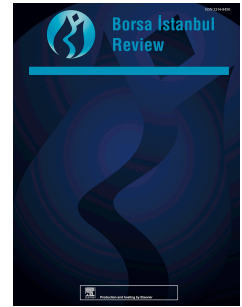


Accepted Manuscript



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PII: S2214-8450(18)30105-4

DOI: <https://doi.org/10.1016/j.bir.2019.02.004>

Reference: BIR 155

To appear in: *Borsa istanbul Review*

Received Date: 10 April 2018

Revised Date: 17 January 2019

Accepted Date: 16 February 2019

Please cite this article as: Ng A. & Ariff M., Does Credit Rating Revision Affect the Price of a Special Class of Common Stock?, *Borsa istanbul Review*, <https://doi.org/10.1016/j.bir.2019.02.004>.

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Submission to: *Borsa Istanbul Review*

07 April 2018

Acknowledgment: This paper is a part of a major research study on Credit Rating Revisions and Stock Returns in 10 developed and emerging economies. The paper benefited from useful comments of one discussant and several participants at the 9-th FIFC conference in Lancaster, United Kingdom on 25-26 September 2017. The authors take full responsibility for all errors.

Does Credit Rating Revision Affect the Price of a Special Class of Common Stock?

Abstract

This paper reports stock return changes induced by credit rating revisions disclosed by credit-rating agency in one stock market, where there is a list of special stocks. Do stock prices of *Shariah*-compliant special firms react to credit rating disclosures? There is a rich literature on credit rating revisions affecting rated firm's stock prices, not the special stocks. The findings reported in this paper suggest stock prices react significantly to credit change disclosures. We also find the average change in the special stock price returns significantly correlated with four key firm-specific variables: two working capital ratios, leverage and profit margin. These findings offer evidence that the special common stocks traded in several key world stock markets could have similar price reactions to credit rating change disclosures in line with the effects known for ordinary common stocks studied to-date. The findings reported here may prompt further studies on other special stocks in other markets.

Key words - *Shariah*-compliant firms, Credit rating changes, Stock prices, New ratings, Affirmation ratings, Price factors, Event study

Paper type - Research

JEL Classification: G14, G21, G24

1.0 Introduction

Corporate credit rating disclosures by credit rating agencies (CRAs) affecting common stock prices have become a new focus of research in recent years. The role of CRAs has increasingly become more prominent because these agencies appear to play a vital role of information signaling not only to issuers, to individual investors, to foreign institutional investors but also to policy makers within financial markets. Credit rating is a process where independent parties as CRAs assign ratings that reflect the creditworthiness of debt instruments of a firm (Moody's, 2004). Such rating opinions are signals to the investors and reflect the governance quality of debt-taking firms rated. Hence, the motivation of this paper is to reveal how rating change news affects stock's abnormal returns of a special type of stock, the *Shariah*-compliant stocks, traded in one leading market. The research then focuses on the second investigation to identify the firm-specific factors that correlate with stock's abnormal returns.

Two important theoretical frameworks relating to credit rating are information asymmetry and signaling. Information asymmetry exists when there is unbalanced information between two parties (Akerlof, 1978). Information asymmetry exists between lenders and investors and this may result in undervalued stock price due to uncertainty from asymmetric information. The credit rating disclosures by the CRAs have no fixed schedules; hence, the asymmetry information effect will be greater for investors who are not familiar with the firms' credit risk. Credit risk is defined as the risk of a borrower becoming not able to meet repay debt obligations on timely basis (Basel, 2000). Yu (2005) and Sengupta (1998) provide evidence that lower information asymmetry (greater disclosure) reduces the cost of debt. On the other hand, signaling is essential in reducing information asymmetry between two parties (Spence, 2002). A firm can signal their prospects to investors through ratings received from CRAs. The information

effect of credit rating *changes* is an on-going topic of excitement and continuous discussion; Ballester and Gonzalez-Urteaga (2017); Safari and Ariff (2015); Fulghieri et al. (2014); Freitas and Minardi (2013); Opp et al., (2013); Rousseau (2012); Kiff et al., (2012); Becker and Milbourn (2011); Deb et al., (2011); Poon and Chan (2008) and Barron et al., (1997).

There are over seventy CRAs in the world today. The “Big Three”, namely Moody’s Investors Service (Moody’s), Standard & Poor’s Rating Services (S&P), and Fitch Ratings (Fitch) were pioneers in the credit rating industry (Ramakrishnan and Scipio, 2016). These three CRAs registered with the Securities and Exchange Commission (SEC), United States (U.S.) in 1975, thus these belong to the privileged class designating the CRAs as nationally recognized statistical rating organizations (NRSRO). CRAs registered in the NRSRO list have been traditionally rating non-Islamic instrument. The rating market is typically oligopolistic in nature with the Big Three command a strong global market share with Moody’s and S&P controlling 40 per cent each, and Fitch around 15 per cent (Christopher, 2012).

Most studies cover developed countries stock markets with no attention to special classes of common stocks. This special form of stocks (*Shariah*-approved) is yet to be studied, to our best of knowledge. There are over 350 Islamic financial institutions operating in more than sixty countries, spanning across Asia, Middle East to the European regions (Sherif and Shaairi, 2013). The global Islamic financial assets exceeded USD2 trillion marks in 2017, representing a growth of 8.3% from USD1,893 billion in the previous year (IFSB, 2018) and is forecasted to grow further to USD3,000 billion by 2020 (GIFR, 2017). There are four main segments in the Islamic finance industry comprising banking, sukuk (bonds), equity funds, and takaful (insurance). The

banking sector dominates the Islamic finance industry with approximately 79% of all Islamic financial assets, followed by Islamic capital market segments namely sukuk (17%), Islamic equity funds (3%) and lastly takaful (1%) (IFSB, 2018). Imam and Kpodar (2013) provide evidence that Islamic banking is complementary and not a substitute to conventional banks, and therefore it is evidently mitigating systemic risk. Furthermore, Islamic banks are more efficient in the provision of financial loss compared to conventional banks (Shawtari et al., 2015).

