DO FUNDAMENTAL FACTORS EXPLAIN STOCK PRICES: EVIDENCE FROM THE MALAYSIAN BANKING SECTOR

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AUGUST 2016

DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 26,360.

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LIST OF ABBREVIATIONS

APT	Arbitrage Pricing Model Theory
BNM	Bank Negara Malaysia
BSE	Bombay Stock Exchange
CAPM	Capital Asset Pricing Model
CLRM	Classical Linear Regression Model
CNLRM	Classical Normal Linear Regression Model
D/E	Debt-to-Equity Ratio
DY	Dividend Yield
EBITDA	Earnings before Interest, Tax, Depreciation and Amortization
EPS	Earnings Per Share
et al.	And Others
EVA	Economic Value Added
EViews 8	Econometric Views 8
FBM KLCI	FTSE Bursa Malaysia KLCI Index
FDIC	Federal Deposit Insurance Corporation
FEM	Fixed Effect Model
FSMP	Financial Sector Master Plan
GDP	Gross Domestic Product
GNP	Gross National Product

HML	High-Minus-Low Measures
JB	Jarque-Bera
KLSE	Kuala Lumpur Stock Exchange
LDR	Loan-to-Deposit Ratio
LM	Lagrange Multiplier
LSDV	Least Square Dummy Variables
M&A	Mergers and Acquisition
MM	Modigliani-Miller Propositions
NIM	Net Interest Margin
NSE	National Stock Exchange of India
OLS	Ordinary Least Square
P/E	Price-to-Earnings Ratio
POLS	Pooled Ordinary Least Square
REM	Random Effect Model
ROA	Return on Asset
ROE	Return on Equity
SFA	Stochastic Frontier Technique
SMB	Small-Minus-Big Measures
SP	Share Price
TOL	Tolerance
VIF	Variance-Inflating Factor

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PREFACE

This study is part of our research project as final year students of the Bachelor of Finance (Hons) course. The fundamental factors that affect stock prices have always piqued our interest. Thus, using the Malaysian banking sector as the backdrop of our study, the research title was given as "Do Fundamental Factors Explain Stock Prices: Evidence from the Malaysian Banking Sector".

Even though many factors are capable of influencing stock prices, the researches of this study strongly believe that fundamental factors such as ratio analysis still play a crucial role in identifying stock prices and explaining their various fluctuations. In order to put our understanding to the test, this study was therefore conducted. Our goal is to identify the relevant fundamental factors that are significant in explaining stock prices. This study is done in hope that it can be beneficial to various parties, particularly individual investors.

ABSTRACT

This study examines the influential power of fundamental factors in explaining stock prices. The independent variables used in this study consist of fundamental components, i.e. debt-to-equity (D/E) ratio, dividend yield (DY), diluted earnings per share (diluted EPS), loan-to-deposit ratio (LDR), and price-to-earning (P/E) ratio. Panel data is employed to carry out this study and all data is collected on an annual basis from the year 2010 to 2015 (6 years). Our targeted populations are the eight chosen publicly-listed Malaysian banks. All sources and information are obtained from Bloomberg as well as each bank's annual report. Our findings indicate that D/E ratio has a negatively significant relationship with share price while diluted EPS and P/E ratio have a positively significant relationship. On the other hand, DY and LDR were found to be insignificant in predicting stock prices.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

It has been nearly twenty years since the 1997 Asian Financial Crisis brought the Malaysian banking system to its heel. However, more systematic effort is needed to measure the state of health of the banking industry and accurately predict a bank's capability of conducting its operation in the event of another banking crisis. Also, in the wake of a financial crisis, apart from banks and government, shareholders of banks bear the brunt of the resulting losses too.

This study seeks to determine the effects of fundamental values on stock market prices for the Malaysian banking industry. The rationale behind this study is that most irrational trading plays a role in bank losses in times of uncertainty, like the 2008 financial crisis. Also, many investors and industries are unable to use macroeconomic factors to determine the exact stock market performance. The alternative to using macroeconomic value to explain share prices is the concept of value relevance. Value relevance is defined as the "ability of accounting numbers to explain the market price of shares". The independent variables used in this study consist of fundamental components, i.e. debt to equity (D/E) ratio, dividend yield (DY), diluted earnings per share (diluted EPS), loan to deposit ratio (LDR), and price to earning (P/E) ratio. The data in this study is collected on an annual basis from the year 2010 to 2015 (6 years).

