

FINANCIAL CONSTRAINTS VERSUS FINANCIAL FLEXIBILITY: WHAT DRIVES ZERO-DEBT PUZZLE IN EMERGING MARKETS?

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This study is focused on gaps in the theory of capital structure research regarding the phenomenon of zero-debt behavior. On the sample of firms from 21 countries with emerging capital markets over the period of 2010–2015, we show that the zero-debt policy choice is firstly driven by financial flexibility motive, while financial constraints could be regarded as the second motive. We show that major determinants of the zero-leverage choice are growth opportunities, profitability, business risk and cash holdings. We find that all these firms are smaller, less profitable, riskier and possess high cash holdings. Moreover, we find that macroeconomic conditions have lower influence on the debt policy decision in comparison with corporate determinants.

Keywords: financial constraints, financial flexibility, zero-debt, capital structure.

JEL: G32.

One of the puzzles in capital structure (CS) theory that have not been fully explained yet, is the presence of firms following the low leverage or even zero leverage policy. The proportion of zero-debt (ZD) firms varies from country to country but the motives that make these firms to follow low debt or

ZD policy are not clear and lack theoretical basis at the moment.

The classic theories of capital structure could not explain the puzzle. The static trade-off theory [Kraus, Litzenberger, 1973] states that firms tend to reach the optimal capital structure through balancing between mar-

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ginal benefits (cheaper financing, tax-deductible interest expenses) and marginal costs (costs of financial distress) from the use of the additional unit of debt. But this theory could explain the decision of the company only in one period as it is not dynamic. In the case of unlevered companies, the theory would state that their bankruptcy costs are too high with the respect to tax gains, but previous research show that this is highly unlikely for zero-debt firms [Korteweg, 2010]. Dynamic trade-off theory version [Fischer, Heinkel, Zechner, 1989] that supposes the constant adjustment of the actual capital structure to the time-varying target level also fails to explain the existence of zero-debt companies.

An alternative model for capital structure, the pecking order theory [Myers, Majluf, 1984], explains the choice of financing with the following hierarchy of sources. Firstly, companies prefer to rely on their retained earnings reducing the costs of information asymmetry through not relying on external funds, then they could use the debt capital, while the equity issue is the most expensive source of financing that is applied as a last resort. This order could be explained by the different degree of costs related to each source with the information asymmetry. However, in several emerging countries (China, Czech Republic, Slovakia, Russia) the empirical tests of this theory have shown the reverse order [Chen, 2004; Delcours, 2007]. That fact led to the appearance of the modified pecking order theory, stating that financing through equity is more preferable than that of debt. Neither of theories specifications could explain however the stable zero-debt policy.

Even if the trade-off or the pecking order theories could explain the zero leverage in one definite period, they are not able to explain the tendency of increasing zero-debt firms nor they could be used to predict the financing choice of the firms in the future.

Estimation of ZD behavior can be useful and necessary from an empirical perspective, because the factors that lead firms to follow ZD policy are more likely to be dominating for these firms [Strebulaev, Yang, 2013]. Moreover, we should consider that ZD level may not be voluntary chosen. The mysterious fact in this pattern comes from the motives which force firms to follow no-debt policy, particularly the peculiarities of financial constraints and a mode deliberate choice of financial flexibility issues. Thus, we add to the literature on zero-debt puzzle by proposing the analysis of two motives (financial constraint and financial flexibility), that could possibly explain the increasing role of ZD phenomenon.

Secondly, the current literature on ZD choice is mostly focused on developed markets.

In this research, we focus on the ZD phenomenon of firms' CS from the emerging markets, making a focus on the motives which cause these firms to adopt ZD policy. Even though there have been several attempts to analyze the ZD puzzle in separate emerging countries, our research tends to explain the ZD policy choice from different perspectives: the impact of firms' financial constraints and financial flexibility motives, the influence of firm- and country-specific characteristics on the choice of ZD policy. Such complex and deep analysis hasn't been made for the emerging capital markets yet.

We aim to provide the new insights into the zero-debt phenomenon by analyzing firms' behavior, incentives and drivers for choosing the ZD policy. We evaluate the sample on the basis of financial flexibility and financial constraints motives to make comprehensive comparison of motives of the ZD choice among firms from emerging markets.

Our research demonstrates the results of capital structure choice among the large and small public companies with zero-debt (ZD), zero long-term debt (LTZD), almost zero-debt (AZD) levels from countries with emerging

markets (Asia, South and Central America, East Europe, Africa). We find out that search for financial flexibility tend to be the major motive to have zero-leverage which is followed by financial constraints motive. We show that the major determinants that explain the choice of zero debt policy are those connected with the unpredicted future results of the firm. We prove moreover that macroeconomic conditions matter less for the zero-debt puzzle as compared with the corporate ones.

The rest of our study is structured as follows: we provide the literature overview, our next section describes the methodology of the analysis, the next one shows the sample construction and data description, then the section that covers the results of the econometric analysis and robustness tests follows, and the conclusions of our study are highlighted in the last section.

Literature review

The zero-debt phenomenon in related literature

The notion that debt conservatism of firms on average is mainly inherited by ZD firms has not gone unnoticed in financial research [Korteweg, 2010]. According to the recent studies, inability to use or increase debt level is inherited by firms at the introductory phase of the life-cycle, which can face volatile earnings and lower tangibility [Dang, 2011; Strebulaev, Yang, 2013; Bessler et al., 2013]. The ZD policy patterns are observed internationally and exist in around 20 countries [Bessler et al., 2013].

The literature on ZD follows two tracks. First, there have been several attempts to define the determinants of CS choice among the firms without debt in their balance sheet by separating these determinants into firm- and country-level characteristics [Bessler et al., 2013]. The second track analyzes the motives which cause firms to follow ZD in their CS.

Country-level characteristics. The possible explanation of the ZD phenomenon can be related to the country-specific factors which force firms to use debt conservative policy. Firms are more likely to have high debt ratios among countries with more stable and healthier economic conditions [Djankov, McLiesh, Shleifer, 2007]. A negative relationship between the likelihood of a firm to be classified as ZD and the relative size of the deposits in a country [Bessler et al., 2013] was found, which indicates that financial intermediation encourages the use of corporate debt [Booth et al., 2001].

Despite the fact that the ZD puzzle exists at the major financial markets there are differences among countries due to the level of their capital market development, creditors protection and legal system. Countries with high creditors protection and a common law show the higher fraction of ZD firms [Bessler et al., 2013]. The common law system offers better protection for external investor than the civil law one, and as a result there is a better access to external financing and higher security values [La Porta et al., 1998; La Porta et al., 2002].

The key characteristics of emerging markets are high investment opportunities and their respective risks, low stock markets liquidity, lack of information transparency, the importance of insider information and the lack of proof of the market efficiency hypothesis, as well as small volumes of trading in financial markets. These markets are also characterized by multilevel ownership structure leading to urgency of agency conflicts and, accordingly, the necessity of testing the significance of agency capital structure motives in these markets [Bekaert, Harvey, 2003]. The authors also note another no less important characteristic: the weak development of corporate governance, which, among other things, leads to high costs for equity. Therefore, we suppose that country level determinants could influence firms' decisions to keep unlevered structure

in emerging capital markets. *Firm-level characteristics*. Previous research show that ZD firms tend to be smaller, keep higher cash reserves, show higher market-to-book ratios and higher payout ratios [Dang, 2011; Devos et al., 2012; Strebulaev, Yang, 2013].

The ZD behavior can be related to business risk. Taking into account that costs of financial distress are a positive function of asset volatility, the presence of ZD pattern is likely to be increasing with higher business risk [Bessler et al., 2013]. This statement holds for firms possessing illiquid tangible assets which cannot be reallocated in the time of bad macroeconomic events [Campello, Giambona, 2013]. Decreasing or entirely de-levering the amount of debt in CS, a firm reduces shareholders' total risk exposure [Meulbroek, 2002].

