

CAPITAL STRUCTURE DETERMINANTS IN TRANSITIONAL ECONOMIES

Ardita Bylo

Istanbul Commerce University, PhD. Candidate, Turkey

Assoc. Prof. Dr. Serkan Çankaya

Istanbul Commerce University, PhD., Turkey

Abstract

Most of the empirical studies about capital structure tend to focus either on overall developed markets or on emerging countries. This paper aims to analyze the determinants of the capital structure of the companies in the Western Balkans (WBs) using a panel of 30 non-financial firms listed in Zagreb Stock Exchange, Belgrade Stock Exchange, and Macedonian Stock Exchange over the period of 2012–2017. The leverage ratio is modeled as a function of firm-specific characteristics. The study shows that firms in the WBs tend to rely more on short-term debt rather than long-term debt. There is a significant negative impact of liquidity, profitability and tax on both leverage level and short-term debt ratio. The long-term debt ratio is significantly positively affected by the growth opportunities of these companies and by its past level. theory. The results obtained from this empirical research indicate that companies in the WBs follow the pecking order. These findings appear to be similar to the results of previous studies of this nature done about emerging and transitional economies.

Keywords: *Capital structure, Western Balkans, transitional economies, leverage*

JEL Classification: *C51, C58, G15, G30, G31*

1. Introduction

Even though there is extensive literature about the usage of leverage among companies, in transitional economies the optimal capital structure decision continues to be an unsolved puzzle. The considerations upon the capital structure have gained remarkable interest since 1950s. The research focused on finding an optimum debt – equity ratio in order to minimize the capital cost and to maximize the companies' value. Modigliani and Miller (1963) paper about capital structure irrelevance of the capital structure decisions on companies' value made a significant contribution to this field of research. The theory was developed under the premise of a perfect capital market, but the review of this assumption and the recognition of market imperfections led to various conclusions that emphasize the importance of the capital structure. Several other studies can be listed as: the trade-off theory (Modigliani & Miller, 1963; Kraus & Litzengerger, 1973; Bradley, Jarrell, & Kim, 1984), the agency cost theory (Jensen & Meckling, 1976; Jensen, 1986), and the pecking order theory (Myers, 1984; Myers & Majluf, 1984).

This paper aims to contribute to the literature on the changing aspects of the capital structure decisions for transitional economies, by analysing the relationship between leverage, profitability, liquidity, risk, and a set of explanatory variables. Following the study of Akman et al. (2015) we used capital structure indicators such as: growth opportunities, market to book value, assets tangibility, the ratio of tax to earnings before tax, and liquidity ratio.

The ability of explaining the capital structure decisions through financial theories has evolved, like in the case of countries that has passed through a long transitional period, such as Eastern European countries. The WBs' economies are considered economies in transition since they opened up to the global market after 1990s. All the countries of this region decentralized and changed towards a market oriented economic model. The banking system is still considered as a factor of great importance in the financial system (IMF, 2015). This study aims to determine the appropriate theoretical capital structure model for transitional economies. The paper examines the capital

structure of the selected large listed companies in Serbia, Croatia, and the Republic of North Macedonia, from 2012 to 2017. The research questions of this paper can be listed as follows:

- What are the main determinants of firms' leverage in general and in short and long-terms for the listed companies in the WBs stock exchanges?
- Is the prevailing literature able to explain the capital structure of the WBs' companies? Is there any noteworthy change in the leverage decision determinants?
- Are the driving forces of the corporate financing decisions based on firm or country specific parameters?

The second section presents a theoretical review about capital structure. The third section presents the data used and explains the econometric methodology. The fourth section discusses the empirical results and presents a cross-country analysis. The last section concludes the study.

2. Theoretical Review and Findings About Capital Structure

Most of the research related to the capital structure have focused on the well-known paper of Modigliani and Miller (1958). Over the last six decades, this enabled the emergence of various theories, regarding capital structure, such as trade-off, pecking order, agency costs, signalling and market timing theory. In the first proposition of Modigliani and Miller (1958), the value of a company is independent of the way it chooses to finance its operations. Later, in 1963, Modigliani and Miller (hereafter MM) explained how debt becomes beneficial for companies, if taxation is taken into account. The authors claim that, the tax deductions encourage the leverage usage.