Saudi Arabia and Malaysia are two major hubs for global Islamic finance and jointly formed 69 per cent of the total assets under management (AUM) at USD66.7 billion in 2017 (USD56.1 billion in 2016) (IFSB, 2018). Saudi Arabia controls the largest volume at 37 per cent of the total Islamic funds in 2017 (38% in 2016), followed by Malaysia holding 32% (29% in 2016) of the total AUM of USD56.1 billion. There are two CRAs in Malaysia namely Malaysian Rating Corporation Berhad (MARC) and RAM Holdings Group, formerly known as Rating Agency Malaysia Berhad (RAM) dominated the Islamic financial industry in Malaysia. The Asset, a publication on Asian financial markets voted RAM as the Rating Agency of the Year in 2017 (RAM, 2018). The Malaysia Central Bank established RAM in 1990. The award marks the third consecutive year of recognition and reaffirms RAM's position as the leading CRA in Asia. RAM has an outstanding rating value of about USD350 billion in 2017 (RAM, 2018).

A short description of the special stocks is warranted. *Shariah*-compliant funds possess distinctive features essential to be complied and approved as a special common stock. The principal foundation is from the *Quran* (words of God conveyed to the Prophet Muhammad) and secondly from *Hadith*, a collection of authentic actions and sayings of the Prophet as he

practiced the Quranic injunctions. The third source of the Islamic laws is from *Ijtihad* as the formal interpretation by qualified scholars of laws (Derigs and Marzban, 2009) on how to adapt principles to new situations unfolding over time. Islam prohibits dealings that lead to exploitation and unfairness but it induces profit-and-loss sharing principle between financiers and entrepreneurs to foster the brother-hood spirit (Saiti and Abdullah, 2016). According to Usmani (1999), it is challenging to find firms that can fully observe all the stringent *Shariah* values. However, some researchers show embedding *Shariah* values in transactions prevent unbridled speculation in financial transactions (Obaidullah, 2001; Naughton and Naughton, 2000).

Four main elements are unique to Islamic finance; (i) Prohibition of interest (*Riba*); Islam prohibits charging of interest (*riba*) because it is exploitative. This is the main distinction between Islamic and conventional banking. Islam encourages its followers to be charitable by lending money with no interest and borrowers to borrow on a profit sharing basis. (ii) Prohibition of *maysir* (games of chance) and of *gharar* (chance); Islam prohibits income derived from business activities such as gambling, casino operations and lottery games where the gains are from sheer chance and/or speculation. Meanwhile, *gharar* refers to uncertain transactions that may create injustice or deception to any parties. (iii) Prohibition of *haram* (illegal) activities; Islam only allows to finance *halal* (legal) activities. Islamic financiers are prohibited to lend money to parties involved in *haram* activities such as pornography, nightclubs, sale of alcohol and pork products. (iv) Compliance with *maqasid* al-Shariah (objectives of Islamic law); This concept refers to protection of five elements from harm such as protection of faith, protection of life, protection of intellect, protection of offspring and protection of wealth.

1.1 Rating Scale

There are three types of credit ratings in general; short-term instruments with tenure lesser than 12 months, long-term instruments with longer tenure than a year and sovereign rating for countries.¹ Rating definitions may vary in each rating agency but there are similarities in the three leading CRAs and RAM ratings (we use this rating firm in this study) as indicated in Table 1. Moody's uses numerical number for grading (1 is better than 2) while S&P and Fitch adopt positive/negative signs (positive denotes better credit quality than negative).

Table 1: Rating Correspondence Table

Moody's	S&P	Fitch	RAM*	Rating Description		
Investment Grade						Remarks
Aaa	AAA	AAA	AAA		Prime	Highest credit quality and extremely strong credit standing.
Aa1	AA+	AA+	AA	]	High Grade	Very high credit quality. Very low default risk and strong capacity to meet financial commitments.
Aa2	AA	AA]		
Aa3	AA-	AA-]		
A1	A+	A+	A	]	Upper Medium Grade	High credit quality. The firm is susceptible to adverse effects of changes in business or economic conditions.
A2	A	A]		
A3	A-	A-]		
Baa1	BBB+	BBB+	BBB	]	Lower Medium Grade	Good credit quality. May be weakened by changes in business or economic conditions
Baa2	BBB	BBB]		
Baa3	BBB-	BBB-]		
Speculative Grade						
Ba1	BB+	BB+	BB	]	Speculative	Indicate vulnerability to default risk due to adverse changes in business or economic conditions over time.
Ba2	BB	BB]		
Ba3	BB-	BB-]		
B1	B+	B+	B	]	Highly Speculative	Highly speculative. Financial commitments currently met. However, capacity for continued payment is vulnerable.
B2	B	B]		
B3	B-	B-]		
Caa1	CCC+	CCC	C		Substantial Risk	Default is highly likelihood.
-	D	D	D		In default	Payments are in default.

*RAM is Rating Agency Malaysia Berhad. They dominate the *Shariah*-compliant ratings.

Meanwhile, RAM adopts alphabets to define rating grades with the first rating AAA as the highest credit quality. Ratings from BBB and above are investment grade on the RAM's scale

¹ Standard & Poor's, "Guide to Credit Rating Essentials" 2010.

and the corresponding investment grade scale is BBB- for S&P and Fitch, and Baa3 for Moody's. The distinction between investment and speculative grades is vital because many large institutions and pension funds mandated to invest in investment grade instruments only.

1.2 Research Questions

The Islamic finance industry has been growing rapidly for the past three decades; however, there is still a low level of penetration and lack of awareness of Islamic financial services. This prompts governments and regulators in many developed and emerging economies to recognize Islamic financial sector as a strategic field of investment (Masih, 2017). There has been no study on credit rating effects on this special class of stocks. Investors are interested to invest in stocks that are ethically *Shariah*-compliant and not just only keen on profits gained from their investments. Srairi (2013) points that conventional banks have higher credit risk exposure than Islamic banks and Islamic financial instruments possess diversification benefits especially in reducing risk in a portfolio of fixed-income securities (Alam et al., 2013; and Abbas and Trichilli, 2015). Furthermore, Moody's (2018) affirmed that the development of Islamic finance sector would outstrip the growth of conventional assets in the near future as demand for *Shariah*-compliant financial instruments increase.

