

Corporate Sector Leverage From Financial Stability Perspective¹

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Abstract

Non-financial companies' indebtedness has risen substantially following global financial crisis era due to increasing global risk appetite and capital inflows towards developing economies. However, reversal of capital flows owing to lower growth prospects of emerging countries, concerns about expansionary monetary policies of developed economies and surged in global risk aversion resulted in higher funding cost for emerging markets' corporate sectors. In order to analyze potential systemic risk stemming from corporate sector's foreign currency risk and roll-over capability, indebtedness should be monitored closely from sustainable financial stability perspective. This study aimed to estimate optimal debt level for non-financial companies listed on Borsa Istanbul Stock Exchange and estimated leverage ratio stood at reasonable levels in spite of the significant increase in indebtedness since global crisis. Even if indebtedness of corporate sector is assumed to be at reasonable levels, non-financial companies' prudential approach for debt sustainability is considered to be important in terms of systemic risk mitigation. Moreover, since this study was conducted for aggregated terms for company sample, sector and company specific factors should also be considered to estimate optimal leverage ratio specifically.

Keywords: Non-financial companies, leverage, financial stability, capital structure

JEL classification: G30, G32, F65

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1. Introduction

After the global financial crisis, expansionary monetary policies of developed countries resulted in search for high yield opportunities, increase in risk appetite and acceleration in capital flows to emerging countries partially due to high growth prospects of developing economies. Along with increased liquidity, interest rates scaled down and funding conditions became favorable which triggered corporate sector indebtedness in these countries. Köksal and Orman (2015) indicated the significant relationship between capital flows and leverage of Turkish non-financial firms, where capital flows boosting especially leverage of large private non-manufacturing firms. In line with enriched liquidity conditions and favorable funding environment since 2008, debt to GDP ratio increased in developing countries where economic activity has been predominantly financed by banking sector. Although higher leverage might be perceived as an indication of access to finance, exchange rate management or debt turnover capacity needs to be properly analyzed for robust and sustainable financial stability.

Contrary to the abovementioned favorable financial environment, due to concerns about expansionary monetary policies of developed economies, increased global risk aversion and lower growth prospects of emerging countries, global capital flows changed its direction back to developed economies since 2013. This caused raise in borrowing costs in emerging economies, as lower global liquidity put pressure on firms' debt roll-over and repayment capacity. In this regard, even if companies' indebtedness might be at sustainable levels, it is vital for firms to consider prudential leverage approach to mitigate systemic risk.

Companies may prefer to use debt to some extent considering tax benefits but they might also be exposed to higher risk premiums due to additional debt. Since non-financial companies constitute majority of banking sector loan borrowers, corporate credit quality, loan standards and lending conditions have significant influence on maintenance of healthy economic activity. On the other hand, fragilities that may arise from corporate sector may leap into the banking sector by causing vulnerabilities and systemic risk.⁵ For instance, Lindner and Jung (2014) emphasized that firms operating in India with high leverage are vulnerable to systemic shocks therefore cautionary policies should be taken to sustain banks as the driving force in the economy.

This study aims to examine the optimal mixture of debt and equity to sustain financially sound, profitable and robust corporate sector that can stimulate economic activity by using data of non-financial companies (NFC) listed on Borsa Istanbul stock exchange. In this regard, interaction between global liquidity conditions and corporate indebtedness are initially examined. Consequently, main capital structure theories -irrelevance theory, trade off theory and pecking order theory- and their arguments regarding firm value and leverage relation are discussed. Then, factors affecting company's debt/equity preferences and borrowing costs are mentioned. In the last part, optimal leverage ratio is investigated for non-financial companies listed on Borsa Istanbul via weighted average cost of capital method.

