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The impact of credit ratings on capital structure

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Abstract

Purpose – The purpose of this paper is to empirically investigate the effect of real credit ratings change on capital structure decisions.

Design/methodology/approach – The study uses three models to examine the impact of credit rating on capital structure decisions within the framework of credit rating-capital structure hypotheses (broad rating, notch rating and investment or speculative grade). These hypotheses are tested by multiple linear regression models.

Findings – The results demonstrate that firms issue less net debt relative to equity post a change in the broad credit ratings level (e.g. a change from A- to BBB+). The findings also show that firms are less concerned by notch ratings change as long the firms remain the same broad credit rating level. Moreover, the paper indicates that firms issue less net debt relative to equity after an upgrade to investment grade.

Research limitations/implications – The study covers the periods of 2009 to 2016; therefore, the research result may be affected by the period specific events such as the European debt crisis. Moreover, studying listed non-financial firms only in the Tadawul Stock Exchange has resulted in small sample which may not be adequate enough to reach concrete generalization. Despite the close proximity between the GCC countries, there could be jurisdictional difference due to country specific regulations, policies or financial development. Therefore, it will be interesting to conduct a cross country study on the GCC to see if the conclusions can be generalized to the region.

Originality/value – The paper contributes to the literature by testing previous researches on new context (Kingdom of Saudi Arabia, KSA) which lack sophisticated comparable studies to the one conducted on other regions of the world. The results highlight the importance of credit ratings for the decision makers who are required to make essential decisions in areas such as financing, structuring or operating firms and regulating markets. To the best of the authors' knowledge, this is the first study of its kind that has been applied on the GCC region.

Keywords Size, Credit ratings, Leverage, Capital structure, Debt issuance, Notch ratings, Broad ratings

Paper type Research paper

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Introduction

Making decisions about the capital structure is considered one of the most significant financial decisions in any firm (Haron, 2014; Krichene and Khoufi, 2015; Kumar *et al.*, 2017). Capital structure decisions are essential to maximize shareholders' wealth and the firm's value as it is related to the way the firm finances its operations and long-term investment through a combination of debt and equity (Proençaa *et al.*, 2014; Dasilas and Papasyriopoulos, 2015). Therefore, a number of studies have been devoted to examining the factors that affect capital structure decisions. Traditional studies have classified these factors into two categories:

(1) external factors which reflect macroeconomic conditions such as inflation rate and interest rate; and

(2) internal factors which are firm-specific such as company size, profitability, liquidity, non-debt tax shield and asset tangibility (Serghiescu and Văidean, 2014; Bandyopadhyay and Barua, 2016).

Credit ratings are the opinions of rating agencies about the probability that a debt-issuing firm will not meet its debt obligations (Milidonis, 2013). Each rating agency uses its methodology of evaluating the creditworthiness of firms and their default risk. The rating agencies also use different lettering systems which summarize their opinions about debt-issuing firms. Credit ratings are available free of charge to the public. They help reduce information asymmetry and help uninformed investors to make wise investment decisions. Rating agencies are paid by the firms being rated; such revenue models in the rating business have been debated due to the possible conflict of interest between the desire of the issuers to get favourable ratings and the need of rating agencies to maintain accuracy and integrity in their ratings (Becker and Milbourn, 2011).

The 2007-2008 financial crisis triggered efforts at different levels to reform financial market regulations. A number of financial requirements and regulations have been made contingent on firms' credit ratings. Such requirements include minimum bank capital according to Basel II and capital adequacy requirements as per Basel III directives (Hasan *et al.*, 2015).

Considering the importance of credit ratings for businesses, investors and regulators, credit rating agencies are expected to provide impartial opinions (Khatami *et al.*, 2016). However, Luitel *et al.* (2016) argued that credit ratings could disfavour emerging markets. They identified a number of internal and external factors of the credit rating business which, along with specific characteristics of the market, could cause negative and biased ratings of emerging market bonds. This, in turn, can lead to restricted access to the international debt market and increased borrowing costs for these markets. Moreover, Khatami *et al.* (2016) found that personal relationships between debt issuers and credit rating agencies have a positive effect on credit ratings.

Credit ratings, as a determinant of the capital structure, have not been studied sufficiently, and researchers have not reached a consensus on the relationship between credit ratings and capital structure (Dasilas and Papasyriopoulos, 2015). Kisgen (2006) conducted a study on the US Compustat firms from 1986 to 2001 and concluded that credit ratings have a direct effect on the capital structure because of the discrete costs and benefits associated with each rating level. On the other hand, Kemper and Rao (2013) could not confirm Kisgen's (2006) conclusion despite applying the same methodology. Moreover, Rogers *et al.* (2016) found that imminent credit ratings change does not represent an important factor for non-financial Latin American firms when making capital structure decisions.

None of the previous studies have been conducted on the Gulf Cooperation Council (GCC) countries. As credit ratings represent an evaluation of the credit quality of the firm, credit ratings have the potential to play a very crucial role in financial decisions during and after a financial crisis (Amrit and Korzhenitskaya, 2012). Therefore, it would be interesting to extend the previous research to a new context by conducting a similar study on a GCC country during the period 2009 to 2016. That is because rating agencies have been put under higher scrutiny by regulators since the 2007-2008 financial crisis. There has also been a call from market participants for them to provide more accurate ratings. The 2007-2008 financial crisis could distort the study results with outliers in the firms' financial data or ratings.

Saudi Arabia represents the largest economy in the GCC region. Saudi Arabia is the only country from the Middle East and North Africa (MENA) region which is a member of the G-20. Saudi Arabia is an oil-based economy, with approximately 62 per cent of government revenues coming from the oil industry (International Trade Administration, 2017). It is the largest oil producer after Russia (U.S. Energy Information Administration, 2016). As a result of the recent sustained drop in oil prices, Saudi Arabia launched an ambitious reform plan in 2016 named "Vision 2030". The vision has socio-economic programs to diversify the economy by increasing non-oil revenues, creating more jobs in the private sector and securing government financing. Saudi Arabia is aiming to transform its Public Investment Fund (PIF) into a global sovereign wealth fund, to develop its capital markets, invest in renewable energy sectors and attract more foreign direct investments (FDI). It also aims to develop a number of sectors with high future potential including the tourism, transportation and information technology industries (International Trade Administration, 2017). Because of the reform plans and the need for greater openness to the international capital market, it is assumed that credit ratings will gain significant attention by firms' management in the Saudi market.