First, most studies are conducted in developed countries such as in the U.S., United Kingdom and Australia, but few in emerging country such as Malaysia. There are different classifications of credit rating announcements; first-time ratings (*new*), rating upgrades, downgrades, Watchlist, affirmation and withdrawal of ratings. *New* and *affirmation* of ratings are not widely studied even in the mainstream cases as the focus as always been on rating upgrades and downgrades. Can these credit rating disclosures as informative events yield significant stock

returns? A *new* rating occurs when a firm assigned rating for the first time by a CRA. Meanwhile, affirmations may occur following an informal review or when issuers release new information or there is a change in market events. The rating committee resolves that the credit quality for the current rating remains unchanged. This study is motivated to address the lack of scrutiny of such firms by studying credit rating change impact at the time of disclosures for *new* ratings and *affirmation* ratings. Second, there is little attention on firm-specific factors influencing stock return changes from credit rating announcements. This study aims to contribute to the literature by investigating the significant firm-specific factors that may influence stock returns. We investigate firm-specific factors correlated with the size of the stock returns around the time of disclosures computed as abnormal returns as per the method first developed by Ball and Brown (1968). Therefore, this research deems to be a significant study in view that Islamic finance considered as an innovation in the evolution of ethically compliant financial assets across the world. This paper is organized as follows. Section 1 is introduction, followed by literature review in section 2. We specify the methodology and hypotheses in section 3. Section 4 shows the research findings and discussions. Section 5 presents our conclusion to the research.

2.0 Literature Review

A firm's credit rating indicates CRA's opinion of the entity's creditworthiness and its ability to fulfill debt obligations. CRAs narrow the information gap by holding information that is not available to the public (Millon and Thakor, 1985), as this private information obtained are directly from the issuers. Thus, this provides lenders the added assurance of the borrowers' credit risk and the latter can potentially lower the cost of borrowings and attract investment funding; Opp et al., (2013); Healy and Palepu (2001); and Verrecchia (1983). Investors distinctly desire

stability of ratings to reduce frequent and exorbitant adjustments cost in their portfolios; Cheng and Neamtiu (2009); Loffler (2005); and Altman and Rijken (2004).

There are vast literatures that researched on rating upgrades and downgrades on stock returns particularly on the U.S market, as these attract more attentions from investors. The empirical studies broadly offer evidence supporting information asymmetry and signaling hypotheses. Rating downgrades are associated with significant negative abnormal returns while rating upgrades have little or no significant effect on stock returns; Hu et al., (2016); Leventis et al., (2014); Choy et al., (2006); Norden and Weber (2004); Dichev and Piotroski (2001); and Holthausen and Leftwich (1986). Prior research shows that managers intentionally released good news swiftly while bad news are withhold. Good news reduced information asymmetry while bad news is associated with larger information asymmetry. Hermalin and Weisbach (2007) document that firms may benefit from increased transparency, but it is costly to them as the managers set profit-maximizing level by determining which signals to release and conceal.

However, studies on *new* announcements are few and mixed findings. Byoun et al., (2014) document that new issue for unsolicited ratings generally lead to negative and insignificant abnormal long run stock performance, but are insignificant for new rating announcements for solicited ratings. Whereas, Poon and Chan (2008) show the negative response of speculative-grade rating for new issues is greater than the positive response of investment-grade rating announcements in the emerging market of China. Elayan et al., (2003) study the stock price reactions for firms traded in the New Zealand market against firms that are synchronously traded in the U.S. market known as American Depository Receipts (ADR), and find that *new* ratings overall generate higher positive market reactions propelled by non-ADR returns. There have also

been limited studies on *affirmation* ratings. Ghachem et al., (2010) studied market reactions during the global financial turmoil in 2008 and find that downgrades with affirmations emerge more persistently during crisis and produce greater market response than just the normal downgrades. Hence, this study aims to contribute to existing literatures by researching the impact of *new* and *affirmation* ratings to the *Shariah*-compliant stock returns. *New* and *affirmation* ratings are rarely study in the main stream and hence, our result is valuable to the investors.

Meanwhile, the finance literature classified factors that affect credit ratings into three main streams: (i) financial ratios such as firm size, current assets, total liabilities; (ii) governance factors such as ownership structure, CEOs performance and board independence; and (iii) macroeconomic factors such as GDP growth, inflation and consumer price index. The great surge in researching financial ratios probably owed most to the seminal work by Altman (1968), using a set of accounting variables to investigate the prediction of corporate bankruptcy in the U.S. Altman develops the ‘Z score’ method using financial ratios in a multiple discriminant analysis. This approach discriminates between two groups (bankrupt and non-bankrupt firms) by deriving a linear combination of certain pre-determined factors that best differentiate between the two groups. Kim and Sohn (2008) employ four variables following Altman’s financial ratios as firm-specific factors to predict credit rating transitions on Korean firms from 2000 to 2004. They observe that retained earnings/total assets are the most dominant factor that influences credit rating migration into higher grading. Poon and Chan (2008) find evidence that return on total assets, earnings before interest and taxes, total assets, and one-month-lag stock return of rated firms positively affect credit ratings, and that the gross debt-to-total capital ratio negatively affects the ratings in China. Gray et al., (2006) find that interest coverage and debt ratios have the most significant effect on credit ratings in Australia. They also observe that industry

variables and profitability ratios influence credit ratings. In India, Kumar and Bhattacharya (2006) report four significant factors affect forecasting of credit ratings; return of assets after tax, total debt to total assets, debt to total invested capital; and total equity to total assets.

Apart from accounting variables, non-financial variables influence credit rating as well. Corporate governance, management control and internationalization, profitability and growth are significant factors impact credit ratings (Murcial et al., 2014). Firms gain higher credit rating if corporate governance is strong compared to firms with weaker governance (Ashbaugh-skaife et al., 2006; and Bhojraj and Sengupta, 2003). Meanwhile, Liu and Jiraporn (2010) point that firms with dominant CEOs bear lower credit ratings and higher yield spreads. Kim and Sohn (2008); Feng et al., (2008); Nickell et al., (2000) and Belkin et al., (1998), find that business cycle affects rating transitions and prediction of credit rating probabilities. Table 2 shows previous studies conducted by other researchers.

