

Corporate Governance and the Cost of Debt in BRICS countries

Suggestion for a short running title: Governance and Cost of Debt in BRICS

This paper proceeds an empirical analysis of the influence of corporate governance on at-issue bond yield spread in BRICS countries during the period 2006-2016. The present analysis reveals that the larger size of the board of directors is associated with the higher cost of debt, and the monitoring role of the independent directors is not appreciated by the debt holders in BRICS countries. The major role of independent directors, conversely, is the mitigation of the risk of wealth expropriation by majority shareholders, and the decreasing effect of the board's independence on the cost of debt is more pronounced in the case of the higher ownership concentration. With regard to ownership concentration, it is associated with the higher cost of debt, as in developed markets, but this effect decreases by the increase in the board independence.

Keywords: corporate governance, ownership concentration, cost of debt, BRICS, probability of default, agency conflicts.

1. Introduction

The cost of debt is one of the major factors of the value of the firm and investment projects. However, by the means of internal mechanisms it is possible to influence only the default premium on debt instrument. Agency theory predicts that the default premium on debt is determined by the intensity of agency conflicts inside the firm, as it affects the risk of debt holders. Corporate governance mechanisms developed in the company can mitigate or increase the intensity of agency conflicts and protect the interests of external investors (Shleifer and Vishny (1997), Myers (1999)). This paper is devoted to the investigation of the influence of corporate governance mechanisms on the cost debt in large emerging markets represented by the sample of companies in BRICS countries.

The choice of the factors of board composition and ownership structure as the determinants of the cost of debt was motivated by the nature of agency conflicts debt holders are faced. First, we consider the agency conflict between managers and other stakeholders, which affects the *probability of an opportunistic behavior* of managers and *the probability of the distortion of information* disclosed in financial reports; second, agency conflict between shareholders and debt holders, influencing *the likelihood of the wealth transfer* from debt holders to majority shareholders (Jensen and Meckling, 1976). Both board composition and ownership structure affect the intensity of these conflicts, and, therefore, default risk associated with the debt investment.

We contribute to the literature with the following findings. First, this study provides a new evidence for the influence of corporate governance on cost of debt in emerging markets. The empirical literature devoted to the investigation of this phenomenon in emerging markets is rather scarce (Juniarti and The Lia Natalia (2012), Bliss and Gul (2012), Shailer and Wang (2015)); the results obtained are ambiguous; and generally only the measure of the cost of debt investigated is the implied cost of debt. However, corporate governance in emerging markets, in BRICS particularly, is different from the one in developed economies. There are at least three specific features of BRICS countries, which are reflected in corporate governance practices: high ownership concentration, significant role of informal institutions and low control of corruption, and weak legal enforcement in some countries (Estrin and Prevezer (2011), Sarkar and Sarkar (2012), Enikolopov and Stepanov (2013), Clarke (2015), Jiang and Kim (2015)).

Second, we apply the new approach to the investigation of the specific role of independent directors in emerging markets. We develop a model that differentiates between the monitoring role of independent directors and the mitigation of debtholders-shareholders agency conflict (Jiang and Kim (2015)).

Third, the special focus of this paper is the methodology of cost of debt measurement. We imply the method which has been not used in the preceding literature on corporate governance. We use at-issue option-adjusted spread accounting for the yield term structure. In the most recent papers the term structure of the yield is considered as the explanatory variables (Borisova et al. (2015), Huang and Petkevich (2016)), what highlights the relevance of this issue.

The paper is structured in the following way. In second chapter we review the preceding theoretical and empirical works related to the subject of the research. The third chapter is devoted to the review of BRICS countries' specific features in relation to established corporate governance practices. The fourth and fifth chapters refer to the hypothesis statement and research methodology overview respectively. Finally, in the sixth chapter we discuss the results of empirical analysis and present the results of robustness check procedures.

2. Literature review

Theoretically, corporate governance, reflected on board composition and ownership structure, should affect the cost of debt. As the main objective of corporate governance is the provision of investors with the assurance that they will get the return on their investment (Shleifer and Vishny, 1997), it determines the intensity of agency conflicts with which debt holders are faced: managers-external investors conflict and shareholders-debt holders conflict (Jensen and Meckling, 1976). Information asymmetry between managers and external investors is associated with the moral hazard problem, which, according to Bhojraj and Sengupta (2003), originates two sources of debt holders' risk escalation: first, self-interested behavior of the managers (agency risk); second, the fact of the non-completeness of corporate information for external investors (information risk). The conflict between shareholders and debt holders is in wealth transfer (or wealth expropriation) and risk shifting (asset

substitution), resulted from the activities of shareholders: shareholders may make managers pay dividends or make share repurchases at the expense of the investing in effective projects or take extremely risky projects, as shareholders' return positively correlates with riskiness of operations (Jensen and Meckling, 1976). This has increasing effect on the variance of the expected cash flows for the debt holders.

The framework of corporate governance which is established in a company which attracts the external capital became especially relevant among investors since the publicity has become aware of the most severe cases of accounting fraud, such as the case of Enron in 2001 (Darrat et al. (2014)).

One of the most significant indicators of corporate governance is board independence. *Independent directors* are opposite to the insiders in the board of directors in terms of their non-participation in the management of a company and non-affiliation with the majority shareholders.

Fama and Jensen (1983) argue that the main objective of the independent directors is to resolve the situations of disagreement among internal managers and play the leading role in taking decisions which influence the degree of the agency conflict between managers and external investors, such as executive compensation or the appointment of the CEO. The authors argue that the value of the human capital of the independent directors is affected mainly by the quality of the internal control provided by them. Their major concern is their reputation; therefore, they are motivated to monitor decision process of managers, what should reduce the risk of managerial opportunism, what influences on the risk premium of creditors.

The alternative logic, which implies that the increased concentration of the independent directors in the board of directors may reduce or not affect the effectiveness of the monitoring, was also put forward: first, independent directors may be inefficient in the

monitoring, because they are appointed by the internal managers; second, the pursue of independent directors to boost their reputation by active involvement in monitoring may fade away due to the process of habituation to the overall board culture (Fama and Jensen (1983)).

The empirical evidence from developed markets supports the hypothesis that independent directors due to their reputational concerns contribute to the more effective monitoring, and what is more important, the benefits from the improved monitoring outweigh potential wealth transfer effect from debt holders to shareholders, as the independence of the board reduces the cost of debt (see Bhojraj and Sengupta (2003) and Anderson et al. (2004) in the U.S., Piot and Missonier-Piera (2007) in France) and increases the credit rating of the bonds (see Ashbaugh-Skaife et al. (2006) in the U.S.).

As the prevailing board of directors' composition differs among countries, the empirical results depend on the country specificity. In countries where the board of directors consists predominantly of insiders, the non-significant relationship between the board independence and the debt pricing is revealed (see Aman and Nguyen (2013) in Japan, Lorca et al. (2011) in Spain).