Eight publicly-listed Malaysian banks were used in this study, which are stated as follow:

1. Affin Holdings Berhad

2. Alliance Financial Group
3. AMMB Holdings Berhad
4. CIMB Group Holdings Berhad
5. Hong Leong Financial Group Berhad
6. Malayan Banking Berhad
7. Public Bank Berhad
8. RHB Capital Berhad

This study also seeks to benefit investors and analysts by giving them an up-to-date alternative of assessing the financial health of the banking industry and may also serve to benefit policy makers in monitoring and regulating the sector.

1.1 Research Background

1.1.1 Financial Systems

As stated by Mishkin (1999), the financial system is of paramount importance to a country and aids in the efficient operation of the economy. In this financial market framework, financial intermediaries which include commercial banks, finance companies, insurance companies, mutual funds and the likes are able to significantly foster the health of an economy. They have the capability to address problems of asymmetric information as well as reduce moral hazard since they possess the ability of accumulating information on their borrowers before issuing out a loan while scrutinizing the checking accounts of their borrowers to ensure periodic payments. Banks also have the economies of scale in monitoring as the monitoring cost incurred for banks are much lower than for individuals. These all explains why banks play such a vital role in a nation's financial sector. In the instance a bank fails to

perform its task, triggers of financial instability would surface, leading to shocks in the financial system and interference in the information flow. This impedes the ability of the financial system to channel funds to productive uses. A severe instance of financial instability may even lead to a financial crisis.

1.1.2 FTSE Bursa Malaysia KLCI Index (FBM KLCI)

The FTSE Bursa Malaysia KLCI (FBM KLCI) was introduced as a main indicator to monitor the top 30 companies by market capitalization listed in the Malaysian Main Market (Lam, Hafizah & Hamizun, 2014). To ensure FBM KLCI sufficiently represents the top 30 companies in the Malaysian Main Market, the index is reviewed semi-annually in June and December. FBM KLCI is the major stock index under the Kuala Lumpur Stock Exchange which was first established in 1976 (formerly known as Bursa Malaysia, 2004). Azevedo, Karim, Gregoriou and Rhodes (2014) stated that the Malaysian stock market has been one of the leading Asian emerging markets for the past 10 years and FBM KLCI is currently recognized as one of the best references for the Asia-Pacific equity index. It reflects the performance of listed companies and also its economy since KLCI index represents the major sectors in the Malaysian economy. In other words, it determines whether the Malaysian economy is performing or failing as well as the country's growth. Thus, any happenings in the country will affect the fluctuations of the market which gives a gain or loss in investments.

Table 1.1: FTSE Bursa Malaysia KLCI Constituent Weightings

Sector	No of Companies	Net Market Capitalization (MYR	Weight (%)

		million)	
Banks	**7**	**154,878**	**31.96**
Telecommunications	4	73,623	15.19
Utilities	2	58,411	12.05
Industrial Goods & Services	3	40,400	8.34
Food & Beverage	3	36,751	7.58
Travel & Leisure	2	30,792	6.35
Oil & Gas	3	30,729	6.34
Chemicals	2	23,761	4.90
Health Care	1	18,434	3.80
Personal & Household Goods	1	7,524	1.55
Media	1	5,939	1.23
Real Estate	1	3,376	0.70
Total	**30**	**484,618**	**100.00**

Adapted from: FTSE Bursa Malaysia Index Series (2016)

From Table 1.1, it shows that the banking sector constitutes almost one third in FBM KLCI in terms of the net market capitalization, and most banks in this study are the top 30 stocks in Malaysia. Also, banks are commonly presumed to play a very vital role in crystallizing Malaysian economic performance

(Ibrahim, 2006). Thus, the bank performance and FBM KLCI index as well as Malaysian economic performance are interrelated.