The objective of the present paper is to empirically investigate the effect of real credit ratings change on capital structure decisions. The study examines the case of listed non-financial firms in the Saudi Arabia stock exchange, Tadawul, during the period 2009 and 2016 to study the relationship between credit ratings and capital structure decisions.

The remaining of the paper is organized as follows. The main themes of the present study are discussed in the literature review. In the empirical investigation section, data, variables and the research setting are explained. Empirical findings and evaluations are given in the research findings section. Concluding remarks are provided in the final section of the present study.

Literature review

In this section, the main themes of the present study are explained with respect to the research setting. Credit ratings, importance of credit ratings for capital structure, credit ratings and traditional capital structure theories, and the credit ratings–capital structure (CR-CS) model are explained and discussed.

Credit ratings

Credit ratings are ordinal predictions of the probability of default of an obligor (Orth, 2012). Credit ratings provide an overall estimate of firms' creditworthiness and rank firms according to the probability that they will not pay their debt (Rogers *et al.*, 2016). Therefore, credit ratings and credit rating agencies have become an important player in today's financial markets, especially after the 2008 financial crisis. The credit ratings business is mainly dominated by Standard and Poor's (S&P) and Moody's, which together account for 80 per cent of the market share, while Fitch has around 15 per cent of it (Duff and Einig, 2009).

There are several reasons for the increased role of credit ratings in the financial markets. These include globalization of financial markets, expansion in the number of firms issuing debt and growing use of financial innovations, especially asset- and mortgage-backed securities, which can be very complex and difficult for investors as well as regulators to understand and evaluate (Frost, 2007).

The purpose of credit rating agencies is to close the gap of information asymmetry as they have the expertise and scale needed to gather and analyze huge amounts of data about debt-issuing firms (Becker and Milbourn, 2011; White, 2016). Credit ratings provide forward-looking opinions on firms' credit quality as represented by the debt issuers' ability to meet their ongoing financial obligations and the likelihood of default. Rating agencies use lettering systems to communicate their assessment of the debt-issuing firms' creditworthiness. By publishing their opinions on debt-issuing firms, credit rating agencies can provide further information, other than that publicly available, about the credit quality of firms (Kisgen, 2006).

Credit rating can be either short term or long term. The latter evaluates creditworthiness independent of the effect of the business cycle. Each credit rating agency defines its own methodology that uses a mix of quantitative and qualitative tools and analysis to grade issuers (Frost, 2007). S&P considers the following for long-term issue credit ratings:

- likelihood of payment: the capacity and willingness of the obligor to meet its financial commitment according to the terms of the obligations;
- nature and provisions of the financial obligation; and
- protection afforded by the financial obligation in the event of bankruptcy or reorganization.

Table I shows credit ratings definitions based on S&P's long-term issue credit rating, which is a forward-looking opinion about the credit quality of the obligor with respect to specific financial obligations and represents an assessment of the default risk. AAA represents the highest (best) rating, while D refers to the lowest (worse) rating. Some broad ratings (e.g. AA) have notches (+/non/−) that further divide the grade into subcategories to refer to the relative position within each category (Standard and Poor's Financial Services LLC, 2017).

Classification	Rating	Definition
Investment grade	AAA	Extremely strong capacity to meet its financial commitment
	AA(+/non/−)	Very strong capacity to meet its financial commitment
	A(+/non/−)	Strong capacity to meet its financial commitment
	BBB(+/non/−)	Adequate capacity to meet its financial commitment
Speculative-grade	BB(+/non/−)	Less vulnerable to non-payment than other speculative issues. Major ongoing uncertainties
	B(+/non/−)	Adverse business, financial or economic conditions will likely impair the capacity or willingness to meet its financial commitment
	CCC(+/non/−)	Vulnerable to non-payment and dependent upon favourable business, financial or economic conditions to meet its financial commitment
	CC, C	Currently highly vulnerable to non-payment
	C	Currently highly vulnerable to non-payment with lower recovery
	D	In default or in breach of an imputed promise
	NR	No rating has been requested, insufficient information for rating, or S&P does not rate the particular obligation

Source: Standard and Poor's Financial Services LLC (2017)

Table I.
Standard and poor's credit rating definitions

Importance of credit ratings for capital structure

Several regulations covering the field of financial institutions and investment intermediaries are directly linked to credit ratings. Therefore, there has been increased reliance on credit ratings which have the potential to affect many parties including financial regulators, banks, insurance companies, mutual funds, pension funds, securities firms and other capital market players (Cantor and Frank, 1994). Credit ratings, for example, dictate the capital requirements for investments made by insurance companies as imposed by the various market regulators (Kemper and Rao, 2013). Moreover, credit ratings affect the cost of borrowing; thus, because of its credit ratings, a firm would bear higher cost such as paying a higher interest rate than a counterpart with better ratings (Kisgen, 2006).

Frost (2007) argued that credit ratings play two important roles in the capital markets. The first role involves publishing information. The significance of this information comes from its timeliness and accuracy, which are crucial in the valuation processes. The second role played by credit ratings is represented by facilitating contracting between parties because the ratings provide efficient benchmarking of the credit quality. Bosch and Steffen (2011) argued that credit ratings are of primary importance in reducing information asymmetry and they are considered even before stock exchange listing. Pan *et al.* (2015) found that information asymmetry is an important factor that affects the financing decision. They indicated that the level and change of information ratings are negatively associated with net debt issuance. Therefore, they argued that a firm with higher ratings tends to have lower leverage as the cost of issuing equity is lower than issuing debt.

