0058* (9.6121)	0.0036* (4.8335)	0.0037 (4.9450)
TRANSITION 1B	0.0284* (19.6665)	0.0296* (19.6283)	0.03394* (15.1566)	----	----
TRANSITION 2B	-0.0121 (-6.8337)	-0.0127* (-7.9100)	-0.0091* (-5.7941)	----	----
UNEMPLOYMENT	-0.0005* (-5.7172)	-0.0015* (-20.3311)	----	----	----
WCAPITAL	-0.1573* (-7.7408)	-0.1726* (-12.2393)	-0.1500* (-7.1740)	-0.1489* (-7.0213)	-0.1488* (-7.0250)
DZSCORE	-0.0187 (-11.0448)	----	----	----	----
<i>Constant</i>	0.1359* (16.0881)	0.1659* (30.1622)	0.1291* (30.0313)	0.1659* (40.0654)	0.1781* (42.3622)
Nr observations	55,892	85,547	95,016	95,016	95,106
Adjusted R-squared	0.3169	0.3009	0.2714	0.2873	0.2912
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 10: Multiple Variable Regressions (Full sample)**  
**PANEL C: Developed vs. Developing Countries (by quartiles)**

The sample consists of 104,605 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{CRISIS}} \text{CRISIS}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{it} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>t</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>t</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*) and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.1253* (-11.0864)	-0.07655* (-9.4178)	-0.08233* (-6.9851)	-0.0727* (-5.2385)	-0.0766* (-5.5132)
STDEBT^2	0.2059* (16.3815)	0.0728* (8.1815)	0.0788* (6.8653)	0.07229* (5.5015)	0.0739* (5.6300)
MATURITY	-0.0157* (-8.2591)	-0.0222* (-15.4582)	-0.0208* (-12.0677)	-0.02171* (-13.8753)	-0.0234* (-14.8014)
ROA	0.0015* (33.4235)	0.0013* (34.337)	0.0013* (26.5281)	0.0012* (26.4854)	0.0013* (26.6326)
SIZE	-0.0058* (-14.9730)	-0.0084* (-28.3094)	-0.0081* (-27.5052)	-0.0076* (-28.7461)	-0.0082* (-30.6068)

UNCONSOLIDATED	-0.0211* (-15.3640)	-0.02657* (-17.488)	-0.0278* (-18.5230)	-0.0262* (-16.2208)	-0.0251* (-15.6856)
INDUSTRY	0.0098* (4.1715)	0.00797* (4.6521)	0.0095* (3.9121)	0.0092* (3.8124)	0.0084* (3.5063)
CONCENTRATION	0.0026* (3.5831)	0.0039* (5.8214)	0.0045* (6.59100)	0.0036* (4.8335)	0.0037 (4.9450)
TRANSITION 1C	0.0265* (21.1085)	0.0321* (-33.3711)	0.0291* (25.6213)	----	----
TRANSITION 2C	-0.0289* (-21.3288)	-0.0384* (-33.3711)	-0.0444* (-42.1259)	----	----
UNEMPLOYMENT	-0.0003* (-3.7516)	-0.0005* (-7.5257)	----	----	----
WCAPITAL	-0.1531* (-7.7379)	-0.1673* (-12.2666)	-0.1463 (-7.2160)	-0.1489* (-7.0213)	-0.1488* (-7.0250)
DZSCORE	-0.02336* (-12.5576)	----	----	----	----
<i>Constant</i>	0.1566* (20.4513)	0.1855* (37.3475)	0.1759* (33.5752)	0.1659* (40.0654)	0.1781* (42.3622)
Nr observations	55,892	85,547	95,016	95,016	95,106
Adjusted R-squared	0.3059	0.2960	0.2752	0.2873	0.2912
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 11: Multiple Variable Regressions (Private Firms)**  
**PANEL A: Developed vs. Developing Countries**