The influence of *board size* is ambiguous, as according to agency theory, the more the size of the board of directors, the more the probability of the inefficiency of the board's functioning (Lipton and Lorsch, 1992); the optimal size of the board of directors – seven or eight (Jensen, 1993); whereas resource dependence theory, proposed by Salancik and Pfeffer (1978), suggests that the larger boards of directors are associated with the higher company's capabilities and performance (Dalton et al. (1999), Hillman et al. (2000)), as the crucial function of the board is the provision with the necessary resources: expertize, contacts, and other parts of human capital of the board members.

The impact of *ownership concentration* on debt holders' risk depends on two effects: according to the "private benefits hypothesis" (Barclay and Holderness, 1989), block holders

are likely to pursue their own interests and make managers take actions that maximize their wealth at the expense of the wealth of minority shareholders and debt holders. These actions may be related to the gaining from different privilege provided by the executives or to the use of the access to the insider information and the ability to influence firm's policies. The "shared benefits hypothesis" suggests that controlling shareholders are interested in effective management to maximize the firm value and, therefore, their own wealth. Shleifer and Vishny (1997) argue that in this case block holders tend to prevent managerial discretion through active monitoring. This has a result in increasing firm value and higher strategic efficiency (Ivashkovskaya and Stepanova (2011a)). Therefore, concentrated ownership can benefit debt holders as it contributes to the reduction of the degree of moral hazard with which debt holders are faced (Rabotinskiy and Stepanova (2014)). Therefore, according to these hypotheses, the impact of concentrated ownership on the risk of debt holders and ultimately on the actual cost of debt depends on which of the two effects is more severe.

There are at least two issues which should be taken into account during the empirical research. The first is the fact that the effect of the largest shareholder is significant if only his votes are legally protected (Shleifer and Vishny (1997)). The second, due to the fact that ownership concentration does not incorporate the factors of the direction of incentives of majority shareholders, the researches often use the more comprehensive measure – the percentage of shares held by investors involved in the process of corporate governance. Ivashkovskaya and Stepanova (2011a) use for this measure the shareholding by strategic investors, financial institutions as block holders, and managerial shareholding.

With regard to the empirical evidence, Ashbaugh-Skaife et al. (2006) have revealed the dominance of "private benefits hypothesis" on the sample of the U.S. companies. The same result was obtained by Shailer and Wang (2015) for the Chinese companies which are in a financial distress and operate in provinces of low institutional development. However, the

dominance of “shared benefits hypothesis” was revealed in Japan by Tanaka (2014a): the presence of large corporate shareholder holding more than 10% of the stock reduces the cost of debt.

However, concentration of ownership is not sufficient to explain debt holders’ risk; ownership identity is also important for investors in debt instruments. *State ownership* is related both to the power of governors, not interested in the firm efficiency (Shleifer and Vishny, 1997), what is observed empirically on multinational samples (Borisova and Megginson, 2011; Borisova et al., 2015); as well as to the excess guarantees to the debt holders in terms of debt repayment and probable bailout by the government in the case of bankruptcy (Borisova and Megginson, 2011), and the support in overcoming of business barriers and subsidization (Rabotinskiy and Stepanova , 2014), what decreases the riskiness of operations (see Shailer and Wang (2015) in China). *Institutional ownership* may also have an ambiguous effect on the degree of the agency conflicts: the incentive for the monitoring of managerial actions by these investors may be different (Shleifer and Vishny (1986)). It depends on the type of the investor: there is an evidence from the U.S. that the ownership of institutional investors who are more sensitive to information asymmetry due to their active trading, but are less likely to influence the corporate governance policies due to their highly diversified positions decreases the cost of debt (Wang and Zhang (2009)); moreover, the favorable effect on the cost of debt has the long-term institutional ownership, because this type of investment is generally not concentrated (Huang and Petkevich (2016)). The effect of *managerial* and *directors’ ownership* is also uncertain. On the one hand, insider ownership brings together their interests and the interests of shareholders (Jensen and Meckling (1976), Jensen (1993)). As shareholders are interested in value maximization, managers become less prone to opportunistic behavior (for example, they tend not to create value-diminishing growth policies), while directors have additional incentives for effective monitoring of the

managerial actions (see Lorca et al. (2011) in Spain). On the other hand, the managerial ownership may lead to the increased power of managers, which can make the monitoring of their actions by the board of directors difficult to implement (see Bradley and Chen (2011) in the U.S., Tanaka (2014a) in Japan).

To sum up, there is contradicting theoretical and empirical basis regarding the influence of different characteristics of corporate governance on the cost of debt. Moreover, the impact is highly dependent on the country-specific corporate traditions.

3. The specificity of corporate governance practices in BRICS countries

The corporate governance practices in BRICS countries differ from the ones in the developed economies, therefore, the investigated factors of corporate governance and the interpretation of results also should be different (Jiang and Kim (2015)). For that reason, in this paper we focus our attention on the specific features of corporate governance in BRICS countries.

Brasil

In spite of the existence of the standards of corporate governance in a Brazil legal system, the two problems prevent the efficient functioning of the corporate internal control. The first is the dominance of the informal institutions over the formal rules. Estrin and Prevezer (2011) argue that in spite of the good legal enforcement, the business in Brazil is subject to the black economy mechanisms and corruption. The members of the board of directors are often nominal, the number of independent directors, which can implement an effective control over the top management as experts, is usually small (Clarke (2015)). Therefore, the external investors cannot rely on the composition of the board of directors as a guarantee of their rights' protection.

The second problem is ownership concentration, the power of block holders and their expropriation of the wealth of minority shareholders and debt holders, which is typical for

Brazilian companies (Clarke (2015)). Therefore, the facts speak for themselves, and the private benefits hypothesis is prevalent in Brazil.

One of the main factors which contribute to the transformation of the traditions in the corporate governance in Brasil is the demands by the Brazilian stock exchange to the system of governance and the level of disclosure for the Brazilian companies. The problem of the power of the block holders has been partially resolving by the increase of the institutional shareholding, enhancing the diffusion of the ownership, and attraction of professional investors as external control bodies (however, according to the “passive monitoring hypothesis” proposed by Shleifer and Vishny (1986), the monitoring effectiveness of the institutional investors may be low).

Russia

As in Brazil, the formal introduction of the corporate governance standards in Russia is considered as in a high level. The standards are consistent with OECD Principles of Corporate Governance (Clarke (2015)). The legal basis is sufficient, and the corporate governance principles are similar to the principles described in the codes of other emerging countries. However, in spite of the fact of the development of the legal requirements to protect minority shareholders and debt holders, some blank spots remain uncovered – for example, there has not been developed a definition of affiliated parties yet (Enikolopov and Stepanov (2013)), the standard of the disclosure of all beneficial shareholders is adopted only since 2010. These facts may definitely undermine the credibility of the corporate governance system in the eyes of debt holders. Moreover, legal enforcement of the standards is considered as weak due to the corruption in regulatory bodies. The weakness of institutional environment is considered as one of the main drawbacks of the corporate governance system in Russia.