Kisgen (2006) argued that bond ratings can impose a direct cost on firms. That is because credit ratings may affect the firm's access to the financial market, its operations, contracts, counterparties it deals with, the type of investors who can invest in the firm, disclosure requirements, and bond covenants. Sometimes, ratings disfavour high performing firms that are pooled with low performing firms that share the same credit rating (e.g. AA+, AA and AA−).

Utility maximizing managers may work hard to get a credit rating upgrade to improve their reputation, which affects their compensations and job security. Such behaviour would have a significant effect on the firm's cost of capital and capital structure decisions (Kisgen, 2006).

It is worth noting that credit ratings could also be affected by the capital structure mix. Andreasen and Valenzuela (2016) investigated the effect of financial openness on corporate and debt ratings. They found that financial openness has a significant impact on credit ratings and that the magnitude of this impact depends on the level of financial development of the country in which the firm operates.

Credit ratings and traditional capital structure theories

Theories on capital structure before Modigliani and Miller (1958) were mainly descriptive. The first formal treatment on capital structure, as proposed by Modigliani and Miller (1958), showed that under capital market assumptions there is no linkage between a firm's value and its capital structure. In other words, their results indicated that a firm's value is independent of its capital mix. However, the main problem in their formulation was the lack of tax shield benefit. Soon after, Modigliani and Miller (1963) revised their formulation by including tax shield benefit. In this form, another problematic result came into existence. It was claimed that the value of a levered firm is equal to the value of an unlevered firm plus the benefit of the tax shield. This was interpreted to mean that more debt-intensive firms will be more valuable than their counterparts. The main reason behind this problem was the role of bankruptcy cost.

Two theories named trade-off theory and pecking order theory (Myer, 1984) have subsequently emerged to explain how firms decide on their capital structure. The trade-off theory suggests that the cost and benefits associated with debt financing affect capital structure choices. Therefore, a value-maximizing firm would seek a debt level that balances interest tax shield benefits with the different costs related to bankruptcy and financial distress (Fama and French, 2002).

On the other hand, pecking order theory suggests a different approach that firms follow while making capital structure decisions. Myer (1984) argued that firms seek external capital only when the funding requirements cannot be met by internal funds. Therefore, firms favour debt over equity because of the higher cost associated with the latter due to information asymmetries.

However, due to the information asymmetry, Ali and Javid (2015) argued that credit ratings help firms to have lower cost and better access to the capital market. The traditional capital theories do not consider all the information given by the credit ratings and therefore, miss considering important issues related to the access to external financing and financial distress. Kisgen (2006) is considered the first to empirically provide evidence of the impact of credit ratings on the capital structure decision through his credit ratings-capital structure (CR-CS) model.

Credit ratings–capital structure (CR-CS) model

Kisgen (2006) empirically tested the impact of credit ratings changes on firms' capital structure decisions. He found that a potential upgrade or downgrade can affect the firm's subsequent capital structure decisions, and the impact is more momentous on the crossover area between investment grade and speculative grade. He also concluded that firms near credit ratings change will issue approximately 1.0 per cent less net debt relative to net equity, and firms will be more concerned with broad ratings change (e.g. from A to BBB+) as regulations are generally associated with broad rating levels.

According to Kisgen (2006), credit rating is an important factor to consider while making capital structure decisions because of the discrete cost or benefit associated with different rating levels. The costs and benefits are discrete because they apply to all firms within a broad rating level irrespective of the notch rating and the relative performance level of the individual firm. Thus a firm near a credit rating upgrade will issue less debt to reap the benefit of the upgrade, which entails lower cost of external financing and wider access to external capital. On the other hand, a firm near a credit rating downgrade will try to avoid the latter by issuing less debt to avoid a higher cost of capital, limited access to external capital, and the negative signal to investors that are associated with credit ratings downgrade.

On the other hand, Krichene and Khoufi (2015) concluded that probable credit rating and real credit rating do not have the same impact on capital structure. They found that firms which have credit ratings close to the investment grade or speculative grade border in the previous year (T-1) will issue 1.67 per cent less debt in the following year. However, in contrast to Kisgen's (2006) findings, Krichene and Khoufi (2015) also found that once a firm has been upgraded to investment grade, it will issue more debt without the fear of being downgraded.

Kemper and Rao's (2013) findings supported the CR-CS model, but for firms with imminent ratings change only. They concluded that the CR-CS model does not apply to all rating levels and argued that Kisgen's (2006) results are driven by the subsample of firms with low credit ratings. Kemper and Rao (2013) argued that the reduction in debt issuance is more related to the lack of access to the debt markets than a conscious decision to decrease

debt issuance. Moreover, they also did not find supporting evidence for the CR-CS model prediction that firms at the investment-speculative grade verge would be exclusively careful about their ratings, which in turn would affect their capital structure decisions. Finally, Kemper and Rao (2013) found that the CR-CS model does not appropriately hold for firms with access to capital markets, firms with access to commercial paper markets and firms with high growth opportunities.

Huang and Shen (2015) studied the cross-country variations that would affect the capital structure decisions after a change in firms' ratings. They found that a change in credit ratings has an asymmetric effect on the capital structure decision. They concluded that firms would adjust their leverage ratio after a ratings downgrade; however, firms would not considerably adjust their leverage ratio after a rating upgrade. Huang and Shen (2015) also found that capital structure adjustments happen more quickly in countries with better financial development and legal environments than other countries, irrespective of the ratings upgrade or downgrade experienced by the firms. Therefore, they argued that credit ratings play a less crucial role in the capital structure adjustment than the financial development and legal and institutional environments in a certain country.

Research methodology

This study is based largely on the methodologies adopted by Kisgen (2006), Krichene and Khoufi (2015) and Ali and Javid (2015) to test the CR-CS hypothesis. The study uses three models to examine the impact of credit rating on capital structure decisions. First, the effect of real broad rating change (BR Test) in the previous year (T-1) on the capital structure of the current year (T) is examined. Second, the effect of real notch rating change (NH Test) in the previous year (T-1) on the capital structure of the current year (T) is studied. Finally, the impact of real rating change to investment or speculative grade (IGSG Test) in the previous year (T-1) on the capital structure of the current year (T) is tested. Furthermore, the study uses the quantitative approach to analyze the data. The study is conducted on listed non-financial firms on the Tadawul stock exchange over the period 2009 to 2016.