The sample consists of 52,821 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{t} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>it</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>it</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*) and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.1001* (-7.36233)	-0.0595* (-4.3130)	-0.0580* (-4.2055)	-0.0492* (-3.2636)	-0.0509* (-3.3882)
STDEBT^2	0.1367* (8.2229)	0.0514* (3.8895)	0.0514* (3.8894)	0.0418* (2.9411)	0.0400* (2.8295)
MATURITY	-0.0178* (-6.9594)	-0.0216* (-10.9026)	-0.0210* (-10.6964)	-0.0209* (-10.6496)	-0.0232* (-11.6747)
ROA	0.0016* (25.2460)	0.0013* (23.6502)	0.0013* (24.2333)	0.0013* (23.3357)	0.0013* (23.2024)
SIZE	-0.0107* (-20.2317)	-0.0115* (-27.0390)	-0.0113* (-26.9062)	-0.0111* (-26.3353)	-0.0123* (-27.7015)

UNCONSOLIDATED	-0.0100* (-5.1306)	-0.0072* (-3.5809)	-0.0064* (-3.1813)	-0.0044* (-2.1050)	-0.0063* (-2.9798)
INDUSTRY	0.0109* (5.0396)	0.0122* (5.0969)	0.0122* (5.1403)	0.0117* (4.7254)	0.0102* (4.1860)
CONCENTRATION	0.0040* (3.2923)	0.0060* (6.1992)	0.0058* (5.9573)	0.0089* (9.0795)	0.0086* (8.8161)
TRANSITION 1A	0.0449* (32.0288)	0.0468* (38.5680)	0.0416* (37.9326)	----	----
UNEMPLOYMENT	-0.0010* (-6.6590)	-0.0015* (-9.9953)	----	----	----
WCAPITAL	-0.1827* (-11.6198)	-0.1665* (-8.4269)	-0.1668* (-8.4611)	-0.1701* (-8.3264)	-0.1699* (-8.3508)
DZSCORE	-0.0142* (-8.25314)	----	----	----	----
<i>Constant</i>	0.1880* (26.8580)	0.1940* (31.8195)	0.1792* (30.5400)	0.1743* (30.0670)	0.1979* (31.8165)
Nr observations	26,626	47,912	48,382	48,382	48,382
Adjusted R-squared	0.3406	0.3140	0.3130	0.3233	0.3286
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 11: Multiple Variable Regressions (Private Firms)**  
**PANEL B: European Union vs. No-European Union Countries**

The sample consists of 52,821 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{t++} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>t</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>t</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*), and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.0814* (-5.8930)	-0.0464* (-3.2461)	-0.0458* (-3.2094)	-0.0492* (-3.2636)	-0.0509* (-3.3882)
STDEBT^2	0.1211* (7.2883)	0.0408* (3.0197)	0.0417* (3.0906)	0.0418* (2.9411)	0.0400* (2.8295)
MATURITY	-0.0186* (-7.3061)	-0.0214* (-10.8342)	-0.0207* (-10.5383)	-0.0209* (-10.6496)	-0.0232* (-11.6747)
ROA	0.0016* (25.3712)	0.0013* (23.5487)	0.0014* (24.0297)	0.0013* (23.3357)	0.0013* (23.2024)
SIZE	-0.0107* (-20.3327)	-0.0113* (-26.6329)	-0.0111* (-26.5790)	-0.0111* (-26.3353)	-0.0123* (-27.7015)