The second primary problem, which is specific for corporate governance of Russian companies, is ownership concentration – both state and public. State concentrated ownership

in Russia is developed both by the specificity of the Russian economy before privatization and the process of renationalization at the beginning of 21th century. As a result, state control is extremely popular among Russian companies. In the state-controlled companies the primary agency conflict refers to the managers/board members and minority shareholders/debt holders. The concentrated ownership in publicly-held companies is also a widespread phenomenon, which has a result in a conflict between block holders and debt holders or block holders and minority shareholders. The power of business groups, family groups and oligarchs as controlling shareholders is large (Clarke (2015)). This problem is partially resolved during the past decade, because there has been a tendency of the offshoring, and many firms diffused their equity among foreign financial institutions and foreign corporate bodies.

The weakness of the formal enforcement in the implementation of the high standards of corporate governance in Russia contributes to the prioritizing of the other stimuli - Enikolopov and Stepanov (2013) argue that the main motive to adhere to high-level standards of governance by Russian companies should therefore be reputation. This channel works effectively only for the companies which are listed in foreign stock exchanges, because there are severe requirements to the disclosure and corporate governance. However, Russian companies often bypass these requirements and prefer, for this reason, to create Special Purpose Vehicle and issue Credit-linked Notes or Loan Participation Notes.

India

India's primary specificity regarding the corporate governance is the historically developed nature of ownership, which is prevailing in the majority of companies and refers to the promoters' control. According to the research of Sarkar and Sarkar (2012), in 2008 92,8% of firms are characterized by concentrated ownership out of the sample of 3 155 Indian firms.

The ownership structure of Indian typical firm is as follows: the block stake of shares is controlled by the promoters' group: promoters are the corporate bodies or individuals, domestic or foreign, which are not only the owners of a firm, but also serve as managers in a company – they are classified as insider owners (Sarkar and Sarkar (2012)). Moreover, they also serve as members of the board of directors; therefore, the insiders on the board mainly hold a stake in a company's equity. As a result, a part of the board of directors is not independent not only from the management, but also from the major shareholders of a company. This may enhance the agency conflict between the debt holders/minority shareholders and majority shareholders, what becomes a greater problem due to the fact that the details regarding the promoters (even their names) are often not disclosed in annual reports. Therefore, the role of independent directors should be significantly larger in India due to the fact of the presence of promoters as representatives of business groups in the boards.

China

Corporate governance in China has several specific aspects which should be taken into consideration in the empirical research: the specificity of the concentrated ownership and its influence on the degree of agency conflicts in a company; the specific role of independent directors with regard to their duties; and the fact of the absence of the disciplinary effect of debt (Jiang and Kim (2015)).

Concentrated ownership and state control are widespread practices in firm-level governance systems in China, as in a majority of the emerging markets countries. However, scholars have not converged in a view regarding the prevalence of the private benefits or shared benefits hypothesis in China – whether the majority shareholders are associated with tunneling of funds and, therefore, expropriating the wealth of the other stakeholders, or they act as effective monitors and mitigate the risk of the managers' opportunistic behavior. The

empirical findings regarding the relationship between ownership concentration and the firm value are ambiguous (Jiang and Kim (2015)).

Another important feature of the Chinese companies is the specific role of the independent directors. As one of the major concerns of internal governance systems is the concentration of the ownership due to the existing probability of the wealth expropriation by the controlling shareholders, the main duty of independent directors in China is the control over the actions of the block holders to protect the interests of minority shareholders and debt holders (Jiang and Kim (2015)). Therefore, the primary role of independent directors in China is not the mitigation of the risk of managerial opportunism, as in the majority of developed countries. As a consequence, the arguments based on the conventional theory are not valid with regard to the Chinese companies.

Finally, in China debt has not a disciplinary effect on the managers (Jiang and Kim (2015)), as it is proposed in the work of Jensen (1986). The primary reason is the extremely low cost of bankruptcy in China: the protection of the rights of creditors in the case of bankruptcy is low; moreover, bailout by the Chinese governance is the widespread measure to save the financially distressed companies.

South Africa

South African corporate governance standards are strong because of the developed stock exchange and its requirements (Clarke (2015)). Companies are required to prepare integrated reports, including the sustainability report, with the detailed disclosure of the corporate governance practices adopted in a firm. The ownership concentration is considered as low, therefore, the information risk and wealth expropriation risk should not be significant for debt holders of South African firms.

However, due to the high administrative costs, which are connected to the comprehensive disclosure and implementation of the best practices of corporate governance,

South African companies also try to avoid the excess requirements from the exchanges and choose the methods of attraction of the external capital which are less costly, for example, ADR (Nag (2015)). Therefore, the creditors in South Africa experience the risk of managerial opportunism, which should be mitigated by the credible and independent board of directors – the framework which is effectively promoted in South Africa.

Summarizing the evidence regarding corporate governance in BRICS countries, three crucial peculiarities should be highlighted: widely spread ownership concentration (what may be reflected in the risk of wealth transfer from debt holders to majority shareholders); weak legal enforcement mechanisms; and the power of informal institutions, informal relationships and corruption.

4. Research hypotheses

Research based on developed markets indicates the crucial role of independent directors in the eyes of debt holders: mitigation of the *risk of managerial opportunism* (Fama and Jensen, 1983). The logic of the favorable effect of board's independence on the cost of debt through increased monitoring of managerial actions is supported by the empirical findings from developed countries (Anderson et al. (2004), Bhojraj and Sengupta (2003), Ashbaugh-Skaife et al. (2006), Piot and Missonier-Piera (2007)). Nevertheless, according to the business practice in BRICS countries, the more important role of independent directors of the firms with high ownership concentration, which prevail in emerging markets (Sarkar and Sarkar, 2012; Clarke, 2015), is expected to be the control over potential *wealth transfer from debt holders to majority shareholders*, what is observed in China (Jiang and Kim, 2015). These arguments lead to the following hypotheses:

H1. Larger percentage of independent directors decreases the cost of debt in BRICS countries.

H2. The favorable influence of the board independence on the cost of debt is more pronounced for the companies with higher ownership concentration

Ownership concentration itself is considered as one of the most significant features of corporate governance in BRICS countries. In Brazil and Russia there is evidence of the influence of block holders on the corporate policies, mainly via the representatives in the board of directors and top management (Clarke (2015)). In India there is an institute of promoters, or insider owners – the managers, which are also the directors and the owners of a company (Sarkar and Sarkar (2012)).

These facts build a solid basis in support of the private benefits hypothesis, proposed by Barclay and Holderness (1989): the block holders influence the company's policy in accordance with their own interests, increasing the risk of debt holders' wealth expropriation, leading to the third research hypothesis:

H3. The increase in ownership concentration increases the cost of debt in BRICS countries (private benefits hypothesis)

Nevertheless, in China and South Africa the prevalence of private benefits hypothesis over shared benefits hypothesis is not yet justified, and there is a probability, that the block holders contribute to more effective monitoring of managerial actions, what decreases the risk of managerial opportunism as a part of agency costs of debt, decreasing the risk premium on the debt instrument (Rabotinskiy and Stepanova (2014)).