The link between CS and payout policies makes the understanding of the debt conservatism puzzle more complex. The ZD firms are not homogeneous but consist of two distinct groups with different levels of financial constraints, namely dividend payers and non-payers [Dang, 2011]. Either debt or dividends can be effective tool to reduce the agency problems regarding free cash flow [Easterbrook, 1984; La Porta et al., 2000; Fama, French, 2002]. Good equity market traits ZD firms accompanied by high dividend payouts [Byoun, Xu, 2013]. There are several agency models which assume that firms with high profitability direct larger fraction of their earnings to debt re-payments or dividend payouts to prevent managers from wasting free cash flow [Jensen, Meckling, 1976; Jensen, 1986; Easterbrook, 1984]. As the dividend and debt policies help in solving free cash flow problems, firms obtaining large profits may show high payout ratio instead of using debt [DeAngelo, DeAngelo, 2007]. Therefore, highly profitable and mature firms may solve the agency problem caused by free cash flow, showing large dividend payouts instead of debt usage, and consequently become debt-free.

The motives for zero-debt choice

Having defined the potential influential characteristics, we still should analyze the motives which cause firms to restrain debt in their CS.

Current literature on ZD puzzle investigated the following set of possible motives: financial constraints [Benmelech, Bergman, 2009], financial flexibility [Marchica, Mura, 2010; Muradoğlu, Sivaprasad, 2012; De Jong, Verbeek, Verwijmeren, 2012; Arslan-Ayaydin, Florackis, Ozkan, 2014], managerial entrenchment [Jensen, Meckling, 1976] or as a reaction to macroeconomic changes [Antoniou, Guney, Paudyal, 2008; Cook, Tang, 2010]. As soon as the forced motive (financial constraints) and the deliberate one (financial flexibility) are the motives tend to play the major role according to the literature on developed markets, we investigate whether this is true for emerging markets as well controlling for macroeconomic conditions. Thus, this paper contributes to the literature by checking the validity of these motives on emerging capital markets.

There are various suggestions about the characteristics of financially constrained firms. The presence of asymmetric information related to asset risk leads to increased costs of debt issuance, and as a result firms are rationed by lenders [Stiglitz, Weiss, 1981]. Also, the new borrowers without a good reputation may face difficulties in getting debt financing [Diamond, 1991]. The ZD firms with limited choices are constrained in their debt capacity and unable to enter debt markets, but not all of them suffer from supply-side constraints, and thus ZD firms may be classified as either financially constrained or unconstrained [Bessler et al., 2013]. Without having sufficient debt capacity, the constrained firms have to follow the ZD policy. The use of external equity is more pronounced among small firms, high growth firms, and low profit firms [Fama, French, 2005; Gatchev, Spindt, Tarhan, 2009]. Concerns about future financing abilities as

well as underinvestment situations are main determinants for constrained firms regarding cash holdings [Almeida, Campello, Weisbach, 2011].

The financial flexibility is the ability of an institution to make effective measures for trends changes of cash flow as a response on the unexpected needs and opportunities [King'wara, 2015]. The decision to issue debt is desirable, whilst the borrowings opportunity costs suggest that the target CS is more conservative than predicted by the trade-off model, and firms which stay financially flexible keep large cash holdings [DeAngelo, DeAngelo, Whited, 2011]. Also, these firms are able to reduce investment distortions due to their better access to debt markets during crisis times. These firms are aiming to save debt capacity for more constrained future periods [De Jong, Verbeek, Verwijmeren, 2012].

Implications of current literature to the zero-debt puzzle among the emerging markets

The CS puzzle presence among firms in Central-Eastern Europe provides some facts and questions, which cannot be explained using traditional approaches. There is a relatively low debt level among East European firms [Jõeveer, 2006]. The research uses the country- and firm-specific factors as the main determinants of leverage change for firms with different size — small or large ones. The low level of debt financing in Hungary and Poland relates to supply-side effect [Cornelli, Portes, Schaffer, 1996; Hussain, Nivorozhkin, 1997]. The financial constraints among Hungarian firms are the result of the combination of the financial incentives of firms and credit rationing within the financial environment [Nivorozhkin, 2007]. These constraints can impede the access of firms to long-term financing as well as their ability to grow [Klapper, Sarria-Allende, Sulla, 2002]. The debt ratio of firms which belong to the transition countries remains lower than in the

EU countries [Nivorozhkin, 2005]. The development of credit markets and economic environment stabilization in the emerging countries can explain the variation of firm's debt ratio.

Literature on zero-debt puzzle in emerging markets has only started to appear.

From the comparison of firms in developed and emerging markets it was found out that the culture and attitude to debt matter for the zero-debt decisions [Ghoul et al., 2018]. As the sample included the data of 1990–2010 it lacks the period of the major zero-debt firms rate increase, which could be provoked by different motives. The research on Indian market [Deb, Banerjee, 2015] provide a focus on the performance of zero-debt and levered firms showing that the formers' results are greater for the studied period of 2000–2007.

Considering the lack of research on the motives of ZD puzzle in the emerging capital market, we focus our research on the issue to provide a contribution to the literature on capital structure formation.

Methodology

We start the analysis from defining two motives measures: the financial constraints measure and the financial flexibility measure. According to the previous section, being the financially constrained or unconstrained, and financially flexible or inflexible, the firms' motives to adopt ZD policy should differ. Our hypotheses could be divided into two groups: first group estimates the determinants of probability to be debt-free, the second one tests the characteristics inherited by the ZD firms.

The determination of financial constraints and financial flexibility measures

Financial constraints. Existing literature aims to evaluate financial constraints from firms' statements relating to their funding situation or changes in investment plans, their actions (dividends paying or not), or

their characteristics (age or size, having low leverage or without credit rating) [Farre-Mensa, Ljungqvist, 2016].

The one of the most popular financial constraints measure according to the frequency of usage in studies is the KZ index [Farre-Mensa, Ljungqvist, 2016]. This index has been developed by [Kaplan, Zingales, 1997] using a text-based approach. The actual KZ index uses five readily financial variables: cash flow, market-to-book, leverage, dividends, and cash holdings [Lamont, Polk, Saá-Requejo, 2001]. The index loads positively on market-to-book and leverage and negatively on cash flow, dividends, and cash. There is implicit assumption that the financial constraints don't vary over time not over the business cycle.

In [Hadlock, Pierce, 2010] authors have updated [Kaplan, Zingales, 1997] text-based approach and have created their own index of financial constraints (SA index). We use the SA index because it is based on the size and age of the firm, the influential firm characteristics, which are less dependent on the accounting standard and are more transparent on emerging markets as compared to the elements of KZ index. Moreover, this measure helps us to enlarge the sample, since size and age information is available for greater number of companies.¹ This index proposes negative loads for size and age, and positive one for size-squared:

$$SA = 0.737 \cdot Size + 0.043 \cdot Size^2 - 0.040 \cdot Age, \quad (1)$$

¹ SA index uses the text-based analysis to determine the respective coefficients. This index is widely used for determining the firms' financial constraints issues by both academics and market practitioners in developed and emerging economies, though the coefficients haven't been recalculated. Due to the lack of evidence of SA index recalculations, we have adopted the approach that has proved its reliability for our analysis. Considering the potential bias of such approach, recalculations of SA index based on text analysis of sampled firms seemed highly difficult to conduct and was of the scope of our research.

where *Size* is the logarithm of the total assets, *Age* is the number of years the firm is listed or the number of years after the IPO took place.

As with the KZ index, subsequent users of the SA index proceed by applying Hadlock and Pierce's coefficients to their own samples [Farre-Mensa, Ljungqvist, 2016].

The higher the value of index, the more constrained a firm is. The agreement among the researchers is to classify the top tercile or fourth and fifth quintiles of firms as constrained and the bottom tercile or first and second quintiles as unconstrained.

In our research, we use the index grouping over quintiles and drop the third quintile to avoid misspecification issue.