The static trade-off theory of capital structure foresees that firms aim to approach a target debt to equity ratio (Myers, 1984). According to this theory, there is an optimal capital structure that maximizes the firm's value, while balancing the taxes, agency and bankruptcy costs with the benefits of an additional debt unit. Thus, a firm's target leverage can be determined by the trade-off between the cost of financial distress and the interest tax shields of debt (Chakraborty, 2010). The pecking order theory explains that new investments, follow a hierarchal process of financing. This theory assumes that firms prefer internal financing more than external funds. When internal cash-flows are not sufficient to finance the activity, firms will borrow, rather than issue equity. This defined pecking order send a signal to the public about the companies' performance. It seems difficult to define an optimal leverage level by using pecking order theory (Bauer, 2004). Agency costs are incurred from asymmetric information and conflict of interest between the principal and the agent. As Jensen and Meckling (1976) mention, there are three common types of agency costs: the monitoring costs, the bonding costs, and the residual losses.

Based on Kumar et al. (2017), most of the capital structure literature, focuses on developed economies and it results to be a limited knowledge on emerging markets. Since the capital markets of transitional economies are relatively less efficient and incomplete than those of developed countries, studies on these economies' markets have become attractive. Different studies show that companies' specific determinants of capital structure vary largely and are mainly focused on growth, profitability, liquidity, risk, tangibility, non-debt tax shield (NDTS), size, and age. The relationship between these variables turns out to vary among studies.

Knowledge about decisions made regarding the capital structure usually originates from the empirical data of developed economies. Empirical studies about leverage and capital structure determinants present conflicting results. Agency cost and static trade off theory generally shows a positive relationship between size and leverage. Rajan and Zingales (1995) explain this relationship by increased transparency and less exposure to the negative aspects of asymmetric information. When firms have growth opportunities, in consistency with the pecking order theory, external financing seems to be more preferred (Booth et al. (2001; Rajan & Zingales, 1995). However, in some empiric evidences about transition economies, Chakraborty (2010) reports a negative effect on the total debt ratio. Theoretically the asset structure of companies with a high level of tangibility tend to have a higher leverage.

However, Chang et al. (2009) claims that there is a negative relation between tangibility and leverage. Based on recent studies the effect of risk on the capital structure contradicts previous theories. Chang et al. (2009) report a positive relation between risk and leverage.

3. Data and Methodology

3.1. Data

The dataset used in this study includes the determinants of the capital structure of the companies in the Western Balkans (WBs) based on a panel of 30 non-financial firms. The panel data set contains 3 countries: Croatia¹, Serbia and the Republic of North Macedonia, each of which includes 10 companies listed respectively in Zagreb Stock Exchange (ZSE), Belgrade Stock Exchange (BELEX), and the Macedonian Stock Exchange (MSE) and each with 6 observations measured at annual intervals, over the period of 2012-2017. Consequently, the total number of observations in the panel data is 180. Companies operating in the financial sector has not been included. The data has been obtained mainly from Stockopedia, ZSE, BELEX, MSE and SEINET² database, and also from the annual reports found on the official sites of the companies. STATA 12 has been used to analyse the data. This is a two-way balanced panel model.

Table 1. The Dependent and Independent Variables' Explanation

Dependent Variables	Definition	Symbol
Leverage	Debt-to-Assets Ratio = Total Debt/Total Assets	LEV
Short-term Debt to Assets	Short-Term Debt-to-Assets Ratio = Total Debt / Total Assets	STDTA
Long-term Debt to Assets	Long-Term Debt-to-Assets Ratio = Total Debt / Total Assets	LTDTA
Independent Variables	Definition	Symbol
Company Size	LN (Total Assets)	SIZE
Growth Opportunities (A)	% change of Total Assets, per year	GRA
Growth Opportunities (S)	% change of Sales, per year	GRS
Taxes	Taxes Payable / EBT	TAX
Non-debt tax shield	Depreciation / Total Assets	NDTS
Tangibility	Tangible Assets / Total Assets	TANG
Profitability	EBT / Total Assets	PROF
Business Risk	Interest Coverage Ratio = EBIT / Interest expenses	RISK
Asset Utilization	Costs of Goods Sold / Total Debt	CGTD
Liquidity	Current Assets / Short-Term Debt	LIQD
Dummy for Macedonia	The effect of Macedonia over the 2 other countries	DM
Dummy for Serbia	The effect of Serbia over the 2 other countries	DS
Dummy for Croatia	The effect of Croatia over the 2 other countries	DC

Table 1 shows the dependent and independent variable definitions and explanations used in this study. In this study, following Akman et al. (2015), three leverage measures are used: total debts to assets; long-term debt to assets, and

¹ Croatia has been included in the analysis since its experience before joining the EU is very relevant for the economic problems of the other WB countries.