UNCONSOLIDATED	-0.0084* (-4.2135)	-0.0053* (-2.6487)	-0.0041** (-2.0288)	-0.0044** (-2.1050)	-0.0063* (-2.9798)
INDUSTRY	0.0106* (4.7135)	0.0122* (4.9817)	0.0123* (5.0496)	0.0117* (4.7254)	0.0102* (4.1860)
CONCENTRATION	0.0077* (6.3760)	0.0086* (8.8753)	0.0080* (8.3944)	0.0089* (9.0795)	0.0086* (8.8161)
TRANSITION 1B	0.0256* (9.2816)	0.02398 (8.3155)	0.0268* (9.4578)	----	----
TRANSITION 2B	-0.0275* (-9.4121)	-0.0274* (-9.1076)	-0.0203* (-6.9999)	----	----
UNEMPLOYMENT	-0.0009* (-6.0303)	-0.0014* (-9.6966)	----	----	----
WCAPITAL	-0.1875* (-11.6258)	-0.1692* (-8.4120)	-0.1692* (-8.4457)	-0.1701* (-8.3264)	-0.1699* (-8.3508)
DZSCORE	-0.0113* (-6.9888)	----	----	----	----
<i>Constant</i>	0.2036* (24.1505)	0.2119* (27.7989)	0.1910* (26.9338)	0.1743* (30.0670)	0.1979* (31.8165)
Nr observations	26,626	47,912	48,382	48,382	48,382
Adjusted R-squared	0.355	0.3205	0.3198	0.3233	0.3286
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 11: Multiple Variable Regressions (Private Firms)**  
**PANEL C: Developed vs. Developing Countries (by quartiles)**

The sample consists of 52,821 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{t} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>t</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>t</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*) and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.0958* (-6.9707)	-0.0699* (-5.0316)	-0.0673* (-4.8552)	-0.0492* (-3.2636)	-0.0509* (-3.3882)
STDEBT^2	0.1259* (7.4991)	0.0558* (4.2015)	0.0546* (4.1107)	0.0418* (2.9411)	0.0400* (2.8295)
MATURITY	-0.0125* (-4.9261)	-0.0194* (-9.7132)	-0.0191* (-9.6596)	-0.0209* (-10.6496)	-0.0232* (-11.6747)
ROA	0.0016* (24.9898)	0.0013* (23.0876)	0.0013* (23.6049)	0.0013* (23.3357)	0.0013* (23.2024)
SIZE	-0.0092* (-17.6909)	-0.0108* (-25.5029)	-0.0105* (-25.2836)	-0.0111* (-26.3353)	-0.0123* (-27.7015)

UNCONSOLIDATED	-0.0062* (-3.0783)	-0.0077* (-3.7247)	-0.0081* (-3.9455)	-0.0044** (-2.1050)	-0.0063* (-2.9798)
INDUSTRY	0.0129* (5.9028)	0.0132* (5.4953)	0.0132* (5.5347)	0.0117* (4.7254)	0.0102* (4.1860)
CONCENTRATION	0.0044* (3.5231)	0.0060* (6.0497)	0.0057* (5.7989)	0.0089* (9.0795)	0.0086* (8.8161)
TRANSITION 1B	0.0414* (24.1204)	0.0463* (28.2938)	0.0371* (27.7004)	----	----
TRANSITION 2B	0.0045* (1.4790)	0.0063* (2.2195)	-0.0133* (-7.4393)	----	----
UNEMPLOYMENT	-0.0016* (-8.4988)	-0.0017* (-9.1828)	---	----	----
WCAPITAL	-0.1846* (-11.6318)	-0.1668* (-8.4148)	-0.1671* (-8.4495)	-0.1701* (-8.3264)	-0.1699* (-8.3508)
DZSCORE	-0.0200* (-12.0356)	----	----	----	----
<i>Constant</i>	0.1847* (25.8553)	0.1957* (31.4391)	0.1801* (30.5003)	0.1743* (30.0670)	0.1979* (31.8165)
Nr observations	26,626	47,912	48,382	48,382	48,382
Adjusted R-squared	0.3293	0.3035	0.3031	0.3233	0.3286
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 12: Multiple Variable Regressions (Public Firms)**  
**PANEL A: Developed vs. Developing Countries**