According to Lin et al. (2011), the protection of legal rights of creditors against the majority shareholders is more important as the institution during the financial crisis period. The basis for this argument is the fact that the growth prospects are small due to financial instability, therefore, the ability of controlling shareholders to promote the implementation of risky projects, as well as the tunneling of funds, is small. Following this logic, it is expected that during the financial crisis the potential for the wealth expropriation by the majority

shareholders is smaller, therefore, the positive influence of ownership concentration is weaker during the crisis, and debt holders rely more on the power of independent directors as the protectors of their interests in the board:

H4. During the period of financial crisis the favorable influence of the board independence on the cost of debt is stronger, while the adverse influence of ownership concentration and the board of directors' size is weaker

5. Cost of debt measurement and other methodology

5.1. Cost of debt approximation

To get the results comparable with the evidence from developed markets, we choose bond yield spread as dependent variable, calculated as the difference between YTM on corporate bond and YTM on benchmark security, following Anderson et al. (2004), Klock et al. (2005), Borisova and Megginson (2011), Bradley and Chen (2011, 2015), Huang and Petkevich (2016). This measure captures micro-level factors only and includes *liquidity premium*, related to the investment in a comparable securities, and the *credit spread*, which reflects the probability of default on debt (credit risk), evaluated in the basis points, and tax issues related to a bond (Petitt et al., 2015). The choice of the indicator related to non-intermediated debt is motivated also by the result of research of Aldamen and Duncan (2012): the effect of corporate governance is more distinct on the risk of investors in debt instruments in the forms of corporate bonds, commercial papers and notes, rather than of bank loans, asset-specific finance and other forms of the intermediated debt.

We focus on at-issue risk of bond holders; and to account for non-constant spot rate of return over time and different embedded options, use option-adjusted spread, which is derived from Z-spread by option-specific adjustments. The need to account for term structure of bond yields is highlighted in the recent papers of Borisova et al. (2015) and Huang and Petkevich

(2016). The yield to maturity typically increases with the increase of the time to maturity (the yield curve is generally upward sloped). However, the calculation of G-spread and I-spread is based on the assumption that the spot yield curve of a government bond is flat.

Z-spread at issue is derived from the following equation:

$$\sum_{i=1}^n \frac{Coupon}{(1+Zspread+spot\ rate\ (gov)_i)^i} + \frac{Par\ value}{(1+Zspread+spot\ rate\ (gov)_n)^n} = P_{at-issue},$$

where $spot\ rate\ (gov)_i$ – spot rate of return on investment in a government bond with maturity i and the same currency of denomination as for the bond for which the spread is calculated; n - the maturity of a corporate bond

Option-adjusted spread is calculated by corrections to Z-spread, specific to a particular option type. The values of at-issue Z-spread and option-adjusted spread for each bond investigated was obtained using Bloomberg Yield and Spread analysis.

5.2. Variables

The explanatory variables include corporate governance factors and controls (bond-specific, firm-specific, country- and year-specific variables).

Board's independence is measured as percentage of independent directors out of the overall size of the board of directors (Ashbaugh-Skaife et al., 2006; Bradley and Chen, 2015), *ownership concentration* as the percentage of shares owned by block holders¹, as in papers of Bhojraj and Sengupta (2003), Anderson et al. (2004), Borisova and Megginson (2011). The interaction variable $\%Independent_{i,t} \times \%OwnConcentration_{i,t}$ is added to differentiate the monitoring role of independent directors and the role in mitigation of the risk of debt holders' wealth expropriation by majority shareholders. Control corporate governance variables include *Board Size*, *CEO duality* dummy and *State Control* as percentage of shares held by state.

¹ Block holders are identified as the shareholders holding more than 5% of shares outstanding

Bond-specific variables include *Maturity to call*, *Issue Size* to capture liquidity risk (Wang and Zhang, 2009; Boubakri and Ghouma, 2010; Bradley and Chen, 2015) and *Sinking fund provision* dummy to cover the factor of the mitigation of the default risk with which bond holders are faced (Boubakri and Ghouma (2010)). Although the last factor may be partially eliminated in the OAS, for some of the investors in emerging markets this factor may be crucial.

The *credit rating* variable, which is often included in the regression model (Anderson et al. (2004), Borisova and Megginson (2011), Kabir et al. (2013)) is not included to prevent multicollinearity and endogeneity: first, some of the determinants of the credit rating are included as the firm-specific and country-specific variables; second, the corporate governance variables have a significant impact on the credit rating, what is proved in empirical studies (see Ashbaugh-Skaife et al. (2006), Aman and Nguyen (2013)).

As default risk depends on the issuer's qualities, the model includes several **firm-specific** factors which explain the creditworthiness of the issuer, except corporate governance characteristics: *Firm Size*, *Leverage*, *Performance*, *Income Volatility*, following Bradley and Chen (2015), Bhojraj and Sengupta (2003), Borisova et al. (2015), Ivashkovskaya and Stepanova (2011b).

We also control for the factors which reflect the business cycle of the country in which an issuer operates, following Boubakri and Ghouma (2010): *GDP per capita*, *crisis* dummy (2008-2009, as the period of highest volatility of EMBI+ index), *corruption*.

5. Data and results

The final chapter is devoted to the statistical analysis of the variables on the base of the constructed sample, panel data regression analysis of the relationship between corporate

governance and the cost of debt, identification of the problems of the regression model and data, as well as the testing of the validity of the obtained results.

5.1 Sample description

As it is chosen to use at-issue yield spread on a corporate bond as the proxy for the cost of debt, the initial database refers to issuance of the corporate bonds by non-financial companies from Brazil, Russia, India, China and South Africa from 2006 to March, 2016. The choice of the period is motivated by the academic significance, as this period covers the period of world financial crisis.

The data was obtained by using Bloomberg fixed income database. Bonds with fixed coupon rate only were considered, because the benchmark for the variable and floating coupon bonds (LIBOR rate) differs from the benchmark for the fixed coupon bonds - yield on a government bond, which captures the majority of macroeconomic factors influencing the yield on a corporate bond. There were also the restrictions regarding the maturity type of a bond set: only the bonds without embedded options or with options in the form of call, put, or sinking fund provisions were taken into consideration. Therefore, convertible bonds are not included in a sample, because this type of financial instruments has both the features of debt and equity; extendible and perpetual bonds are not included due to the specific nature of the yield curve for these types of bonds.

The overall number of fixed coupon straight, callable, puttable or sinkable bonds' issues by non-financial firms available for the yield and spread analysis (YAS analysis) in Bloomberg database for the period of investigation is 399.

Then the observations with missing information regarding at-issue yield spread were dropped, also the observations which refer to the bond issuance by companies without complete information regarding corporate governance available were ignored (the structure of

the board of directors and the percentage of shares owned by block holders – shareholders, which control more than 5% of ordinary shares of a company).

The information regarding the corporate governance factors was collected from the annual reports of the companies, reports for securities exchanges (such as SEC 20-F forms), bond issue prospectuses dated before the date of the bond issue (therefore, all corporate governance variables are lagged).

Also the observations with regard to the companies without any information regarding the control variables (historical EBITDA, book value of total long-term liabilities) were dropped. There was also the censoring of sample carried out: the bonds issues with at-issue spread more than 1500 basis points were dropped as outliers. Also the bonds issues by the companies without the functioning board of directors at the moment of bond issue were not taken into account, because the board of directors is the core of the corporate governance. The ultimate sample consists of 295 observations – bond issues. The data collected is unbalance panel data.

