Proposed Model for Forecasting the Intrinsic Value of Commercial Applied to Commercial Banks Listed on the Bahrain Stock Exchange

Tharwah Shaalan[1]

[1] Assistant professor, Business Administration faculty, Finance and Economics Department, Taibah University, KSA

Correspondence: Tharwah Shaalan, Assistant professor, Business Administration faculty, Finance and Economics Department, Taibah University, KSA. Tel: 966-014-8618-888-4533. E-mail: tshaalan@taibahu.edu.sa

Abstract

Here we propose a model to evaluate and forecast the intrinsic value of banks, a more appropriate approach as opposed to considering their valuation based on market value. This is because the capital markets in the Arab region, when viewed within the framework of a set of explained variables, prove to be inefficient. These variables include: profitability, capital adequacy, weights of the bank assets that indicate the associated size and various risks according to the Basel committee's two and the operational efficiency variable. The last variable in question reflects the efficiency of the bank's internal operations, and the total investments of a commercial bank as proxy of the size of bank assets and financial leverage: the impact of the financial risk on the intrinsic value of the commercial bank. The study used the multi-regression panel data to forecast the value of banks using cash flows approach discounted at the weighted average cost of capital of both equity and borrowed capital. The study found that the three variables: capital adequacy, operational efficiency, and financial leverage explained the intrinsic value of Bahrain commercial banks. The study structure included the following: introduction, review of the relevant literature, hypotheses, methodology and data, mathematical model, empirical results, conclusion, and finally recommendations.

Keywords: intrinsic value, commercial bank, cashflows approach

1. Introduction

Accessing the value of firms in the Arab region using a book approach could lead to problems and relying on the market valuation could prove to be inaccurate. This is because the capital markets of the region, classified as weak and emerging, are inefficient. Many finance scholars, therefore, have resorted to an alternative approach, that is, the discounted cash flows approach. This approach is based on the capacity of an asset to generate future cash flows during the life of the enterprise. This is not considered as a separate approach from the market, but it does help correct deviations incurred by using the market approach. This study is based on the Gordon growth model (GGM) which was proposed by Gordon in 1962. Gordon assumed that the growth rate should be greater than the cost of capital. In this study, the growth rate is assumed to be equal to zero. This is because the cash flows of banks in some years were negative, and the study is also based on the Mayer (1974) approach, which uses a valuation method based on the present value method; separating cash flows into two components—cash flows resulting from financing decisions and cash flows resulting from firm decisions—and discounting at a rate that reflects the cost of capital.

2. Review of the Relevant Literature

The studies by Ibid (1993), Shaker (1996), and 1993) aimed to propose a model for estimating the value of the public companies in Egypt and, therefore, a fair estimate of the value of these firms. There were, they found, differences between the performance of the studied groups, and they were unable to predict the value of the firms since the cash flow and growth rates were negative. Similarly, Shaker (1996) tested an approach to estimate the value of enterprises, attempting to achieve a quantitative model that interprets the value of the corporation. This model included the profitability and liquidity variables, the efficiency of financing decisions and investment decisions, and the efficiency of operational performance. Shaker concluded that these variables have varying explanatory powers and different relations of direction. In the same context, Marrar, Ayyad, and Awad (2012) published a study entitled "The intrinsic value and market value of the ordinary share: proof of PSE," in which they examined the positive relationship between intrinsic value and market value. They found that the value of the market indicates the variations in the intrinsic value and that demand factor is the primary determinant of the market value of the Palestinian stock exchange. Radim (2012),

using a modified historical model to estimate the intrinsic value of the share, reviewed the various methods of fundamental analysis used to test the shares. In the study, Radim's model mainly focused on the historical model, modifying it using the selected accounting indicators on the Boragh Exchange. The model was used to compare the accuracy of the accounting value estimates with the accuracy of the intrinsic value estimates. Both values, it was found, are affected by time. This model can also help potential investors make correct investment decisions. Kusuma and Chaitanya (2014) tested the ability of the intrinsic value to give the investor the possibility of a real valuation of the stock and the possibility of applying the intrinsic value and compare it to the average market value from 2012–2013.

