ISSN 0798 1015

REVISTA ESPACIOS

HOME Revista ESPACIOS ÍNDICES / Index A LOS AUTORES / To the AUTORS

Vol. 39 (Number 44) Year 2018. Page 16

The determinants of corporate capital structure: evidence from Russian panel data

Los determinantes de la estructura del capital corporativo: evidencia de datos del panel ruso

Igor KIRSHIN 1; Gleb VOLKOV 2

Received: 07/05/2018 • Approved: 22/06/2018

Contents

ABSTRACT:
The paper discusses the dependence of firm's financial leverage on traditional determinants of capital structure for the firms operating in oil, gas, and chemical complex of the Russian Federation. The analysis is based on the panel data of 17 companies for a six-year period (2011-2016). Ten firm factors were selected as the determinants of corporate capital structure. To achieve the objective, the authors used multiple linear regression models, applied to panel data, the Fixed Effects Model, the mixed-effect model.
Keywords: Determinants of capital structure, financial leverage, multiple linear regression, panel data

RESUMEN:
El documento analiza la dependencia del apalancamiento financiero de la empresa en los determinantes tradicionales de la estructura de capital para las empresas que operan en complejos de petróleo, gas y químicos de la Federación Rusa. El análisis se basa en los datos del panel de 17 empresas para un período de seis años (2011-2016). Diez factores firmes fueron seleccionados como los determinantes de la estructura del capital corporativo. Para lograr el objetivo, los autores utilizaron múltiples modelos de regresión lineal, aplicados a los datos del panel, el Modelo de efectos fijos, el modelo de efectos mixtos.
Palabras clave: determinantes de la estructura de capital, apalancamiento financiero, regresión lineal múltiple, datos de panel

1. Introduction

Firm's competitiveness largely depends on access to financing and cost of capital. Management decisions associated with the selection of capital structure are of high importance for business owners interested in firm value maximization and accumulation of competitive advantages. Being tightly bound to long-term financing, firm's capital structure is defined by debt-to-equity ratio and by the selected method of financing.

According to the literature, all factors influencing firm's capital structure are divided into two categories: (a) external factors that reflects specific macroeconomic indicators of national economy (for example, inflation rate, key interest rate) and (b) internal business-specific factors, such as ROA, firm size, asset tangibility, asset liquidity, asset turnover, etc. Given that virtually all domestic firms are affected by the same external factors, let's analyze the impact created by a certain set of internal factors on the financial decisions related to firms' capital structure.

The firms operating in oil, gas, and chemical industry are used as the inputs. Being one of the key growth drivers, oil, gas, and chemical industry determines national economic trends, while short- and long-term decisions on capital structure significantly affect current state and future evolution of the financial industry in Russia.

This research study is designed to combine classical and modern capital structure theories, to determine firm-specific factors that significantly affect funding decisions, and to develop the econometric models based on panel data set. Therefore, the second chapter is devoted to the academic literature review, the third chapter discusses the methodology for determination and calculation of independent variables, data collection and sampling, and application of econometric models. The fourth chapter summarizes the results of the research study and provides their interpretation. The final chapter provides the conclusions.

1.1. Literature review

Modigliani–Miller theory (1958). Modigliani and Miller were the first who had derived optimal capital structure theory. They proposed and proved two assertions within this theory. First, they have asserted that under conditions of perfect financial market firm's leverage doesn't affect its market value, which remains constant despite the size of its debt and equity. According to the second assertion, the equity capital of a leveraged firm costs more than the capital of an unleveraged firm. The Modigliani-Miller theorems (1958) is a reference point for capital structure theory, assuming that there is no difference in lending to individuals and legal entities, nor bankruptcy costs, taxes, and other agency costs.

Trade-off theory. The trade-off theory that has been evolved from the Modigliani–Miller theorems states that a firm will borrow funds until the maximum amount of tax deductions on interest paid for loans raised is equal to marginal financial distress costs (Mayer, 2001).