The sample is misbalanced in term of the issues' distribution by country and currency denomination: almost half of the bonds are issued by Indian companies and denominated in Indian Rupees (table 2). The main reason for this is the availability of the information regarding at-issue yield spread in Bloomberg Professional. Moreover, by including more variables in the model, some observations were lost, but this ensures the less probability of endogeneity problem related to the omitted variables.

5.2. Descriptive statistics

The bonds in the investigated sample of issues by the companies in BRICS countries are issued with the mean option-adjusted spread of 239.11 basis points, on the amount of \$313 mln and 5.9 years to call on average. 30% of bonds are callable, 24% are puttable, and only 3% of them are characterized with the sinking fund provision (appendix 1).

On average, the issuers are characterized by the following corporate governance characteristics: the board of directors consists of 10 directors (8 directors in Brazil, 9 directors in Russia, 10 directors in India and China, 12 directors in South Africa), 46% of them are independent non-executive (28% in Brazil, 34% in Russia, 50% in India, 39% in China, 76% in South Africa). The ownership is highly concentrated, as it was predicted: the mean percentage of shares held by block holders is 66%. The mean ownership concentration also varies across countries: in Brazil - 68%, in Russia 73%, in India 57%, in China 68%, in South Africa 89%.

5.3. Empirical results

The results of the testing of the basic model and the model with the interaction variables reflecting the influence of crisis period on the relationship between corporate governance variables and cost of debt are presented in table 3.

The degree of multicollinearity of model with crisis interactions is higher than in a basic model: VIF for the variable $\ln(BoardSize) \times crisis$ is 83.24, for $OwnConcentration \times crisis$ 52.06. This problem is important, as in the model with the dropped insignificant variables all the interactions with *crisis* become insignificant. Therefore, the influence of crisis period on the relationship between corporate governance factors and the cost of debt is not significant on 10% significance level; the basic model is more adequate.

The degree of the board's independence has a favorable effect on the cost of debt in BRICS countries only if the risk of wealth transfer from debt holders to majority shareholders is high – if the percentage of shares held by block holders exceeds 46.9%. The larger degree of the board's independence is associated with the higher cost of debt if ownership concentration is lower than 46.9%, but this effect is eliminated with the increase in ownership concentration, at 1% significance level. Moreover, the negative influence of the board independence on the cost of debt is observed from the level of ownership concentration of

46.9%, and the negative marginal effect of the board's independence is more pronounced if ownership concentration in a company is larger, according to the equation of the marginal effect: $\frac{\partial Spread}{\partial \%Independent} = 985.1 - 2101 \cdot \%OwnConcentration$ (table 3). As the mean ownership concentration for the companies from BRICS countries is 66% (appendix 1), an increase in the percentage of independent directors on 0.1 percentage points decreases the yield spread on a corporate bond on 40.16 basis points for the mean observation in a sample.

This result is consistent with the theory of Fama and Jensen (1983) and the specificity of the corporate governance in BRICS countries. The institute of independent directors is highly appreciated by debt holders in these countries as the mechanism of the mitigation of the risk of wealth expropriation by the majority shareholders (if ownership concentration is more than 46.9%), as it was highlighted by Jiang and Kim (2015) with regard to China. The positive influence of the percentage of independent directors on the cost of debt in the case of the relatively low ownership concentration is in line with the logic of Fama and Jensen (1983) regarding the fact that the efficiency of the monitoring activities by the independent directors may be undermined by their habituation to the overall board culture or by the affiliation with the insiders which have hired independent directors. We consider that one of the possible reasons for the inefficiency of the monitoring by the independent directors is the power of informal institutes in BRICS countries (Estrin and Prevezer (2011), Enikolopov and Stepanov (2013)). There have been not revealed the difference in the impact of the board's independence during the crisis period.

This finding differs from the results of the empirical research in developed countries (Bhojraj and Sengupta (2003), Anderson et al. (2004), Piot and Missonier-Piera (2007)), in which only the favorable impact of the board's independence on the cost of debt was revealed.

Ownership concentration. The larger the percentage of shares controlled by block holders, the higher the bond yield spread, but this influence is partially mitigated by the increase in the percentage of the independent directors at 1% significance level, ceteris paribus, as the marginal effect of the ownership concentration is the following:

$$\frac{\partial Spread}{\partial \%OwnConcentration} = 1945 - 2101 \cdot \%Independent \text{ (table 5).}$$

This result is consistent with the private benefits hypothesis proposed by Barclay and Holderness (1989) and empirical findings from developed countries (Ashbaugh-Skaife et al. (2006)). It is also in line with logic that the debt holders investing in companies from BRICS highly appreciate the function of independent directors of the mitigation of the risk of the wealth expropriation by majority shareholders.

State control as explanatory variable is omitted due to collinearity in the BRICS sample (table 3). However, the significant relationship between this variable and the cost of debt is revealed at the testing on the country subsamples (table 6). Nevertheless, the most reliable results are based only on the Indian subsample due to the inefficient size of other subsamples to ensure that OLS estimates are unbiased and consistent.

In Brazil and Russia state control is associated with the higher cost of debt, what is consistent with a theory of Shleifer and Vishny (1997). However, in India and China state control has a favorable influence on the yield spread (table 3). It is an evidence of the potential existence of excess guarantees from the government in the case of the default on debt obligations, as well as government support in operations, what decreases the default risk premium on a corporate bond (Borisova and Megginson (2011), Rabotinskiy and Stepanova (2014)).

The results regarding influence of CEO duality are not representative, as only 2% of observations are characterized by CEO duality (appendix 1).

All of the control variables, except firm size, influence the cost of debt as it was expected (table 3): volatility of company's income and low control of corruption in a country increase the cost of debt; leverage is insignificant due to the nature of its influence: both the disciplinary effect and the higher risk of insolvency; effect of GDP per capita is low due to the fact that the majority of bonds are issued in a domestic currency (refined in OAS).

5.4. Robustness checks

The potential weak spots in the econometric model, which can undermine the results obtained are: multicollinearity, the method of the measurement of the variables and the size of the sample, as well as endogeneity of corporate governance variables.

The concern regarding the presence of the endogeneity in the model, which is significant, as the endogeneity has a result in the inconsistency of the OLS and FE estimates, is relevant to the estimated model: the ownership concentration, board size and the independence of the board of directors are related to the informal business rules and traditions which are not observed and therefore omitted in the model, what makes these variables correlated with the error term. However, the instrumental variables approach is not applicable to these variables; thus, the endogeneity problem is not considered in the present paper.

According to the VIF analysis, the variables, which potentially may generate a problem of multicollinearity, are $\ln(\text{Issue Size})$ and $\ln(\text{Firm Size})$. However, according to the correlations' analysis (appendix 2), the most significant correlations refer to the relationship between $\ln(\text{FirmSize})$ and $\ln(\text{BoardSize})$ (0.42) and $\ln(\text{IssueSize})$ and Corruption (0.41). Nevertheless, correlations among corporate governance variables, which often take place, are low or insignificant (appendix 2). The most significant correlations of the board size and the board's independence are revealed with the interaction variable. This variable also is characterized by high VIF (48.7).