² System for Electronic Informations from Listed Companies

short-term debts to assets. Independent variables are: firm size, growth opportunities, taxes, tangibility, profitability, business risk, and liquidity.

3.2. Methodology

Panel data models evaluate the time effects, the unit-specific effects, or both, to deal with heterogeneity or individual effects that can be detected or not. Hausman specification test is one of the most appropriate tests used to determine which effect, fixed or random, is more consistent and significant in the panel data used. The null hypothesis states that the preferred model is random effects, whether according to the alternative one the model would be based on fixed effects (Greene, 2008). It basically tests whether the unique errors (ui) are significantly correlated with the regressors in the model, thus, in other words, the null hypothesis of Hausman test states that these unique errors are not correlated (Park, 2011).

H0: Error term (ui) is uncorrelated with “xit”

H1: Error term (ui) is correlated with “xit”

Table 2. Results of Hausman Test

Model	Dependent Variable	Chi² (n)	Prob. > chi²
1	LEV	7.52	0.0233
2	STDTA	-16.33	n/a
3	LTDTA	-4.18	n/a

The results of Hausman test have been displayed in Table 2. Based on these values, since the probability in Model 1 is $0.0233 < 0.05$, the null hypothesis is rejected, and as result the fixed effect model will provide a better estimation. Regarding the second and third models, since $\text{chi}^2 < 0$ in both of them, they fail to meet the asymptotic assumptions of the Hausman test. This suggests that there is not enough information to reject the null hypotheses, and so as result the random effects model shall be used.

In order to further examine our second and third model, the Hausman test for fixed effects model versus random effects model can also be cast as a test of the additional over-identifying restrictions that RE model imposes. The null hypotheses of this test (performed by `xtoverid` through STATA) stands that RE model is consistent (Wooldridge, 2002; Wooldridge, 2010; Arellano, 1993).

H0: Random effects model is consistent

H1: Fixed effects model is consistent

Table 3. Results of the over-identifying restrictions test: fixed vs random effects

Model	Dependent Variable	Chi²(n)	P-value
2	STDTA	24.253	0.0001
3	LTDTA	3.085	0.5437

Based on the results of Table 3, the p-value of Model 2 is small enough ($p\text{-value} = 0.0001 < 0.05$) to reject H0, and since the p-value of Model 3 is $0.5437 (> 0.05)$, in this case the evidence against RE is not rejectable. Thus, the second model is considered to be a fixed effects model, whereas the third model a random effect one.

We considered the following alternative models for the specification of the capital structure for each company, as a start point:

- Model 1: $LEV = f(\text{SIZE, GRA, GRS, TAX, TANG, PROF, RISK, LIQD})$
- Model 2: $STD\text{TA} = f(\text{SIZE, GRA, GRS, TAX, TANG, PROF, RISK, LIQD})$
- Model 3: $LT\text{DTA} = f(\text{SIZE, GRA, GRS, TAX, TANG, PROF, RISK, LIQD})$

The test hypothesis is established as bellow:

H0: There are no individual and time effects

H1: There is autocorrelation

Table 4. The Results of the Baltagi Wu LBI Tests

Model	Dependent Variable	Durbin-Watson	Baltagi-Wu LBI
1	LEV	0.8106938	1.2759304
2	STD\text{TA}	1.2102871	1.5632805
3	LT\text{DTA}	1.2682174	1.6243993

The Baltagi-Wu LBI statistic values and the Bhargava et al. (1982) Durbin-Watson statistic for zero first order serial correlation statistic values both reject the null hypothesis raised in relation to the above models (see Table 4). The rejection of the null hypothesis here indicates the need to correct the standard errors for serial correlation.