A classic case of the trade-off theory has been developed by Kraus and Litzenberger (1973), who have demonstrated that the market value of a leveraged firm is equal to the market value of an unleveraged firm increased by tax deductions on debenture interest less the current value of agency and financial distress costs. Then, firm's optimal or target capital structure is determined, reflecting the balance between agency and financial distress costs on the one hand, and tax shield resulted from the financial leverage on the other.

This theory allows determining the target level of borrowings that varies depending on a particular business. In general, profitable firms with great opportunities for growth and with a great share of current assets will be underleveraged, while the large firms with stable cash flows and a significant share of noncurrent assets will be overleveraged (Mayers, 2003). Besides, the form of incorporation greatly affects financing decisions. As a rule, publicly owned firms borrow more funds than private owned or foreign firms do. These conclusions will help the investors to make investment decisions and the firms to make financing decisions.

Pecking order theory. The pecking order theory discards another one assumption made under the original Modigliani-Miller theorem, stating that the capital market suggests informational efficiency. Information asymmetry in real markets allows speaking about adverse selection problem. Unlike other market players, company managers by virtue of their job position have access to all information flows and are able to assess the real value of assets and development perspectives. For example, if equity financing is the only option for a company to fund an investment project, and if the shares are undervalued by the market, then the management team would likely avoid economically viable investment project, rather than issue additional shares. Such opportunist behavior of managers leads to so-

called cost of external financing, i.e. cost of refusal from investment project with a positive NPV.

The main concepts, underpinning the pecking order theory, were introduced by Donaldson (1961). Having analyzed managerial decisions of the largest American corporations, Donaldson suggested that "corporate managers prefer internal financing of investment expenditures to external financing". Later, this theory was expanded by Myers and Majluf (1984), Krasker (1986), Narayanan (1988).

Information asymmetry leads to a certain hierarchy of financing sources. The companies prefer to use internal financing sources, then the external debt, and finally, equity financing. Debt financing is more advantageous compared to equity financing as it implies lower transaction costs. According to the research study conducted by Baskin, the costs associated with US debt securities issue are about 1% of the amount raised, while the same costs associated with stock issue are in the range of 4-15%

The theory developed by Myers and Majluf (1984) suggests that the companies prefer to finance investments using internal sources, then the borrowed funds, and, finally, equity financing due to information asymmetry between managers, shareholders, and investors.

Due to asymmetry, current investors will be against the additional equity issue for other potential investors, who may ignore the internal value of assets and business opportunities, and require higher yields to compensate for high investment risks.

Agency theory. Unlike the theories mentioned above, the agency theory suggests that the interests of shareholders and managers are not aligned, and the managers, although acting as shareholders' agents, sometimes act not on behalf of the investors, but for their own benefit (Jensen and Meckling, 1976).

Jensen and Meckling (1976) introduced the concept of agency costs. According to Jensen and Meckling, such costs involve the expenses incurred by the owners for supervision of management activity, as well as expenses associated with the performance of agents' obligations and other residual losses. Besides, the authors have identified two types of conflicts of interest that lead to agency costs: conflicts between shareholders and managers, and conflicts between debtholders and equity holders, which arise, when the debt increases and the equity holders may benefit of behalf of debtholders in case of default.

Market timing theory. Although this theory does not determine the optimal capital structure, it demonstrates that specific capital market and macroeconomic conditions can affect the capital structure of the listed companies.

According to the theory, managers synchronize their actions with the market, meaning that the firms issue their shares at a high price and then will try to repurchase them at a lower price. The beneficiaries are current shareholders and managers acting on behalf of the investors, who plan to synchronize their actions with the market (Baker and Würgler, 2002).

Having examined the alternative options that could be used by the managers to finance the decisions, it is possible to come to a conclusion that capital structure theories constitute a framework of analysis, as aside of theoretical backing they provide the factors that can be used to explain managerial decisions on firms' capital structure selection.