This paper provides descriptive statistics of the data to highlight any pattern on the studied sample. The paper tests the research hypothesis using the ordinary least square (OLS) regression methods based on a 5 per cent significance level. The paper conducts significance testing and checks for major regression problems such as multicollinearity and autocorrelation. Moreover, the overall explanatory power of the regression models is calculated to ensure the results are statistically and economically significant.

Sample and sampling method

As stated earlier, the research population is taken from all listed non-financial firms on Tadawul, the Saudi Arabia stock exchange, during the period 2009 to 2016. Data are taken from Bloomberg Terminal (Bloomberg Fundamentals data type), Tadawul's website and annual reports of the companies where needed (Argaam.com). S&P Long-Term Issue Credit Ratings is used for the credit ratings variables. The sample is randomly selected from the non-financial firms by using Excel random number generation function to assign random numbers to each firm; then the firms are sorted in ascending order using the random numbers and the first 100 company are included in the sample. Financial firms are excluded as they exhibit significantly different appetite towards debt and therefore cannot be studied along with non-financial firms (Maung and Chowdhury, 2014). Therefore, banks, diversified financials and insurance companies as classified by Tadawul are excluded from the study.

The sample also excludes any firm with missing values for the used variables for the research period. The final sample consists of 97 non-financial firms representing 54 per cent of the total population with 776 firm-year observations. Large issuance of debt may cause a downgrade for a firm near a downgrade and also for a firm not near a downgrade. In light of this fact, firms with very large debt offering have not been excluded from the sample due to their small number.

Definition of variables

The variables used in the regression models based on Kisgen (2006) are defined as follows:

Dependent variables

$NetDIss_{it} = (\Delta D_{i,t} - \Delta E_{i,t})/A_{i,t}$; and

$NetDIss_{it}$ represents the net amount of debt minus the net equity raised during the year, divided by beginning-of-year total assets.

Independent variables

D_{it} = Book long-term debt plus book short-term debt for firm i at time *t*;

ΔD_{it} = Long-term debt issuance minus long-term debt reduction plus changes in current debt for firm i from time *t*-1 to *t*

E_{it} = Book value of shareholders' equity issuance for firm i at time *t*

ΔE_{it} = Sale of common and preferred stock minus purchases of common and preferred stock for firm i from time *t*-1 to *t*;

A_{it} = Beginning-of-year total assets for firm i at time *t*;

BR = Dummy variable for firm's broad credit rating with ordinal values as illustrated in Table II;

NH = Dummy variable for firm's notch credit rating with ordinal values as illustrated in Table II;

IGSG = Dummy variable equal to 1 for firms that have an investment grade at the beginning of the period; otherwise equal to 0 for firms that have a speculative grade at the beginning of the period;

ΔBR = Previous year broad credit rating score minus current year score ($BR_{t-1} - BR_t$);

BR_{up} = Dummy variable equal to 1 if previous year broad credit rating score minus current year score is greater than 0 ($\Delta BR > 0$); otherwise equal to 0;

BR_{down} = Dummy variable equal to 1 if previous year broad credit rating score minus current year score is less than 0 ($\Delta BR < 0$); otherwise equal to 0;

ΔNH = Previous year notch credit rating score minus current year score ($NH_{t-1} - NH_t$);

NH_{up} = Dummy variable equal to 1 if previous year notch credit rating score minus current year score is greater than 0 ($\Delta NH > 0$); otherwise equal to 0;

NH_{down} = Dummy variable equal to 1 if previous year notch credit rating score minus current year score is less than 0 ($\Delta NH < 0$); otherwise equal to 0;

$\Delta IGSG$ = Previous year investment-speculative grade score minus current year score ($IGSG_{t-1} - IGSG_t$);

$IGSG_{up}$ = Dummy variable equal to 1 if previous year investment-speculative grade score minus current year score is less than 0 ($\Delta IGSG < 0$); otherwise equal to 0;

$IGSG_{down}$ = Dummy variable equal to 1 if previous year investment-speculative grade score minus current year score is greater than 0 ($\Delta IGSG > 0$); otherwise equal to 0;

Credit Score = 1.4501 Log (A) + 11.6702 EBITDA/A - 6.0462 Debt/Total Capitalization; and

Kit = Set of control variables, namely leverage (Lev): $D_{i,t-1}/(D_{i,t-1} + E_{i,t-1})$, profitability (Prof): $EBITDA_{i,t-1}/A_{i,t-1}$, and Size: $\ln(Sales_{i,t-1})$.

Rating	Classification (IGSG)	Broad rating code (BR)	Notch rating code (NH)	Credit score ≥ Higher and equal to	< to
AAA	Investment grade	1	1	13	100000
AA+		1	2	12	13
AA		1	3	11	12
AA−		1	4	10	11
A+		2	5	9	10
A		2	6	8	9
A−		2	7	7	8
BBB+		3	8	6	7
BBB		3	9	5	6
BBB−		3	10	4	5
BB+	Speculative grade	4	11	3.5	4
BB		4	12	3	3.5
BB−		4	13	2.5	3
B+		5	14	2	2.5
B		5	15	1.5	2
B−		5	16	1	1.5
C		6	17	0.5	1
D		7	18	−100000	0.5

Table II.
S&P long-term issue credit ratings and assigned numerical score

Note: S&P long-term issue credit ratings are assigned ordinal numbers that correspond to the investment-speculative grades classification, the broad credit ratings levels and the notch ratings grades
Source: Standard and Poor's Financial Services LLC (2017)

Specification of hypotheses

H1. After recent broad credit ratings downgrade or upgrade, firms issue less debt relative to equity than firms that experienced no change in ratings:

$$H_0: \quad \beta_i \geq 0 \qquad i = 1, 2$$

$$H_1: \quad \beta_i < 0$$

The following regression models will be used to test whether the net issuance of debt versus equity is affected by a recent broad rating upgrade or downgrade represented by having a non-zero broad rating change:

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{BR}_{up} + \beta_2 \text{BR}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \tag{1}$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{BR}_{up} + \beta_2 \text{BR}_{down} + \varepsilon_{it} \tag{2}$$

H2. After recent notch credit ratings downgrade or upgrade, firms issue less debt relative to equity than firms that experienced no change in ratings.

$$H_0: \quad \beta_i \geq 0 \qquad i = 1, 2$$

$$H_1: \quad \beta_i < 0$$

The following regression models are used to test whether the net issuance of debt versus equity is affected by a recent notch rating upgrade or downgrade:

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{NH}_{up} + \beta_2 \text{NH}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \tag{3}$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{NH}_{up} + \beta_2 \text{NH}_{down} + \varepsilon_{it} \tag{4}$$

H3. After recent credit ratings change to investment or speculative grade, firms issue less debt relative to equity than firms not close to the investment-speculative crossover point (BBB- and BB+):

$$H_0: \quad \beta_i \geq 0 \qquad i = 1, 2$$

$$H_1: \quad \beta_i < 0$$

To test the effect on the net issuance of debt as a result of recent credit ratings change to an investment or speculative grade, the following regression models will be used:

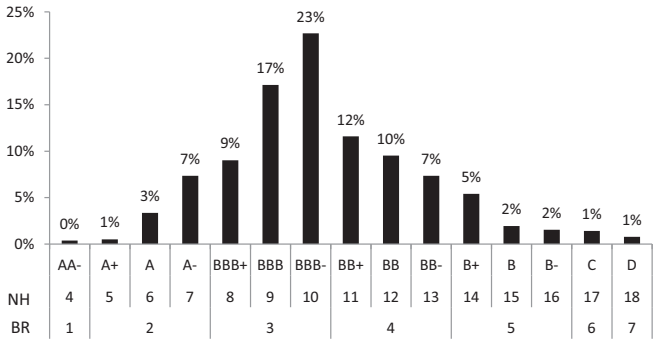
$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{IGSG}_{up} + \beta_2 \text{IGSG}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \tag{5}$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{IGSG}_{up} + \beta_2 \text{IGSG}_{down} + \varepsilon_{it} \tag{6}$$

Research findings

Descriptive statistics

Figures 1 and 2 show the sample summary statistics. Figure 1 illustrates the percentage of firm-years within each credit rating over the study period 2009 to 2016. The figure indicates



Note: The figure shows the broad ratings score (BR) and the notch ratings score (NH)

Figure 1.
The percentage of firm-years by credit ratings across the firm-years

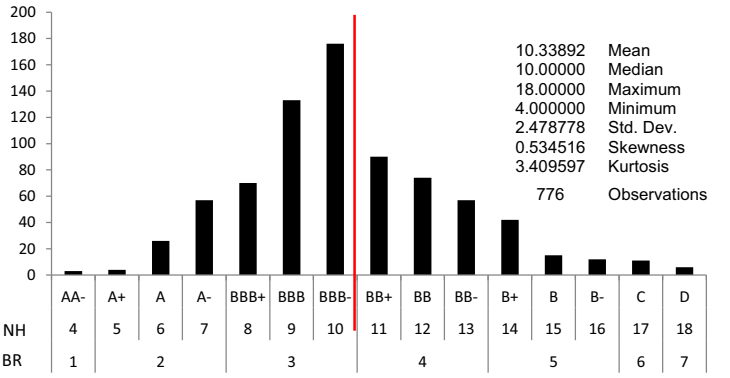


Figure 2.
Credit ratings distribution, 2009-2016

that the sample is characterized by moderately normal distribution which makes the empirical findings not biased by any specific credit ratings.

Figure 2 shows the distribution of credit ratings within the sample. The figure indicates that 75 per cent of the firm-years are within two broad credit ratings BBB +/non/− and BB+/non/− and around 35 per cent reside on the investment-speculative grade crossover point (23 per cent for BBB- and 12 per cent for BB+). The mean, median and standard deviation of the sample indicate moderately normal distribution, with 75 per cent of the firm-years having either BBB or BB broad rating levels. These rating levels are expected to cause firms to be more sensitive to a change in ratings as they will either try to avoid being downgraded to speculative grades or will try to be upgraded to investment grade.

Table III demonstrates the mean and standard deviation of the net debt issuance and the leverage ratio by rating across the firm-years from 2009 to 2016. It is noticed that the

	NetDIss			Leverage		
Ratings	Mean (%)	Std. Dev. (%)	Obs.	Mean (%)	Std. Dev. (%)	Obs.
AA−	0.3	1.6	3	0	2	3
A+	0.6	1.5	4	1	2	4
A	1.1	2.6	26	1	3	26
A−	2.9	5.9	57	4	8	57
BBB+	1.5	8.7	70	3	8	70
BBB	4.9	13.2	133	6	11	133
BBB−	6.2	15.5	176	10	15	176
BB+	8.7	28.4	90	10	16	90
BB	18.1	69.7	74	7	44	74
BB−	10.0	49.8	57	8	21	57
B+	7.2	9.9	42	15	20	42
B	4.8	9.1	15	8	17	15
B−	4.4	8.7	12	4	29	12
C	6.9	9.4	11	15	18	11
D	3.9	7.4	6	3	51	6
All	6.8	29.2	776	7.4	19.9	776

Table III.
Net debt issuance (NetDIss) and leverage (LEV) ratio by ratings

Note: The table shows the mean and standard deviation of the net debt issuance (NetDIss) and the leverage (LEV) by credit ratings for the sample firm-years from 2009 to 2016

leverage are nearly the same for BBB− and BB+ which reside in investment grade and speculative grade, respectively.

