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The Relationship Between Profitability and Stock Prices: Evidence from the Saudi Banking Sector

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Abstract
This paper aims to examine whether there is a relationship between the profitability ratios; measured by Net Profit Margin (NPM), Return on Assets (ROA), and Return on Equity (ROE), and the stock market prices of listed banks in Saudi Arabia. In order to introduce this relationship for investors to make investment decisions, Quarterly profitability of the selected banks and stock prices data during 2011 to 2018 are analyzed by panel data regression modeling techniques. This paper has conducted a panel unit root test. The data are shown to be non-stationary at the level with constant and with time trend for some variables, and they became stationary in the first difference for all variables. Therefore, to test the research's hypotheses, Autoregressive Distributed Lag (ARDL) model is used, the results of which implied that there is no long – term rel/ationship between profitability and stock prices, while there is a positive significant association between ROA and stock prices in short–term.
Keywords: Banking Sector, Profitability Ratios, Saudi Arabia, Stock Prices.
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1. Introduction

The relationship between stock prices and the financial rations has attracted considerable attention in the accounting and finance literature. In general, shareholders aim to obtain capital gains from the increased value of shares by investing in shares. In order to maximize profit, investor can benefit from financial ratios and it must be included in the decision- making process on behalf of following right investment strategy. Profitability ratios are one of the financial ratios based on financial statements that can be indicative factors for investors in the preference of stocks they will invest in (Purnamasari et al., 2016, Ferrer and Tang, 2016).

Predicting future stock prices is an important from the point of view of investment's expected return so it is necessary to examine the factors affecting stock prices. According to Guoyi and Renzhong (2009), the volatility of share prices of bank has a significant impact on the direction of the stock market. Saudi Arabia is one of the fastest growing banking markets in the Middle East (SAMA, 2003). The value of shares traded for banks during the year 2017 amounting to SAR194.86 billion that represent 23.30 % of the total value of traded compared to SAR 98.73 billion or 13 % for 2010. In term of number of shares traded (adjusted), the bank and financial services sector reached SAR 9.40 billion shares that represent 21.70% of the total volume traded during the year 2017 while reached SAR 5.87 billion shares or 17.79% for the year 2010 (Tadawul, 2010, Tadawul, 2017).

Profit is the economic justification for the continuity of any firms as it is an important indicator of economic performance assessment. The theories of financial management agreed unanimously that maximizing the wealth of shareholders by increasing the stock market is the main objective to be followed by company's management (Shawer and Al-Ajlouni, 2018).

The aim of this study is to explore whether the profitability performance is the basic cause in determining the value of stocks in the market or there are other factors like rumors and general local and global economic condition not taking in account. In this study, clarification will be made regarding the performance of banks' profit in Saudi Arabia on the prices of their stocks compared to other factors, by knowing the effect of profitability ratios, such as Net Profit Margin (NPM), Return on Assets (ROA) and Returns on Equity (ROE).

The main objective of this study is to evaluate the relationship between profitability and stock prices in selected 11 Saudi banks from 2011 to 2018 using a panel ARDL approach.

The paper is organized as follows: section 1 include introduction, section 2 presents literature review and theoretical framework. Section 3 including the data, the model, estimation method and the test procedure. Section 4 reviews the empirical result. The concluding remark is in section 5.

1.1 Originality

The previous literature was interested in studying the relationship between bank's profitability and its stock price. However, the measurement of this relationship to the banking sector in Saudi Arabia did not take such interest in studies that dealt with the relationship between profitability and stock price. This study is important in the sense that it will be the first study to highlight the determinants (the profitability ratios) that may affect Saudi banks share prices. Therefore, identifying these determinants (profitability ratios) will provide knowledge to the potential investors about the key factors affecting stock prices for the Saudi Banking sector and thus assist them improve their investment strategy.

1.2 An Overview of the Saudi Arabia Banking Sector

The global banking system is undergoing through a period of change driven by shifts in the competitive environment and by regulatory change. Saudi Arabia is one of the fastest growing banking markets in the Middle East (SAMA, 2003). Over the past years, there have been changes in banking sector in the kingdom. For example, introducing new products and services, distribution channels and offering more Islamic banking services. In the near future, commercial banks that are operating in the competitive environment are likely to be more efficient in the region amid technological developments and government favorable policies. "Saudi Arabian banks are among the top-rated ones in the industry, based on capital adequacy, liquidity, provisioning norms and profitability" (SAMA, 2003).