Table 2: References to Literatures on Factors Affecting Credit Rating

Year	Authors	Significant Determinants
2016	Anand, Soomro and Solanki	Firm size and leverage have significant positive correlation
2014	Maltritz and Molchanov	GDP growth as significant factor
2014	Murcial, Murcia, Rover and Borba	Corporate governance, management control, internationalization, profitability and growth
2013	Freitas and Minardi	Change in the number of notches for downgrades
2010	Liu and Jiraporn	CEO power
2009	Matousek and Stewart	Equity size, total assets, return on asset, liquidity and net interest margin
2008	Kim and Sohn	Retained earnings/total assets
2008	Poon and Chan	Profitability, debt structure, firm size and stock performance
2006	Ashbaugh-Skaife, Collins and LaFond	Number of block holders and CEO power
2006	Gray, Mirkovic and Ragunathan	Profit margin, interest coverage and leverage
2006	Kumar and Bhattacharya	Return of asset after tax, total debt/total assets, debt/total invested capital; total equity/ total assets
2004	Kim and Gu	Times interest earned ratio, return on assets, and total assets
2003	Bhojraj and Sengupta	Proportion of directors in the board and institutional investors
2003	Elayan, Hsu and Meyer	
2000	Nickell, Perraudin, and Varotto	Total debt to total asset, firm size GDP growth

3.0 Data and Methodology

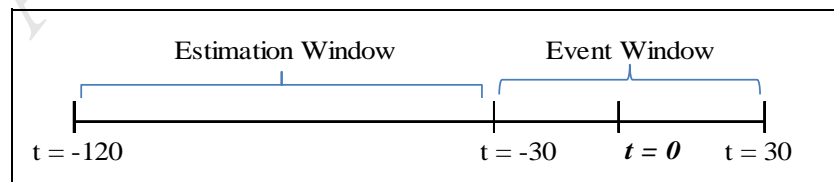
3.1 Data description

A data set is collected over five years from 2012 to 2016, using daily stock prices data from Bursa Malaysia, one of the several markets where this special class of stocks is available to investors. Information on credit rating is based on rating disclosures given to the firms by the rating agency, RAM. The stock prices are denominated in the local currency, Ringgit Malaysia. Daily historical data is chosen over monthly frequency in order to increase precision in estimation and information content of announcements (Kothari and Warner, 2007; and MacKinlay, 1997). We are testing two of the several possible rating types; *new* and *affirmation* ratings. Other types of ratings may be included in further research when data become available. There are 33 observations with firm-specific factors (29% on *new* ratings and 71% on *affirmation* ratings) in the data set: we exclude macroeconomic factors. Ten firm-specific factors initially tested, and then we trimmed the variables to five.

3.2 Methodology

We examine the impact of rating change announcements by using Event Study methodology (Fama et al., 1969). The first step is to (i) define the estimation window, event date and event window (see Figure 1); (ii) estimate the daily stock and market returns; (iii) estimate the expected returns for each asset in the estimation window; (iv) measure the abnormal returns in the event window.

Figure 1: Timeline for an Event Study



3.2.1. Estimation Window

Two periods are defined; (i) estimation window and (ii) event window. An event date is the day that the CRA announces the credit rating disclosure on the firm whether it is a *new* or *affirmation* rating. Each firm has different event date ($t=0$). The estimation window is the trading days before the event window to estimate the expected returns of each stock by employing the Market Model of Sharpe (1963). There is no fixed yardstick in choosing an estimation window. A short estimation window may cause impreciseness in measured parameters. Conversely, a long estimation window may lead to changes in the data influencing the estimated parameters. We observed that the normal length taken by other researches ranges from 30 to 120 days. Hence, we have chosen the designated estimation window from -30 days to -120 days to obtain estimates in this study and this is reasonable in line with previous studies.

3.2.2. *Event Window*

The event window is the period of trading days where the abnormal returns are calculated and is set before (-) and after (+) the event. The length of event window selection is arbitrary and past literatures do not advocate any unanimity to the event window definition: since there is no study of *Shariah*-listed firms, there is no known norm on this item. A “long horizon” event window normally applies to up to a year or more. Brown and Warner (1980) show that a long-horizon produced low power and severely misrepresent the event window (Kothari et al., 1997). Consequently, other authors select a shorter event window; Freitas and Minardi (2013) tested 14 days before and 30 days after; Creighton et al., (2007) tested 20 days; Choy et al., (2006) tested 1, 5 and 10 days; Rao and Sreejith (2013) reduced the event window to 5 days; before and after the event day. In this study, we have selected 30 days to determine a better cumulative abnormal stock return.

3.2.3. *Estimate daily stock and market returns.*

Daily stock returns² and market returns are computed as per equation (1) and (2) below.

$$R_{jt} = \ln (P_{jt} / P_{jt-1}) \quad \text{Eq.(1)}$$

where; \ln is the natural logarithm, R_{jt} is daily return on security 'j' on day 't', P_{jt} is closing price of stock 'j' on day 't', and P_{jt-1} is closing price of stock 'j' on day 't-1'.

$$R_{mt} = \ln (I_t / I_{t-1}) \quad \text{Eq.(2)}$$

where; R_{mt} is the daily return on market index on day 't', and I_t and I_{t-1} is the closing index value on day 't' and 't-1', respectively.

3.2.4 *Estimated expected returns*

The expected return is determined by adopting the Market Model (MacKinlay, 1997) as defined in equation (3) on a specific security. The Market Model works well in assessing the benchmark rate of return (Binder, 1998; and Armitage, 1995).