The sample consists of 51,784 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{it} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>it</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>it</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*) and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.1164* (-14.9740)	-0.1301* (20.0265)	-0.1371* (-10.4846)	-0.1067* (-5.9348)	-0.1153* (-6.3115)
STDEBT^2	0.2057* (12.2885)	0.1840* (14.1464)	0.2022* (13.1057)	0.1519* (7.5486)	0.1573* (7.7803)
MATURITY	-0.0229 (-12.2413)	-0.0323* (-18.1447)	-0.0288* (-13.8305)	-0.0187* (-8.9372)	-0.0204* (-9.4481)
ROA	0.0014* (23.6109)	0.0014* (29.2401)	0.0015* (16.5463)	0.0013* (16.4918)	0.0013* (16.7533)
SIZE	-0.0036* (-14.0173)	-0.0044* (-17.5688)	-0.0036* (-11.3846)	-0.0052* (-17.8851)	-0.0057* (-18.9515)

UNCONSOLIDATED	-0.0351* (-18.0950)	-0.0385* (-17.6795)	-0.0448* (-18.6226)	-0.0461* (-12.0883)	-0.0441* (-11.8418)
INDUSTRY	0.0019** (2.1766)	0.0028** (3.2195)	0.0074** (2.2079)	0.0071** (2.0476)	0.0064*** (1.8730)
CONCENTRATION	0.0039* (4.2401)	0.0023** (2.6351)	0.0038* (4.4103)	-0.0021** (-2.3338)	-0.0019** (-2.1060)
TRANSITION 1A	0.0178* (13.5293)	0.0240* (15.9930)	0.0257* (13.6277)	----	----
UNEMPLOYMENT	-0.0011* (-16.2370)	-0.0017* (-23.1666)	----	----	----
WCAPITAL	-0.1604* (-35.0480)	-0.1596* (-35.9344)	-0.1069** (-3.4531)	-0.1161** (-3.3116)	-0.1157** (-3.3043)
DZSCORE	-0.0256* (-24.5478)	----	----	----	----
<i>Constant</i>	0.1523* (40.0083)	0.1621* (40.2533)	0.1275* (21.0939)	0.1347* (21.2665)	0.1526* (23.0949)
Nr observations	28932	37635	46634	46634	46634
Adjusted R-squared	0.2962	0.2675	0.2091	0.2460	0.2501
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 12: Multiple Variable Regressions (Public Firms)**  
**PANEL B: European Union vs. No-European Union Countries**

The sample consists of 51,784 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{t++} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>it</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>it</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*), and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.0810* (-10.4332)	-0.0946* (-14.5023)	-0.1052* (-6.3435)	-0.1067* (-5.9348)	-0.1153* (-6.3115)
STDEBT^2	0.1682* (10.1466)	0.1451* (11.3026)	0.1636* (8.9600)	0.1519* (7.5486)	0.1573* (7.7803)
MATURITY	-0.0217* (-11.7335)	-0.0311* (-17.5860)	-0.0279* (-13.2967)	-0.0187* (-8.9372)	-0.0204* (-9.4481)
ROA	0.0014* (24.1379)	0.0015* (29.9259)	0.0015* (15.9541)	0.0013* (16.4918)	0.0013* (16.7533)
SIZE	-0.0026* (-10.1557)	-0.0031* (-12.2540)	-0.0025* (-9.6197)	-0.0052* (-17.8851)	-0.0057* (-18.9515)