Figure 3 illustrates the net debt issuance by credit ratings across the firm-years from 2009 to 2016. It can be noticed that in the broad credit ratings Level 4, firms with BB ratings issue more debt relative to equity compared with firms with BB+ or BB−. This figure shows the mean net debt issuance (NetDIss) by credit rating across firm-years from 2009 to 2016. The sample is for all non-financial firms, excluding companies with missing data. The red line indicates the investment-speculative grade cross-over point.

Table IV shows the count of credit ratings by year. The summary does not indicate any trend which could be associated with regional or global events such as the 2012 European debt crisis. It can also be seen that the majority of firm-years lie in two broad credit ratings levels 3 and 4, which correspond to the investment-speculative grades area that makes it crucial to understand the behaviour of firms that have imminent or recent ratings change.

Broad rating test

In this section, the effect of real broad rating change (BR Test) in the previous year (T-1) on the capital structure of the current year (T) is studied. According to Kisgen's (2006, p. 1036) CR-CS hypothesis, "firms with minus or plus rating will issue less debt relative to equity than firms that are in the middle".

Kisgen (2006) assumed that firms with minus or plus ratings would be more concerned about maintaining their rating in case of minus ratings or will be concerned about gaining higher rating in case of plus rating, and therefore, they will issue less debt compared to equity. The below two regressions were used to test the impact of a real broad credit rating change on the net debt issuance relative to equity offering. Model 1 includes the control variables:

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{BR}_{up} + \beta_2 \text{BR}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \quad (1)$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{BR}_{up} + \beta_2 \text{BR}_{down} + \varepsilon_{it} \quad (2)$$

Because of the concern about maintaining the benefits of higher ratings or avoiding the cost of lower ratings, it is predicted that $\beta_i < 0$ for i = 1, 2. Table V shows the results of these

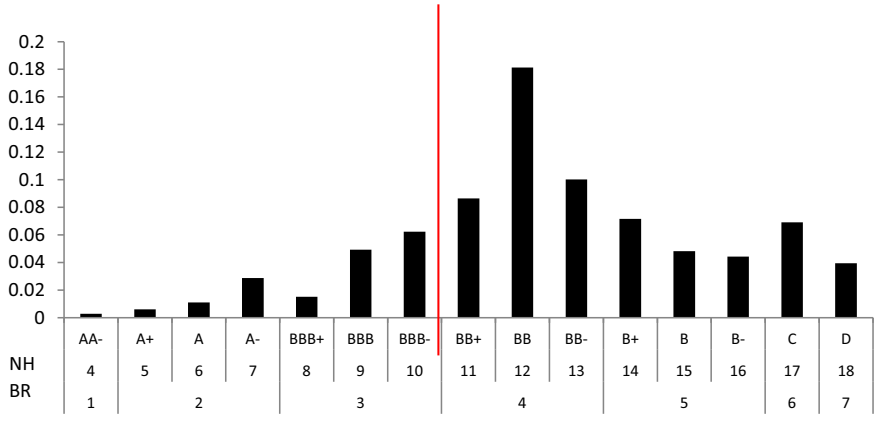


Figure 3.
Net debt issuance by credit ratings, 2009-2016

Broad rating	S&P equivalent rate	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
1	AA−			1	1		1		
1 Total				*1*	*1*		*1*		
2	A+		1	1	1	1			
	A	1	2	3	4	5	3	5	3
	A−	9	8	7	6	5	6	7	9
2 Total		*10*	*11*	*11*	*11*	*11*	*9*	*12*	*12*
3	BBB+	6	8	8	11	12	10	8	7
	BBB	24	18	18	16	17	16	14	10
	BBB−	17	24	18	21	22	26	25	23
3 Total		*47*	*50*	*44*	*48*	*51*	*52*	*47*	*40*
4	BB+	10	11	18	8	10	7	10	16
	BB	6	11	6	15	8	13	9	6
	BB−	13	6	6	5	7	6	7	7
4 Total		*29*	*28*	*30*	*28*	*25*	*26*	*26*	*29*
5	B+	8	4	8	3	5	3	4	7
	B	3			3	3	2	1	3
	B−		1	2	3	1	2	1	2
5 Total		*11*	*5*	*10*	*9*	*9*	*7*	*6*	*12*
6	C		1			1	1	6	2
6 Total			*1*			*1*	*1*	*6*	*2*
7	D		2	1			1		2
7 Total			*2*	*1*			*1*		*2*
Grand total		*97*	*97*	*97*	*97*	*97*	*97*	*97*	*97*

Table IV.
Credit ratings

Notes: Credit ratings by years. The table shows trend of ratings over the study period

regressions. The results are consistent with the CR-CS hypothesis and previous studies. Both coefficients (β_1 and β_2) have negative signs; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted which predicts that after recent broad credit rating downgrade or upgrade, firms issue less debt relative to equity than firms that experienced no change in ratings. Model 1 shows that firms issue approximately 1 per cent less debt relative to equity after broad credit rating downgrade (e.g. downgrade from A−to BBB+), and firms issue approximately 2 per cent less debt relative to equity after broad credit rating upgrade (e.g. upgrade from BBB to BBB+).

These results are not affected by any financial distress because, in the case of firms being downgraded, the control variables would isolate the effect of financial distress as can be seen from the positive coefficients for the firms' size and profitability and leverage ratio.

On the other hand, in the case of a firm being upgraded, the financial distress concept does not hold as the firm will choose to issue less debt. These two results support the CR-CS hypothesis as firms in the wake of a recent credit rating upgrade may issue less debt to maintain or obtain the benefits of higher ratings, while firms that have had a recent ratings downgrade may issue less debt to avoid the extra costs incurred as a result of the downgrade.