Financial flexibility. In the modern literature, there are several definitions of financial flexibility. Based on the previous literature, we chose the measure that is based on excess cash estimates since it is closely correlated with financial flexibility [Hu, Jiang, Lee, 2013; Lee, Moon, 2011; Blau, Fuller, 2008; DeAngelo, DeAngelo, 2006]. Our measure of excess cash is calculated through an optimal cash holdings model to find the required level of cash reserve [Arslan-Ayaydin, Florackis, Ozkan, 2014]. The construction of the equation is made as follow²:

$$\begin{aligned} Cash\ Holdings_i &= \\ &= \beta_0 + \beta_1 MTB_i + \\ &+ \beta_2 Size_i + \beta_3 CFTA_i + \beta_4 Lev_i + \\ &+ \beta_5 NWCTA_i + \beta_6 CAPEXTA_i + \\ &+ \beta_7 RD_i + \beta_8 Div_i + \varepsilon_i, \end{aligned} \quad (2)$$

² The model also includes the mean cash-flow standard deviation of firms in the same industry over previous 5 year (INDSIGM) as an additional explanatory variable [Opler et al., 1999]. However, we could not obtain necessary information for firms in our sample and removed this variable from our model. Also, the model is estimated for each year and industry separately, which means that there is no need to control for year and industry dummies in the model.

where i stands for i -firm, MTB is the market-to-book ratio, $Size$ is the logarithm of total assets, $CFTA$ is the net income before depreciation and amortization over book value of total assets, Lev is total debt over book value of total assets, $NWCTA$ is net working capital over book value of total assets, $CAPEXTA$ is capital expenditure over book value of total assets, RD is the value of R&D expenses over the total assets and Div is the dummy variable set to one if a firm pays dividends in that year and zero otherwise, ε_i is the residuals. These residuals ε_i of the model are used as a proxy for the excess cash measure. Further, this measure is grouped according to the median value: flexible — higher than median, and inflexible — lower than median.

Based on this measure, we classify firms as flexible and inflexible ones.

ZD choice under different effects

Leverage definition. We define the book leverage ratio of firm as:

$$BL_{it} = \frac{(DLTT_{it} + DLC_{it})}{TA_{it}}, \quad (3)$$

where $DLTT$ is the amount of long-term debt exceeding maturity of one year, DLC is the debt in current liabilities, including long-term debt due within one year, TA is the total assets of the firm. The book leverage ratio is defined similarly in most recent capital structure papers [Strebulaev, Yang, 2013; Graham, Leary, 2011; Leary, Roberts, 2010; Lemmon, Zender, 2010]. The choice of denominator is less important in the context of ZD [Strebulaev, Yang, 2013]. If firms apply the same accounting rules (IFRS or GAAP) there is no need to make adjustments when comparing leverage internationally [Rajan, Zingales, 1995].

ZD and AZD firms' definition. We define firm as ZD firm in particular year if the outstanding amounts of both short-term debt (DLC) and long-term debt ($DLTT$) are

less than 1% [Strebulaev, Yang, 2013]. For comparison purposes, we also will calculate the fraction of firms that possess less than 5% long-term debt in total debt and called them as zero long-term debt entities (LTZD). We are also going to define the second category of firms which can be called as almost zero debt (AZD) firms. These firms possess a marginal debt presence in their capital structure and are classified as AZD if book leverage ratio is less than 5% [Strebulaev, Yang, 2013].

The further examination of the ZD (AZD) pattern includes more comprehensive set of firm- and country-level variables in the logit regression analysis.

Firm-level effect. The traditional capital structure factors (traditional determinants as: *Tangibility*, *Profitability*, *Growth opportunities* and *Size* are used as the control variables) are unable to explain the presence of ZD firms that is why we are aiming to evaluate if the ZD (AZD and LTZD) choice is attributable to changes in other firm-specific variables [Bessler et al., 2013]. Firstly, tax provisions are suggested to be a primary factor for CS choices [Fan, Titman, Twite, 2012; De Jong, Kabir, Nguyen 2008]. Due to tax deductions are affected by interest payments, we assume our first hypothesis.

Hypothesis 1. Firms with high tax payments are more likely to be ZD firms and these payments cause positive influence on firm's ZD choice.

Then, perhaps, firms may become debt-free because of tax deductions from non-debt sources [DeAngelo, Masulis, 1980], so we state second hypothesis.

Hypothesis 2. The non-debt tax shield affects ZD choice positively.

Firms with ample cash flow can fund investment opportunities with retained earnings, and thus have less incentive to use debt.

Hypothesis 3. Cash flow has a positive impact on a firm's decision to be debt-free.

Additionally, low leverage limits the agency costs of debt [Myers, 1977]. Leverage can be very low in cases of agency conflict over the future investment timing and additional debt issuance [Hackbarth, Mauer, 2012]. Becoming the debt-free and mitigating underinvestment problems, we assume the following.

Hypothesis 4. ZD firms to show high cash holdings, and reliance on new equity financing — both measures cause positive impact on ZD choice in the firms' CS policy.

We further consider the dividends payout ratio as a proxy for the degree of asymmetric information. Firms with low dividend ratios are more likely to suffer from high informational costs, hence limited access to the debt markets. Thus we propose next hypothesis.

Hypothesis 5. Proxy variables for asymmetric information are positively related to probability of maintaining a ZD policy.

Without interest, depreciation and amortization expenses, dividends could be used to smooth the earnings of ZD firms. When they are joined with high equity issuances, higher dividends might indicate a mean of establishing a reputation for moderation in expropriating wealth from minority shareholders [Gomes, 2000].

Hypothesis 6. ZD firms make higher dividends payouts and this measure causes positive impact over firms to follow the ZD policy.

A ZD firm's stock return volatility reflects its business risk, and this volatility equals to asset volatility. We use the Altman Z-score as the variable for the business risk measurement.

Hypothesis 7. The high level of assets risk is inherited by ZD firms — the impact of interest is positively related to ZD choice.

Country-level effect. Taking into account possible substantial differences over the countries, it is important to examine country-

specific factors in more details. Considering the hypotheses described above we are going to examine the impact of country-level characteristics on the CS choice.

Hypothesis 8. Difference between common law countries and civil law countries among emerging capital markets is influential. We use a dummy variable that takes the value of 1 for firms from a civil law country (and 0 otherwise).

The presence of creditor protection can also affect the CS choice. The Creditor Protection Score (CPS) which has been introduced by [La Porta et al., 1998] with several updates by [Djankov, McLiesh, Shleifer, 2007] has been substituted by the Strength of legal rights index (LRPI) calculated by the World Bank. For the regression analysis, we determine a bankruptcy code dummy variable, which takes the value of 1 if the firm belongs to a country with high creditor protection (LRPI is from second, third and fourth quartiles) and 0 otherwise.³

Hypothesis 9. Countries with strong bankruptcy code have more ZD firms than countries with weak creditor protection, thus high level of the creditors protection positively affects the ZD choice.

The development of capital markets has been hindered by the deficiencies of the country's corporate governance system and can be one of the determinants for firms to follow ZD policy [Nivorozhkin, 2015]. The level of capital market development is usually measured by the market capitalization of listed firms to country's GDP, the amount of credits from financial sector over GDP and the amount of deposits to financial sector over GDP.

Hypothesis 10. The variables which define the development of the country's financial system cause negative effect on firms to follow the ZD policy.

³ The definition of the LRPI construction is presented in the Table 1, and its value for each country from the sample is shown in the Appendix Table A1.

Staying in the line with related research papers we use GDP per capita growth, and the inflation rate as additional control independent variables in our logistic regression (see Table 1 for definition of variables).

Sample and Data

Sample construction

Our research is based on the sample of emerging markets companies. Based on the country classification our sample comprises of all actively traded industrial firms from 21 countries which are classified as emerging markets.⁴ We collect annual balance sheet data, income statement and cash flow statements data and market data of listed firms from the Capital IQ database over the period from 2010 to 2015. All variables are denominated in US dollars. Considering the specific nature of financial and utility firms (Capital IQ classification) we exclude them from our sample. Staying in line with major academic studies, we omit firm-year observations with missing information on total assets, depreciation and amortization, cash, *EBIT*, retained earnings, earnings from continuous operations (or earnings before extraordinary items), total equity, total shares outstanding and market capitalization. We then winsorize all variables at the 1% and the 99% tails not to deal with potential outliers. After all data cleaning steps, our final panel data set includes 6525 industrial firms with a total of 24 149 firm-year observations⁵. An overview of all the variables we use in our analysis with a detailed description of construction are shown in Table 1. The list of the countries and their

⁴ The data has been obtained from the World Bank database. Following the “One China principle”, the missed country-level indicators for Taiwan have been taken equal to Chinese ones.