Rising oil prices and the concurrent economic boom in Saudi Arabia benefitted the Kingdom's banking sector, consequently, bank assets and credits increased at a compounded annual growth rate (CAGR) of about 17% and 23%, respectively, during 2002 – 2008 period (Saudi Hollandi Capital, 2011). The general economic recovery since 2010 and the rise in oil prices increased confidence, so the total assets of commercial banks in KSA raised by 4.3% year - on - year (yoy). Saudi banks maintained growth momentum in 2011 and total bank assets grew by 8.5% (yoy) to SAR 1436.9 billion from SAR 1324 in 2010 (Saudi Hollandi Capital, 2011). Saudi banks expect to see double digit assets growth by early 2020, because it supported by government plans to diversify its oil-based economy.

Table 2. Type of Saudi banks

Traditional Banks	Shariah - Compliant (Islamic Banks)
Alawwal Bank	Al Rajhi Bank
Arab National Bank	Alinma Bank
Banque Saudi Fransi	Bank Albilad
Riyad Bank	Bank AlJazira
Samba Financial Group	
Saudi British Bank	
Saudi Investment Bankthe National Commercial Bank	

Source: (AL Jazeera Capital, 2018).

Over the last decade, there has been a growth in local bank budgets (aggregate $ 138 bio) through internal capital generation. Saudi Arabia's banking system is integrated well with international banking, as seven out of eleven banks operating in the kingdom have foreign shareholders.

The Saudi banking sector has 12 listed and other non- listed banks. The 12 banks listed show in table 1 above. "Of the 12 banks, Al Rajhi Bank, Alinma Bank, Bank Albilad, and Bank AlJazira are Shariah-compliant and account for 26.5% of total banking assets" (AL Jazeera Capital, 2018).

The Saudi stock market (Tadwual) has witnessed many fluctuations during 2016, which influenced by local and international economic conditions. This including the political situation in the region and structural reforms of the local economy. The bank and Financial Services sector has jumped 9.2 % YoY at the end of 2016. The shares of 4 banks have increased compared with 8 losing shares. The market value of bank sector has reached SAR 429.3 billion, that is equivalent to 26% of total market value. The Saudi banks posted lowest profitability growth witnessing a marginal increase of 1.7 % YoY in 2010 (Al bilad Capital, 2017).

2. Literature Review and Theoretical Framework

2.1 Literature Review

The relationship between stock returns and publicly available information has attracted considerable interest in many literatures over the last forty years. Many studies have dealt with the factors that affect stock prices in the market in general or those related to the performance as measured by financial ratios. The literature, which discussed the factors affecting market stock price, was divided into different groups. The main group of these studies discussed the internal factors that affect market stock prices, each of these studies took a range of internal performance factors such as net profit margin, earnings per share, dividend per share price earnings ratio, the return on assets, the return on equity, book value per share, debt equity ratio, total asset turnover ratio and dividend yield (Bayrakdaroglu et al., 2017, Susilowati, 2015, Om and Goel, 2017, Bhattarai, 2014, Uwuigbe et al., 2012, Srinivasan, 2012). Other group of studies focused on the macro economic factors that affect the stock prices, such as gross domestic product, inflation, interest rate, consumer price index and exchange rate and money supply (Al-Majali and Al-Assaf, 2014, Narayan et al., 2014, Celebi and Hönig, 2019, Demir, 2019).

This study will discuss and focus on some of the internal factors influence on market prices, as it relates to the purpose of the current study in more details. Ball and Brown (1968) in their early study, test the relationship between accounting profits and stock prices for 261 companies listed on the New York Stock Exchange for the period from 1957 – 1965. The result indicated that the annual profit and the information on the number of this profit have a significant impact on the share prices compared to the impact of the rest of the information before the announcement of profits.