These results also show that the pecking order theory fails to predict such capital structure decisions. The theory has a limited view which assumes that firms will issue more

Variables/statistics	Model 1	Model 2
Intercept	0.0034 (0.0319)	0.0721*** (0.0117)
BRup	−0.0248 (0.0310)	−0.0511 (0.0373)
BRdown	−0.0098 (0.0295)	0.0030 (0.0345)
LEV	0.8228*** (0.0444)	
PROF	0.0459 (0.1011)	
SIZE	0.0004 (0.0048)	
R-squared	0.3156	0.0025
Adjusted *R*-squared	0.3112	−0.0001
F-statistics	71.0269	0.9668
Prob (F-statistics)	0.0000	0.3808

Notes: The table shows the regression results of broad credit ratings change (BRup or BRdown) on the net debt issuance (NetDIss) with the inclusion of control variables. The dummy variables BRup and BRdown are used to study the effect of the broad ratings upgrade and downgrade separately as each event may lead to different capital structure decisions. Three control variables are included; Leverage (LEV), Profitability (PROF) and Size (SIZE). As the calculated F-statistics is > the critical value (Prop), the model is statistically significant. The adjusted *R*-squared is consistent with previous studies which were in the range of 0.28 to 0.38. The exclusion of the control variables in Model 2 renders insignificant adjusted *R*-squared which proves that the control variables (LEV, PROF and SIZE) are significant variables that need to be considered while examining the impact of credit ratings on net debt issuance. Standard errors are given within the parenthesis. ***, **, and * denote significance at the 1, 5 and 10% levels, respectively. Autocorrelation and multicollinearity have been tested for Model 1. The Breusch–Godfrey Serial Correlation LM test shows no serial correlation for Model 1 as the Durbin–Watson stat is 1.85 which is close to 2. The variance inflation factors tests show a value of approximately 1 for all independent variables which means that there is no multicollinearity among them. The correlation matrix which is shown in the Appendix also indicates low correlation among independent variables

Table V.
Regression results of broad credit ratings change on net debt issuance

(less) debt only when investments are higher (lower) than the internally generated funds, and it completely ignores the credit ratings effect.

Notch rating test

In this test, the effect of real notch rating change (NH Test) in the previous year (T-1) on the capital structure of the current year (T) is evaluated. According to Kisgen (2006), firms are more concerned with broad credit ratings change rather than a notch change within a broad ratings level. Therefore, we evaluate whether the net debt issuance is affected by recent notch credit ratings downgrade or upgrade irrespective of the broad ratings level using the following regression models:

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{NH}_{up} + \beta_2 \text{NH}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \quad (3)$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{NH}_{up} + \beta_2 \text{NH}_{down} + \varepsilon_{it} \quad (4)$$

The regression results are shown in Table VI. The results show that notch ratings change is of lower significance compared to broad ratings change as suggested by previous studies. This is mainly because regulations are generally associated with broad credit ratings rather than notch ratings. Because β_1 and β_2 have coefficients with positive signs, therefore, the null hypothesis is accepted and we cannot prove that a recent notch rating change have an impact on net debt issuance relative to equity offering.

Variables/statistics	Model 3	Model 4
Intercept	−0.0157 (0.0325)	0.0462 (0.0137)
NHup	0.0313 (0.0227)	0.0237 (0.0272)
NHdown	0.0386* (0.0224)	0.0773*** (0.0260)
LEV	0.8187*** (0.0445)	
PROF	0.0814 (0.1010)	
SIZE	0.0000 (0.0048)	
R-squared	0.3185	0.0025
Adjusted *R*-squared	0.3141	−0.0001
F-statistics	71.9742	4.4143
Prob (F-statistics)	0.0000	0.0124

Notes: The table shows regression results of notch credit ratings upgrade (NHup) and downgrade (NHdown) on net debt issuance (NetDIss) with the inclusion of control variables. Three control variables are included: Leverage (LEV), Profitability (PROF) and Size (SIZE). Since the calculated value of F statistics is > the critical value (Prop), the model is statistically significant. The Adjusted *R*-squared is consistent with previous studies which were in the range of 0.28 to 0.38. The exclusion of the control variables in Model 4 renders insignificant the adjusted *R*-squared, which proves that the control variables (LEV, PROF and SIZE) are significant variables that need to be considered while examining the impact of credit ratings on net debt issuance. Autocorrelation and multicollinearity have been tested for Model 3. The Breusch–Godfrey Serial Correlation LM test shows no serial correlation for Model 3 as the Durbin–Watson stat is 1.85, which is close to 2. The variance inflation factors tests show a value of approximately 1 for all independent variables, which means that there is no multicollinearity among them. The correlation matrix that is shown in the Appendix also indicates low correlation among independent variables

Table VI.
Regression results of notch credit ratings change on the net debt issuance

Investment grade-speculative grade test

The third test examines the impact of real credit rating change to investment or speculative grade (IGSG Test) in the previous year (T-1) on the capital structure of the current year (T). Kisgen (2006) anticipated significant negative impact of the credit rating change on net debt issuance. The following regression models test the impact of credit rating change to investment grade and speculative grade separately to identify the impact of each event.

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{IGSG}_{up} + \beta_2 \text{IGSG}_{down} + \varphi \text{K}_{it} + \varepsilon_{it} \quad (5)$$

$$\text{NetDIss}_{it} = \alpha + \beta_1 \text{IGSG}_{up} + \beta_2 \text{IGSG}_{down} + \varepsilon_{it} \quad (6)$$

The regression results are shown in Table VII. The results show that a credit rating upgrade to investment grade is negatively associated with the net debt issuance as suggested by Kisgen (2006) and some other previous studies. The firms issue 2 per cent less debt relative to equity after an upgrade to investment grade to obtain the benefits of the higher credit ratings.

The results, on the other hand, show a positive relationship between a recent downgrade to speculative grade and net debt issuance, which is inconsistent with the CR-CS hypothesis. The result could either be affected by the sample size, or there could be other variables to be considered when the credit ratings of the firms are around the investment-speculative grade transition zone. Therefore, we cannot reject the null hypothesis, and we conclude that a change to investment grade has a different impact on the net debt issuance than a change to speculative grade.