⁵ Acharya et al (2015), Lindner and Jung (2014), Kilic (2014), Aydın et al (2006)

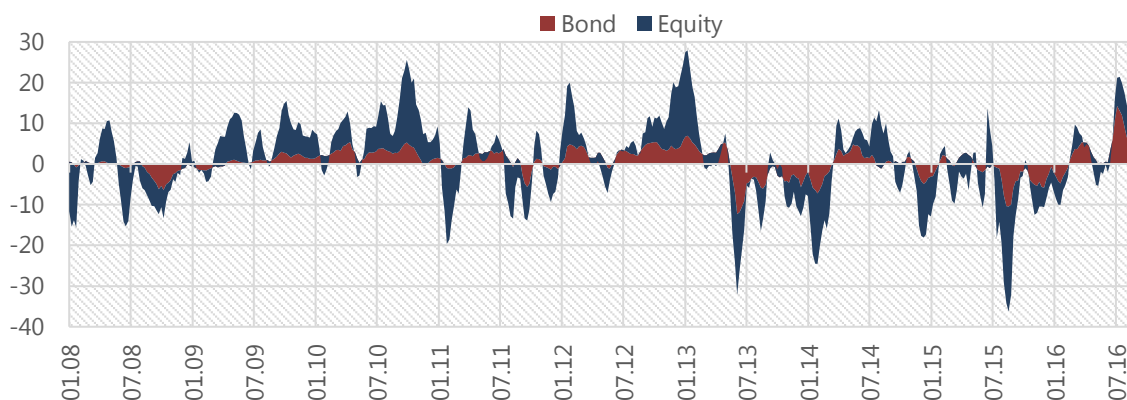
2. Corporate Sector Indebtedness

To alleviate the effects of global financial crisis, developed economies conducted expansionary monetary policies. As global liquidity increased with these policies, emerging market economies made use of the advantages offered by higher capital inflows searching for high yield. In line with enriched liquidity conditions and favorable funding environment, corporate sector debt to GDP ratios have increased in developing economies where economic activity is predominantly financed by banking sector. While banking sector stands as the primary financial intermediary for these countries, recently bond issuance also gained importance for corporate sector finance.

Favorable global risk appetite and high yield return opportunities in developing economies have led corporate sector to benefit from low funding cost environment and to undertake more exchange rate risk due to foreign currency denominated liabilities. Increasing leverage by non-financial companies was attributed as a favorable development since it promoted economic growth and increased financial deepening.

Capital Flows to Emerging Markets
(Million USD, 4-Week Moving Sum)

Graph 1



Source: EPFR

However, starting from second quarter of 2013, capital flows changed its direction back into hard currencies. Thus, developing economies had to face with reversed cash flows due to surged global risk aversion, concerns about continuity of easing monetary conditions and lower growth prospects for emerging economies⁶. In this response, local currencies of emerging markets depreciated against hard currencies and funding costs scaled up which resulted in increased currency and interest risk on developing countries' NFC balance sheets and jeopardized profitability due to weakened roll-over capability and high exchange loss.

Credit risk indicators and exchange rates pointed out surge in debt burden of emerging countries' corporate sector while bond returns tended to be flat since 2013 year end. Even though JP Morgan EMBI+ recorded remarkable increase after global