Further, Wald test and Breusch and Pagan LM test for fixed and random effects models has been performed, respectively. The test hypothesis would be as following:

H0: There is constant variance among cross section error terms

H1: There is heteroscedasticity

Table 5. The Results of the Wald Tests and Breusch and Pagan LM Test

Model	Dependent Variable	Chi ²	Probability
Wald Tests			
1	LEV	42354.12	0.0000
2	STD\text{TA}	33543.25	0.0000
Breusch and Pagan LM Test			
3	LT\text{DTA}	277.45	0.0000

Based on Table 5, since the p-value is smaller than 0.05 the results reject the null hypotheses and thus suggest that there is evidence of heteroscedasticity. Since the tests recognize the presence of heteroscedasticity and autocorrelation in all models, heteroscedasticity-robust standard errors are going to be used for the regression of fixed and random effects panel data, following Stock & Watson (2006), eliminating in this way the HAC problem (Fischer & Sousa-Poza, 2009; Nichols & Schaffer, 2007).

4. Empirical Findings

The results of robust standard error adjusted fixed (for the first and second models) and random effects (for the third model) panel regression are displayed in Table 6. F-statistics, chi-square statistics and other values demonstrate that the selected models are reliable. Even though, R-square values indicate a relatively low significance level of these models, at 26%, 16% and 17% for LEV, STD\text{TA} and LT\text{DTA}, respectively, suggesting the idea that short-term debts might depend more on macroeconomic factors.

Table 6. Results of Standard Error Adjusted Panel Regressions

Variable	Model 1 (fixed-effects model)			Model 2 (fixed-effects model)			Model 3 (random-effects model)		
	Coef.	Robust Std. Err.	Prob.	Coef.	Robust Std. Err.	Prob.	Coef.	Robust Std. Err.	Prob.
Robust Standard Error adjustment for 30 clusters in id (Robust) Number of observations 180 = (2012-2017)									
	LEV			STDTA			LTDTA		
GRA							0.15399**	0.0636	0.015
PROF	-0.3670*	0.0709	0.000	-0.3486**	0.1706	0.050			
TAX	-0.0027***	0.0016	0.102	-0.0043**	0.0020	0.039			
RISK	0.00002**	0.00001	0.014	0.00002*	0.0000	0.004			
LIQD	-0.0118**	0.0045	0.013	-0.0106*	0.0032	0.002	-0.0006***	0.0004	0.090
LTDTA(-1)							0.8318*	0.0562	0.000
PROF(-1)	-0.3201*	0.0868	0.001				-0.2115*	0.0810	0.009
TAX(-1)							-0.0015***	0.0008	0.058
DS							-0.0175***	0.0111	0.117
C	0.4891	0.0153	0.000	0.3311	0.0115	0.000	0.0322	0.0123	0.009
R²	0.2617			0.1597			0.1665		

Note: *Significant at 1% level, **Significant at 5% level, ***Significant at 10% level

Table 6 shows that liquidity has a significant negative relationship with the debt to equity ratio for each model. Profitability have a significant negative impact on short-term debts to equity and total debts to equity, and even the lagged one period of profitability has a significant negative effect on the leverage as a whole and in long-terms of the debt. Growth opportunities induce to an increasing of the leverage in terms of total debts, however this results insignificant in short and long terms. The three of the models indicate that the companies' size, tangibility, asset utilization, and non-debt tax shield does not connect to leverage significantly.

As Fan et. al. (2012) reports, profitability seems to have generally a negative impact on the leverage, with the exception of some developed countries like the USA, Canada, and Ireland. The lack of developed debt securities' markets in transitional economies or the presence of operation costs in developed countries may be an explanation. In this connection, the pecking order theory appries that companies with high profits prefer their own resources, whereas unprofitable companies depend on debts. Agency costs concerns may also explain the negative relationship among profitability and debt preferences, since debts might not be preferred in such circumstances. This is consistent with the fact that there is a dominance of small businesses and banks as primary financing resources in the Western Balkans.