The relationship between profitability rations and stock prices was examined by (Bayrakdaroglu et al., 2017). Panel data regression was used between stock prices of 87 firms in ISE100, and their profitability ratios such as gross profit margin (GPM), operating profit margin (OPM), net profit margin (NPM), return on asset (ROA) and return on equity (ROE). The result shows that there was a positive linear relationship between the net profit margin of companies and their stock prices. The study recommended taking the net profit margin into consideration when making investment decision. Susilowati (2015) has done a similar exercise on the Indonesian Stock Exchange, using different internal factors such as Return on Asset, Return on Equity, Net profit Margin and Earning per share. The author used the data from ISE for enlisted of companies in Indonesian Stock Exchange in 2008 –2011 period using regression analysis. The results of the analysis show that Return on asset has a significant negative effect on the stock price, while return on equity, Net profit margin and Earing per share have a positive effect on the stock price. He concludes that Return on Asset, Return on Equity, Net Profit Margin, and Earning per Share simultaneously affected significantly the stock price.

Saldanli et al (2017) has recently examined the causality relationship of the stock prices of ten deposit banks traded in Borsa Istanbul using the VECM Granger causality approaches over the period between June 2007 and October 2016. They tested the causality relationship between three variables such as industrial production, exchange rates and money supply. The results show that the industrial production index is not considered to be one of the determinants of share prices for banks examined.

Research Hypotheses

The basic motivation of this paper is to determine if there is a relationship between the profitability ratios and stock prices of banks traded on the Saudi stock market. These ratios can be a guiding factor for investors' investment decisions.

This study attempts to test the following hypotheses:

- There is a significant relationship between Net Profit Margin (NPM) and Stock Prices.
- There is a significant relationship between Return on Asset (ROA) and Stock Prices.
- There is a significant relationship between Return on Equity (ROE) and Stock Prices.

2.2 Theoretical and Conceptual Framework

2.2.1 Profitability Ratios

Profitability ratios are financial benchmarks used to measure and evaluate the company's ability to generate income related to revenues, balance sheet assets, operating cost and shareholders' equity within a specific period of time (CFI Education, 2015, Lesakova, 2007).

2.2.2. Net Profit Margin (NPM)

Net profit margin (NPM) is the ratio of net profits to sales or revenue for a business or business segment and it measures as a percentage. Generally, the higher your NPM, the better for your business (Winicki, 2019).

2.2.3 Return on Assets (ROA)

Return on Assets measures the efficiency of companies in the use of assets, higher ROA value indicates better firm's performance (Rosikah et al., 2018). It also measures the level of income versus shareholders' investments rather than total assets. According to Brigham and Houston (2001), ROA defined as net income (net profit after taxes) divided by total assets.

2.2.4 Return on Equity (ROE)

Return on Equity is a measure of the efficiency with which the company employs owner´s capital. It is an estimate of the earnings of invested equity capital, or alternatively, the percentage return to owners on their investment in the firm (Lesakova, 2007). It can be used to measure of financial performance, however no analyst should infer that a higher ROE is always better than a lower one, because ROE is prone to three problems such as a time problem, a risk problem and a value problem. It calculated based on division of net profit after tax and total equity (Lesakova, 2007).

3. Data Collection and Methodology

3.1 Data

The study depending on ARDL method to identify the relationship between the profitability of the banking sector and stock prices. It includes quarterly profitability and stock prices data for eleven Saudi banks listed in Saudi Stock Exchange (Tadawul), excluding the National Commercial Bank due to lack of data. The dependent variable used in this study is stock price, measured in SAR "Saudi Riyal". Three determinants of profitability ratios are used such as Net Profit Margin NPM, Return on Assets ROA, and Return on Equity ROE. The estimation analysis of this paper is based on total panel observations of 352 and the span of the panel is from 2011- Q1 to 2018- Q4. This paper uses the EViews package for estimation and testing the hypotheses of this study.

Quarterly data covering for the period (2011-2018) were used, based on Bloomberg database and Saudi Stock Exchange (Tadawul). It is observed that all the variables in this paper used the natural logarithm (excluding Net

Profit Margin because they contain negative values). It was confirmed that the logarithmic regression of the econometric model is the best form of function model based on several criteria, most notably the coefficient of selection and Sargan (Maddala and KIM, 1998). The estimated parameters therefore reflect flexibility.