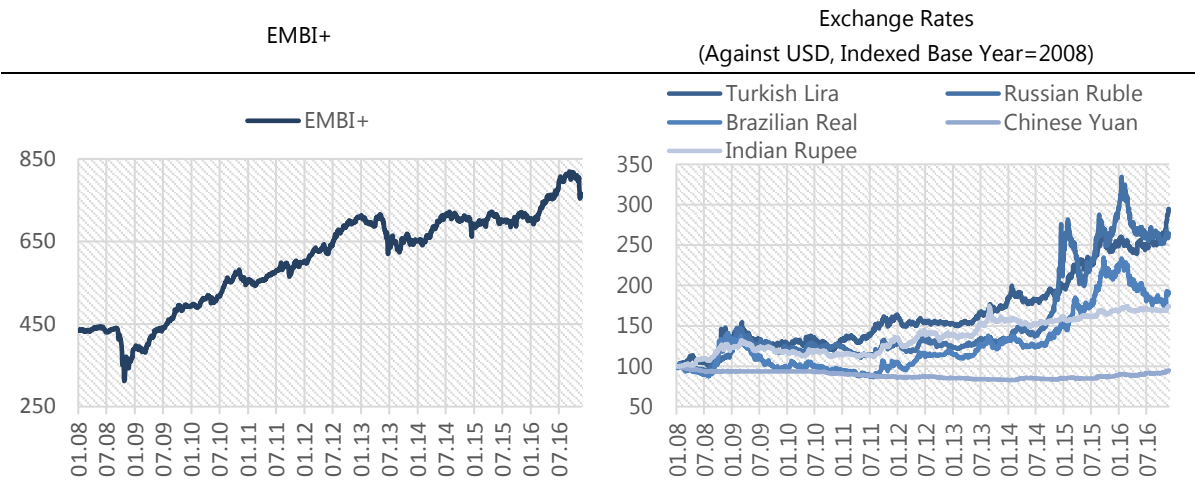
⁶ Capital Flows to Emerging Market Economies, Institute of International Finance

financial crises and preserved its increasing trend till 2013, the index tended to become flat between 2013-2015 periods. On the other hand, due to the deceleration in capital flows majority of emerging country currencies depreciated against US dollar. Local currency depreciation especially for Russian Ruble and Brazilian Real recorded more volatile developments while Chinese Yuan performed better primarily owing to its country specific prospects.

These unfavorable developments jeopardized external borrowings and triggered FX risk for companies especially those without financial and natural hedge but having high net FX open position. From financial stability perspective, it is worth to mention that since corporate loans are generally the major asset of banking sector balance sheets in developing countries, these fragilities had reflections on banking sector asset quality and financials⁷. Within this scope, the magnitude of reliance on foreign sources by banks gains importance regardless of dynamics of corporate sector and the country's economic fundamentals.

Emerging Market Financials

Graph 2



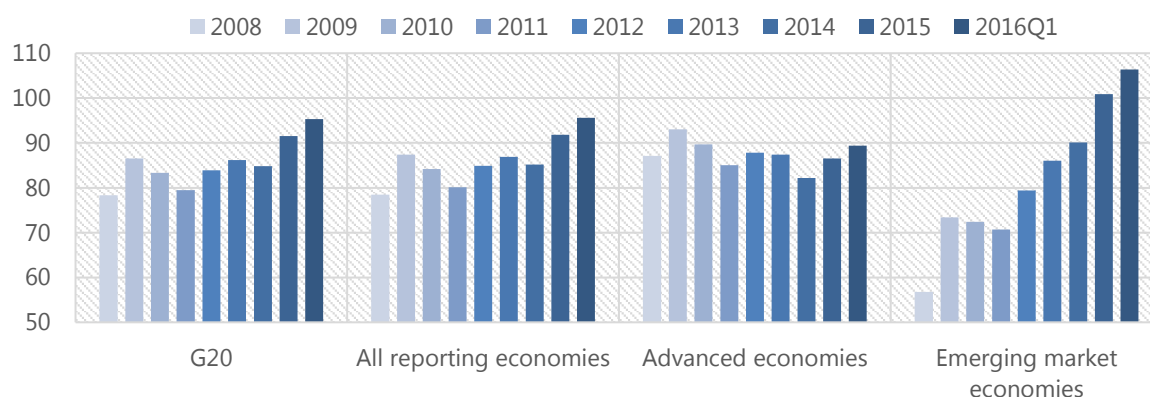
Source: Bloomberg

NFC loans to GDP ratio preserved a flat trend for mature economies while it recorded a tremendously increasing tendency for emerging economies particularly due to their continuing financial deepening process and abovementioned global funding conditions. In general developing economies benefited from favorable funding environment and NFCs borrowed with lower interest rates. In particular, Chinese share from capital flows and jump in corporate borrowing should be analyzed separately considering its country unique growth prospects.