---

2. Methodology

Identification, selection, and calculation of dependent and independent variables. The correlation between regressors and variables is very important for the purpose of the empirical study. To justify the choice, it is necessary to consider complementary theories and empirical observations. To evaluate company debt a number of authors, for example, Rajan and Zingales (1995), use various classical capital ratios. The leverage ratio that defines the total amount of debt relative to assets is the most frequently used ratio. DER (Debt-to-Equity Ratio) is often used as a dependent variable when applying multiple regression analysis to the capital structure. For the purpose of this paper, DER is defined as total liabilities to total shareholders' equity ratio.

$$DER = TL/TE \quad (1)$$

Firm size, return on assets, growth opportunities (Growth rate in Plant, Property and Equipment (PP&E) and Growth rate in Total Assets), non-debt tax shields, Asset Turnover, Liquidity of the assets, Cash and cash equivalents, and assets tangibility are used as the explanatory variables, which are frequently used in foreign relevant studies.

Return on assets

$$ROA = EBIT / TA \quad (2)$$

Pecking order theory predicts a negative relationship between firm's return and its total debt, basing on the idea that a company uses internal financing sources first (for example, profit) (Myers and Majluf, 1984).

The trade-off theory identifies a positive relationship between those variables, provided that higher firm's yield assumes higher profit, which may be subject to tax-exempt (Kraus and Litzenberger, 1973). Most of the empirical studies demonstrated that firm's ROA had a negative effect on the capital structure (Mazur, 2007).

Firm size

$$Size = Ln (NS) \text{ or } Size = Ln (TA) \quad (3)$$

Firm size is one of the most accepted variables, used to explain DER ratio. According to the trade-off theory, the larger the firm, the higher the DER ratio. The researchers suggest that relatively higher DER ratio of the large firms can be explained by more stable and less volatile cash flows and the capability to benefit from the scale effect when issuing the stock (Graham et al., 1998; Gaud et al., 2005). Large firms have more advantages compared to small firms if to speak about credit markets and credit conditions (Ferri and Jones, 1979; Wiwattanakantang, 1999). The larger the firm, the more it transparent to the potential investors, which reduces informational asymmetry on the market and increases the ability to raise funds from the creditors. Due to informational asymmetry, small firms may face higher borrowing costs(Graham, 2000; Padron et al., 2005).

Besides, there is so-called 'Too Big to Fail' effect that suggests that the failure of the large firms is unacceptable to the national economy. As a rule, the government prefers to provide administrative and financial support to large firms and banks through loans in severe economic conditions, rather than to small businesses.

However, the results, demonstrating the relationship between the firm size and the amount borrowed, are contradictory. As said above, according to the trade-off model, some studies prove that there is a positive relationship between the amount of borrowed funds and the firm size (Rajan and Zingales, 1995; Shulman et al., 1996; Wiwattanakantang, 1999; Boateng, 2004; Padron et al., 2005; Gaud et al., 2005). Other researchers, such as Marsh (1982), Titman and Wessels (1988), and Chen (2003) identified a negative correlation between debt and firm size. Marsh (1982) has suggested that small firms are largely dependent on the bank loans due to limited access to the equity market. In turn, other researchers did not identify any regular dependence of firm size on the amount borrowed. For example, Ferri and Jones (1989); Chung (1993); Ozcan (2001) state that the scale effect affects the leverage ambiguously.

The following interdependent factors are usually used to characterize firm size: natural logarithm of the net proceeds (Titman and Wessels, 1988; Rajan and Zingales, 1995; Wiwattanakantang, 1999; Graham, 2000; Ozcan, 2001; Gaud et al., 2005), natural logarithm of total assets (Padron et. al., 2005), book value of total assets (Scott and Martin, 1975), firm’s market value(Graham, 2000) . We have used the natural logarithm of the net proceeds as a proxy-variable of firm size for the purpose of this study.

Titman and Wessels (1988) argue that there is a positive correlation between firm size and debt, supposing more distributed operations of the large firms, and, consequently, their ability to achieve and maintain greater leverage.