Does multicollinearity generate a problem of identification of the effect of each investigated factors? The two approaches were applied to test whether the results are robust in terms of multicollinearity: estimation of the basic model without insignificant variable with the highest VIF $\ln(\text{IssueSize})$, without all insignificant variables ($\ln(\text{IssueSize})$, *Maturity to call*, *Performance*, *Leverage*), as well as without interaction variable; and the estimation of the model on the modified sample: the sample with the additional observations from India (for which the ownership concentration is measured as the sum the promoter shareholding) and truncated sample (with observations with the positive option-adjusted spread only).

According to the results of the regression analysis (table 5), the initial results are robust to the potential multicollinearity, as the signs and the significance of the coefficients are not changed. Results of the estimation of the model without interaction variable are also consistent with the inference based on the basic model: overall, the more the board's independence, the less the cost of debt; but the basic model provides with the more comprehensive understanding of this effect regarding its dependence on the level of ownership concentration.

Therefore, despite the fact of the presence of multicollinearity, the estimates of coefficients remain unbiased and consistent.

As the methodology used by Bloomberg Professional to make adjustments to Z-spread to obtain Option-adjusted spread is not available, the analysis of the regression model with the alternative approximation of the yield spread (Z-spread and G-spread) is made, including additional dummy variables *call* and *put* to account for the effect of embedded options on the yield spread. There was also tested the specification with the use of the alternative measures for the firm performance (*ROA*), firm size ($\ln(\text{total assets})$) and leverage (long-term debt to total assets) (table 6).

According to the results of the testing of alternative specifications, the sign and the significance of all corporate governance variables, except board size, are consistent. However, the variable $\ln(BoardSize)$, which was significant at 1% significance level in the basic model, is significant only at 10% significance level in the alternative specifications, and is characterized by the much lower marginal effect (table 6).

Therefore, the results are robust to different specifications and different size of the sample, except the significance and the value of the marginal effect of the board size on the cost of debt.

Conclusion

In this paper we aim to study the influence of corporate governance mechanisms on the cost of debt in BRICS countries. The main finding of the study is the empirical evidence demonstrating that corporate governance matters for debtholders in BRICS countries. However, due to the specificity of corporate governance practices in emerging markets, the nature of the influence of board structure on the risk of debt holders is completely different from the one in developed economies. In the debtholders' perspective, the ownership concentration plays the crucial role in corporate governance in emerging countries. First, the cost of debt is extremely sensitive to ownership concentration itself, i.e. higher ownership concentration is related to the higher cost of debt. Therefore, the risk of the wealth expropriation by majority shareholders is significant for the debt holders in emerging markets. The tunneling of funds by majority shareholders and the promotion of the interests via representatives are likely in the environment in which the informal institutions are highly powerful.

Second, ownership concentration alters the role of independent directors in corporate governance in BRICS countries. The monitoring role of independent directors usually

appreciated by investors in developed countries (Bhojraj and Sengupta (2003), Anderson et al. (2004), Piot and Missonier-Piera (2007)) is not revealed for BRICS countries. We see two possible explanations for this finding. On one hand, the power of informal institutions may lead to the real affiliation of formally independent directors with insiders, as it was predicted by the theory of Fama and Jensen (1983). On the other hand, in emerging markets the motivation of directors (that is higher for affiliated directors) plays the crucial role, while cancelling out the positive effect of independent expertise and opinion. The institute of corporate governance is appreciated by debtholders only in the case of highly concentrated ownership, as the mechanism of the prevention of the wealth transfer from debtholders to majority shareholders. Decreasing effect of the board's independence on the cost of debt is more pronounced for the companies with more concentrated ownership, that is, in the case of the higher likelihood of the existence of the powerful owner.

With regard to the limitations of this research, firstly, the country-specific analysis was not possible due to the size of the country subsamples (except Indian subsample). Secondly, the comprehensive analysis of the additional factors of ownership structure (institutional ownership, insider ownership) was not conducted for the reason of non-availability of data from Brazil and China. Moreover, the sample bias problem may be relevant, as the sample of the bonds investigated is restricted by the availability of data in Bloomberg database.

The present study has the potential for the further research. First, the widening of the sample will allow the basis for the qualitative comparable analysis of the influence of corporate governance on the cost of debt in different countries. Second, the data on the same bonds, but on the year-by-year basis (not at-issue) will allow to investigate the effect of corporate governance on the cost of debt in dynamics, with the more comprehensive set of variables.

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Table 1. The variables' definition and methods of their measurement

Variable	Method of the measurement		Source
	Basic model	Robustness check	
Spread	Option-adjusted spread at bond's issue	1. Z-spread at bonds' issue 2. G-spread at bonds' issue	Bloomberg Professional
Corporate governance variables			
ln(Board Size)	Natural logarithm of the number of directors on the board of directors before the date of bonds' issue		Annual reports, 20-F forms, bond issue prospectuses
%Independent	Total number of independent non-executive directors to the size of the board before the date of bonds' issue		
%Ownership Concentration	The percentage of shares held by block holders (>5% of shares outstanding) before the date of bonds' issue		
State control	Dummy variable: 1 if the state ownership is more than 25% before the date of bond's issue, 0 otherwise		
CEO duality	Dummy variable: 1 if the CEO also serves as the chairman of the board before the date of bond's issue, 0 otherwise		
Bond-specific variables			
Maturity to call	Number of years to the first call		Bloomberg Professional
ln(IssueSize)	Natural logarithm of the issue amount in US dollars		
Sink	Dummy variable: 1 if the bond with sinking fund provision, 0 otherwise		
Call²		Dummy variable: 1 if the bond is callable, 0 otherwise	
Put³		Dummy variable: 1 if the bond is puttable 0 otherwise	
Firm-specific variables			
Performance	ROE: Net income to total common equity for the fiscal year before the date of bond's issue	ROA: Net income to total assets for the fiscal year before the date of bond's issue	Bloomberg Professional
Volatility	Standard deviation of EBITDA for 6 preceding years, scaled by the mean EBITDA for this period		
Leverage	Book value of long-term liabilities to book value of equity for the fiscal year before the date of bonds' issue	Book value of long-term debt to book value of equity for the fiscal year before the date of bonds' issue	
ln(FirmSize)	Natural logarithm of Sales in US dollars for the fiscal year before the date of bonds' issue	Natural logarithm of total assets in US dollars for the fiscal year before the date of bonds' issue	

² in the model of Z-spread and G-spread as dependent variables

³ the same

Country-specific, macroeconomic variables		
GDP per capita	The value of the corresponding indicator for the year of bonds' issue	World Bank, World Development Indicators
Corruption	The value of the indicator "Control of corruption"	World Bank, World Governance Indicators
crisis	Dummy variable: 1 for the years 2008 and 2009, 0 otherwise	

Table 2. Data distribution

	Number	Percentage	Cumulative %
<i>1. Issues by country</i>			
Brazil	42	14,24	14,24
Russia	34	11,53	25,76
India	141	47,80	73,56
China	42	14,24	87,80
South Africa	36	12,20	100,00
Total	295	100,00	
<i>2. Issues by currency denomination</i>			
US dollars	46	15,59	15,59
Euro	8	2,71	18,31
Russian Ruble	34	11,53	29,83
Indian Rupee	137	46,44	76,27
Chinese Yuan	42	14,24	90,51
South African Rand	28	9,49	100,00
Total	295		

Sources: Bloomberg Professional, author's calculations.