Based on the results there is not a significant relation between tangibility and leverage. The impact of liquidity on leverage is significant and negative, and has a higher influence in total and short-term debt ratios. Thus, companies with a high level of liquidity prefer short-term debts toward long-term debts. Growth opportunities expressed as a rate of change of the total assets, affect the leverage as a whole positively suggesting that the companies depend on

the capital structure in the case of making a decision about new investments. In line with our findings, Akman et al. (2015) reports that in developed countries there is a negative relationship between growth opportunities and debt-to-equity ratio, while in less developed countries this relationship turns out to be positive. We could not find significant relationship between company size and leverage. One reason may be the fact that the sample includes large-scale firms, which makes it more difficult to identify the size effect in the capital structure. Taxes have a slight downward impact on the overall leverage. In addition, taxes of a previous period tend to decrease the long-term debt ratio, supporting the tradeoff theory, under which the firms see taxes as an essential determinant of leverage. It is observed that the business risk variable considered as interest coverage rate has surprisingly a significant incremental effect on leverage. This result is in contrast to the theoretical expectations of pecking order and trade off theory stating that companies under financial distress circumstances decrease the leverage level, as they wish to avoid issuing equity. Regarding business risk, its impact should be seen both from the perspective of the firm and their creditors. Firms in possession of a considerable amount of collateral tend to increase their leverage level, independently of the afflictions debt financing may cause. On the other hand, as long as these firms own collateral, creditors will continue to be predisposed and give debts. Further, the lagged one period long-term debt ratio appears to have a positive significant effect on the long-term debt leverage.

In addition to the firm specific factors used in this study, other factors such as the macroeconomic determinants can be effective in the formation of capital structure. Transitional economies have different capital market and institutional structures and the power of banking industry might limit the explaining power of the classical theories asserted for developed countries. In these countries, most of the debt is covered by long-term debts (Booth et al., 2001).

5. Conclusions

This research explores the determinants of capital structure choices of thirty Western Balkans companies listed on the stock exchange markets of Macedonia, Serbia, and Croatia, for the period 2012-2017. The capital structure of the companies observed is financed by debts at an approximate rate of 42 percent. Transitional economies are facing many challenges such as the lack of investor protection rights, legal stability and the availability of financing sources. The high ratio of non-performing loans is the main issue of this region and has resulted in fewer loans, especially for the non-financial companies. The main financing method is through the banking system, as the other sectors such as insurance market, capital market and bond market are not fully developed.

The results found in this study reveal that the capital structure determinants of companies placed in emerging and transitional economies and their behaviours seems to be similar. Namely, both total debt to equity and short-term debt to equity ratios, decrease with respect to profitability and liquidity, while the leverage measured by the long-term debt ratio increases significantly in relation with the possibilities of growth. In this way we notice that WB firms demonstrate reactions that support pecking order theory. However, we note that both the total debt to equity and short-term debt to equity ratios are affected positively by risk, albeit to a small extent, and negatively by taxes. This shows that these companies partially follow the statistic trade off theory. Our findings do not show any supporting evidence about the agency cost theory.

Regarding the long-term debt rate, there is a negative impact from the lagged one period variables of profitability and taxes, meanwhile the firms with high long-term debt rates tend to increase even more this kind of leverage level. Another significant finding of this model is that Serbia causes the long-term debt ratio to decrease in the entire region. For the analysed period, Serbia has the lowest average rate of long-term debt to total asset among the three countries with an approximately rate of 10%. In conclusion, transitional economies require a unique theoretical approach to explain their capital structures.

Acknowledgement: We would like to thank the Assoc. Prof. Dr. Elif Güneren Genç, Istanbul Commerce University, for her insights and valuable comments about methodology.