⁵ The total number of firm-year observations including the lag years is equal to 27 150 firm-year observations.

institutional characteristics are presented in Appendix Table A1.

We calculate the book leverage as the ratio of the sum of short- and long-term debt to total assets [Devos et al., 2012; Strebulaev, Yang, 2013; Bessler et al., 2013]. ZD observations are firm-year observations with leverage less 1%, AZD observations are firm-year observations with book leverage less 5%, and LTZD observations are firm-year observations with zero long-term debt.⁶ The Appendix Table A2 provides descriptive statistics for all variables.

The median book leverage ratio is 23.1% for the full sample, whilst this indicator for constrained firms is around 20.4% and for flexible firms is around to 21.6%. Being constrained, firms choose around 23.4% of leverage on average, while being flexible the level of leverage on average rise to 24.5%. This could be a result of being forced to choose lower level of debt in case of financial constraints. Here, the preliminary hypothesis could be derived

Hypothesis 11. The financing constraints (small size and young age due to SA index) are determinants for the CS choice, while the flexibility of financing results in rather larger and older firms.

However, the financially flexible firms on average are riskier, possess higher cash holdings, they are less tangible and profitable comparing to constrained firms. Other variables are in line with expectations and logic as described above.

Results of the econometric models

The results of the econometric models' analysis follow the abovementioned hypotheses that we structured accordingly in Table 2.

⁶ Due to the extremely low level of purely zero-debt and long-term zero debt firms we assume to consider a firm with leverage level less 1% as zero-debt firm, whilst we assume to consider a firm with the fraction of long-term debt in the total amount of debt less 5% as zero long-term debt firm.

Table 1

Variables' definition

Variable	Definition and construction methodology
<i>Firm-level variables</i>	
<i>Book leverage</i>	Ratio of long- and short-term debt to total book equity
<i>Age</i>	Difference between the actual year and a firm's IPO date
<i>Size</i>	Natural logarithm of book value of total assets
<i>Market-to-book</i>	Market-to-book ratio is calculated as the sum of total assets and market value of equity less total stockholders' equity, to total assets
<i>Tangibility</i>	Ratio of fixed assets to book value of total assets
<i>Profitability</i>	Ratio of operating income before depreciation to book value of total assets
<i>Payout ratio</i>	Ratio of the sum of cash dividends and share repurchases to book value of total assets
<i>Equity issuances</i>	Ratio of total equity issuances to book value of total assets
<i>Taxes</i>	Ratio of income taxes paid to total book value of total assets
<i>Non-debt tax shield</i>	Ratio of depreciation and amortization to book value of total assets
<i>Cash holdings</i>	Ratio of cash equivalents to book value of total assets
<i>Business risk</i>	Altman Z-score — a credit-strength test that gauges a publicly traded manufacturing company's likelihood of bankruptcy (source: S&P Capital IQ database)
<i>Payout dummy</i>	Dummy variable that takes the value of 1 if a firm has a payout ratio greater than zero in a given year (and 0 otherwise).
<i>Cash flow</i>	Value of cash flow as the sum of earnings from continuous operations and depreciation and amortization to book assets
<i>Growth opportunities</i>	The ratio of growth opportunities is calculated as the sum of market capitalization and total debt to book assets
<i>R&D</i>	Ratio of research and development expenses to book a value of total assets
<i>Capital expenditures</i>	Ratio of capital expenditures to book value of total assets
<i>Country-level variables</i>	
<i>Deposits</i>	Demand, time and saving deposits in deposit money banks and other financial institutions as a share of GDP. See Table A1 for the mean value in all countries (Source: World Bank)
<i>Credits</i>	Domestic credit provided by the financial sector includes all credit to various sectors on a gross basis to the GDP. See Table A1 for the mean value in all countries (Source: World Bank)
<i>Market value</i>	The share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values. See Table A1 for the mean value in all countries (Source: World Bank)
<i>Inflation rate</i>	Measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. See Table A1 for the mean value in all countries (Source: World Bank)
<i>GDP per capita</i>	Annual real GDP per capita in the country. See Table A1 for the mean value in all countries (Source: World Bank)
<i>Legal system</i>	Dummy variable that equals 0 for countries with a common law system, and 1 for countries with a civil law system. See Table A1 for an overview of the legal system in all countries (Source: International Monetary Fund)

Table 1 (continued)

Variable	Definition and construction methodology
<i>Bankruptcy code</i>	Dummy variable that equals 1 if the country has a high legal rights protection score (LRPI belongs to second, third and fourth quartiles), and 0 – otherwise. Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed to expand access to credit. See Table A1 for an overview of the bankruptcy codes in all countries (Source: World Bank)

Despite our models tested all the hypotheses, we are focusing on our main findings respectively to corresponding hypotheses.

Multivariate firm-level analysis

The Table 3 shows the results of our binary choice (probit) regression models. The dependent variable takes the value of 1 if a firm is ZD, AZD and LTZD in a given year (and 0 otherwise). The explanatory variables used in the models are one-year lagged to avoid endogeneity problems. To control country and industry time effect we use the country and industry fixed effects. The columns 1, 3, 5 and 7 report the results of firm-level specific characteristics, whilst the column 1 shows the result of model with control variables only, the column 3 represents the extended model, the column 5 includes the dummy variable of financially constrained and financially flexible measures, and the column 7 provides the results for the extended model with dummy variables that include firms belongingness to constrained flexible or unconstrained flexible, or constrained inflexible, or unconstrained inflexible type.

The Table 3 also provides the economic implication by providing the average marginal effects in probability that a firm follows a ZD, AZD or LTZD policy as an answer for change in an explanatory variable or the change from zero to one for a dummy variable. We compute the probit models for three panels: the ZD firms, the AZD firms and the LTZD firms to define the determinants

causing these firms to follow ZD, AZD or LTZD policy respectively.

There are several major results that should be highlighted.

First of all, the negative intercepts for the all three panels imply that these firms are less common than debt (levered) firms. The usage of standard CS determinants for the estimations ZD pattern provides worse results comparing to the extended models for the all three panels according to the pseudo *R*-squared value.

Secondly, we examined the set of internal and external factors that influence the choice of zero leverage policy. It should be specified, that in most cases the determinants are very close for zero and almost zero panels whereas the results differ significantly for long-term debt absence. This could be explained by the fact, that on emerging markets total debt prove to show more reliable results since even short-term debt act could act for long-term purposes. Thus, total debt helps more in describing the capital structure choice of a firm, whereas the results on long-term debt choice help with the interpretation on the firm's creditworthiness, flexibility and constraints existence.

Within the set of internal characteristics, the following results are worth discussing.