Table 2 below shows the average profitability ratios for the banking sectors during the study period, where table 3 summaries the common sample descriptive statistics. It shows (table 3) from the Kurtosis statistics; all variables distribution is Leptokurtic[1] with positive skewness, except net profit margin has a negative skewness. The major conclusion from these shape statistic is that, it cannot confirm that all these distributions are normal, this can be confirmed by the Jarque – Bera test which is considerable evidence to reject the normality null hypotheses for all these distributions.

Table 3. Average Profitability Ratios for the banking sectors during the study period

Year	Period	Price	NPM	ROA	ROE
2011	Q 1	244.39	5.416	0.167	1.210
	Q 2	225.77	5.598	0.180	1.248
	Q 3	209.37	5.282	0.199	1.346
	Q 4	214.35	4.807	0.205	1.396
2012	Q 1	268.26	6.027	0.224	1.567
	Q 2	225.99	5.797	0.229	1.580
	Q 3	225.01	5.363	0.229	1.583
	Q 4	219.56	5.469	0.227	1.587
2013	Q 1	226.63	5.814	0.211	1.501
	Q 2	253.20	5.934	0.213	1.497
	Q 3	266.70	5.893	0.217	1.525
	Q 4	274.85	5.280	0.212	1.507
2014	Q 1	312.39	5.675	0.212	1.522
	Q 2	307.36	6.001	0.212	1.523
	Q 3	367.64	5.721	0.212	1.501
	Q 4	301.37	5.742	0.213	1.529
2015	Q 1	312.45	5.744	0.212	1.542
	Q 2	318.23	6.189	0.219	1.606
	Q 3	263.00	5.823	0.218	1.593
	Q 4	240.21	5.323	0.212	1.542
2016	Q 1	218.54	5.756	0.211	1.542
	Q 2	215.64	5.768	0.200	1.425
	Q 3	187.33	4.888	0.195	1.369
	Q 4	245.90	3.556	0.181	1.238
2017	Q 1	233.32	5.454	0.178	1.202
	Q 2	256.15	5.428	0.174	1.182
	Q 3	259.80	5.490	0.183	1.224
	Q 4	259.05	4.617	0.197	1.289
2018	Q 1	288.30	5.604	0.202	1.320
	Q 2	324.57	5.635	0.205	1.326
	Q 3	328.02	5.593	0.210	1.343
	Q 4	331.40	5.101	0.216	1.388

[1] "A leptokurtic distribution has excess positive kurtosis, where the kurtosis is greater than 3" Horse, T. 2019. *Kurtosis: Definition, Leptokurtic, Platykurtic* [Online]. WordPress. Available: https://www.statisticshowto.datasciencecentral.com/probability-and-statistics/statistics-definitions/kurtosis-leptokurtic-platykurtic/#leptokurtic [Accessed June 15 2019].

Table 4. Descriptive Statistics Data

Variable	PRICE	NPM	ROA	ROE
Mean	23.93392	0.499369	0.018679	0.129980
Median	20.49500	0.526950	0.018650	0.128700
Maximum	87.90000	0.816700	0.036400	0.246600
Minimum	7.030000	-0.273600	0.002500	0.010300
Std. Dev.	15.28058	0.135064	0.005464	0.041808
Skewness	2.063949	-0.994430	0.361855	0.072235
kurtosis	7.227755	5.256440	4.402184	3.678785
Jarque –Bera	512.0640	132.6906	36.51821	7.063762
Probability	0.000000	0.000000	0.000000	0.029250
Observations	352	352	352	352

Source: the result use EVIEWS 9.

3.2 Methodology

In previous studies, different methodologies were used to estimate the relationship between the profitability and stock prices for bank sector, however, this study will use the most frequently method such as Panel data unit root tests and a Panel Granger Causality test.