Kusuma and Chaitan (2014) tested the ability of intrinsic value to give investors a real valuation of a stock and compare it to the average market value for 2012 and 2013. Al-zararee and Al-azzawi (2014), in their study ""Cash flow impact on company value" attempted to verify the relationship between cash flows and ownership over the market value of pharmaceutical industrial companies in Jordan, a place where there is still a need to bridge the gap between theory and practice, considering fixed capital, working capital, and cash flows of ownership. Dion, from 2004 to 2010, used the time series method to determine the market value of companies (despite the difficulties related to the economic situation and the precarious operational status of the companies, which likely affected the study variables). Dion found that the free cash flow has a significant positive effect on the market value of the firm shares. Jenkinson and Landsman (2015) aimed to assess the expectations of private equity managers regarding discounted cash flows. Their study included 483 Spanish investment funds for the period 1988–2011, and they detected a concentration of net asset value on cash flows at the start of the fund's lifetime, which was an exciting result for non-biased fund managers to test assets and maintain optimal portfolios for their investors. The authors also found evidence of poor performance of fund managers to maintain a high valuation of assets so as to get higher fees. In the banking sector, Gharbi and Khamoussi (2016) explored the impact of fair value by comparing Islamic banks (n = 20) and traditional banks (n = 40) in the GCC region. They analyzed the impact of changes in fair value accounting on bank infections between 2003 and 2008, finding the fair value to be linked to Islamic and traditional banks operation in the GCC.

Addressing the relationships between banking risk, operational efficiency, and banking concentration and commercial bank performance, Bergstresser (2001) aimed to assess the relationship between the concentration in the banking market of commercial banks and the risks of the loan portfolio. This study used changes in competition in local banking markets that occurred between 1980 and 1994 to assess the impact of market competition on the form of risk that commercial banks face in lending. It was found that increasing concentration in deposits was associated with low mortgage lending, which is one of the riskiest loans and accompanied by a 20% drop in lending to the real estate sector. Additionally, control variables supported the causality of the experimental relationship. The concentration also seemed to increase the bank's average capital as well as the average share of assets destined for lending and to reduce bank failure rates during this period. Also, the change in bank portfolio risk affected the value of government commitments towards the banking sector as well as the health and stability of the largest financial sector in the economy. Altunbas, and Carbo et al. (2004) tested the relationship between capital, risk, and efficiency of a large sample of European banks between 1992 and 2000. The European banks were found to be inefficient, and this appeared to result from a significant increase in capital and decrease in risk. This study detected a positive relationship between risk and the level of capital and liquidity, which might indicate the use of capital to restrict risky activities. These authors also found evidence for the financial strength of the corporate sector, which has a positive impact on reducing bank risks and capital levels. Moreover, there are no significant differences in the relationship between capital and efficiency to the risks of commercial banks and savings banks.

Based on the balanced approach of the performance measurement of the firms, Kholi (200a) and Kholi (200b), relied on the balanced scored cart model, which was also used by Kaplan and Norton, and included a variety of performance measures related to four areas: financial performance, customer relations, internal operations, and learning and growth activities. The measurements were derived from a balanced performance measurement model of the facility's vision and strategies, and focused on what matters to customers, employees, and investors. These studies also addressed the disadvantages of the balanced measurement model, including the presumption of causation, which is not valid; this is because the causal relationship requires a time interval between cause and effect, something that is not addressed by the balanced measurement model. The model thus assumes a questionable imposition. Moreover, it is a hierarchical model, which exposes it to many criticisms, such as a failure to consider the uncertainties associated with the strategy. Kholi (200b) tested the relationship between the internal performance measures and the market value of business sector firms in Egypt. Kholi's study was designed to test the viability of the measures of economic value added and the extent to which this measure exceeds the traditional accounting performance measures. Many independent variables were used (economic value added, remaining rate of return, the economic value added of the share, net operating profit, the rate of return on a property right, cash distributions per share). It was found that 40% of the changes in added market value

cannot be explained by financial variables (traditional accounting, residual income, and value-added economic measure). Therefore, businesses aiming to improve their market value should consider other non-financial metrics within the performance measure.

3. Hypotheses

3.1 The rate of equity return, bank adequacy, liquidity, profitability, operational efficiency, leverage, and size of assets (the independent variables) have no statistically significant effect on the commercial bank's intrinsic value (the dependent variable).

3.2 The independent variables are unrelated to each other.

3.3 There is no autocorrelation between residuals.

3.4 Random error is normally distributed

3.5 A model that predicts the bank's intrinsic value cannot be achieved.

4. Methodology and Data

4.1 Using Stata program (version 14A)

A multi-linear regression method was used for each year at the level of all banks, and the level of each bank for all years (panel date multilinear regression).