⁷ IMF Global Financial Stability Report, October 2015, Chapter Three: Corporate Leverage in Emerging Markets

Non-Financial Company Credit (% GDP)

Graph 3



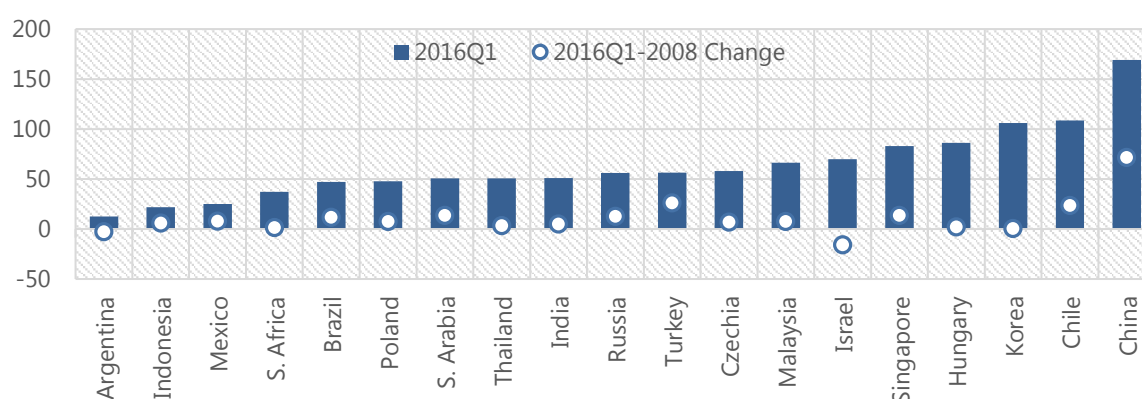
Source: BIS

Based on conversion to US dollars at market exchange rates.

In the country specific NFC leverage framework, as mentioned above China's case is obviously stronger compared to peer countries. Compared to the global financial crisis period Chinese corporate sector increased its financial indebtedness enormously which might be attributable to relatively higher growth prospect of the country. Chilean and Korean companies also follow Chinese companies in terms of loan to GDP ratio. On the other hand, even though Turkish corporate sector companies recorded high increase after favorable liquidity conditions, credit to GDP ratio is at reasonable levels compared to peer group countries. In this regard, continuing financial deepening process should be taken into consideration while assessing leverage surge.

NFC Credit (% of GDP)

Graph 4



Source: BIS

In an economic environment where NFC finance is predominantly provided by financial sector, particularly banking sector, roll-over capability and funding cost management gain more importance. Financial fragilities derived from NFCs balance sheets and debt repayment capacity also bring out concerns about financial stability. Given the evident importance of systemic and contagion risks, preserving optimal share of equity finance is vital to mitigate interest and currency risk for corporate financials.

3. Capital Structure Theories and Firm Preferences for Leverage

Value of a firm can be basically described as net present value of future cash flows of the company. In order to discount future cash flows, weighted average cost of capital (WACC) is generally used. Basically, WACC is the weighted average of cost of equity and cost of debt where weights are determined by value of debt and equity (Brealey and others, 2011). The capital structure gains importance in terms of company survival and debt roll-over (Lynch, 2009).

The fundamental study on capital structure which is also known as the irrelevance theory by Modigliani and Miller (1958), states that firm value or WACC is indifferent from the mixture of debt and equity in an efficient environment without taxes, dividends, bankruptcy cost and agency conflicts. According to the irrelevance theory, if company's debt to asset ratio increases by one percent than it only means one percent decrease in equity's share in firm balance sheet size. However, this share transition do not cause any change in cost of capital and firm value. The irrelevance theory was also improved by incorporating tax shields in firm value calculation, such that the firm value increases continuously along with debt usage (Modigliani and Miller, 1963). Fundamental drawback in this theory is thought to be the underestimation of financial distress such as bankruptcy and agency costs (Frank and Goyal, 2007).