1.1.3 The Banking Industry in Malaysia

Malaysia has been chosen to be the backdrop of this study as it is a country with a rich history of financial sector reforms. Since the 1970s, various restructuring programs were initiated, leading to a rapid economic growth and a significant improvement in the nation's financial system. When the country fell prey to the 1997 Asian financial crisis, Bank Negara Malaysia took a brave stance in 2000 by initiating a forced merger of numerous banks in order to mitigate the risk of insolvency of small local banks and to prevent bank runs while at the same time to raise the capital adequacy and financial strength of the local banking industry (Lai, Ling, Eng, Cheng & Ting, 2015). Meanwhile, various macroeconomic policies including capital controls and deflationary policies were also introduced to curb the problem (Ang & McKibbin, 2006). This has further led to a greater industrial transformation which involves large restructuring of the corporate and banking sectors. The Financial Sector Master plan 2001-2010 (FSMP), followed by the Financial Sector Blueprint 2011-2020, were clear policies that highlighted the importance of the financial sector to Malaysia's economic growth in the process of achieving its macroeconomic goals (Kok & Munir, 2015). In recent years, Malaysia has become part of the developing world with vast emphasis on its banking sector. In addition to these interesting facts, Malaysia possesses a good database set that allows the assessment of a long range of time series data for study and research, giving us even more reasons to conduct our study on Malaysian ground (Ang, 2008).

Moreover, the Malaysian government has all along been very supportive of the banking sector and approves of rapid bank lending in order to achieve its

growth objective. The various 1990s infrastructure projects initiated by the government further increased the confidence of the Malaysian banking sector to raise the lending volume. Between the periods of 1995-1997, the banking sector contributed 58% of net funds raise, in comparison with the equity market and domestic debt market of 15% and 11% respectively (Ghani & Suri, 1999). However, bank lending has to be at an optimal pace. Over lending by banks will often cause the quality of investment projects to be compromised and reduce overall productivity growth. This is the case because rapid lending will hamper banks' competence in risk assessment, project selection and monitoring (Ghani & Suri, 1999).

Nonetheless, the Malaysian government's action in guaranteeing deposits during the 1990s encouraged banks to endorse a risk taking nature by borrowing short and lending long, leading to high gearing and a large asset-liability mismatch. In order to fund their capitalization plans, banking institutions borrowed heavily from external sources instead of acquiring internal funds or issuing long term bonds. As a result, these banks had to lend excessively to produce just enough returns in order to service their debt obligations, overall deteriorating their portfolios' quality (Ghani & Suri, 1999).

Thus, it can be concluded that the financial soundness of banks are very crucial. According to Jha and Hui (2012), the performance in the financial system can be further enhanced to weather adverse upsets if it has a sound and profitable banking sector. In other words, a bank's weak performance will possibly cause a slippery slope of other unwanted consequences such as simultaneous failure of other banking institutions and stunted economic growth. The stability of a bank can be determined through financial ratio analysis (where its data can be obtained through balance sheets and income statements) as it measures and analyzes an institution's performance and fundamentals, which facilitates the identification of good and underpriced

investments (Faruk & Habib, 2010). Deterioration in a bank's annual report will have an effect on the stock returns and essentially make raising future capital at a reasonable cost a challenge. Thus keeping a bank's health in check has motivated this study focusing on the banking sector.

The banking companies that are included in this study consist of Affin Holdings Berhad, AMMB Holdings Berhad, Alliance Financial Group Berhad, CIMB Group Holdings Berhad, Hong Leong Financial Group Berhad, Malayan Banking Berhad (Maybank), Public Bank Berhad, and RHB Capital Berhad.

1.1.3.1 Affin Holdings Berhad

Affin Holdings Berhad (AHB) was established on 31 May 1975. It was previously named as I.M.A Sdn Bhd and constitutes a private limited company. It altered its name to AFFIN Motor and Credit Finance (Malaysia) Sdn Bhd on 15 September 1978 and again changed its name to AFFIN Credit (Malaysia) Sdn Bhd on 16 January 1979. Subsequently, on 2 March 1991, the name was changed to AFFIN Holdings Sdn Bhd. On 6 May 1991, it was listed in Malaysia under its present name. During the 1990s and the 2000s, it acquired Antara Discount Berhad, Telenas (Malaysia) Sdn Bhd, ACF Holdings Bhd and Asia Commercial Finance (M) Bhd, AFFIN-UOB Securities Sdn Bhd, and BSN Commercial Bank Berhad. ASSIN Islamic Bank Berhad commenced its business operation in 2006. In 2014, Affin Group acquired HWANG DBS Investment Bank Berhad (AFFIN Holdings Berhad, 2016).