To empirically investigate the relationship between banks profitability and stock prices, this paper employs an asymmetric version of the autoregressive distributed lag model (ARDL) to determine long-run and short-run effects of this relationship. The pooled mean group (PMG) approach in the panel ARDL framework have introduced by (Pesaran et al., 1999) . Pesaran et al. (2001) has extended ARDL model in order to incorporate I (0) and I (1) variables in same estimation. According to Pesaran et al. (1999) "the homogeneity in the long-run relationship can be attributed to several factors such as arbitration condition, common technologies, or the institutional development which was covered by all groups". In my analytical framework, this homogeneity may be the consequence of the distant goal of knowing the internal factors that affect stock prices and adding these factors as sources that investors can use to make the right investment decision. The panel ARDL method had been used by many researchers such as (Binder and Offermanns, 2007, Bildirici and Kayıkçı, 2012, Boubaker and Jouini, 2014).

Assume an autoregressive distributive lag (ARDL) (p, q1, q2,...., qN) dynamic panel specification is given as follows:

$$y_{it} = \sum_{j=1}^{p} \delta_i Y_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} X_{i,t-j} + \varphi_i + e_{it} \quad (1)$$

Where $\boldsymbol{y_{it}}$ denotes the dependent variable (stock price in this research); $\boldsymbol{X_{it}}$ is a $k \times 1$ vector of explanatory variables that allowed to be purely I (0) or I (1)(such as net profit margin, return in asset, return in equity) ; $\boldsymbol{\delta_{ij}}$ is the coefficient of the lagged dependent variable scalars; $\boldsymbol{\beta_{ij}}$ is $k \times 1$ coefficient vectors; $\boldsymbol{\varphi_i}$ is the unit-specific fixed effects; $\boldsymbol{i}$ denotes a specific unit and is varying from 1 to N; $\boldsymbol{t}$ is time trend *(t= 1, 2, 3 ...T)* ; $\boldsymbol{p, q}$ are optimal lag orders; $\boldsymbol{e_{it}}$ is the error term.

The error- correction form of the ARDL model is used to test the short-run relationships between variables are written as follows:

$$\Delta y_{it} = \theta_i \left[y_{i,t-1} - \lambda_i X_{i,t} \right] + \sum_{j=1}^{p-1} \xi_{ij} \Delta y_{i,t} + \sum_{j=0}^{q-1} \beta_{ij} \Delta X_{i,t-j} + \varphi_i + e_{it} \quad (2)$$

Where $\theta_i = (1 - \delta_i)$, specific speed of adjustment coefficient (expected that $(\theta_i < 0)$

if $\theta_i = 0$, then there would be no evidence that there is a long- run relationship, and this parameter is expected to be significant negative, if the variables exhibit a return to long – run equilibrium; λ_i = vector of long–run relationships; $e_{it} = [\, y_{i,t-1} - \lambda_i X_{i,t} \,]$ the error correction term; ξ_{ij} , β_{it} are the short run dynamic coefficient.

4. Results and Discussion

4.1 The Model

As expected, Saudi banks sector price can be affected by numerous other variables besides the profitability. In order to test the research's hypotheses, Autoregressive Distributed Lag (ARDL) model is used, to estimate the relationship between profitability and stock price. The first step in the estimation is to start the empirical estimation of the relationship between profitability and stock price, used log-linear equation as follows:

$$\Delta \ln Stock\ Price_{it} = C_0 + \beta 1 NPM_{it} + \beta 2 \ln ROA_{it} + \beta 3 \ln ROE_{it} + \varepsilon it \quad (3)$$

Where: Net Profit Margin (NPMit) = Net Income divided by Revenue.

Return on Assets (ROA_{it}) = Net Income divided by total assets.

Return on Equity (ROE_{it})= Net Income divided by equity.

C0 = Constant term of the model.

β1, 2, 3 = Parameters of the model.

ε = Random.
it = i and t cross section and time in the panel, respectively.

This model will describe the relation between the study variables. The model used, include four variables such as, Stock prices, Net Profit Margin, Return on Asset and Return on Equity. It suggests that the stock price as a dependent variable, where Net Profit Margin, Return on Asset and Return on Equity the independent variables.

4.2 Empirical Strategy and Main Result

This study uses EVIEWS 9 program to estimate the study model using panel data for 11 banks for 32 quarters.