As Modigliani and Miller stated to increase debt share to benefit from tax advantage, Kraus and Litzenberger (1973) mainly counter argued this capital mix via proposing Trade-off Theory which considers a balance between bankruptcy cost and tax benefits of debt. According to this approach, firm value might be optimized by considering tax shield of debt and financial distress such as bankruptcy costs and non-bankruptcy costs. While increasing indebtedness to some extent might be a positive aspect in terms of replacing expensive equity to reduce WACC; on the contrary side high leverage might create weaknesses such as additional financial risk, higher risk premiums and higher equity return desire which put pressure on WACC to scale up. In this regard, firm value is a combination of the present value of all equity financed firm plus the present value of tax shield minus the present value of financial distress cost (Brealey and others, 2011). This approach also has some weaknesses such as complex tax code, whether bankruptcy costs are transferable and/or fixed, and the structure/magnitude of transaction costs (Frank and Goyal, 2007)

Another milestone approach for capital structure is Pecking Order Theory introduced by Myers (1984) and with co-author Majluf (1984) which emphasizes preferring internal funds to external funds and debt to equity in case of external finance. In the trade-off theory, firm's decision is a trade-off between tax advantage and leverage-related costs. Pecking order theory argues that adverse selection implies retained earnings to be more favorable than debt. The ordering may stem from a variety of sources including agency conflicts and taxes. Myers and Majluf (1984) stated that in case of stable economic cycles, trade-off theory is appropriate for large-scale firms, on the other hand for unstable economic cycle pecking-order theory works better for small-scale firms

In the literature, there are several studies investigating which capital structure theory best explains financing choices of corporates, although conclusions are mixed. Shyam-Sunder and Myers (1999) make use of two models to compare the fit of

pecking-order theory and trade-off theory. In the model for pecking-order theory, they model long-term debt as a function of financing deficit of the company. On the other hand, for trade-off theory, they make use of a target adjustment model, where the firm issues debt as it departs from its optimal debt level. The authors showed that pecking-order theory has much explanatory power than trade-off theory. By incorporating debt capacity into the model of Shyam-Sunder and Myers (1999), Lemmon and Zender (2010) indicated that pecking order theory describes the choice of corporates better. If it is possible firms prefer to use their internal funds to retire debt and reduce leverage while concerns over debt capacity is the reason to issue equity. On the other hand, Frank and Goyal (2003) tested performance of pecking-order theory for American firms and showed that equity issuance is more closely related with financing deficit compared to debt issuances which violates the pecking-order theory. Similarly, Köksal and Orman (2015) tested the suitability of trade-off and pecking order theory for Turkish non-financial companies and showed that trade-off theory explains the capital structure of large private non-manufacturing firms better and pecking-order theory performs best for small public firms in the manufacturing sector. While conventional capital structure theories only consider debt, equity and internal sources as funding streams, Shimpi (2004) showed that insurative leverage (proportion of contingent capital) and risk leverage (proportion of transferred risk) are also important streams to consider along with financial leverage.

Besides the studies focusing on capital structure theory tests, there is a group of articles exploring the factors affecting firm leverage. Karaşahin and Küçükşaraç (2016) examined capital structure determinants of Turkish non-financial firms listed on Borsa Istanbul. In this study, the effect of firm and industry specific factors and macroeconomic variables on short-term and long-term leverage ratios of non-financial companies was investigated. The authors showed that size and tangibility have positive relation with long-term leverage ratio; while on the other hand, profitability and liquidity have negative relation with short-term leverage ratio. Frank and Goyal (2009) studied capital structure preferences of American firms and showed that as asset size, tangibility and expected inflation increases firm leverage increases and as profitability and market-to-book asset ratio increases leverage decreases. Compatible with the literature, Köksal and Orman (2015) found that firm leverage is positively correlated with firm size, potential debt tax shields, median of industry debt ratios, and inflation, and negatively correlated with profitability, business risk, and real GDP growth for Turkish non-financial companies.