The study covered 12 years: from 2004–2015.

The statistical test was carried out on four commercial banks registered in the Bahrain Stock Exchange: the Bahraini-Kuwaiti Bank (BBK), the National Bank of Bahrain (NBB), the Ahli United Bank (AUB), and Muscat Bank (MB).

4.2 Study Variables and Descriptions

ROE refers to the rate of return on property right: This variable reflects the ability of funds owned to generate cash flows represented in a series of profit streams.

CA variable reflects the sufficiency of the bank's capital, weighted by the asset risk weights with weights that reflect the degrees and levels of risk in accordance with the Basel II classification of banks.

Natural logarithm of asset size LNA reflects the total investment available to the bank as measured by the natural logarithm of asset size.

TL/TA Leverage reflects the bank's risks related to total bank obligations due to total assets.

Leverage EQ/TA reflects the banking risks related to the level of title and its relationship with total assets.

LA/TA indicates the ratio of liquid assets to total assets. It reflects the impact of the asset's investments on the intrinsic bank value.

Dependent variable: The INTV Bank intrinsic value index was estimated through the operating cash flow value divided by the weighted cost rate of the funds, where it reflects the cost of both the funds owned and the cost of the debt (deposits). We relied on the distributions model of Gordon (1959), which calculates the value of the arrow with a zero-growth rate and is theoretically unacceptable. We also adopted the Myers model (1974) to separate the cash flows into two parts: the funds owned, and the funds borrowed. The bank's intrinsic value index was calculated by dividing this value by the total assets. If the value of this indicator is > 1, this means the intrinsic value index is efficient; whereas if the value is < 1, this means the bank intrinsic value index is inefficient.

4.3 Mathematical Model

$$Yi = b_0 + b_1 x_1 + b_2 x_2 + \ldots + b_p x_{Pi} + \varepsilon_i = 1, \ldots, n \tag{1}$$

Where

∘ Y_i: response variable

∘ $x_1, \ldots, x_p$, are predictor variables (Random-effects)

∘ $b_0, \ldots, b_p$ are regression coefficients

∘ $\varepsilon_i \sim_{ii} d\ N(0, \sigma 2)$ is the error variable

5. Empirical Results

5.1 Hypothesis One

Based on our analyses, for Hypothesis One, we reject the null hypothesis and accept the alternative hypothesis. This is because of the existence of a statistically significant relationship with the explained variables, including the bank adequacy. The value for this variable (t= 0.02) was associated with an inverse relationship; the greater the bank adequacy, the lower the intrinsic value of the commercial bank. The operation efficiency was significant (t = 0.02), and this variable was associated with a positive correlation; as the operational efficiency increases, the value of the bank increases. The variable leverage was also significant (t= 0.04), and it was again associated with a positive correlation: as the bank's financial risk increased, the intrinsic value increased in this analysis. The adjusted r-squared value was 48.42%, and the probability of the regression model was (F = 0.0000). These findings show that the independent variables could account for 48.24% of the intrinsic bank value, with the remaining value depending on other factors. Tables (1) and (2) explain the results of our testing of Hypothesis One.

Table 1. ANOVA result

Source	SS	df
Model	380.25	7
Residual	294.46	40
Total	674.72	47
Prob > F	0.00	
R-squared	0. 56	
Adj R-squared	0.48	
Root MSE	2.72	

Table 2. Regress results

INTV	Coef.	P>|t|
ROE	-27.69	0.09
OE	14.41	0.02*
CA	-15.76	0.02*
LR	4.97	0.20
TLTL	8.22	0.21
EQ	55.68	0.04*
LNA	-0.39	0.61

* P > 0.05, ** P >0.01

The results of a multi-linear regression analysis using a model (random-effects GLS regression) for each of the four banks showed that the overall gradient had an R-squared value of 0.56, indicating that the three variables (operational efficiency, bank capital adequacy, and the financial leverage) could explain 56% of the dependent variable (Fig. 1 and (Table 3).