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \epsilon_{jt} \quad \text{Eq.(3)}$$

α_j and β_j are parameters estimated from the estimation window with ordinary least squares. R_{jt} is the return on stock j in period t, α_j and β_j are regression parameters, R_{mt} is the return on the market in period t and ϵ_{jt} is the error for period t. Alpha (α_j) is the intercept of the regression line and represents risk free rate. Beta (β_j) is the slope coefficient and represents systematic risk.

$E(R_{jt}) = \alpha_j + \beta_j R_{mt}$; where $E(R_{jt})$ is expected return on security j, α_j is intercept, β_j is slope of the regression, R_{mt} is expected market return.

3.2.5 *Measure abnormal returns in event window*

The abnormal returns are the difference between the actual return and the expected (estimated) return on day t as described in equations (4) and (5). It is an estimate of change in

² Returns are estimated in simple returns or continuously compounded returns. In this study, the compounded returns is selected to avert errors from negative values in addition to fulfilling the normality assumptions.

share price on the trading day caused by credit rating announcement. The abnormal returns across the given ratings are mean to produce the abnormal average returns (AAR) for day t, where N is the number of firms. The cumulative abnormal average returns (CAAR) is calculated by summing the AAR over the t days.

$$AR_{jt} = R_{jt} - E(R_{jt}) \quad \text{Eq.(4)}$$

where, AR_{jt} is the abnormal return, R_{jt} is the actual return on security j on day t and $E(R_{jt})$ is the expected return on security j on day t.

$$AAR_{jt} = \frac{1}{N} \sum_{j=1}^N (AR_{jt}) \quad \text{Eq.(5)}$$

3.2.6. Parametric Significance Test

The t-statistic is computed following Brown and Warner (1985) to examine the significance of AAR (and CAAR) in the event window as in equation (6).

$$t \text{ statistic (AAR)} = AAR_t / S(AAR_t) \quad \text{Eq.(6)}$$

where AAR_t is the average abnormal returns and S is the standard deviation. The standard deviation is estimated from the excess returns over days -31 to -120, representing 90 days estimation window. The $S(AAR_t)$ is the standard deviation equivalent to:

$$SAAR_t = \sqrt{\sum_{t=-120}^{t=-31} (AAR_t - A^*)^2 / n - 1} \quad \text{Eq.(7)}$$

The t-statistic for CAAR is as follows:

$$SCAAR_{(A, B)} = \sqrt{(t \text{ var } (AAR_t))} \quad \text{Eq.(8)}$$

$$T \text{ statistic (CAR)} = CAAR_{(A, B)} / S(CAAR_{(A, B)}) \quad \text{Eq.(9)}$$

where $SCAAR_{(A, B)}$ is the standard deviation of the cumulative average residuals over days from A to B, T equals the number of days in the CAAR statistics and $\text{var}(AAR_t)$ is variance of abnormal returns during the estimation window.

3.3 Hypotheses on Rating Announcements

The hypothesis is formulated to test two classification of rating announcements, which is *new* and *affirmations* as below:

H_0 : There is no stock price reaction around the announcement of credit rating changes.

H_A : There is a positive/negative stock price reaction around the announcement of credit rating changes.

3.4 Hypotheses on Firm-Specific Variables Impacting CAAR

The following equation (10) is formulated to test on the relationship between CAAR and firms-specific factors to identify significant determinant correlated with stock price changes.

$$CAAR_{i,30t} = \alpha + \beta_1 WCTC + \beta_2 WCTA + \beta_3 TDTA + \beta_4 \ln TD + \beta_5 GPM + \varepsilon_{it} \quad \text{Eq.(10)}$$

Where;

$CAAR_{i,30t}$	=	cumulative average abnormal returns
$WCTC$	=	working capital/total capital
$WCTA$	=	working capital/total asset
$TDTA$	=	total debt/total asset
$\ln TD$	=	log total debt
GPM	=	gross profit margin

LIQUIDITY RATIO

H1: There is a positive relationship between CAAR and WCTC.

H2: There is a positive relationship between CAAR and WCTA.

WCTC (working capital/total capital) and WCTA (working capital/total asset) are both liquidity ratios following the studies of Poon and Chan (2008); Adams et al., (2003); Kumar and

Haynes (2003) and Altman (1968). Working capital is computed by taking current asset minus current liability. These ratios measure the firm's cash flow ability to meet its financial obligations in the short-term. A firm that suffers operational losses will experience shrinking current assets. Chen and Kieschnick (2018) investigate working capital management and find that the firm's cash flow volatility correlated with the future cash flow uncertainty that it faces.

LEVERAGE RATIO

H3: There is a negative relationship between CAAR and TDTA

TDTA (total debt/total asset) known as debt ratio is to determine a firm's risk level. A high debt ratio affects the firm's ability to honor its debt obligations. Bae et al., (2013); Chen and Zhao (2006); Jorion et al., (2005) and Altman (1968) show that firms with higher debts face higher risks of insolvencies.

H4: There is a negative relationship between CAAR and LnTD

LnTD (log of total debt) is expected to be negatively associated with credit rating. As a general rule of thumb, a firm with high debts is at risk of bankruptcy if the entity is unable to repay its financial obligations (Altman, 1968). Kisgen (2006) points that firms reduce their debt financing to achieve better ratings as high debt level will potentially lead to higher default probabilities.

PROFITABILITY RATIO

H5: There is a positive relationship between CAAR and GPM.

GPM (gross profit margin) is vital because it indicates whether the sales of the firm are generating sufficient profit to meet its expenses. Gray et al., (2006) document firms that have better earnings generally has greater capability to generate cash to settle their financial

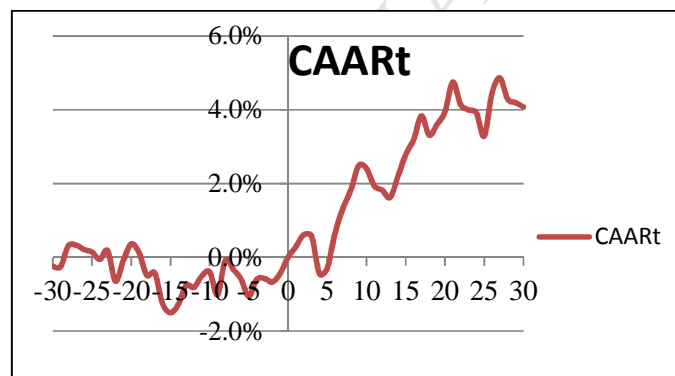
commitments. This ratio provides insight of a firm's ability to utilize surplus earnings to generate new business, Adams et al. (2003).