Table 3. Results of the panel data regression analysis (BRICS sample)

Variables	OAS at issue (basic)	OAS at issue (influence of crisis)
<i>Corporate governance variables</i>		
ln(BoardSize)	282.0*** (98.41)	309.3*** (107.54)
ln(BoardSize)×crisis		-144.9 (97.54)
%Independent	985.1*** (341.59)	794.3** (320.05)
%Independent×crisis		-56.7 (145.48)
%Independent×OwnConcentration	-2101*** (586.5)	-1804*** (496.90)
OwnConcentration	1945***	2406***

	(492.8)	(522.87)
OwnConcentration×crisis		-568.8** (275.70)
State Control	omitted	
CEO duality	omitted	
<i>Bond-specific variables</i>		
Maturity to call	-5.234 (5.86)	-6.751 (6.38)
ln(IssueSize)	5.171 (10.65)	9.220 (11.21)
Sink	-206.2*** (53.85)	-207.63*** (53.21)
<i>Firm-specific variables</i>		
ROE	-135.2 (160.89)	-178.58 (135.53)
Volatility	132.3* (76.89)	110.54 (70.60)
Leverage	61.69 (39.69)	28.37 (39.78)
ln(FirmSize)	82.27*** (18.31)	91.01*** (19.48)
<i>Country-specific/macroeconomic variables</i>		
GDP per capita	-0.0206** (0.008)	-0.0218** (0.008)
corruption	-208.0* (126.46)	-67.4 (127.12)
crisis	-	600.45 (406.34)
Constant	-2383*** (636.28)	-2803*** (696.98)
Model	FE	FE
Year dummies	Yes	Yes
Observations	295	295
Number of companies	108	108
R ²	0.430	0.447
Hausman χ^2	-186.91	-791.08
Wald χ^2	108.49***	115.09***
Breush-Pagan F	6.05***	6.06***

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 4. Results of the cross-sectional regression analysis (country subsamples)

Variables	OAS at issue				
	Brazil	Russia	India	China	South Africa
<i>Corporate governance variables</i>					

ln(BoardSize)	-805.8*** (266.9)	-128.0* (64.72)	-35.52 (37.04)	44.66 (52.99)	-223.4 (806.9)
%Independent	-883.2*** (264.4)	75.27 (280.9)	5.909 (234.5)	-1213 -1781	-1039 -1856
%Independent× OwnConcentration	964.0 (605.1)	-83.70 (335.9)	-97.56 (396.1)	2018 -1951	655.4 -2693
Own Concentration	-527.8 (421.8)	-230.0* (108.6)	42.98 (222.0)	-650.5 (678.4)	-819.6 -1358
State Control	296.5** (140.8)	137.9** (51.13)	-116.5*** (34.50)	-197.7** (92.18)	564.3 (368.6)
CEO duality	137.8 (431.2)	omitted	165.8*** (59.02)	2929** -1188	omitted
<i>Bond-specific variables</i>					
Maturity to call	10.54** (4.915)	0.926 (4.730)	1.236 (4.480)	94.12** (44.96)	-14.73* (7.992)
ln(IssueSize)	35.25 (133.3)	-30.63** (14.42)	-14.34* (7.254)	3.792 (26.40)	70.17 (76.42)
Sink	omitted	120.3** (43.75)	-223.6** (96.17)	omitted	omitted
<i>Firm-specific variables</i>					
ROE	-140.0 (102.4)	-515.2*** (152.2)	-51.50 (102.7)	-122.3 (439.5)	1522** (694.5)
Volatility	179.9 (111.6)	-30.63 (33.83)	-24.31 (32.60)	5.353 (17.90)	379.9 (236.7)
Leverage	36.60 (75.46)	54.37* (29.85)	-14.82*** (4.634)	1.731 (10.50)	-148.7 (109.5)
ln(FirmSize)	-48.67 (50.95)	-32.38** (12.66)	-16.10* (8.611)	-15.01 (13.30)	97.22 (217.3)
<i>Country-specific variables</i>					
GDP per capita	0.342 (0.406)	-3.266*** (0.707)	-0.742** (0.320)	7.007** (3.345)	0.122** (0.0521)
Corruption	985.7 -147	-8294*** -2043	851.8* (432.7)	-28956** -13283	71675** -26966
Constant	716.8 -1813	15659*** -3083	2101*** (618.7)	-37982** -18229	7453* -3917
Model	OLS	OLS	OLS	OLS	OLS
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	42	34	141	42	36
R ²	0.920	0.920	0.552	0.804	0.774
Adj R ²	0.8500	0.8352	0.4733	0.6649	0.4726

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5. Results of the panel data regression analysis on the modified model (set of variables) and with modified size of the sample

Variables	OAS at issue				
	without ln(IssueSize)	without all insignificant variables	without interaction variable	widened sample ⁴	truncated sample ⁵
<i>Corporate governance variables</i>					
ln(BoardSize)	279.6*** (99.26)	210.5** (80.71)	342.5** (139.2)	260.9*** (94.21)	376.8*** (113.6)
%Independent	1,021*** (358.6)	1,018** (409.9)	-394.6** (199.0)	1,027*** (356.3)	986.7*** (325.9)
%Independent× OwnConcentration	-2,176*** (615.7)	-2,077*** (699.0)	-	-2,163*** (614.4)	-1,974*** (485.2)
Own Concentration	1,955*** (497.0)	2,081*** (650.8)	1,027** (490.9)	2,182*** (455.9)	1,852*** (434.9)
State Control	omitted				
CEO duality	omitted				
<i>Bond-specific variables</i>					
Maturity to call	-5.132 (5.816)	-	-5.845 (6.052)	-4.677 (5.572)	0.513 (1.932)
ln(IssueSize)	-	-	13.22 (11.82)	0.609 (10.35)	-1.522 (10.84)
Sink	-209.7*** (52.99)	-238.8*** (27.72)	-198.8*** (57.55)	-218.9*** (50.70)	-258.9*** (33.41)
<i>Firm-specific variables</i>					
ROE	-141.7 (155.8)	-	-123.3 (162.3)	-142.6 (160.8)	-149.2 (130.4)
Volatility	134.5* (76.74)	125.7 (84.55)	108.7 (89.68)	132.5* (77.59)	105.5 (90.11)
Leverage	61.92 (39.58)	-	40.79 (41.77)	50.20 (30.56)	75.85* (41.68)
ln(FirmSize)	80.53*** (17.66)	77.17*** (17.97)	85.11*** (18.45)	73.02*** (19.36)	55.57*** (19.93)
<i>Country-specific variables</i>					
GDP per capita	-0.0205** (0.0086)	-0.0196** (0.0093)	-0.020*** (0.0077)	-0.0205** (0.0082)	0.00235 (0.00885)
Corruption	-209.4* (125.9)	-355.2*** (117.7)	-135.8 (139.4)	-204.4* (120.7)	-233.6* (134.2)
Constant	-2,270*** (556.3)	-2,262*** (649.3)	-2,048*** (630.4)	-2,286*** (626.2)	-2,360*** (692.0)
Model	FE	FE	FE	FE	FE
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	295	295	295	321	280