4.2.1 Correlation Analysis

The second step in the estimation is to test the correlation between variables. The correlation analysis is a technique that can test whether and how strongly pairs of variables are related. This research tests the correlation between net profit margin, return on asset, return on equity and stock price.

Table 5. Correlation Analysis results

Variables	Correlation	t-Statistic	Probability
Price	1.000		
NPM	0.284696	5.55609	0.0000
ROA	0.664361	16.62945	0.0000
ROE	0.580125	13.32446	0.0000

Source: the result use EVIEWS 9.

The results in table 4 show that, there is a weak relationship between net profit margin(NPM) and bank stock prices, and a strong and significant a relationship between return on asset (ROA) and stock prices at 0.66 and this result is consistent with (Susilowati, 2015).

4.2.2 Unit Root Test (URTs)

The third step in the estimation is to test the stationarity property of each variable under study. For this purpose, the diagnostic tests for panel unit root tests will be applied, where it has limited power, the power of a test is the probability of rejecting the null hypotheses when it is false and the null hypotheses is unit root (Maddala and KIM, 1998). Levin, Lin & Chu unit root (LLC) test were used and it has suggested the following hypotheses:

H_0: each time series contains a unit root.
H_1: each time series is stationary.

The null hypotheses are $\rho = 0$ and the necessary condition for the Levin-Lin-Chu test is $\sqrt{NT}/T \rightarrow 0$, while sufficient conditions would be $N_T/T \rightarrow 0$ and $N_T/T \rightarrow \kappa$. (N_T means that the cross-sectional dimension N is a monotonic function of time dimension T).

Table 6. Levin – line – Chu Test (LLC) Results

Panel Unit Root Test (ADF)				
Variables	At Level		At First Difference	
	Constant	Constant & Trend	Constant	Constant & Trend
PRICE	-1.61537**	-0.56851	-15.2840 ***	-12.8423 ***
NPM	-7.83652***	-6.61664***	-16.1538***	-13.2689 ***
ROA	0.47728	3.80935	-4.20858***	-3.76277***
ROE	-2.86503***	3.80935	-4.30988***	-2.05549 ***

Note: (*) indicates that the parameter is significant at 10%, (**) indicates that the parameter is significant at 5%, (***) indicates that the parameter is significant at 1%.

The result in table 5 shows that some variables are non-stationary at the level with constant (e.g ROA) and with time trend (e.g ROA, ROE & Price), and they became stationary at the first difference for all variables. The result of (LLC) at 1st Difference is expose that reject the Null hypotheses (H_0: has a unit root) and accept the alternative assumption (H_1: has no unit root). These results (reject the null of unit root) were consistent with (Oh, 1996) and (Wu, 1996).

4.2.3 Panel Granger Causality

The fourth step in the estimation is to investigate the possibility of Granger causality relationship between the logarithms of stock prices and profitability in eleven banks listed in Saudi Arabia from 2011 to 2018.

Table 7. Panel Causality Tests Result

P- value	F – Statistic	The Direction of Causality
0.85	0.16266	NPM ⇏ LnStock Price
0.55	0.59628	LnROA ⇏ LnStock Price
0.51	0.67316	LnROE ⇏ LnStock Price
0.0183**	4.05231	Ln Stock Price ⇒ NPM
0.0016***	6.55911	Ln Stock Price ⇒ LnROA
0.0085***	4.84286	Ln Stock Price ⇒ LnROE

Test use EVIEWS 9. Note ***, **, * indicate the significance at 1%, 5% and 10% level, respectively. NPM, ROA and ROE. indicate the Net Profit Margin, Return on Assets, and Return on Equity, respectively.

The result of the panel causality test is shown for all study variables with 2 Lags Interval in Appendix 1. Table 6 summers only the presentation of the variables that shows the results of a causal relationship between them, whether in one direction or a mutual direction. According to the finding of the causality test, the causality relationship from profitability ratios (NPM, ROA, ROE) and stock prices has no significance level of 1%, 5% or 10 %. In this regard, it could be interpreted as the profitability ratios provide no useful information for the stock prices of the banks in question. In another word, profitability Ratios have got no impact on these banks' stock prices, and vice versa, there is a causality relationship from stock prices to net margin with a significance level of 5% and 1% for return on assets and return on equity. Where the result of the assessment requires to accept the null hypotheses, which indicted there is no causality relationship between net profit margin, return on assets, return on equity and stock prices in Saudi bank sector.