The positive coefficient of the income taxes paid for the panel A and B (ZD and AZD firms respectively) proves that firms with higher tax payments are more likely to be debt-free (Hypothesis 1), whereas this coefficient is statistically insignificant for

Table 2

The tested hypotheses

Hypothesis	Description	Result obtained (dependency pattern)
Hypothesis 1	Firms with high tax payments are more likely to be ZD firms and these payments cause positive influence on firm's ZD choice	Accepted, positive and statistically significant dependency for ZD and AZD choices
Hypothesis 2	The non-debt tax shield affects ZD choice positively	Mostly not accepted, not proved under statistically significant levels, hence revealed the negative dependency for LTZD choice
Hypothesis 3	Cash flow has a positive impact on a firm's decision to be debt-free	Accepted, proved for ZD and AZD choices
Hypothesis 4	ZD firms to show high cash holdings, and reliance on new equity financing — both measures cause positive impact on ZD choice in the firms' CS policy	Cash holdings proved our expectations while the equity issuance showed negative impact without necessary statistical significance
Hypothesis 5	We assume that proxy variables for asymmetric information are positively related to probability of maintaining a ZD policy	Negative statistical significant impact only for AZD choice
Hypothesis 6	ZD firms make higher dividends payouts and this measure causes positive impact over firms to follow the ZD policy	The negative dependency for ZD and AZD, while opposite for LTZD; hypothesis have not reached the required statistical significance level
Hypothesis 7	The high level of assets risk is inherited by ZD firms — the impact of interest is positively related to ZD choice	Accepted, the positive and statistically significant result for all panels
Hypothesis 8	Difference between common law countries and civil law countries among emerging capital markets is influential	No significant linkage obtained
Hypothesis 9	Countries with strong bankruptcy code have more ZD firms than countries with weak creditor protection, thus high level of the creditors protection positively affects the ZD choice	Accepted for LTZD. The results for other measures are insignificant
Hypothesis 10	The variables which define the development of the country's financial system cause negative effect on firms to follow the ZD policy	Mostly accepted, but some variables have not showed necessary statistically significance level
Hypothesis 11	The financing constraints (small size and young age due to SA index) are determinants for the CS choice, while the flexibility of financing results in rather larger and older firms	Partially accepted regarding the impact of financial flexibility

the panel C: the LTZD firms. Increase in the income tax ratio to total assets among the ZD and AZD firms results in the around 10% and 40% increase in probability to follow the ZD and the AZD policy respective-

ly. Switching to the LTZD firms the overall result of the income tax ratio shows the statistical insignificance.

The negative coefficients on profitability for the ZD and the AZD firms' panels (co-

lumn 3, 5 and 7) shows that the less profitable firms are more likely to follow the debt-free (around 2% marginal effect) and almost debt-free (around 15% marginal effect) policies. The profitability measure is insignificant for the LTZD choice again supporting the idea, that firms consider long term debt together with the short-term debt for strategic purposes, thus, the one part of the total debt cannot be explained by the same determinants but rather explain the determinants of long-term debt accessibility. To prove that argument, we see the significance of size (the greater the size, the more probable for the firm to get a long-term debt which decreases the probability of zero-debt), tangibility (the same interpretation) and business risk (the greater the risk, the greater the probability of zero-debt).

As for the ZD and AZD, we obtain another set of major factors, mostly responsible for the level of unpredictability of the future outcomes: growth opportunities, profitability, cash holdings and business risk. Particularly, firms that follow ZD and AZD policies have lower growth opportunities, higher market-to-book ratios. Firms following the AZD and LTZD policies are smaller, while the later ones are also older (the Age variable shows insignificant level for panels A: the ZD firms and panel B: the AZD firms, while the direction of impact for the panel A is negative and for the panel B positive). At the same time, the positive coefficients cash holdings (for the ZD and AZD firms) can support our debt choice argument based on agency costs (Hypothesis 4). The increase of cash holdings to avoid underinvestment issues [Opler et al., 1999] shows the highest significance: a change in cash holdings is related to an increase in the probability to become ZD or AZD in the range of 4% and 17% for the ZD and AZD firms respectively. Moreover, the positive cash flow has a positive impact over the ZD and AZD choice (Hypothesis 3). We found out that equity issues demonstrate negative impact over AZD

choice — the contradiction of the pecking order theory — the firms use equity instead of debt for financing, rather than recapitalization (Hypothesis 4).

A payout ratio shows statistical insignificance for all three groups (Hypothesis 6), whereas the dividends payout dummy variable negatively affects the AZD policy choice (Hypothesis 5) and does not support out hypothesis regarding the positive impact of asymmetric information proxy. Additionally, the high asset risk of firms from all panels show that the riskier firms are more likely to choose ZD, AZD and LTZD policies (Hypothesis 7) — these findings are consistent with the inference that the risky firms are constrained to use debt [Bolton, Freixas, 2000].

We see from adding the financial constraints and financial flexibility dummies (column 7), that the ZD choice is more common among unconstrained inflexible firms, the AZD choice is more common among unconstrained both flexible and inflexible, and constrained inflexible firms. Thus, we state that the inflexibility is the dominant motive to follow the ZD. And AZD. Still, when we consider LTZD choice, it is more common only for constrained inflexible firms (Hypothesis 11). From that observation we could state that constrained firms either try to rely on short-term debt in the volume that exceeds 5% of total capital if they are flexible or they are forced to stick to long-term zero debt policy if they are both inflexible and constrained. Thus, their choice of strategy is also to a large extent dependent on flexibility. Overall, we could summarize that the firm's choice of zero-leverage is not always necessarily a forced case of financial constraints. Even if the firms are not constrained, they tend to keep the flexibility.

Multivariate country-level analysis

The use of country fixed effects in our probit models in Table 3 (columns 1, 3, 5 and 7)

Table 3

Firm-level and country-level probit regressions

This table reports coefficients and marginal effects (in italics) from firm-level and country-level probit regressions over the sample period from 2010 to 2015. The dependent variable takes the value of 1 if a firm has ZD, AZD or LTZD in each year (and 0 otherwise). A firm is classified as ZD if it has less than 1% leverage ratio, as AZD if it has less than 5% leverage ratio, and as LTZD if it has less than 5% long-term debt in total debt.

Variable	1	2	3	4	5	6	7	8
<i>Panel A: the ZD firms</i>								
Financially constrained					-0.303 <i>-0.0026851</i>	-0.346 <i>-0.0029248</i>		
Financially flexible					-0.172 <i>-0.0015266</i>	-0.173 <i>-0.0014584</i>		
Constrained flexible							-0.373 <i>-0.0032939</i>	-0.414 <i>-0.0034708</i>
Unconstrained flexible							-0.127 <i>-0.0011203</i>	-0.022 <i>-0.0001828</i>
Constrained inflexible							-0.312 <i>-0.0027551</i>	-0.357 <i>-0.0029937</i>
Unconstrained inflexible							0.125 <i>0.0011031</i>	0.212 <i>0.0017784</i>
Size	0.082 <i>0.0007617</i>		0.015 <i>0.0001381</i>	0.077 <i>0.0006647</i>	-0.034 <i>-0.0003059</i>	0.018 <i>0.0001509</i>	-0.043 <i>-0.0003807</i>	-0.004 <i>-0.0000301</i>
Age	-0.018 <i>-0.0001683</i>		0.002 <i>0.0000165</i>	-0.004 <i>-0.0000381</i>	-0.007 <i>-0.0000635</i>	-0.014 <i>-0.0001192</i>	-0.011 <i>-0.0001005</i>	-0.022 <i>-0.0001823</i>
Market-to-book	0.996 <i>0.0092494</i>		2.542*** <i>0.0229445</i>	3.084*** <i>0.026681</i>	2.570*** <i>0.0227942</i>	3.134*** <i>0.0264793</i>	2.590*** <i>0.022851</i>	3.151*** <i>0.0264357</i>
Tangibility	-3.367* <i>-0.031255</i>		-0.760 <i>-0.0068632</i>	-0.894 <i>-0.0077342</i>	-0.773 <i>-0.0068517</i>	-0.906 <i>-0.0076571</i>	-0.773 <i>-0.0068186</i>	-0.907 <i>-0.0076073</i>
Profitability	1.015 <i>0.0094235</i>		-2.542* <i>-0.0229453</i>	-2.893* <i>-0.0250309</i>	-2.613* <i>-0.0231753</i>	-2.939* <i>-0.0248309</i>	-2.615* <i>-0.0230692</i>	-2.943* <i>-0.0246945</i>
Non-debt tax shield	-8.502 <i>-0.0789261</i>		-4.169 <i>-0.0376322</i>	11.480* <i>0.0993252</i>	-4.359 <i>-0.038662</i>	11.900* <i>0.1005407</i>	-4.320 <i>-0.0381095</i>	12.054* <i>0.101127</i>
Growth opportunities	-0.905 <i>-0.0084033</i>		-3.053*** <i>-0.0275624</i>	-3.604*** <i>-0.0311775</i>	-3.102*** <i>-0.0275135</i>	-3.679*** <i>-0.0310811</i>	-3.126*** <i>-0.0275778</i>	-3.701*** <i>-0.0310473</i>
Dividends pay dummy			0.060 <i>0.0005441</i>	-0.010 <i>-0.0000898</i>	0.071 <i>0.0006333</i>	-0.008 <i>-0.0000656</i>	0.069 <i>0.0006069</i>	-0.009 <i>-0.0000722</i>