Asset structure

Firm’s asset structure demonstrates the percentage of each type of asset in total assets. The financial indicators, characterizing the distribution of certain assets in general asset

structure, involve liquidity and tangibility.

Asset tangibility

Asset tangibility as an independent variable is determined as the sum of tangible assets and inventories divided by total assets. Gaud et al. state that the amount of tangible assets have to be increased by the amount of inventories as the loans are partially used to finance inventories, and the inventories characterize firm liquidity at its liquidation (Gaud et. al., 2005).

The fact that a company owns a constant amount of tangible assets can be viewed by the creditors as the security, allowing them to withdraw funds in case a borrower will expect financial difficulties.

Consequently, the investors will consider growing percentage of tangible assets in total assets as a positive sign, while debt increase will be considered as absolutely reasonable decision (Nivorozhkin, 2005).

On the other hand, if to speak about the emerging markets, such as Russian, the percentage of the tangible assets in total assets will not be considered as money back guarantee, as poorly developed legal framework may lead to delays in bankruptcy procedures. The empirical studies conducted in developing countries have shown that there is a negative correlation between the amount of tangible assets and leverage (Nivorozhkin, 2002).

Asset liquidity

$$\text{Asset liquidity} = \text{cash and bank accounts} / TA$$

According to the pecking order theory, the firms characterized by high liquidity ratio can use liquid assets as a source to fund own investments. Therefore, firm’s liquidity ratio should negatively affect the debt ratio (Ozcan, 2001).

Asset Turnover

$$\text{Asset Turnover} = \text{Total sales} / TA$$

Total asset turnover is an activity ratio that reflects how many times the capital invested in the total assets is turned over. The effect of asset turnover ratio on debt ratio was examined by Hutchinson and Hunter (1995), and O’Brien and Vanderheijden (1987).

Growth rate of PP&E and Growth rate of TA

Speaking about possible growth indicators, it's necessary to mention Titman and Wessels' (1988) hypothesis for a negative correlation between growth rates and debt. The authors believe that the firms, operating in the expanding industries, which are free to select the areas for future investments, will, probably, face higher agency costs. Consequently, expected firm's growth will have a negative relationship with its long-term debt. On the other hand, Chan revealed a positive relationship between possible growth and leverage in China (Chen, 2003). For the purpose of this research study, we have determined that there are two possibilities for growth, measured by the annual growth rate of Plant, Property, and Equipment (PP&E) and total assets growth rate.

A number of researchers support a hypothesis according to which firm's managers with positive expectations are prone to expand production assets by increasing the investment in PP&E. This requires additional internal and/or external sources of financing to be attracted. There is a hypothesis that positive expectations drive debt financing.

NDTS

It is common knowledge that the tax shield is not a unique way to ease the corporate tax burden. Non-debt tax shields (NDTS) can serve as an alternative (even less costly) to reduce corporate income tax. Surely, there are various non-debt tax shields, such as accelerated amortization and investments tax credit (Cloyd te al., 1994)

Graham justified a positive relationship between loan size and NDTS. He noted that the problem with non-debt tax shields in the form of accelerated amortization and investments tax credits is that they positively correlate with ROI (Graham, 2000). If profitable firms

invest significant funds and borrow funds to finance such investments, then there may appear a positive relationship between debt and non-debt tax shield. We used annual amortization to total assets ration as a proxy variable for NDTS. Our choice is guided by the fact that amortization is the most important component of the non-debt tax shield.

LN (Cash and cash equivalents)

It is clear that the decisions on the capital structure are affected by the cash flows. The empirical studies have determined a positive relationship between leverage and cash flow under signaling theory, and a relationship between leverage and cash flow under pecking order theory. For example, Harris and Raviv (1991), as well as Ravid and Sarig (1991) believe that high financial leverage is affected by the expectations of significant cash flows. On the other hand, the followers of pecking order theory advocate that there is a negative correlation between leverage and cash flow. Information asymmetry between managers and shareholders justifies possible undervaluation of common shares on the market and lack of firm's target capital structure. Consequently, internal sources of financing are preferable compared to the external sources, if managers are dependent on cash flows to serve firm's current financial needs.