4.2.4 Estimating (ARDL) Model

Since some of the variables are stationary at the level and some are in the first difference, it finds that the appropriate to use the ARDL method, especially the number of time period is greater than the number of cross sections. Fig. 1 shows the determine the optimal delay and ARDL pattern, Schwart's lowest criterion is related to ARDL (4,3,3,3). Thus, the optimal pattern is (4,3,3,3).

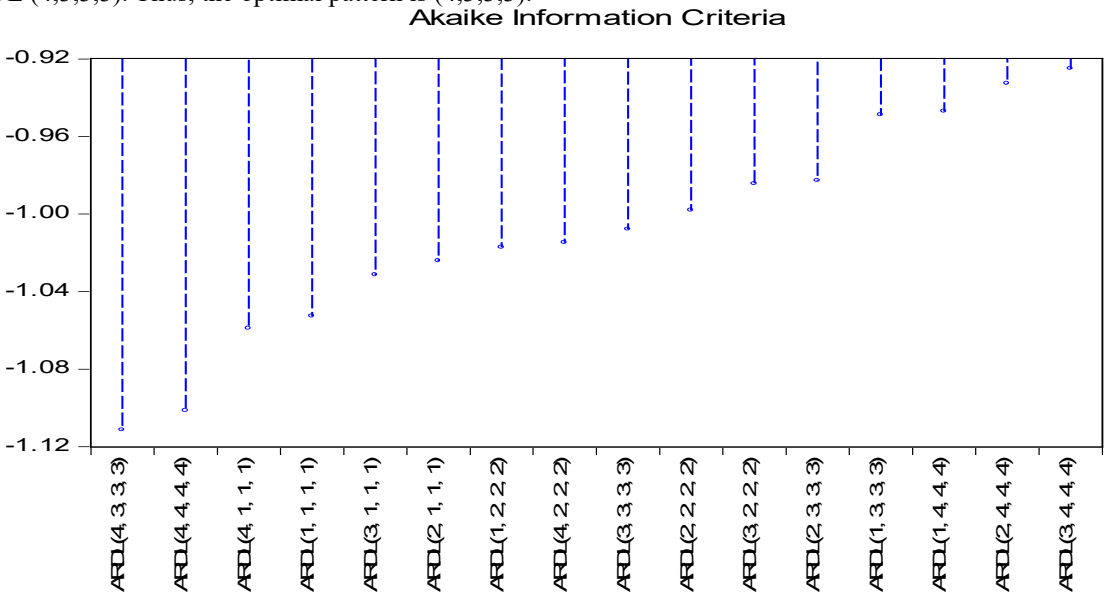

Figure 1. Selection Optimal Model ARDL According to Schwarz Criterion.
Source: the result use EVIEWS 9.

Table 8. (ARDL) Model Results of estimating long- term and short-term coefficients by PMG - ARDL (4,3,3,3) dynamic estimator.

	Variable	Coefficients	t-Statistic	Probability value (PV)
Long-term coefficients (LR)	NPM	-1.080932	-1.079050	0.2819
	Ln (ROA)	-0.457492	-1.220237	0.2238
	Ln (ROE)	-0.181246	-0.700760	0.4843
Short-term coefficients (SR)	D.Ln price (-2)	0.231092	2.821702	0.0053***
	D(NPM)	0.317907	1.578396	0.1161*
	D.Ln ROA (-2)	1.067268	2.436579	0.0157***
	D. Ln ROE (-1)	0.281316	0.732275	0.4649

Note ***, **, * indicate the significance at 1%, 5% and 10% level, respectively.
Source: Result use EVIEWS 9.

The result in table 7 shows the estimation of overall form of research in the formwork of the ARDL (4,3,3,3). "According to theoretical expectations, the error-correction coefficient sign (ECM) is negative and between zero and 1 and is statistically significant" (Fazli and Abbasi, 2018). It can be seen that, there is no long – term relationship between the explanatory variable (stock prices in this research) and the dependent variables (Profitability) (the long-run for all variables are significantly negative as expected). However, they have a positive effect in short- term.