4.0 Results and Discussion

4.1 Findings on Credit Rating Changes Impact

New Ratings: Investors are excited with the announcement of *new* ratings in Malaysia, an emerging market. New credit ratings entrance to the market draw attention from the investors with CAAR in general register positive stock returns. Overall, stock returns on the *Shariah*-compliant stocks are positive and highly significant; see Figure 2 and Table 3.

Figure 2: Abnormal Returns for New Ratings (t-30 to t+30)



Stock price dipped slightly in the pre-announcement period from day -30 to day -15. This may suggest that investors initially pay little attention to speculative news on the rated firms and they may show some initiative anxieties. Nonetheless, stock price surged and statistically significant from the announcement day onwards and continuously until day +22, and reached a peak CAAR of 4.75% on day +21. This may imply that investors have received additional information after the announcement date and this creates more confidence on the *new* ratings announcement. Hence, the stock price pushes further to a high CAAR in the range of 4.0% in the post-

announcement period. The impact of *new* ratings in the market for *Shariah*-compliant stocks is statistically significant stronger in the post-announcement period than the pre-announcement period.

Table 3: AARs, CAARs and t statistic for New Ratings (t-30 to t+30)

Day	AART	t-test	CAART	t-test	Day	AART	t-test	CAART	t-test
-30	-0.25%	-0.909	-0.25%	-0.303	0	0.44%	3.117***	0.00%	0.002
-29	-0.01%	-0.125	-0.25%	-1.059	1	0.28%	2.036**	0.29%	0.122
-28	0.57%	4.068***	0.31%	0.432	2	0.33%	2.350**	0.61%	0.257
-27	0.01%	0.124	0.33%	0.475	3	-0.04%	-0.303	0.57%	0.240
-26	-0.12%	-1.119	0.21%	0.304	4	-1.02%	-6.935***	-0.44%	-0.171
-25	-0.07%	-0.724	0.14%	0.208	5	0.15%	1.048	-0.29%	-0.112
-24	-0.20%	-2.201**	-0.06%	-0.077	6	0.96%	6.324***	0.67%	0.241
-23	0.23%	2.634**	0.18%	0.237	7	0.66%	4.272***	1.33%	0.466
-22	-0.82%	-6.573***	-0.65%	-0.573	8	0.50%	3.214***	1.83%	0.632
-21	0.56%	4.113***	-0.09%	-0.069	9	0.66%	4.237***	2.48%	0.842
-20	0.45%	3.296***	0.36%	0.266	10	-0.08%	-0.521	2.40%	0.814
-19	-0.24%	-1.805*	0.12%	0.088	11	-0.47%	-3.038***	1.94%	0.645
-18	-0.61%	-4.388***	-0.49%	-0.325	12	-0.12%	-0.757	1.82%	0.606
-17	0.07%	0.517	-0.42%	-0.279	13	-0.20%	-1.293	1.62%	0.539
-16	-0.84%	-5.703***	-1.26%	-0.737	14	0.56%	3.679***	2.18%	0.714
-15	-0.25%	-1.719*	-1.50%	-0.879	15	0.60%	3.949***	2.79%	0.897
-14	0.22%	1.586	-1.28%	-0.738	16	0.40%	2.606***	3.18%	1.019
-13	0.52%	3.584***	-0.77%	-0.418	17	0.65%	4.266***	3.83%	1.207
-12	-0.05%	-0.346	-0.81%	-0.445	18	-0.52%	-3.383***	3.31%	1.025
-11	0.31%	2.202**	-0.51%	-0.274	19	0.30%	1.932*	3.61%	1.114
-10	0.11%	0.841	-0.39%	-0.212	20	0.33%	2.198**	3.94%	1.213
-9	-0.62%	-4.461***	-1.01%	-0.519	21	0.81%	5.252***	4.75%	1.427
-8	0.93%	6.110***	-0.09%	-0.040	22	-0.61%	-3.923***	4.14%	1.216
-7	-0.24%	-1.577	-0.32%	-0.148	23	-0.14%	-0.908	4.00%	1.173
-6	-0.27%	-1.816	-0.59%	-0.268	24	-0.08%	-0.515	3.92%	1.149
-5	-0.46%	-3.165	-1.05%	-0.470	25	-0.63%	-4.069	3.29%	0.944
-4	0.46%	3.092	-0.60%	-0.261	26	1.16%	7.207	4.45%	1.218
-3	0.03%	0.173	-0.57%	-0.250	27	0.42%	2.586	4.86%	1.327
-2	-0.10%	-0.681	-0.67%	-0.292	28	-0.58%	-3.574	4.29%	1.151
-1	0.24%	1.676*	-0.44%	-0.188	29	-0.09%	-0.585	4.19%	1.124
					30	-0.12%	-0.737	4.08%	1.092

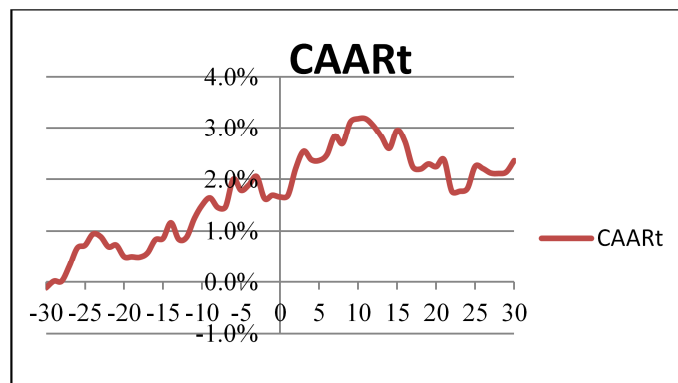
Note: *, **, and ***: statistically significant at 10%, 5%, and 1% acceptance level, respectively.