Table 3 (continued)

Variable	1	2	3	4	5	6	7	8
Payout ratio			-1.492 -0.0134723	-1.390 -0.0120251	-1.685 -0.0149423	-1.577 -0.0133235	-1.724 -0.0152095	-1.619 -0.0135865
Equity issuance			-0.178 -0.0016047	-0.167 -0.0014416	-0.084 -0.0007411	-0.056 -0.0004766	-0.103 -0.0009096	-0.080 -0.0006718
Income tax			12.619*** 0.113908	10.808** 0.0935078	13.011*** 0.1153972	11.216** 0.094758	12.942*** 0.1141777	11.183** 0.0938205
Cash flow			2.791** 0.0251952	2.993** 0.0258934	2.761** 0.024484	2.952** 0.0249437	2.789** 0.0246075	2.957*** 0.0248114
Cash holdings			4.364*** 0.039394	4.089*** 0.0353794	4.566*** 0.0404939	4.295*** 0.0362888	4.594*** 0.040533	4.320*** 0.0362403
Business risk			0.470*** 0.004243	0.518*** 0.0044782	0.485*** 0.0043051	0.536*** 0.0045292	0.489*** 0.0043146	0.542*** 0.0045438
Legal system		-1.124 -0.0119209		-0.377 -0.0032653		-0.439 -0.0037116		-0.415 -0.0034789
Deposits		0.000 4.58e-06		0.009 0.0000768		0.009 0.0000759		0.009 0.0000768
Credits		-0.011 -0.0001166		-0.014*** -0.0001204		-0.014*** -0.0001197		-0.014*** -0.000121
GDP per capita		-0.000 -3.08e-07		-0.000 -1.40e-07		-0.000 -1.37e-07		-0.000 -1.30e-07
Inflation rate		0.007 0.0000696		0.009 0.0000793		0.009 0.0000727		0.009 0.0000749
Market value		-0.004 -0.0000395		-0.002 -0.0000215		-0.003 -0.0000251		-0.003 -0.0000231
Bankruptcy code		-0.247 -0.0026156		0.050 0.0004353		0.041 0.0003435		0.057 0.0004775
Intercept	-6.271	-3.923**	-7.777***	-7.005***	-7.441***	-6.553***	-7.404***	-6.542***
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Pseudo R ²	8.3524	2.7309	21.0061	17.7806	21.1347	17.9162	21.1441	17.9406
N	18 923	19 083	18 285	18 660	18 285	18 660	18 285	18 660
<i>Panel B: the AZD firms</i>								
Financially constrained					0.015 0.0008049	0.042 0.002217		
Financially flexible					-0.113 -0.0058863	-0.105 -0.005578		

Table 3 (continued)

Variable	1	2	3	4	5	6	7	8
Constrained flexible							-0.163 -0.0084343	-0.133 -0.0070111
Unconstrained flexible							0.211 0.0109275	0.261 0.0137985
Constrained inflexible							0.055 0.0028451	0.082 0.0043565
Unconstrained inflexible							0.150 0.0077973	0.161 0.0085368
Size	-0.122*** -0.0070168		-0.102*** -0.0053098	-0.089*** -0.0047419	-0.103*** -0.0053717	-0.086*** -0.0045552	-0.131*** -0.0067872	-0.115*** -0.0060766
Age	0.001 0.0000541		0.010 0.0005402	0.012 0.0006544	0.010 0.0005408	0.013 0.0006958	0.004 0.0002202	0.006 0.0003437
Market-to-book	1.791*** 0.1029136		3.230*** 0.1680465	3.324*** 0.1763149	3.224*** 0.1676182	3.316*** 0.1757293	3.202*** 0.1661131	3.284*** 0.1737471
Tangibility	-2.058*** -0.1182685		-0.402 -0.0209242	-0.417 -0.0220984	-0.411 -0.0213504	-0.422 -0.0223747	-0.408 -0.021154	-0.407 -0.0215485
Profitability	1.397** 0.0803005		-2.819*** -0.1466794	-2.860*** -0.1516871	-2.824*** -0.1468159	-2.867*** -0.1519178	-2.846*** -0.1476385	-2.895*** -0.153129
Non-debt tax shield	-2.184 -0.1255153		0.199 0.0103685	5.496 0.2915063	0.219 0.0113881	5.528 0.2929685	0.224 0.0116211	5.596 0.2960246
Growth opportunities	-1.733*** -0.0995884		-3.767*** -0.1959641	-3.882*** -0.20589	-3.760*** -0.1955033	-3.873*** -0.2052387	-3.743*** -0.1941889	-3.846*** -0.2034721
Dividends pay dummy			-0.170* -0.0088235	-0.185** -0.0098081	-0.168* -0.0087424	-0.185** -0.0097985	-0.169* -0.0087446	-0.186** -0.0098587
Payout ratio			-0.628 -0.0326508	-0.519 -0.0275115	-0.627 -0.0325948	-0.508 -0.0269152	-0.636 -0.0329973	-0.496 -0.0262418
Equity issuance			-0.936** -0.0487027	-0.970** -0.0514732	-0.942** -0.0489759	-0.984** -0.0521352	-0.952** -0.0493658	-0.998** -0.0527774
Income tax			7.903*** 0.4111444	7.129*** 0.3781588	7.904*** 0.4109744	7.123*** 0.3774851	7.906*** 0.4100619	7.197*** 0.3807279
Cash flow			1.895** 0.0986007	1.887** 0.1000723	1.886** 0.0980529	1.881** 0.0996996	1.875** 0.0972398	1.860** 0.0984159
Cash holdings			3.321*** 0.172771	3.084*** 0.1635824	3.359*** 0.1746703	3.123*** 0.1654894	3.363*** 0.1744537	3.127*** 0.1654358

Table 3 (continued)

Variable	1	2	3	4	5	6	7	8
Business risk			0.548*** 0.0285182	0.558*** 0.0296088	0.549*** 0.0285399	0.559*** 0.0296016	0.551*** 0.0286015	0.561*** 0.0296605
Legal system		0.127 0.0073748		0.373 0.019801		0.344 0.0182473		0.354 0.0187224
Deposits		0.001 0.0000808		0.006*** 0.0003254		0.006*** 0.0003172		0.006*** 0.0003153
Credits		-0.006*** -0.0003417		-0.008*** -0.0004454		-0.008*** -0.0004436		-0.009*** -0.0004502
GDP per capita		0.000 5.23e-08		-0.000 -1.17e-07		-0.000 -1.17e-07		-0.000 -4.46e-08
Inflation rate		-0.020 -0.0011408		-0.013 -0.0006733		-0.013 -0.0006968		-0.013 -0.0006926
Market value		0.003** 0.0001982		0.004** 0.0002089		0.004** 0.0002028		0.004** 0.0002166
Bankruptcy code		0.232 0.0135096		0.096 0.0050669		0.073 0.003865		0.054 0.0028717
Intercept	-1.723***	-3.037***	-3.742***	-4.480***	-3.736***	-4.464***	-3.562***	-4.322***
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Pseudo R ²	4.9409	1.3226	17.8081	17.0278	17.8293	17.0473	17.8827	17.1178
N	19 083	19 083	18 629	18 660	18 629	18 660	18 629	18 660

Panel C: the LTZD firms	
Financially constrained	0.054 0.004406
Financially flexible	-0.102 -0.0083207
Constrained flexible	-0.112 -0.0091553
Unconstrained flexible	-0.142 -0.0115448
Constrained inflexible	0.087 0.0071202

Table 3 (continued)