The major shareholder of AFFIN Holdings Berhad is Lembaga Tabung Angkatan Tentera (the nation's premier superannuation fund manager for the armed forces). Affin Group (which includes AFFIN Bank Berhad and AFFIN Islamic Bank Berhad) is a major home-grown financial services conglomerate,

focusing on the provision of commercial, Islamic and investment banking services, underwriting of general and life insurance, and money broking as well as fund management (AFFIN Holdings Berhad, 2016).

From Table 1.2, the group's earnings increased gradually from RM488.6 million in 2010 to RM650.0million in 2013, which also contributed to the increase of both its share price and its market capitalization. However, its earnings dipped in 2014 and 2015. This is due to a squeeze in the net interest margin, stiff competition among industry as well as one-off provisioning for a few large accounts. However, the drop in its earnings and share price did not reflect the strength of its fundamentals that continued to remain robust (AFFIN Holdings Berhad, 2016).

Table 1.2: Net Income, Share Prices and Market Cap for Affin Holdings Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	488.6	508.0	628.9	650.0	605.3	369.3
Share Price (RM)	2.92	2.91	3.25	3.92	2.90	2.34
Market Capitalization (RM' million)	4, 618.2	4, 603.3	5,141.3	6,202.5	5,634.6	4,546.5

Adapted from: Bloomberg (2016)

1.1.3.2 AMMB Holdings Berhad

Arab-Malaysian Development Bank Berhad was incorporated on 5 August 1975 and commenced operations on 1 April 1976 as a joint venture comprising of Arab and Malaysian shareholders. It was later renamed as Arab-Malaysian Finance Berhad (AMFB) (AmBank Group, 2016).

During the 1980s, AMFB established the Arab-Malaysian Credit Berhad, Malaysian Ventures Berhad, and Arab-Malaysian Unit Trusts Berhad. AMFB also acquired Teguh Insurance Company Sdn Bhd, Perima Assurance Berhad, and Kris Securities Sdn Bhd. In 1988, AMFB became the first merchant bank to be listed on the Kuala Lumpur Stock Exchange (KLSE). During the 1990s, it launched AMMB Labuan (L) Ltd and acquired First Malaysia Finance Berhad, the Malaysian operations of Security Pacific Asian Bank Limited. In 2001, AMFB acquired MBf Finance Berhad and merged with it. MBf Finance Berhad later changed its name to AmFinance Berhad. AMFB was later converted into a holding company and was privatized in 2005. AmBank (M) Berhad was created on 1 June 2005 after the merging of AmBank and AmFinance. In 2006, AmIslamic Bank commenced operations (AmBank Group, 2016).

Currently, the Group consists of AMMB Holdings Berhad which is listed in Bursa Malaysia's Main Board together with its subsidiaries that provide a wide range of conventional, Islamic financial products and services as well as activities such as personal banking, business banking, and family takaful. Presently, there are more than 175 Ambank Branches with a strong workforce of over 12,000 employees (AmBank Group, 2016).

From Table 1.3, it can be seen that the group's earnings increased steadily from RM1, 008.6 million from 2010 to RM1, 918.6 million in 2015. However, there was a slight drop in both its share price and its market capitalization in 2012. Also, the decrease of its share price in 2015 was due to rising credit cost which had negatively affected its profitability and return on assets, subsequently leading to the drop in its market capitalization (Say, 2016).

Table 1.3: Net Income, Share Prices and Market Cap for AMMB Holdings Berhad

	2010	2011	2012	2013	2014	2015
Net income (RM' million)	1,008.6	1,342.8	1,484.4	1,620.7	1,782.4	1,918.6
Share Price (RM)	5.00	6.49	6.31	6.55	7.18	6.36
Market Capitalization (RM' million)	15,070.9	19,562.1	19,019.5	19,742.9	21,641.8	19,170.2

Adapted from: Bloomberg (2016)