⁴ the sample with the additional observations from India (for which the ownership concentration is measured as the sum the promoter shareholding)

⁵ the sample with observations with the positive option-adjusted spread only

Number of companies	0.429	0.387	0.387	0.412	0.425
R ²	108	108	108	118	105
Hausman χ^2	145.31***	41.15***	-1431.22	-332.60	340.50***
Wald χ^2	105.88***	94.27***	106.98***	108.32***	80.71***
Breush-Pagan F	6.29***	6.88***	5.65***	6.78***	8.00***

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 6. Results of the panel data regression analysis on the modified model (method of the measurement of the dependent and control variables)

Variables	Z-spread at issue	G-spread at issue	OAS at issue other controls⁶
<i>Corporate governance variables</i>			
ln(BoardSize)	195.1** (81.09)	196.3* (102.46)	192.0* (102.65)
%Independent	1163*** (233.5)	2458*** (554.56)	929.6** (420.90)
%Independent×OwnConcentration	-2211*** (347.88)	-3936*** (774.31)	-1986** (770.60)
Own Concentration	1529*** (421.54)	2431*** (563.68)	1656*** (531.85)
State Control	omitted		
CEO duality	omitted		
<i>Bond-specific variables</i>			
Maturity to call	1.334 (5.84)	0.368 (6.59)	-5.312 (5.99)
ln(IssueSize)	13.08 (13.96)	-22.77*** (6.19)	6.856 (11.13)
sink	-305.7*** (52.01)	-192.8*** (62.91)	-208.4*** (62.80)
call	-20.46 (23.52)	64.43*** (24.68)	-
put	-0.780 (32.93)	-70.61** (29.67)	-
<i>Firm-specific variables</i>			
Performance	-127.2 (99.54)	-164.7 (164.01)	-46.59 (709.02)
Volatility	25.31 (64.15)	98.82 (87.62)	51.73 (78.24)
Leverage	140.7*** (42.96)	60.41 (48.21)	53.02 (38.88)

⁶ the model with the alternative measures of Performance (ROA), Firm size (total assets) and Leverage (long-term debt to total assets)

ln(FirmSize)	-18.38 (26.51)	90.65*** (22.24)	87.59*** (26.28)
<i>Country-specific variables</i>			
GDP per capita	-0.0226*** (0.008)	-0.0323*** (0.0110)	-0.0210*** (0.0075)
Corruption	-259.8** (108.3)	88.44 (150.5)	-213.6* (114.6)
Constant	-1532*** (617.0)	-1937*** (632.0)	-1961*** (674.3)
Observations	295	295	300
R ²	0.415	0.434	0.387
Number of companies	108	108	111
Hausman χ^2	-169.07	616.69***	705.21***
Wald χ^2	84.92***	108.41***	85.80***
Breush-Pagan F	5.99***	5.79***	6.10***

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendices

Appendix 1. Summary statistics (Observations=295)

<i>Continuous variables</i>	Mean	Std Dev	10th Pct	25th Pct	50th Pct	75th Pct	90th Pct
OAS at issue	239.11	234.79	26.25	76.68	185.20	312.61	565.85
Z-spread at issue	248.58	205.05	53.27	116.92	208.79	319.93	451.84
G-spread at issue	257.26	227.63	62.12	120.50	217.97	322.69	540.51
BoardSize	10.41	3.15	6	8	10	13	14
%Independent	0.46	0.22	0.18	0.33	0.5	0.57	0.78
Own Concentration	0.66	0.25	0.34	0.43	0.64	0.89	1.00
Maturity to call	5.89	4.94	0.74	2.99	5.00	7.17	10.00
IssueSize (USD mln)	313.00	461.00	6.80	20.40	80.90	439	994
Performance (ROE)	0.10	0.18	0.003	0.03	0.07	0.16	0.21
Volatility	0.52	0.41	0.15	0.27	0.44	0.67	0.88
Leverage	1.39	1.50	0.28	0.49	0.79	1.71	2.99
FirmSize (ln(Sales))	10.61	1.93	8.21	9.40	10.51	11.76	13.08
GDP per capita	3280	2338	1010	1164	2215	5820	6584
Corruption	-0.42	0.27	-0.87	-0.56	-0.46	-0.33	-0.07
<i>Dichotomous variables</i>	Mean	1			0		
State Control	0.28	84			211		
CEO duality	0.02	7			288		
sink	0.03	8			287		
call	0.30	88			207		
put	0.24	71			224		
crisis	0.06	17			278		

Sources: Bloomberg Professional, annual reports, author's calculations.

Appendix2. Correlation matrix

		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
OAS at issue	A	1.00															
ln(Board Size)	B	-0.44***	1.00														
%Independent	C	-0.21***	0.18***	1.00													
%Independent×OwnConcentration	D	-0.13**	0.16***	0.79***	1.00												
Own Concentration	E	0.16***	-0.07	0.008	0.57***	1.00											
State Control	F	0.12**	0.36	0.17***	0.48***	0.50***	1.00										
CEO duality	G	0.03	0.05	0.03	-0.10*	-0.17	-0.10*	1.00									
Maturity to call	H	0.27***	0.04	0.07	0.25	0.35***	0.37***	0.03	1.00								
ln(IssueSize)	I	0.26***	-0.002	-0.10*	0.09	0.24***	0.15***	0.11*	0.33***	1.00							
sink	J	-0.08	-0.03	-0.13	-0.12	0.003	-0.11*	0.11*	-0.02	0.05	1.00						
Performance	K	0.39***	-0.30***	-0.29***	-0.21	0.16***	-0.06	0.06	0.18***	0.07	-0.0003	1.00					
Volatility	L	0.03	0.01	-0.06	-0.11*	-0.08	-0.10*	-0.06	0.07	0.04	-0.06	-0.08	1.00				
Leverage	M	0.09	-0.28	0.07	0.11**	0.10*	-0.20***	-0.07	-0.09	-0.13**	-0.05	-0.04	0.02	1.00			
ln(FirmSize)	N	-0.42***	0.42***	0.08	0.06	-0.02	0.34***	0.22***	0.05	-0.06	0.02	0.003	-0.04	-0.18***	1.00		
GDP per capita	O	0.23***	-0.13**	-0.20***	0.03	0.28***	0.03	-0.03	0.35***	0.62***	0.20***	0.02	0.07	-0.15**	-0.35***	1.00	
Corruption	P	0.33	0.11*	0.18***	0.25***	0.18***	0.19***	0.03	0.35***	0.41***	-0.30***	0.13**	-0.03	-0.01	-0.23***	0.13**	1.00

*** p<0.01, ** p<0.05, * p<0