Table 3. Random-effects GLS regression

Number of observations		INTV	Coef.	Std. Err	P>|z|	Prob > chi2
Number of groups	4	ROE	-27.69	15.8	0.08	
R-squared	48	OE	14.41	6.03	0.02*	
		CA	-15.76	6.70	0.02*	
Within	0.083	LR	4.97	3.83	0.19	0.0000
Between	0.982	TATL	8.38	6.60	0.20	
Overall	0.564	EQ	55.68	26.09	0.03*	
Observation per group:	12	LNA	- 0.39	0.76	0.61	
		Cons	-8.33	12.81	0.52	

* P < 0.05, ** P <0.01

5.2 Hypothesis Two

This hypothesis was validated by testing the VIF variation coefficient, which had an average FIV value of (2.10), which is statistically acceptable. (Fig. 1. and Table 4).

Table 4. VIF estimation

Variables	VIF	1/VIF
CA	3.89	0.256764
EQ	2.26	0.441877
LR	1.94	0.516493
OE	1.92	0.520970
LNA	1.87	0.534699
ROE	1.61	0.620134
TATL	1.21	0.826918
Mean	VIF	2.10

VIF test

5.3 Hypothesis Three

This hypothesis was invalid as the Heteroscedasticity White's test for testing found no autocorrelation between residuals (Chi-square value = 0.173; Table 5). Therefore, there is no subjective link between residuals; the residuals variation is constant and has no differences.

White's test for Ho: homoscedasticity

Against Ha: unrestricted heteroscedasticity

Table 5. Heteroscedasticity test

Source	chi2	df	p
Heteroscedasticity	42.72	35	0.1733
Skewness	7.85	7	0.3464
Kurtosis	1.17	1	0.2784
Total	51.75	43	0.1694

5.4 Hypothesis Four

This hypothesis was confirmed by the convolution and kurtosis test. This is shown in Table 5 and Fig 2. No autocorrelation was found between residuals.

5.5 Hypothesis Five

This hypothesis was confriemd and therefore, the intrinsic value can predict through the following model:

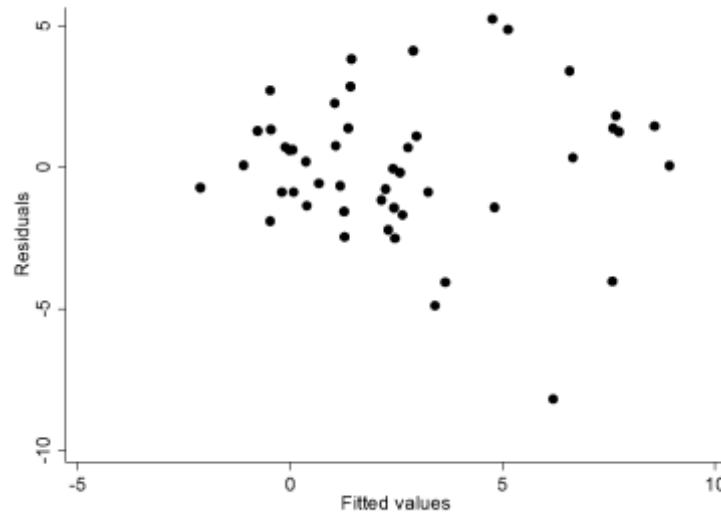$$Y_{INTV} = -8.33 + 14.41OE - 15.76\,CA + 55.68EQ \qquad (2)$$
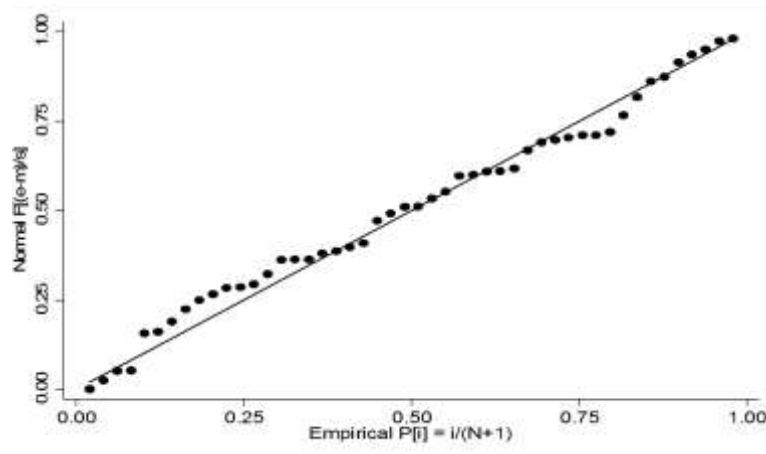
Figure 1. The residual plot

Figure 2. Normality of residuals of Y

6. Conclusion

The validity of the study hypotheses proved that independent variables interpreted the intrinsic value of a commercial bank. The variables included bank adequacy, operational efficiency, assets size, and profit on equity, and liquidity. The second hypothesis was validated by the lack of a strong correlation relationship between independent variables; thus, the variance inflation factor test value was accepted. The fourth hypothesis was also proved thus, and no autocorrelation between residuals was found. The model, as proved by the fifth hypothesis, is able to predict the intrinsic bank value through the Overall R-sq. Value and the significance of the model coefficient, which was zero.