On the other hand, there are also studies on the relation between cost of borrowing and leverage. Mizen and Tsoukas (2012) explored firm characteristics and financial crisis on the borrowing premiums of Asian countries. They pointed out that firms with lower leverage and higher Z-scores (lower probability of bankruptcy) have lower borrowing cost in the bond markets. Altunok and Fendoğlu (2015) studied determinants of bank loan rates for Turkish non-financial companies and showed that borrowing cost decreases as leverage decreases, tangible asset ratio and asset size increases. Moreover, increase in policy rates and decrease in global capital flows has increasing effect on borrowing costs.

In order to model deviation from optimal debt level in their trade-off theory test, Shyam-Sunder and Myers (1999) used historical average of leverage ratio to represent the optimal leverage ratio. On the other hand, Jalilvand and Harris (1984) used three-year moving average for firm leverage. Although, Damodaran (2012) conducted analysis for optimal leverage ratio of a firm, any specific study focusing on optimal leverage ratio estimation for a specific country was not encountered.

4. Optimal Leverage Ratio: Turkish NFC Case

Debt and equity are main funding sources for a company. Firms generally prefer to raise capital via debt issuances since interest payments are tax deductible. However, as the debt to asset ratio of a firm increases, cost of debt also increases since firms are perceived to be riskier in the market. On the other hand, although equity is more expensive compared to debt, firms may prefer to issue equity which does not need to be paid back in financially unfavorable times when earnings are declining. In order to maximize firm value, corporates select a mix of debt and equity which minimizes their weighted average cost of capital. This section aims to find optimal leverage ratio for NFCs listed on Borsa Istanbul in Turkey.

Data and Indicators

Weighted average cost of capital for a firm can be expressed by the following formula, where $WACC, r_e, r_d, E, D$ denote weighted average cost of capital, cost of equity, cost of debt, equity and debt level respectively.

$$WACC = r_e \left(\frac{E}{D+E} \right) + r_d \left(\frac{D}{D+E} \right) (1 - \text{tax rate})$$

In order to find out the optimal leverage ratio which corresponds to the minimum level of weighted average cost of capital; cost of equity and cost of debt are needed to be modelled as a function of leverage ratio. In this regard, cost of equity can be modelled via using capital asset pricing model (CAPM):

$$r_e = r_f + \text{Beta} (r_m - r_f)$$

where r_f and r_m denote risk-free return and market return respectively. As debt level increases, equity also becomes riskier since default risk of the company rises. Therefore, beta coefficient increases which brings up cost of equity. Industry index of Turkey (XUSIN Index) consisting of 146 firms is used to represent corporate sector in this study. For the market return, daily return of BIST100 Index (XU100 Index) is used. Sensitivity of the industry index to the price changes in the market index which is called as beta is calculated via the following formula:

$$\text{Beta}_{levered} = \frac{\text{Covariance}(r_m, r_i)}{\text{Var}(r_m)}$$

where r_i denotes return of the industry index. Beta coefficient was estimated as 0.77 using daily returns of industry and market index in 2015. However, it is worth to note that beta coefficient does not change significantly if the daily returns in the 2011-2015 period is used. The estimated beta coefficient which is 0.77 is indeed the levered beta coefficient corresponding to the leverage ratio of the firms represented in the industry index which has 54% debt to asset ratio as of 2015 year-end. In order to calculate cost of equity for various leverage ratios, it is needed to calculate levered beta coefficient for differing debt to equity ratios via the following formula.

$$\text{Beta}_{unlevered} = \left(\frac{\text{Beta}_{levered}}{\left(1 + \frac{D}{E} (1 - \text{tax rate})\right)} \right)$$

After calculating levered beta stream, cost of equity for increasing debt to asset ratio was derived with CAPM formula. Average of 3 month government bond annual rate in 2015 was used to denote the risk-free rate which is 9.9%. Fernandez et al. (2015) collected market risk premiums used in 41 countries in 2015 with a survey.