5. Conclusion

To test the relationship between profitability and the stock prices of 11 banks that are traded in Saudi stock market, Panel data analysis techniques were used. To this end, the causality relationship between the profitability and stock prices of these banks was examined via the Panel Granger Causality test. The causality test was used to test the causality relationship between the profitability ratios and stock prices of the banks. The results conclude that there was a causality relationship with level of 1% and 5% for banks' prices and profitability, and there was no causal relationship between profitability and price. In addition to this, the Autoregressive Distributed Lag (ARDL) model was used to determine long-run and short-run effects of this relationship. No log-term relationship was identified for banks profitability and its stock prices; however, they have a positive effect in short- term.

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Appendix

Appendix 1: Pairwise Granger Causality Tests

Pairwise Granger Causality Tests
Date: 04/19/19 Time: 21:13
Sample: 2011Q1 2018Q4
Lags: 2

Null Hypotheses:	Obs	F-Statistic	Prob.
NPM does not Granger Cause LOG(PRICE)	330	0.16266	0.8500
LOG(PRICE) does not Granger Cause NPM		4.05231	0.0183
LOG(ROA) does not Granger Cause LOG(PRICE)	330	0.59628	0.5515
LOG(PRICE) does not Granger Cause LOG(ROA)		6.55911	0.0016
LOG(ROE) does not Granger Cause LOG(PRICE)	330	0.67316	0.5108
LOG(PRICE) does not Granger Cause LOG(ROE)		4.84286	0.0085
LOG(ROA) does not Granger Cause NPM	330	5.81622	0.0033
NPM does not Granger Cause LOG(ROA)		1.86078	0.1572
LOG(ROE) does not Granger Cause NPM	330	2.82539	0.0607
NPM does not Granger Cause LOG(ROE)		0.59726	0.5509
LOG(ROE) does not Granger Cause LOG(ROA)	330	2.35317	0.0967
LOG(ROA) does not Granger Cause LOG(ROE)		1.75630	0.1743

Appendix 2: The ARDL Results

Dependent Variable: DLOG(PRICE)
Method: ARDL
Date: 05/29/19 Time: 05:01
Sample: 2012Q1 2018Q4
Included observations: 308
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): NPM LOG(ROA) LOG(ROE)
Fixed regressors: C
Number of models evalulated: 16
Selected Model: ARDL (4, 3, 3, 3)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
NPM	-1.080932	1.001744	-1.079050	0.2819
LOG(ROA)	-0.457492	0.374921	-1.220237	0.2238
LOG(ROE)	-0.181246	0.258642	-0.700760	0.4843
Short Run Equation				
COINTEQ01	-0.320824	0.097904	-3.276929	0.0012
DLOG(PRICE(-1))	-0.114410	0.080181	-1.426901	0.1552
DLOG(PRICE(-2))	0.231092	0.081898	2.821702	0.0053
DLOG(PRICE(-3))	0.224487	0.084350	2.661379	0.0084
D(NPM)	0.317907	0.201412	1.578396	0.1161
D(NPM(-1))	0.090260	0.233722	0.386185	0.6998
D(NPM(-2))	-0.004023	0.180230	-0.022324	0.9822
DLOG(ROA)	0.275214	0.470862	0.584491	0.5596
DLOG(ROA(-1))	0.413655	0.430030	0.961920	0.3373
DLOG(ROA(-2))	1.067268	0.438019	2.436579	0.0157
DLOG(ROE)	0.162559	0.563736	0.288360	0.7734
DLOG(ROE(-1))	0.281316	0.384167	0.732275	0.4649
DLOG(ROE(-2))	-0.005151	0.267227	-0.019277	0.9846
C	0.466624	0.184103	2.534584	0.0120

Mean dependent var	0.018058	S.D. dependent var	0.146155
S.E. of regression	0.111904	Akaike info criterion	-0.972436
Sum squared resid	2.441876	Schwarz criterion	0.750831
Log likelihood	328.1488	Hannan-Quinn criter.	-0.286659

*Note: p-values and any subsequent tests do not account for model selection.