References

- Akman, E., Gokbulut, R. I., Nalin, H. T., & Gokbulut, E. (2015). Capital Structure in an Emerging Stock Market: The Case of Turkey. *Çankırı Karatekin University Journal of The Faculty of Economics and Administrative Sciences*, 5(2), 639-660. doi:10.18074/cnuibf.240
- Arellano, M. (1993). On the testing of correlated effects with panel data. *Journal of econometrics*, 52(1-2), 87-97. doi:10.1016/0304-4076(93)90040-C
- Bauer, P. (2004). Determinants of capital structure: empirical evidence from the Czech Republic. *Czech Journal of Economics and Finance (Finance a uver)*, 54(1-2), 2-21. Retrieved 11 02, 2018, from <https://studylib.net/doc/8183773/determinants-of-capital-structure---czech-journal-of-econ...>
- Bhargava, A., Franzini, L., & Narendranathan, W. (1982). Serial Correlation and the Fixed Effects Model. *Review of Economic Studies*, 49(4), 533-549. Retrieved 10 28, 2018, from <https://EconPapers.repec.org/RePEc:oup:restud:v:49:y:1982:i:4:p:533-549>
- Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The journal of finance*, 56(1), 87-130. doi:10.1111/0022-1082.00320
- Bradley, M., Jarrell, G. A., & Kim, E. H. (1984). On the existence of an optimal capital structure: Theory and evidence. *The journal of Finance*, 39(3), 857-878. doi:10.1111/j.1540-6261.1984.tb03680.x
- Chakraborty, I. (2010). Capital structure in an emerging stock market: The case of India. *Research in international business and finance*, 24(3), 295-314. doi:10.1016/j.ribaf.2010.02.001
- Chang, C., Alice, L., & Cheng, L. (2009). Determinants of Capital Structure Choice: A Structural Equation Modeling Approach. *Quarterly Review of Economics and Finance*, 49(2), 197-213. Retrieved 11 03, 2018, from <https://ideas.repec.org/a/eee/quaeco/v49y2009i2p197-213.html>
- Fan, J., Titman, S., & Twite, G. (2012). An International Comparison of Capital Structure and Debt Maturity Choices. *Journal of Financial and Quantitative Analysis*, 47(1), 23-56. doi:10.1017/S0022109011000597
- Fischer, J., & Sousa-Poza, A. (2009). Does Job Satisfaction Improve the Health of Workers? New Evidence Using Panel Data and Objective Measures of Health. *HEALTH ECONOMICS*, 18(1), 71-89. doi:10.1002/hec.1341
- Greene, W. (2008). *Econometric analysis* (6th ed.). Upper Saddle River, N.J.: Pearson/Prentice Hall.
- IMF. (2015). *The Western Balkans: 15 years of economic transition*. Washington, D.C.: International Monetary Fund. Retrieved 11 02, 2018, from http://shtetiweb.org/wp-content/uploads/2015/03/erei_sr_030915.pdf
- Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *The American Economic Review*, 76(2), 323-329. Retrieved 11 02, 2018, from <https://www.jstor.org/stable/1818789>
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4), 305-360. Retrieved 11 27, 2018, from <https://www.sciencedirect.com/science/article/pii/0304405X7690026X>
- Kraus, A., & Litztenberger, R. (1973). A state-preference model of optimal financial leverage. *Journal of Finance*, 28(4), 911-922. doi:10.1111/j.1540-6261.1973.tb01415.x
- Kumar, S., Colombage, S., & Rao, P. (2017). Research on capital structure determinants: a review and future directions. *International Journal of Managerial Finance*, 13(2), 106-132. doi:10.1108/IJMF-09-2014-0135
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 48(3), 261-297. Retrieved 11 27, 2018, from <http://www.jstor.org/stable/1809766>

- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American economic review*, 53(3), 433-443. Retrieved 11 02, 2018, from <https://www.jstor.org/stable/pdf/1809167.pdf>
- Myers, S. C. (1984). The capital structure puzzle. *The journal of finance*, 39(3), 574-592. doi:10.1111/j.1540-6261.1984.tb03646.x
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221. Retrieved 11 27, 2018, from <https://www.sciencedirect.com/science/article/pii/0304405X84900230>
- Nenu, E. A., Vintilă, G., & Gherghina, S. C. (2018). The Impact of Capital Structure on Risk and Firm Performance: Empirical Evidence for the Bucharest Stock Exchange Listed Companies. *International Journal of Financial Studies*, 1-29. doi:10.3390/ijfs6020041
- Nichols, A., & Schaffer, M. (2007, 07 14). Clustered Errors in Stata. Retrieved 10 29, 2018, from United Kingdom Stata Users' Group Meetings 2007: https://www.stata.com/meeting/13uk/nichols_crse.pdf
- Park, H. M. (2011). Practical guides to panel data modeling: A step by step analysis using Stata. Public Management and Policy Analysis Program, Graduate School of International Relations, International University of Japan, 1-52. Retrieved 10 29, 2018, from https://www.iuj.ac.jp/faculty/kucc625/method/panel/panel_iuj.pdf
- Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The journal of Finance*, 50(5), 1421-1460. doi:10.1111/j.1540-6261.1995.tb05184.x
- Stock, J., & Watson, M. (2006). *Introduction to Econometrics* (2nd ed.). Boston, MA: Addison Wesley.
- Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: The MIT Press.
- Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data* (2nd ed.). Cambridge, MA: The MIT press.