Affirmation Ratings: Affirmations are ratings reviewed by the CRA leading to no rating changes that is an indication of good news and thus, we expect positive reactions. It is a novel result that affirmations ratings are highly associated with statistically significant positive

abnormal returns in both the pre and particularly in the post-announcement periods. The market reaction is generally positive and receptive to affirmations ratings; see Figure 3 and Table 4.

In the pre-announcement period, CAARs slowly increased from day -30 until day +22, reaching CAAR of 2.38%: Figure 3.

Figure 3: Abnormal Returns for Affirmation Ratings (t-30 to +30)



There is much excitement building up suggesting that investors are probably looking forward for an upgrade in the ratings. However, stock price subsequently decreased and moved randomly up and down in the post-announcement period from day +23 until day +30 as the news of the rating announcement impact begin to fade gradually. Investors recognize that an *affirmation* rating serves as a certification signal of the issuer's credit quality. Since there are no changes to the rating, hence investors do not need to panic. Second, investors are relief that they are not required to play the guessing game of an upgrade or especially a possible downgrade rating after the affirmation announcement day. Hence, the affirmation announcement thereafter drives up stock price in the market. We can deduce that credit ratings play a vital role in signaling the firm's credit risk (Kisgen, 2006).

Table 4: AARs, CAARs and t statistic for Affirmation Ratings (t -30 to +30)

Day	AART	t-test	CAART	t-test	Day	AART	t-test	CAART	t-test
-30	-0.12%	-0.502	-0.12%	-0.107	0	-0.03%	-0.742	1.66%	1.392
-29	0.13%	3.517***	0.01%	0.060	1	0.03%	0.687	1.69%	1.419
-28	0.00%	-0.021	0.01%	0.067	2	0.52%	11.008***	2.21%	1.729*
-27	0.30%	7.890***	0.32%	0.881	3	0.33%	6.956***	2.54%	1.948*
-26	0.36%	8.396***	0.67%	1.513	4	-0.17%	-3.461***	2.37%	1.792*
-25	0.05%	1.365	0.72%	1.636	5	-0.01%	-0.304	2.36%	1.778*
-24	0.22%	5.975***	0.94%	2.103**	6	0.11%	2.448**	2.47%	1.864*
-23	-0.05%	-1.362	0.89%	1.860*	7	0.36%	7.738***	2.84%	2.087*
-22	-0.20%	-4.897***	0.69%	1.225	8	-0.15%	-3.102***	2.69%	1.955*
-21	0.03%	0.869	0.73%	1.287	9	0.42%	8.836***	3.12%	2.192**
-20	-0.22%	-5.487***	0.50%	0.791	10	0.07%	1.439	3.18%	2.240**
-19	0.00%	-0.057	0.50%	0.789	11	0.00%	-0.075	3.18%	2.235**
-18	-0.01%	-0.204	0.49%	0.777	12	-0.14%	-3.084***	3.04%	2.109**
-17	0.08%	2.289***	0.58%	0.908	13	-0.21%	-4.504***	2.82%	1.925*
-16	0.25%	6.923***	0.83%	1.243	14	-0.23%	-4.776***	2.60%	1.737*
-15	0.03%	0.794	0.86%	1.287	15	0.36%	7.472***	2.95%	1.938*
-14	0.30%	8.220***	1.16%	1.634	16	-0.22%	-4.647***	2.73%	1.760*
-13	-0.32%	-7.870***	0.84%	1.040	17	-0.49%	-9.735***	2.24%	1.359
-12	0.04%	0.966	0.88%	1.089	18	-0.04%	-0.854	2.19%	1.332
-11	0.36%	8.770***	1.24%	1.434	19	0.10%	1.975**	2.29%	1.391
-10	0.26%	6.294***	1.50%	1.692*	20	-0.05%	-1.056	2.24%	1.357
-9	0.14%	3.480***	1.64%	1.847*	21	0.14%	2.778***	2.38%	1.437
-8	-0.19%	-4.520***	1.45%	1.573	22	-0.61%	-11.686***	1.77%	0.995
-7	0.01%	0.324	1.47%	1.587	23	0.00%	-0.060	1.77%	0.993
-6	0.53%	12.043***	2.00%	1.928*	24	0.05%	1.030	1.82%	1.023
-5	-0.21%	-4.767***	1.78%	1.656*	25	0.43%	8.264***	2.25%	1.234
-4	0.11%	2.414**	1.89%	1.756*	26	-0.04%	-0.839	2.20%	1.209
-3	0.16%	3.634***	2.05%	1.898*	27	-0.09%	-1.676*	2.12%	1.159
-2	-0.42%	-8.970***	1.63%	1.371	28	-0.01%	-0.165	2.11%	1.155
-1	0.06%	1.349	1.69%	1.424	29	0.03%	0.578	2.14%	1.171
					30	0.22%	4.382***	2.36%	1.285

Note: *, **, and ***: statistically significant at 10%, 5%, and 1% acceptance level, respectively.

4.1.1 Information leakages

There are some information leakages prior to the announcement, evidenced by the stock price movement. Some investors may anticipate rating changes prior to the announcement, thus these information are factor in the abnormal stock returns prior to the official released (Stickel, 1986). Tahaoglu and Guner (2010) investigate stock performance for firms listed on the Istanbul Stock Exchange and document that affiliated shareholders can reap profits above the market returns. Besides, Irvine et al. (2007) point that high abnormal trading volumes and abnormal

returns happened five days prior to news of a buy recommendation released affirm this, thus this suggests traders received insider tipping.

4.2 Findings on Determinants Impacting Abnormal Returns

The descriptive statistics results in Table 5 show that three out of five variables; WCTC, TDTA and GPM have the highest mean. This suggests these three variables are likelihood to produce significant result in this research. CAAR (dependent variable) has a mean of 0.0855, standard deviation of 0.3339, with minimum and maximum value of -0.114 and 1.90 respectively.

Table 5: Descriptive Statistics on Variables Entering the Regression Test.