9.3% is used in this study as the market risk premium for Turkey as suggested by Fernandez et al. (2015).

There are alternative approaches for modelling cost of debt as a function of leverage ratio. As an example, Damodaran (2012) suggested to model cost of debt using interest coverage ratio (ICR). The author derived the spread and ICR relation using US corporate bond issuances. There is negative relation between ICR and spreads, as ICR decreases cost of borrowing increases. According to his methodology, as the debt level of corporate increases, interest expenses rise which causes ICR to decelerate and spread to increase. The approach that Damodaran (2012) used might not be applicable for now in Turkey since local corporate bond market recently started to operate actively. Moreover, ICR is not the only factor to determine cost of borrowing. Therefore, in this article, cost of borrowing is modelled as a function of firm characteristics. The relation between cost of borrowing and firm characteristics for Turkish NFCs was initially examined by Altunok and Fendođlu (2015). Considering main findings of mentioned study, independent variables were determined and improved. In this regard, this study focuses on NFCs listed on the Borsa Istanbul and matches their financial ratios with loan interest rates. To represent the general interest rate in the market, benchmark rate was used and difference between loan interest and benchmark rate was derived as the dependent variable and called as spread. Then, the spread of cost of borrowing for a corporate could be modelled via the following linear regression.

$$Spread = \beta_0 + \beta_1 \log(\text{assets}) + \beta_2(\text{leverage}) + \beta_3(\text{current ratio}) + \beta_4(\text{ROE}) + \beta_5(\text{stock turnover}) + \beta_6(\text{sales growth})$$

Assets stands for total asset size of the company, leverage is debt to equity ratio, current ratio is calculated by dividing short-term assets to short-term liabilities, return on equity (ROE) is the ratio of annualized net profit over four quarter average equity. Stock turnover ratio is calculated as division of annualized cost of goods sold to four quarter average inventory level.

Data includes TL loan rates that were originated in 2016 for 262 non-financial firms listed on the exchange. To eliminate maturity factor on loan rates, loans that only have a maturity of 3 months to 2 years are considered. Descriptive statistics of the variables used in the regression are given in the following table.

Descriptive Statistics					Table 1
	Mean	Std Dev.	Minimum	Maximum	
Loan Rate -Benchmark Spread	3.68	2.45	-4.63	8.75	
Log Asset	8.54	0.64	6.93	10.42	
Leverage	1.73	0.86	0.16	3.96	
Current Ratio	1.38	0.53	0.22	5.22	
ROE	0.06	0.19	-0.98	0.66	
Stock Turnover Ratio	7.24	14.89	0.03	181.28	
Sales Growth	0.12	0.25	-0.65	2.46	
# of Observation	1,371				

Source: CBRT, Public Disclosure Platform, Finnet

Regression results indicate that asset size, debt to equity ratio, return on equity and current ratio are significant factors affecting cost of borrowing. As the asset size,

current ratio and return on equity decreases while debt to equity ratio increases, cost of borrowing increases.

Regression Results	Table 2		
	1	2	3
Log Asset	-0.5821*** (0.0989)	-0.5999*** (0.0988)	-0.4456*** (0.1071)
Leverage	0.8074*** (0.0737)	0.8305*** (0.0739)	0.5528*** (0.0875)
Sales Growth		-0.7332*** (0.2496)	-0.1807 (0.2721)
Current Ratio			-0.4544*** (0.1336)
ROE			-1.6736*** (0.4054)
Stock Turnover Ratio			0.0046 (0.0042)