Variable	1	2	3	4	5	6	7	8
Unconstrained inflexible							-0.121 -0.009891	-0.087 -0.0070657
Size	-0.231*** -0.0186013		-0.225*** -0.0183363	-0.174*** -0.014202	-0.220*** -0.0179207	-0.183*** -0.0149344	-0.208*** -0.0169147	-0.175*** -0.0142917
Age	0.016*** 0.0012913		0.016** 0.0012818	0.006 0.0005149	0.017*** 0.0013729	0.006 0.0004603	0.022*** 0.0017755	0.009 0.0007491
Market-to-book	0.045 0.0036516		0.046 0.0037178	0.127 0.0103992	0.042 0.0033916	0.109 0.0089031	0.044 0.003582	0.109 0.00886
Tangibility	-2.106*** -0.169289		-2.072*** -0.1688833	-2.088*** -0.1703387	-2.079*** -0.1693814	-2.088*** -0.1704015	-2.080*** -0.1694477	-2.084*** -0.1700154
Profitability	0.100 0.0080294		0.129 0.0105071	-0.092 -0.0075437	0.114 0.0092508	-0.131 -0.0106513	0.095 0.0077288	-0.163 -0.0132902
Non-debt tax shield	-5.530 -0.444478		-6.237* -0.5082854	-7.190* -0.5866307	-6.165* -0.5022712	-7.071* -0.5770452	-5.949* -0.4847374	-6.846* -0.5586729
Growth opportunities	-0.014 -0.0011417		-0.063 -0.005145	-0.109 -0.0089123	-0.058 -0.0047531	-0.091 -0.0074463	-0.061 -0.0049651	-0.091 -0.0074161
Dividends pay dummy			-0.038 -0.0031042	0.037 0.0030523	-0.037 -0.0029945	0.033 0.0027318	-0.035 -0.0028907	0.033 0.0027175
Payout ratio			1.695 0.1381786	0.895 0.0730368	1.685 0.1373038	0.912 0.074447	1.727 0.1407102	0.949 0.0774543
Equity issuance			-0.036 -0.0029625	0.013 0.0010963	-0.047 -0.0038222	0.009 0.0007229	-0.004 -0.00036	0.049 0.0039707
Income tax			-0.077 -0.0062578	-0.792 -0.0646249	-0.011 -0.0008978	-0.633 -0.051656	0.085 0.0069167	-0.544 -0.0443752
Cash flow			-0.457 -0.037273	-0.361 -0.0294704	-0.450 -0.0366789	-0.349 -0.0285111	-0.429 -0.0349412	-0.328 -0.0268031
Cash holdings			-0.241 -0.0196502	-0.018 -0.0015026	-0.212 -0.0172737	0.046 0.0037238	-0.226 -0.0183871	0.031 0.0025058
Business risk			0.067*** 0.0054982	0.072*** 0.005864	0.068*** 0.0055047	0.072*** 0.0059018	0.067*** 0.0054674	0.072*** 0.0058787

Table 3 (continued)

Variable	1	2	3	4	5	6	7	8
Legal system		0.076 0.006185		-0.142 -0.0115717		-0.192 -0.0156592		-0.211 -0.017237
Deposits		0.002 0.0001931		0.003 0.0002156		0.002 0.0001872		0.002 0.0001647
Credits		0.008*** 0.0006415		0.007*** 0.0005518		0.007*** 0.0005547		0.007*** 0.0005532
GDP per capita		-0.000*** -2.63e-06		-0.000*** -3.19e-06		-0.000*** -3.14e-06		-0.000*** -3.14e-06
Inflation rate		-0.002 -0.0001819		-0.006 -0.0004532		-0.006 -0.0005		-0.006 -0.0005288
Market value		-0.005*** -0.0004388		-0.006*** -0.0005139		-0.006*** -0.0005221		-0.006*** -0.0005185
Bankruptcy code		0.480*** 0.0390525		0.244* 0.0199331		0.196 0.0160069		0.169 0.0137724
Intercept	-2.499***	-3.286***	-2.599***	-1.376***	-2.664***	-1.210**	-2.803***	-1.237**
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	Yes	No	Yes	No	Yes	No
Pseudo R ²	5.4235	1.8924	5.4606	4.5784	5.4846	4.6496	5.5324	4.7031
N	19 009	19 083	18 586	18 660	18 586	18 660	18 586	18 660

Note: All explanatory variables are lagged by one period and described in Table 2. Fixed effects are indicated at the bottom of each column, the “Yes/No” statement indicates whether the respective fixed effect was included into the model or not. Standard errors are adjusted for heteroscedasticity and clustered at the firm level.

***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

cannot fully explain the increasing percentage of ZD, AZD and LTZD firms. Assuming the considerable cross-sectional variances over the countries, it is necessary to examine country-specific factors in more detail.

The results of probit regressions involving the set of country-level variables are shown in Table 3 (columns 2, 4, 6 and 8). The explanatory power of just country variables is extremely low (column 2) for the all policies choice. Moreover, including the country-level variables instead of country fixed-effects leads to lower explanatory power of models than ones with only firm-level characteristics, country and industry fixed-effects meaning that the capital structure decisions are driven mainly by internal factors [Mitton, 2008]. Analyzing the more “powerful” model (column 8) according to pseudo R-squared all the firm-level characteristics remain the same impact as described above. In addition, we find that the level of credits boosts the usage of corporate borrowings for the ZD and AZD firms, while it results in the LTZD choice. Also, the depth of financial system (deposits variable) together with high market capitalization to country’s GDP (market value variable) are positively related to AZD choice (Hypothesis 10). High level of country’s financial system development decreases the chance to follow the LTZD policy which goes in line with our hypothesis. Additionally, the high creditors protection (bankruptcy code variable) increases chances to be long-term debt-free firm (Hypothesis 4). The impact is the same for the AZD and ZD firms, but the inference does not show the statistical significance. This finding is close to our argumentation on financial flexibility and constraint. The greater the creditor’s protection level is, the tougher are conditions for financially constrained firms. This will influence firms’ choice of long-term debt mostly and in case of their inflexible position will most probably lead to zero-leverage choice. This is proved by the results of financial constraints

and flexibility measures for these specifications.

Robustness tests

In order to check the robustness of our firm- and country-level results for the AZD firms we check whether the 10% threshold can be used for the description of AZD firms.⁷

According to the results, the AZD firms are smaller and older, they show higher market-to-book ratio and lower both profitability and growth opportunities. The impact of income tax level, cash flow, cash holdings and asset risk coincide with inference of AZD firms with 5% leverage threshold.

By adding the country specific variables, we have found the positive influence of inflation rate, market capitalization level and bankruptcy code to follow the AZD policy. Generally, the robustness test proved our previously received results.

Conclusion

Our study provides insights into the pattern of firms’ choices to follow a ZD policy, a behavior that cannot be fully explained by the standard theories of capital structure. The growth of ZD, AZD and LTZD rates of has become a phenomenon not only among developed markets, but emerging ones as well. Our analysis show that the choice of zero-debt policy is mostly driven by internal factors rather than country-level ones, which in term explains why we could observe the ZD phenomenon in a global arena.

The major determinants that influence the ZD policy are represented by growth opportunities, business risk, profitability and cash holdings thus approximating the level of future outcomes predictability and the need for future investments as well.

⁷ Due to arguments in academic literature regarding the optimal or necessarily required level of leverage for indicating the almost zero-debt pattern. The results of the regressions are omitted, but can be provided upon the request.

We observe that the leverage ratios based on total debt provide more information on capital structure choice on emerging capital markets in comparison with the long-term debt ratios only. This finding goes in line with the previous literature that is focused on the total debt, supporting our proposition that both long term and short-term debt could be used for strategic purposes on emerging capital markets [Ghoul et al., 2018].

We considered two major motives for ZD behavior: financial constraints and financial flexibility. We show that financial flexibility motive is true for firms whether they

are constrained or not. Thus, firms try to keep the flexibility to have the opportunities for large investments in the future even if they are not forced to stick to the zero-debt policy by the market.

The further analysis should look deeper into the governance mechanisms that could provoke managerial entrenchment motives and ownership issues to consider the risk aversion level of different types of investors. The introduction of these factors on emerging capital markets would decrease the sample available for the investigation but will help with the thorough discussion of other possible motives for becoming a ZD firm.