UNCONSOLIDATED	-0.0327* (-17.3218)	-0.0351* (-16.5869)	-0.0406* (-13.8885)	-0.0461* (-12.0883)	-0.0441* (-11.8418)
INDUSTRY	0.0020** (2.3987)	0.0033** (3.8043)	0.0080** (2.2939)	0.0071** (2.0476)	0.0064*** (1.8730)
CONCENTRATION	-0.0008 (-0.8494)	-0.0020** (-2.3058)	-0.0004 (-0.4990)	-0.0021** (-2.3338)	-0.0019** (-2.1060)
TRANSITION 1B	0.0306* (18.1229)	0.0327* (19.2887)	0.0322* (8.0793)	----	----
TRANSITION 2B	-0.0043** (-2.8565)	-0.0028*** (-1.9002)	-0.0045** (-3.3123)	----	----
UNEMPLOYMENT	-0.0005* (-7.1637)	-0.0012* (-16.4396)	----	----	----
WCAPITAL	-0.1707* (-36.8349)	-0.1678* (-37.0816)	-0.1138** (-3.3747)	-0.1161** (-3.3116)	-0.1157** (-3.3043)
DZSCORE	-0.0250* (-24.4324)	----	----	----	----
<i>Constant</i>	0.1315* (30.8236)	0.1388* (31.0970)	0.1146* (24.0128)	0.1347* (21.2665)	0.1526* (23.0949)
Nr observations	28,932	37,635	46,634	46634	46634
Adjusted R-squared	0.3181	0.2823	0.2253	0.2460	0.2501
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 12: Multiple Variable Regressions (Public Firms)**  
**PANEL C: Developed vs. Developing Countries (by quartiles)**

The sample consists of 51,784 observations for firms on ORBIS database over the period 2001-2010.

The following regression is estimated:

$$\text{Cash}_{it} = \alpha + \gamma \beta_{\text{STDEBT}} \text{STDEBT}_{it} + \beta_{\text{STDEBT}^2} \text{STDEBT}^2_{it} + \beta_{\text{MATURITY}} \text{MATURITY}_{it} + \beta_{\text{ROA}} \text{ROA}_{it} + \beta_{\text{SIZE}} \text{SIZE}_{it} + \beta_{\text{UNCONSOLIDATED}} \text{UNCONSOLIDATED}_{it} + \beta_{\text{INDUSTRY}} \text{INDUSTRY}_{it} + \beta_{\text{CONCENTRATION}} \text{CONCENTRATION}_{it} + \beta_{\text{TRANSITION}} \text{TRANSITION}_{it} + \beta_{\text{WCAPITAL}} \text{WCAPITAL}_{it} + \beta_{\text{UNEMPLOYMENT}} \text{UNEMPLOYMENT}_{it} + \beta_{\text{DZSCORE}} \text{DZSCORE}_{it} + \beta_{\text{YEARS}} \text{YEARS}_{t} + \beta_{\text{COUNTRIES}} \text{COUNTRIES}_{it} + e_{it}$$

CASH<sub>it</sub> is the cash holding of firm i in year t. α is the constant term. STDEBT<sub>it</sub> is a quadratic function of short term bank loans over total assets of firm i in year t. MATURITY<sub>it</sub> is equal to non current liabilities over total debt of firm i in year t. ROA<sub>it</sub> is equal to Return on Total Assets of firm i in year t. SIZE<sub>it</sub> is defined by the natural logarithm of total assets of firm i in year t. UNCONSOLIDATED<sub>it</sub> is a binary variable equal to one if firm i in year t reports unconsolidated accounts and zero otherwise. SECTOR<sub>i</sub> is a binary variable referring to the Sector which the firm operates (Manufacturing, Wholesale, Retail or Services). CONCENTRATION<sub>it</sub> binary variable equal to one if firm i in year t has a recorded shareholder (s) with more than 49.9% of equity capital. TRANSITION<sub>it</sub> refers to group of countries aligned by different criteria of developing. UNEMPLOYMENT<sub>it</sub> refers to the percentage of labor force unemployed for each country in year t. WCAPITAL<sub>it</sub> is defined as Stocks+Debtors-Creditors over Total Assets of firm i in year t. DZSCORE<sub>it</sub> is binary variable using Altman's Bankruptcy prediction equal to 1 if firm i in year t is in a distress zone and zero if in safe or gray zone. The countries are (in alphabetic order): Bosnia Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia and Ukraine. White heteroskedasticity - consistent standard errors & covariance. t-statistics in parenthesis. Superscript \* indicate statistical significance at 0,01(\*), 0,05 (\*\*), and 0,10 (\*\*\*) percent levels. Countries and Years dummy variables were included in some of the regressions (as reported)