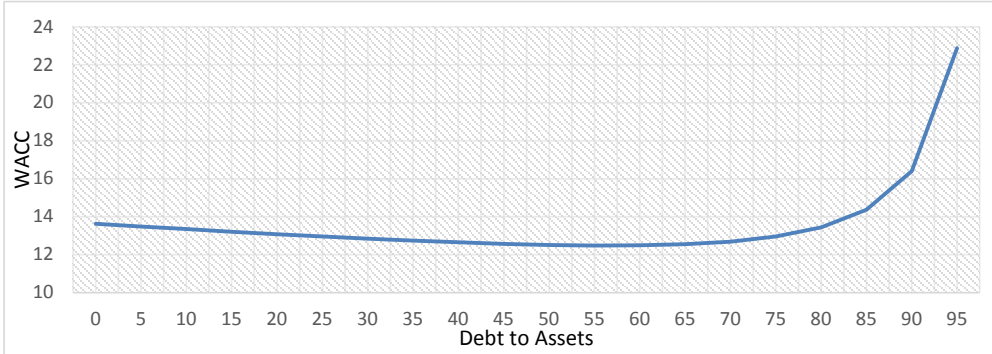
Source: CBRT, Public Disclosure Platform, Finnet

In order to estimate cost of debt, coefficient between spread and debt to equity ratio is used for different leverage ratios. Since firm value maximizes with the lowest cost of capital, optimal debt and equity mix is determined at lowest cost of capital level.

Optimal Debt Level Analysis

Cost of debt and cost of equity relation for various debt to asset ratios indicate that optimal leverage ratio for NFCs examined in this study hovers around 55-65% while actual leverage ratio of the firms represented in the industry index is 54% as of 2015 December.

Optimal Debt to Assets Ratio Graph 5



Source: PDP, Finnet, CBRT, author calculations

Difference between estimated optimal and actual leverage ratio for these companies might be partially due to agency costs which are not considered in the WACC method. Conflicts between shareholders and debt holders cause agency cost

of debt. Shareholders of companies near bankruptcy might prefer risky investments while debt holders knowing that shareholders will opt for riskier projects might ask for higher yields. On the other hand, as described by Jensen and Meckling (1976) agency cost of equity is associated with the "separation of ownership and control". Managers may prefer to take suboptimal decisions to increase their personal benefits besides maximizing the value of the firm which cause shareholders to ask for higher returns. Depending on the magnitude of agency cost of debt and equity, corporates may deviate from optimal leverage ratio based on WACC approach.

Moreover, different theories may also indicate varying optimal leverage ratios for different sectors. Karaşahin and Küçüksaraç (2016) showed that industry-specific factors have significant effects on firm leverage determination. On the other hand, Frank and Goyal (2007) stated that capital structure preferences of private firms, small public firms and large public firms might differ. Although, large public companies may prefer to use retained earnings and corporate bonds, small public firms fund themselves particularly with equity finance. Therefore, optimal leverage ratio analyses should be enriched with consideration of sectoral differences and company size.

5. Conclusion and Assessments

In this study, non-financial companies' increasing indebtedness following global crisis era was analyzed considering global risk appetite and capital inflows to developing countries. Even though scaling up leverage ratios might be attributable to continuing financial deepening process and improved corporate sector financial access, potential systemic risk stemming from corporate sector's financials should be monitored closely for sustainable financial stability. High reliance on foreign sources rather than equity finance may result in vulnerable NFC financials regardless of dynamics of corporate sector and the country's economy itself.

On the Turkish corporate sector side, current leverage ratios stand at reasonable levels although Turkey is amongst the countries which recorded significant increase in indebtedness since global crisis. Turkish NFCs' limited level of indebtedness before the increase in global liquidity; and deepening domestic financial system has decisive role in this development. In this study, optimal leverage ratio of NFCs listed on Borsa Istanbul was examined via weighted average cost of capital method. This study pointed out that leverage ratio of NFCs examined in this analysis hovers around estimated indebtedness levels. However, even if indebtedness of non-financial corporate sector is assumed to be at reasonable levels, prudential approach for firms' debt sustainability is considered to be important in terms of systemic risk mitigation. Moreover, this study was conducted for aggregated term while sector/company specific factors should also be considered to estimate optimal leverage ratio specifically for further studies.

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