Data sampling. The panel data used in this study involve the indicators of 17 firm operating in oil, gas, and chemical complex of the Russian Federation for the period 2011-2016. Consequently, 102 observations were analyzed to determine the model to be used to make the decisions on firm’s capital structure.

---

3. Results

The research objective is to identify the best prognostic model, describing the dependence of Y (DER) attribute on the array of independent variables X in linear regression model class with various sets of independent variables with the possible inclusion of random effects' means. It was decided to use Akaike Information Criterion (AIC) as a method for model quality evaluation.

First, let’s consider a linear regression model with fixed effects (model equation 1):

$$Y_{i,t} = a_{i} + X_{i,t}' W + e_{i,t},$$

where: i – firm indicator, t – year indicator, $X_{i,t}$ – a row of independent variable matrix, W – coefficient vector, a_{i} – an unobservable individual effect, i.e. intercept, unique to each i-th firm, $e_{i,t}$ – normally distributed white noise with the same dispersion. It is assumed that random error is independent of the year of observation and firm.

The coefficients for model equation 1 are calculated using maximum likelihood method (which, in case of normal error, is equivalent to the least square method). Let’s search all possible combinations of independent variables, and then compare the resulted models using AIC criterion. Simulation results are provided below (Table 1).

Table 1
Simulation results (Model 1)

#	Coefficient of the model equation	Values
1.	Intercept	-20.0470
2.	LN (Net Sales)	-0.6601
3.	EBIT/TA	-4.1294
4.	Growth rate of PP&E	-0.3095
5.	NDTS	-9.1129

6.	Tangibility	3.2222
7.	Asset Turnover	1.1023
8.	Asset liquidity	3.7801
9.	LN (Total Assets)	1.8016

Model equation 1 contains only eight regressors, as two regressors, namely growth rate of TA and LN (cash and cash equivalents), have been excluded. The resulting regression model that includes eight variables has the smallest AIC. A set of eight regressors derived as a result of "compression" of original ten regressors in the model equation (in terms of information maximization) is an array of independent variables. However, a degree of their impact cannot be determined solely by the coefficient of regression. To evaluate the degree of impact it is necessary to consider a variable to which the coefficient is applied. Partial correlation coefficients are the most efficient way to determine the size and the degree of impact. The values of partial correlation coefficients determine the tightness of linear dependence of the result on the corresponding factor provided that the impact of other factors is excluded (Table 2). In other words, partial correlation coefficients determine "pure" correlation between two variables provided that (linear) impact of other factors is excluded.

Table 2
Simulation results

#	**Variable**	**Value of the partial correlation coefficients**
1	DER	1
2	LN(Net Sales)	-0.155769537
3	EBIT/TA	-0,642046584
4	Growth rate of PP&E	-0.003311249
5	Growth rate of TA	0.093808217
6	NDT S	-0.410280546
7	Tangibility	0.011448246
8	LN(cash and cash equivalents)	-0.456308430
9	Asset Turnover	0.681498126
10	Asset liquidity	0.449966842
11	LN (Total Assets)	0.433405824

It is necessary to note that the software package uses $Y_{i,t} = a + a_{i} + X_{i,t}' W + e_{i,t}$ model equation, where a is an intercept. The intercepts for the firms from the sample are provided in Table 3.