Model	1	2	3	4	5
<b>Variables</b>					
STDEBT	-0.0838* (-10.6396)	-0.1082* (-16.5688)	-0.1141* (-7.6663)	-0.1067* (-5.9348)	-0.1153* (-6.3115)
STDEBT <sup>2</sup>	0.1699* (10.1794)	0.1554* (11.9233)	0.1619* (9.3764)	0.1519* (7.5486)	0.1573* (7.7803)
MATURITY	-0.0143* (-7.8463)	-0.0229* (-13.3263)	-0.0199* (-8.1467)	-0.0187* (-8.9372)	-0.0204* (-9.4481)
ROA	0.0013* (23.0204)	0.0014* (27.9783)	0.0013* (15.4743)	0.0013* (16.4918)	0.0013* (16.7533)
SIZE	-0.0056* (-19.9847)	-0.0069* (-23.8051)	-0.0064* (-13.4053)	-0.0052* (-17.8851)	-0.0057* (-18.9515)

UNCONSOLIDATED	-0.0337* (-16.6954)	-0.0413* (-18.1426)	-0.0444* (-17.5101)	-0.0461* (-12.0883)	-0.0441* (-11.8418)
INDUSTRY	0.0013** (1.5815)	0.0022** (2.5735)	0.0068*** (1.9076)	0.0071** (2.0476)	0.0064*** (1.8730)
CONCENTRATION	0.0019** (2.0415)	0.0001 (0.1135)	0.0010 (1.2247)	-0.0021** (-2.3338)	-0.0019** (-2.1060)
TRANSITION 1C	0.0161* (7.3144)	0.0150* (6.5805)	0.0123* (5.2558)	----	----
TRANSITION 2C	-0.0325* (-27.4983)	-0.0369* (-30.0172)	-0.0390* (-15.1887)	----	----
UNEMPLOYMENT	-0.0001*** (-1.7545)	-0.0004* (-6.2721)	----	----	----
WCAPITAL	-0.1657* (-36.1189)	-0.1632* (-36.5138)	-0.1133** (-3.4260)	-0.1161** (-3.3116)	-0.1157** (-3.3043)
DZSCORE	-0.0271* (-25.8328)	----	----	----	----
<i>Constant</i>	0.1725* (40.8339)	0.1888* (41.1557)	0.1736* (19.3396)	0.1347* (21.2665)	0.1526* (23.0949)
Nr observations	28,932	37,635	46,634	46634	46634
Adjusted R-squared	0.3159	0.2827	0.2359	0.2460	0.2501
<i>Year Dummy</i>	NO	NO	NO	NO	YES
<i>Country Dummy</i>	NO	NO	NO	YES	YES

**Table 13: Short term debt turning point**

The table presents for each of the regressions from tables 9 to 11 (models 1 to 5) the “turning point” e.g. maximum level of short term bank loans over total assets before cash reserves start to increase. This value is calculated as :

$$\frac{\partial \text{Cash}}{\partial \text{STDebt}} = 0 \Leftrightarrow \beta_{\text{STDebt}} + 2 \times \beta_{\text{STDebt}^2} = 0$$

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>All</b>					
<b>Panel A</b>	0.3103	0.4726	0.4282	0.5028	0.5183
<b>Panel B</b>	0.2858	0.4407	0.4016	0.5028	0.5183
<b>Panel C</b>	0.3043	0.5258	0.5224	0.5028	0.5183
<b>Public</b>					
<b>Panel A</b>	0.2829	0.3535	0.3390	0.3512	0.3665
<b>Panel B</b>	0.2408	0.3260	0.3215	0.3512	0.3665
<b>Panel C</b>	0.2466	0.3481	0.3524	0.3512	0.3665
<b>Private</b>					
<b>Panel A</b>	0.3661	0.5788	0.5642	0.5885	0.6363
<b>Panel B</b>	0.3361	0.5686	0.5492	0.5885	0.6363
<b>Panel C</b>	0.3805	0.6263	0.6163	0.5885	0.6363