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COUNTRIES'

The table summarizes the country-level variables. LRPI denotes the Legal Rights Protection Index from the World Bank database. Mean values are reported for the variables deposits, credits, GDP per

Country	Legal system	Deposits (% of GDP)	Credits (% of GDP)	GDP per capita (current US\$)	Inflation (annual %)
1	2	3	4	5	6
Argentina	Civil law	16.45	30.86	11 879.30	15.94
Brazil	Civil law	53.20	99.21	11 018.84	6.22
Bulgaria	Civil law	64.24	65.55	7358.97	1.68
Chile	Civil law	44.04	113.08	13 797.86	2.62
China	Civil law	47.03	155.85	6165.65	2.39
Croatia	Civil law	68.34	87.63	13 433.71	1.52
Estonia	Civil law	53.31	82.50	17 190.17	2.00
India	Common law	62.62	75.71	1425.17	9.17
Indonesia	Civil law	31.88	40.29	3316.26	5.53
Israel	Common law	75.40	86.17	33 484.18	1.80
Malaysia	Common law	121.82	133.18	9955.59	2.07
Mexico	Civil law	26.22	47.16	9361.52	3.93
Peru	Civil law	31.51	21.59	5777.48	3.01
Poland	Civil law	49.38	66.60	13 120.37	2.07
Romania	Civil law	32.01	43.56	8979.25	3.61
Russia	Civil law	40.36	42.36	12 457.71	8.88
South Africa	Common law	59.94	180.72	6870.06	5.49
Taiwan	Civil law	47.03	155.85	6165.65	2.39

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Appendix

Table A1

DESCRIPTION

capita, inflation rate, market capitalization of listed firms, total tax rate, and the percentage of zero-debt (ZD), almost zero-debt (AZD) and long-term almost zero-debt (LTZD)* firms during the sample period.

Market value (% of GDP)	Strength of legal rights index (LRPI): 0=weak to 12=strong	Total number of firms in the sample	The share of ZD firms (% of total number)	The share of AZD firms (% of total number)	The share of LTZD firms (% of total number)
7	8	9	10	11	12
10.52	2 — Low LRPI	27	0.00%	9.49%	1.46%
50.14	2 — Low LRPI	77	5.41%	12.21%	1.82%
8.74	9 — High LRPI	24	2.10%	13.45%	10.08%
111.73	4 — Low LRPI	64	0.78%	6.23%	0.62%
56.71	4 — Low LRPI	1765	0.39%	4.49%	10.81%
32.25	5 — High LRPI	37	3.62%	11.96%	5.98%
7.58	7 — High LRPI	10	0.00%	2.04%	4.08%
75.90	6 — High LRPI	101	3.78%	14.60%	7.89%
43.47	5 — High LRPI	236	2.05%	6.79%	7.12%
75.24	6 — High LRPI	258	1.48%	5.11%	3.95%
143.46	7 — High LRPI	535	0.16%	5.49%	6.54%
39.36	10 — High LRPI	42	0.79%	1.89%	1.89%
48.53	8 — High LRPI	30	0.56%	3.33%	2.00%
33.51	7 — High LRPI	185	1.26%	9.64%	5.42%
6.96	10 — High LRPI	16	6.33%	13.92%	2.53%
40.63	6 — High LRPI	59	7.32%	13.18%	1.01%
241.60	5 — High LRPI	118	0.00%	6.44%	4.75%
56.71	4 — Low LRPI	1138	0.00%	2.57%	7.17%

1	2	3	4	5	6
Thailand	Civil law	104.95	152.59	5543.93	1.77
Turkey	Civil law	49.74	78.24	10 006.20	7.74
Vietnam	Civil law	12.44	114.70	1704.88	7.86

Note: * — due to the extremely low level of purely zero-debt and long-term zero debt firms we assume to consider a firm with leverage level less 1% as zero-debt firm, whilst we assume to consider a firm with the fraction of long-

SUMMARY

Variable	All firms					
	N	Mean	SD	Median	Min	Max
<i>Leverage</i>	24 149	0.254	0.248	0.231	0.000	24.773
<i>Size</i>	24 149	5.783	1.750	5.730	1.915	10.067
<i>Age</i>	24 149	10.414	6.543	10.000	0.000	35.000
<i>Market-to-book</i>	24 149	1.480	1.154	1.155	0.144	46.388
<i>Tangibility</i>	24 149	0.315	0.209	0.296	0.000	0.991
<i>Profitability</i>	24 149	0.043	0.100	0.043	-4.845	7.969
<i>Payout</i>	24 149	0.019	0.026	0.013	0.000	0.852
<i>Equity issuances</i>	24 149	0.023	0.083	0.000	0.000	4.776
<i>Income taxes</i>	24 149	0.010	0.014	0.008	-0.144	0.365
<i>Non-debt tax shield</i>	24 149	0.003	0.021	0.000	0.000	2.666
<i>Cash holdings</i>	24 149	0.109	0.097	0.085	0.000	0.869
<i>Business risk</i>	23 499	2.653	2.129	2.180	-1.060	12.600
<i>Cash flow</i>	24 149	0.030	0.108	0.033	-4.963	6.805
<i>Growth opportunities</i>	24 149	1.206	1.185	0.870	0.024	45.813

Note: the table shows the number of firm-year observations (*N*), the mean, the standard deviation (*SD*),

Финансовые ограничения или финансовая гибкость: что определяет выбор нулевого долга на развивающихся рынках капитала?

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Table A1 (continued)

7	8	9	10	11	12
84.86	3 — Low LRPI	316	0.21%	4.24%	9.10%
31.72	3 — Low LRPI	176	2.93%	10.66%	6.35%
23.64	7 — High LRPI	249	0.00%	2.82%	15.85%

term debt in the total amount of debt less 5% as long-term zero-debt firms (LTZD).

Table A2

STATISTICS

Financially Constrained Firms				Financially Flexible Firms			
<i>N</i>	Mean	SD	Median	<i>N</i>	Mean	SD	Median
9639	0.234	0.309	0.204	4520	0.245	0.237	0.216
9639	4.270	1.067	4.311	4520	5.377	2.071	4.736
9639	6.319	4.995	5.000	4520	9.036	6.040	8.000
9639	1.481	1.354	1.104	4520	1.634	1.419	1.229
9639	0.319	0.208	0.299	4520	0.306	0.164	0.298
9639	0.038	0.139	0.045	4520	0.035	0.084	0.041
9639	0.016	0.027	0.006	4520	0.021	0.024	0.016
9639	0.036	0.108	0.000	4520	0.033	0.094	0.000
9639	0.010	0.015	0.007	4520	0.010	0.013	0.008
9639	0.003	0.031	0.000	4520	0.001	0.008	0.000
9639	0.106	0.108	0.073	4520	0.156	0.114	0.130
9372	2.864	2.360	2.340	4502	3.113	2.484	2.490
9639	0.021	0.151	0.033	4520	0.024	0.088	0.034
9639	1.222	1.396	0.837	4520	1.394	1.447	0.966

the median as well as the minimum (Min) and maximum (Max) value of each variable (only for the all firms).

Данное исследование сфокусировано на пробелах в теории формирования структуры капитала, касающихся мотивов выбора нулевого уровня долга. На выборке компаний из 21 страны с развивающимися рынками капитала за период с 2010 по 2015 г. мы проследили, что выбор политики структуры капитала обусловлен в первую очередь мотивом финансовой гибкости. Вторым по значимости мотивом являются финансовые ограничения. Мы определили, что основными детерминантами выбора нулевого долга являются возможности роста, бизнес-риск, доходность компании и наличие у компании денежных средств. Наши результаты показали, что компании с нулевым долгом зачастую малого размера, менее прибыльные, более рискованные и располагают высокими денежными ресурсами. Нами установлено, что внутрикорпоративные факторы более значимы при выборе нулевого долга, чем макроэкономические условия.

Ключевые слова: финансовые ограничения, финансовая гибкость, нулевой долг, структура капитала.

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