7. Recommendations

Based on our findings, we recommend that banks should not raise bank adequacy by keeping semi-liquid assets in high proportions. This increased liquidity but had a negative effect; thus, the negative cash flows reflected negatively on the intrinsic value of the banks.

The difficulties we encountered in our attempts to gather information about the banks covering an extended period (such data is not available from the website of the Bahraini investor directory, and banks do not publish long-term financial reports.) We recommend that such data be archived on bank websites and that future studies should follow the approach outlined here.

References

Aggarwal, D., Padhan, P. (2017). Impact of Capital Structure on Firm Value: Evidence from Indian Hospitality Industry. *Theoretical Economics Letters, 7*, 982-1000. https://doi.org/10.4236/tel.2017.74067

Alkholi, H. (2001a). An empirical test of the relationship between internal performance measurements and market value of a firm: imperial test on Egyptian business sector. *Journal of Accounting and Management and Insurance, Cairo University, 57*, 87-135.

Alkholi, H. (2001b). Using the balanced scored card to measure the strategic performance of the business sector firms. *Journal of Accounting and Management and Insurance, Cairo University, 57*, 1–48.

Amiri, A., Ravanpaknodezh, H., & Jelodari, A. (2016). Comparison of stock valuation models with their intrinsic value in the Tehran Stock Exchange. *Marketing and Branding Research, 3*, 24–40

Altunbas, Y., Carbo, S. et al. (2004). Examining the relationship between capital, risk, and efficiency in the European banks Center for Banking and Financial Studies, SBARD, University of Wales, 1–35.

Armstrong, A., Fic, T. (2014). Bank diversification and valuation: international evidence, National Institute of Economic and Social Research, Discussion Paper No. 438, 1-24.

Al Zararee, A., Al-Azzaw, A. (2014). The Impact of Free Cash Flow on Market Value of Firm. *Global Review of Accounting and Finance, 5*(2), 56–63.

Berger, A., Clarke, G.R. et al. (2005). Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership. *Journal of Banking and Finance, 29*(9), 2179–2221. https://doi.org/10.1016/j.jbankfin.2005.03.013

Chowdhury, A., Chowdhury, S. (2010). Impact of capital structure on firm's value: Evidence from Bangladesh. *BEH–Business and Economic Horizons, 3*(3), 111–122. https://doi.org/10.15208/beh.2010.32

Gharbi, L., Khamoussi, H. (2016). Fair value and banking contagion: Empirical evidence from Islamic and conventional banking sectors in the GCC region. *Journal of Islamic Accounting and Business Research, 7*(3), 1–23. https://doi.org/10.1108/JIABR-12-2014-0042

Gordon, M. J. (1962). The Savings, Investment, and Valuation of a Corporation. *Review of Economics and Statistics, 44*, 37–51. https://doi.org/10.2307/1926621

Goncharov, I. (2015). Fair Value Accounting, Earnings Volatility, and Stock Price Volatility, Lancaster University Management School, Lancaster University, 1–48.

Myers, S. (1974). Interactions of corporate financing and investment decisions implications for capital budgeting. *Journal of Finance, 29*, 1–25. https://doi.org/10.1111/j.1540-6261.1974.tb00021.x

Naeem Ullah, M. (2014). Market Value, Book Value, and Earnings: Is Bank Efficiency A Missing Link. *Journal of Business and Management, 16*(3), 125–130.

Said, I. (1991). A proposed framework to estimate the public value to the privatization purposes: an empirical study on the industrial food sector. *Scientific Journal of Economic and Commerce, Ain shames University, 2*, 933–995.

Shaker, N. (1996). More comprehensive model to interpret and determine the substantial value. *Scientific Journal of economic and commerce, Ain shames University, 2*, 1193-1279.

Tarawneh, M. (2006). A Comparison of Financial Performance in the Banking Sector: Some Evidence from Omani Commercial Banks. *International Research Journal of Finance and Economics, 3*, 1-12.