Variable	Obs	Mean	Std. Dev.	Min	Max
CAAR	33	0.0855	0.3339	-0.114	1.900
WCTC	33	33.4576	28.5276	-59.500	83.860
WCTA	33	0.2524	0.1970	-0.300	0.640
TDTA	33	22.7121	10.0577	0.000	37.770
LnTD	33	5.8434	1.2814	1.041	6.789
GPM	33	27.5946	18.0320	12.440	91.410

Note: CAAR = cumulative average abnormal returns; WCTC = working capital/total capital; WCTA = working capital/total asset; TDTA = total debt/total asset; LnTD = log total debt; GPM = gross profit margin.

Table 6: Regression Results on the Firm Factors and Stock Returns

	Coef.	Std. Err.	t	P>t
CAAR				
WCTC	0.01874	0.01138	1.6510*	0.1110
WCTA	-3.14677	1.73254	-1.8200*	0.0800
TDTA	0.01654	0.00988	1.6700*	0.1060
LnTD	-0.06912	0.06539	-1.0600	0.3000
GPM	0.01125	0.00265	4.2500***	0.0000
cons	-0.02958	0.29700	-0.1000	0.9210
Number of observation	=	33		
F(5, 27)	=	5.430		
Prob > F	=	0.0014		
R-squared	=	0.5014		
Adjusted R-squared	=	0.4094		

Note: CAAR = cumulative average abnormal returns; WCTC = working capital/total capital; WCTA = working capital/total asset; TDTA = total debt/total asset; LnTD = log total debt; GPM = gross profit margin.

The regression results in Table 6 show four out of five variables are statistically significant impacting the stock returns: (i) WCTC and WCTA (represent liquidity ratio); (ii) TDTA

(represents leverage ratio); and (iii) GPM (represents profitability ratio). The regression model is significant with F-ratio and factors are significant at or below 0.10% acceptance level.

Liquidity ratio (WCTC and WCTA); WCTC has a positive coefficient and is statistically significant. On the other hand, WCTA is statistically significant but has a negative sign. In essence, working capital is crucial but a negative sign on WCTA may indicate that the firm does not have sufficient liquidity to pay its creditors in short term particularly if the business acquires more debts, thus increasing its current liabilities and reducing its working capital. Nonetheless, it is consistent with previous studies that working capital to total assets ratio is one of the significant factors to determine firm failure or bankruptcy (Korol, 2013; Tykvova and Borell, 2012; Bee and Abdollahi, 2011). Firms with higher degree of liquidity are able to meet unexpected needs for cash and will have lower probability of default.

Leverage ratio (TDTA); TDTA is statistically significant; however it has a positive sign. Nonetheless, the finding is consistent with the studies by Livingston et al., (2018) and Kedia et al., (2017). This can mean that the debt ratio varies across industries; firms engaged in utilities and oil and gas industries are capital-intensive compared to general trading businesses. Leverage influences the credit rating process and high leverage ratio is associated with lower ratings. Moreover, TDTA is a significant factor in forecasting credit rating (Kumar and Bhattacharya, 2006). In general, a greater debt ratio indicates the firm's debt level is greater than its assets and is a sign that the creditors have to be more vigilant.

Total debt (*LnTD*): The result shows that total debt has a negative coefficient as expected, though it is not statistically significant. Firms experiencing higher total debts are more likely to have a negative relationship with stock returns. A high debt ratio may increase the firm's inability to meet its financial obligations and possibility the risk of default.

Profitability (*GPM*): *GPM* is the most profound significant variable impacting credit rating compared to other tested variables, consistent with previous studies (Poon and Chan, 2008; Gray et al., 2006). Profitability is a measure of the firm's ability to manage its operating cost effectively and able to charge competitive rates in the market. Chen and Kieschnick (2018) document that a firm's capability to fund its working capital reinforced by sound profit margin.

5.0 Conclusion

This research aims to present evidence for the first time on stock prices of a special class of firms respond to credit rating changes by studying the price movements around the announcement of credit rating changes. The literature is very rich with studies of credit rating changes on the common stocks, but this study is perhaps the first attempt on the Islamic securities as a special class of common stocks. Previous studies mainly investigate upgrade and downgrade changes, and not on *new* assignment and *affirmation* ratings. Therefore, we are documenting it for the first time for these two classes of credit rating changes while also investigating variables correlated with stock price changes.

The findings document that ethical investment on this special class of stock has a significant influence on the stock returns around the announcement of *new* ratings and *affirmation* ratings. This is a novel result and is valuable news to market participants in Islamic finance. *New* and *affirmation* ratings are perceived to be less important for not contributing any new information,

but our studies show otherwise. Liquidity, leverage and profitability are statistically significant influenced on the *Shariah*-compliance stocks. Gross profit margin (profitability ratio) is the most relevant significant factor with respect to the investigation of factors influencing stock returns.

Overall objectives of this research are: economic and commercial implications of credit rating disclosure effects on stock prices; and the identification of factors affecting stock returns. Individual investors (or fund managers) may gain useful insights from the reported findings since a knowledge of CRA rating changes would reveal the appreciation of values if rating change is positive while negative news value would reduce the value of the firm with *new* and *affirmation* rating announcements. A firm can regard *new* and *affirmation* ratings to assert their financing decision to existing investors and attract potential investors based on the healthy financial position and bright prospects ahead.

This study may give investors some assurances to be more courageous in investing in newly rated *Shariah*-compliant stocks. Both *new* and *affirmation* ratings are informative events based on our findings. The certification role by CRAs will help the less-informed investors lacking in skills and resources to assess credit risk and make better investment decisions. The credit rating announcements reduces asymmetric information between the issuers and investors. Investors may take greater interest on the highlighted financial ratios in this special class of stocks as potential determinants for their monitoring. In this regard, this study endeavors to bridge the gap between theory and practice. Therefore, it is meaningful to examine the impact of stock returns around the rating announcements and factors influencing the stock returns as dependable and informative instruments for investment decisions.

There are some limitations in this research. The sample size is small since the announcement of rating changes is not as large as compared to the mainstream market. We have excluded macroeconomic factors in this research and these could be included in a future study to test for correlation in addition to the firm-specific factors used in this study.

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