Variables/statistics	Model 5	Model 6
Intercept	−0.0010 (0.0317)	0.0682*** (0.0110)
IGSGup	−0.0226 (0.0452)	−0.0321 (0.0544)
IGSGdown	0.0388 (0.0423)	0.0225 (0.0506)
LEV	0.8250*** (0.0443)	
PROF	0.0648 (0.0992)	
SIZE	0.0001 (0.0048)	
R-squared	0.3160	0.0007
Adjusted *R*-squared	0.3116	−0.0019
F-statistics	71.1501	0.2840
Prob (F-statistics)	0.0000	0.7529

Notes: The table shows regression results of credit ratings change to investment grade or speculative grade (IGSGup or IGSGdown) on the net debt issuance relative to equity offering (NetDIss) with the inclusion of control variables. The dummy variables IGSGup and IGSGdown are used to study the possible distinct impact of credit ratings change to investment and speculative grade, respectively, as each event may lead to different capital structure decisions. Three control variables are included: Leverage (LEV), Profitability (PROF) and Size (SIZE). As the calculated value of F statistics is > the critical value (Prop), the model is statistically significant. The adjusted *R*-squared is consistent with previous studies, which were in the range of 0.28 to 0.38. The exclusion of the control variables in Model 6 renders insignificant adjusted *R*-squared, which proves that the control variables (LEV, PROF and SIZE) are significant variables that need to be considered while examining the impact of credit ratings on net debt issuance. The Breusch–Godfrey Serial Correlation LM test shows no serial correlation for Model 5 as the Durbin–Watson stat is 1.86, which is close to 2. The variance inflation factors tests show a value of approximately 1 for all independent variables, which means that there is no multicollinearity among them. The correlation matrix which is shown in the Appendix also indicates low correlation among independent variables

Table VII. Regression results of credit ratings change to investment grade or speculative grade on the net debt issuance

Conclusion

Credit ratings have long been studied and documented as an important determinant of key managerial decisions. However, there is no complete agreement among research findings on how credit ratings affect capital structure decisions. Some researchers believe that there is a lack of significant data, which prevents us from reaching concrete findings. Firms with recent or imminent credit ratings may maintain their credit ratings by tools such as restructuring rather than debt issuance.

This paper adopts Kisgen's (2006) methodology with some modifications by studying the impact of real change instead of probable change and by examining the impact of notch ratings. It finds that non-financial firms listed on the Saudi Arabia stock exchange, Tadawul, issue 1 to 2 per cent less debt relative to equity after a recent broad ratings change (e.g. a change from A− to BBB+). This study also finds that the firms are less concerned by notch ratings change as suggested by previous studies. Moreover, consistent with the CR-CS hypothesis, it is found that the firms issue 2 per cent less debt relative to equity after an upgrade to investment grade. However, this finding does not support the CR-CS hypothesis that suggests that firms with recent downgrade to investment grade would issue less debt relative to equity as a means of financing.

This paper contributes to the empirical research by studying the impact of credit ratings on capital structure decisions in a new context – by examining non-financial firms listed on Tadawul stock exchange in Saudi Arabia. This is a subject that has lacked sophisticated studies comparable to those conducted on other regions of the world. This study could lay down the way for similar studies in other countries in the GCC region. The paper highlights the importance of credit ratings for decision-makers who are required to make imperative decisions about financing, structuring, or operating firms and regulating markets.

The main implication that can be derived from this study is that firms should give high attention to credit ratings while making decisions related to capital structure. The study indicates that credit ratings have the potential to affect the cost of capital, investment process, accessibility to financial markets, and in turn, the overall value of firms. Therefore, firms may take preventive moves, especially to avoid unfavourable ratings and maintain better ratings within the investment grades.

It would be interesting to apply similar research on all or other GCC countries to see if the capital structure decision would be affected by local regulations and financial developments. The number of listed companies in each GCC country is relatively small; therefore, it would be better to include all the countries in the region to obtain a sample large enough to reach a good generalization about the firms' behaviour.

With a larger sample, future research may construct multiple panels to exclude firms with very large debt offerings as such large issuances of debt may cause a downgrade for a firm near a downgrade and also for a firm not near a downgrade. Moreover, future research may study the impact of credit ratings on a specific industry rather than including firms from different industries as each industry may have a specific appetite or restriction on the debt markets.

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Appendix

Variables	NETDISSIT	BRUP	BRDOWN	LEV	PROF
NETDISSIT					
BRUP	−0.04985				
BRDOWN	0.008397	−0.1058			
LEV	0.561003	−0.04947	0.035309		
PROF	0.000324	0.051948	−0.24035	−0.02936	
SIZE	0.081302	0.027266	−0.04578	0.13261	0.327984

Table AI.
Model 1 correlation matrix

Notes: The small value of the credit ratings correlation coefficients (BRup and BRdown) may indicate that there is a non-linear relationship between the credit ratings and the net debt issuance. For example, a downgrade within the investment grades may have a smaller effect on the capital structure than a downgrade to speculative grades. Another explanation might be that there are some extreme data values that need to be removed or more control variables to be included

Variables	NETDISSIT	NHUP	NHDOWN	LEV	PROF
NETDISSIT					
NHUP	0.003219				
NHDOWN	0.101618	−0.26338			
LEV	0.561003	−0.04927	0.115495		
PROF	0.000324	0.09777	−0.24991	−0.02936	
SIZE	0.081302	0.035538	−0.05171	0.13261	0.327984

Table AII.
Model 3 correlation matrix

Notes: The correlation coefficients of notch credit ratings changes (NUup and NHdown) indicate that notch changes in credit ratings are insignificant predictors of the net debt issuance

Variables	NETDISSIT	IGSGUP	IGSGDOWN	LEV	PROF
NETDISSIT					
IGSGUP	−0.02189				
IGSGDOWN	0.016905	−0.04358			
LEV	0.561003	−0.01119	−0.01504		
PROF	0.000324	0.026243	−0.139	−0.02936	
SIZE	0.081302	−0.02638	−0.03281	0.13261	0.327984

Table AIII.
Model 5 correlation matrix

Notes: The small value of the credit ratings correlation coefficients (IGSGup and IGSGdown) may indicate that more control variables need to be considered while studying the impact of credit ratings change to investment and speculative grades. Another explanation might be that there are some extreme data values that need to be removed

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