Table 3

Intercepts (a_{i} = Intercept + firm i)

Firm #	Firm name	a_{i}
firm1	PAO Kazanorgsintez	-20,047
firm2	PAO Nizhnekamskshina	-2,0453
firm3	PAO Gazpromneft	-62,4893
firm4	PAO KVART	-17,6996
firm5	OAO Kazan synthetic rubber plant	-16,9161
firm6	AO Nefis Cosmetics	-17,0548
firm7	PAO Nizhnekamskneftekhim	-22,8612
firm8	AO Karpov Chemical Plant	-16,8307
firm9	PAO LUKOIL	-27,0518
firm10	OAO SARATOVNEFTEGAZ	-19,351
firm11	OAO TAIF NK	-19,6647
firm12	PAO SIBUR	-19,6647
firm13	PAO Rosneft	-20,5977
firm14	OAO Surgutneftegaz	-23,0285
firm15	PAO TATNEFT	-25,1673
firm16	PAO TRANSNEFT	-23,2474
firm17	AO Nizhnekamskuglerod	-19,3066

The intercept for the first firm is a_{1} = Intercept. The intercepts for other firms are a_{i} = Intercept + firmi. The following values have been obtained for the coefficients used in model equation 1: Multiple R-squared = 0.9543, Akaike Information Criterion = 318.6768.

It is clear that the groups (firms) differ, as the values of the coefficients a_{i} used in model equation 1 differ greatly. This is also justified by AOV analysis of residuals from full models. The hypothesis of equality of means in groups is rejected with almost zero significance level.

Let's consider model equation 2 with fixed effects, which differs from model equation 1 by the absences of distinctions between the firms. The model equation uses the same intercept a for all firms (its value is calculated in the line "Intercept").

$$Y_{i,t} = a + X_{i,t}' W + e_{i,t}$$

Using the same approach, we obtain model 2 (Table 4).

Table 4
Simulation results (Model 2)

№	Coefficient of the model equation	Values
1.	Intercept	-14.0677
2.	LN (Net Sales)	-0.6185
3.	EBIT/TA	-22.0651
4.	NDT	-16.3596
5.	LN (cash and cash equivalents)	-0.7535
6.	Asset Turnover	6.7225
7.	Asset Liquidity	2.1180
8.	LN (Total Assets)	1.9681

Multiple R-squared = 0.6951
AIC = 478.3061

This model is worse than model 1, as AIC is higher.

Both models were compared to the mixed-effect model (Model 3). For the purpose of Model 3, it is assumed that a random effect is a mean DER value for each firm. For example, a_{i} is a random value that has the normal distribution with unknown mean and dispersion. The same maximum likelihood method was used for valuation. Fixed effects used in the model are the values of the coefficients for independent variables (Table 5).

Table 5
Simulation results (Model 3)

№	Coefficient of the model equation	Values
1.	Intercept	4.281889
2.	Growth rate of PP&E	-0.258984
3.	EBIT/TA	-5.435790
4.	NDT	-7.684858

Intercept is a mean value for a_{i}. In this case, random effects have zero means.

Table 6
Random effects (Model 3)

Firm №	Firm name	Random effects
firm1	PAO Kazanorgsintez	-0.11131943
firm2	PAO Nizhnekamskshina	15.73404227
firm3	PAO Gazpromneft	-0.44296871
firm4	PAO KVART	-2.27239620

firm5	OAO Kazan synthetic rubber plant	-0.67009947
firm6	AO Nefis Cosmetics	-0.09315534
firm7	PAO Nizhnekamskneftekhim	-2.09122190
firm8	AO Karpov Chemical Plant	-1.21986215
firm9	PAO LUKOIL	-2.12357576
firm10	OAO SARATOVNEFTEGAZ	-2.68841586
firm11	OAO TAIF NK	0.37762729
firm12	PAO SIBUR	0.37762729
firm13	PAO Rosneft	-1.07268987
firm14	OAO Surgutneftegaz	-0.15709590
firm15	PAO TATNEFT	-2.58125461
firm16	PAO TRANSNEFT	-2.50821485
firm17	AO Nizhnekamskuglerod	1.54297320

Multiple R-squared = 0.9463466
AIC = 390.3495.

Due to upwards excursion demonstrated by the second firm, the normal random effects model provides worse AIC compared to model 1, as AIC is based on maximum likelihood.

It is impossible to exclude a single component in case of random effects model. We can exclude the observations related to firm 2 and firm 3, which are also characterized by the large coefficient for fixed effects. The better results are obtained for AIC criterion in the course of recalculation of the parameters for the fixed-effect model, i.e. AIC for the fixed-effect model is better, but the variation in AIC is lower. The mixed-effect model with heteroscedasticity assumption cannot be used due to a limited number of observations.

The simulation has been performed with the help of R software package for statistical computing and graphics that is available for free. The package is developed using a scripting language and can be deployed on any platform.

4. Conclusions

The methodology used for the purpose of this research study demonstrates that asset turnover, ROA, asset liquidity, firm size, identified through total assets and NDTS have the most significant impact on the capital structure (DER) of the firms operating in oil, gas, and chemical complex of the Russian Federation. Asset turnover, asset liquidity, and total assets have a positive impact, while ROA and NDTS - a negative one.

Simulation results and observation data provided by the followers of the trade-off theory and the pecking order theory are compared in table 7.

Table 7
Comparison of simulation results with observation data

	Theoretical relationship		Simulation results for Russian firms
	Trade-off theory	**Pecking order theory**	
Asset Turnover			+
ROA	+	-	-
Asset liquidity		-	+
Size (TA)	+	-	+
NDTS	+		-

Moreover, identified statistical relationships justify the results of previous empirical studies, which have demonstrated that asset liquidity and total assets positively correlate with DER in case of Russian firms, provided that high liquidity of tangible assets is considered as the guarantee by the creditors in the event of borrower's default. On the other hand, ROA and NDTS are the regressors which negatively correlate with the leverage. The results of empirical research support pecking order theory, according to which a profitable form characterized by high liquidity, does not require too borrow too much. Two regressors, namely growth rate of TA and LN (cash and cash equivalents) have not been included into the set of independent variables.

Finally, it is necessary to note that the research study may have limitations and possible extensions.

First, as the data used in the research study are based on the Russian accounting standards, the comparisons made with other research results may be somewhat inaccurate. However, it is possible to collect data for the emerging economies in Central and Eastern Europe and analyze this panel data set, considering country-specific accounting rules.

Bibliographic references

Baker, M. and Würgler, J. (2011) 'Market timing and capital structure', Journal of Finance, Vol. 57, pp. 1-32;

Boateng, A. (2004) 'Determinants of capital structure: Evidence from international joint ventures in Ghana', International Journal of Social Economics, Vol. 31, pp. 56-66;

Chung, K. (1993) 'Assets characteristics and corporate debt policy: an empirical test', Journal of Business Finance and Accounting, Vol. 20, pp. 83-98;

Chen, J. (2003) 'Determinants of capital structure of Chinese-listed companies', Journal of Business Research, Vol. 57, pp. 1341-1351;

Cloyd, C., Limberg S., Robinson J. (1997) 'The impact of federal taxes on the use of debt by closely held corporations', National Tax Journal, Vol. 50 No. 2, pp. 261-277;

Donaldson, G. (1961) Corporate Debt Capacity: A Study of Corporate Debt Policy and the Determination of Corporate Debt Capacity, Division of Research, Graduate School of Business Administration, Harvard University, Boston.

Ferri M. and Jones W. (1979), 'Determinants of Financial Structure: a New Methodological Approach', Journal of Finance, Vol. 34, pp. 631-644;

Gaud, P., Jani, E., Hoesli, M., Bender, A. (2005) 'The capital structure of Swiss companies: an empirical analysis using dynamic panel data', European Financial Management, Vol. 11 No. 1, pp. 51-69;

Graham, J. (2000) 'How Big Are the Tax Benefits of Debt?', Journal of Finance, Vol. 55, pp. 1901-1941;

Harris, M. and Raviv, A. (1991) 'The theory of capital structure', Journal of Finance, Vol. 46, pp. 297-356;

Hutchinson, R. and Hunter, R. (1995) 'Determinants of capital structure in the retailing sector in the UK', The International Review of Retail, Distribution and Consumer Research, Vol. 5, No. 1, pp. 63-78;

Jensen, M. and Meckling, W. (1976) 'Theory of the firm: managerial behavior, agency costs, and capital structure', Journal of Financial Economics, Vol. 2, pp. 305-360;

Krasker, W. (1986) 'Stock price movements in response to stock issues under asymmetric information', Journal of Finance, Vol. 41, pp. 93-105;

Kraus, A. and Litzenberger, R. (1973) 'A State-Preference Model of Optimal Financial Leverage', Journal of Finance, Vol. 28, pp. 911-922;

Marsh, P. (1982) 'The Choice between Equity and Debt: An Empirical Study', Journal of Finance, Vol. 37, pp. 121-144;

Mazur, K. (2007) 'The determinants of capital structure choice: Evidence from Polish companies', International Advanced Economic Research, Vol. 13, pp. 495-514;

Modigliani, F. and Miller, M. (1958), The cost of capital, corporation finance and theory of investment, American Economic Review, Vol.48, pp. 261-297;

Myers, S. (2003) 'Financing of corporations', Handbooks of the Economics of Finance, Vol. 1A, pp. 216-253;

Myers, S. (2001) 'Capital structure', Journal of Economic Perspectives, Vol. 15, pp. 81-102;

Myers, S. and Majluf N. (1984) 'Corporate financing and investment decisions when firms have information that investors do not have', Journal of Financial Economics, Vol.13, pp. 187-221;

Narayanan, M. (1988) 'Debt versus equity under asymmetric information', Journal of Financial and Quantitative Analysis, Vol. 23, pp. 39-51;

Nivorozhkin, E. (2002) 'Capital Structures in Emerging Stock Market: the Case of Hungary', The Developing Economies, Vol. XL-2, pp. 166-187;

Nivorozhkin, E. (2005) 'Financing Choices of Firms in EU Accession Countries', Emerging Markets Review, Vol. 6, pp. 138-169;

O'Brien, T. and Vanderheiden, P. (1987) 'Empirical measurement of operating leverage for growing firms', Financial Management, Vol. 16, No. 2, pp. 45-53;

Ozkan, A. (2001) 'Determinants of Capital Structure and Adjustment to Long Run Target: Evidence from UK Company Panel Data', Journal of Business Finance & Accounting, Vol. 28, pp. 175-198;

Padron, Y., Apolinario, R., Santana, O., Martel, V., Sales, L. (2005). 'Determinant factors of leverage: an empirical analysis of Spanish corporations', Journal of Risk Finance, Vol. 6, No. 1, 60-68;

Rajan, R. and Zingales, L. (1995) 'What do we know about capital structure? Some evidence from international data', The Journal of Finance, Vol. 50 No. 5, pp. 1421-1460;

Ravid, S. and Sarig, O. (1991) 'Financial signaling by committing to cash outflows', Journal of Financial and Quantitative Analysis, Vol. 26, pp. 165-180;

Ross, S., Westerfield, R., Jaffe, J. (1993) Corporate finance, 3d edt., Irwin;

Scott, D. and Martin, J. (1975) 'Industry influence on financial structure', Financial Management, Vol. 4 No. 1, pp. 67-73;

Titman, S. and Wessels, R. (1988) 'The determinants of capital structure choice', The Journal of Finance, Vol. 43, pp. 1-19;

Wiwattanakantang, Y. (1999) 'An empirical study on the determinants of the capital structure of Thai firms', Pacific-Basin Finance Journal, Vol. 7(3-4), pp .371-403.

---

1. Higher School of Business, Kazan Federal University, Russia, kia1125@mail.ru

2. Center of Graduate Studies, Institute of Management, Economics and Finance, Kazan Federal University, Russia, ggv94@mail.ru

Revista ESPACIOS. ISSN 0798 1015
Vol. 39 (Nº 44) Year 2018

[Index]