1.1.3.3 Alliance Financial Group Berhad

Established in 1958 by Banque de L'Indochine and renamed as the Alliance Banking Group in 2001 after the successful merging of seven financial institutions, the Alliance Banking Group now comprises of Alliance Bank Malaysia Berhad (Alliance Bank), Alliance Finance Berhad, Alliance Merchant Bank Berhad as well as Alliance Unit Trust Management Berhad. Its subsidiaries underwent several merger and acquisition activities including the merging between Alliance Finance Berhad and Alliance Bank, and the merging between Alliance Merchant Bank Berhad and Kuala Lumpur City Securities (KLCS) to form Alliance Investment Bank Berhad (AIBB) in 2006. Besides, entering into a 10-year bancassurance partnership with Manulife Insurance Berhad in 2013, Alliance Bank provides a comprehensive bancassurance product suite to its customers. Furthermore, in 2014, AIBB acquired a 51% equity stake in HwangDBS Vickers Research Sdn Bhd (HDBSV) which was then renamed AllianceDBS Research Sdn Bhd (Alliance Financial Group, 2016).

Presently, the Group is a financial service group which provides end-to-end financial solutions through its consumer and business banking, Islamic banking, investment banking, unit trust and asset management as well as stockbroking businesses. The banking group offers its financial services through its principal subsidiaries, namely the Alliance Bank Malaysia Berhad (also known as Alliance Bank), Alliance Investment Bank Berhad, Alliance Investment Management Berhad, and Alliance Islamic Bank Berhad. Also, by using multi-pronged delivery channels including retail branches, Islamic banking centres, privilege banking centres to name a few, it offers easy access to its wide range customer base throughout the whole nation (Alliance Financial Group Berhad, 2016).

From Table 1.4, it shows that the group's net income had increased steadily from 2010 to 2014, in line with the increase of its share price and market capitalisation. However, its earnings registered a decline of RM32.7 million in 2015 which was mainly caused by margin compression despite the robust loans growth and normalisation of credit costs (Alliance Financial Group Berhad, 2015). Although the group's net income dropped in 2015, its share price and market capitalization were not affected.

Table 1.4: Net Income, Share Prices, and Market Cap for Alliance Financial Group Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	301.4	409.2	502.6	538.0	563.5	530.8
Share Price (RM)	2.88	3.17	3.89	4.40	4.41	4.79
Market Capitalization (RM' million)	4,458.5	4,907.5	6,022.1	6,698.6	6,686.6	7,296.3

Adapted from: Bloomberg (2016)

1.1.3.4 CIMB Group Holdings Berhad

Bian Chiang Bank was first established in Kuching in 1924. In 1979, it was purchased by Fleet Group and was renamed Bank of Commerce Bhd. In 1986, Bank of Commerce controlled Pertanian Baring Sanwa, whose name was later changed to Commerce International Merchant Bankers Bhd (CIMB). In 1991, Bank of Commerce (M) Bhd was formed as the merger between Bank of Commerce Bhd and United Asian Bank. Meanwhile, Bank of Commerce Bhd, which was the listed holding company, was renamed Commerce-Asset Holdings Bhd (CAHB). In 1999, Bank of Commerce merged with Bank Bumiputra, resulting in the biggest merging in Malaysia's banking history, to form Bumiputra-Commerce Bank, under the control of CAHB (CIMB group, 2016).

In 2002, CAHB took over the control of Bank Niaga from the Indonesian government. Also, CIMB Bhd was listed on the Main Board of the Kuala Lumpur Stock Exchange in January 2003. In 2005, CIMB was delisted from the KLSE and CAHB was renamed as Bumiputra-Commerce Holdings Bhd. The new CIMB group was launched in 2006 after the merger of Commerce International Merchant Bankers, Bumiputra-Commerce Bank, and Southern Bank. In 2009, CIMB Thai was established after the acquisition of Bank Thai in 2008 and CIMB Bank Singapore was set up. In the 2010s, CIMB group continued to expand its business to Cambodia, Taiwan, India, Korea, and Lao (CIMB group, 2016).

Now, the Group is a universal bank with its headquarter situated in Kuala Lumpur. It is currently the largest Asia Pacific (ex-Japan) based investment bank and one of the world's largest Islamic banks. CIMB group operates under several companies, namely CIMB Investment Bank, CIMB Bank, CIMB Islamic, CIMB Niaga, CIMB Securities International, and CIMB Thai, to name a few. Their business activities are currently focusing in the areas of

Consumer Banking, Wholesale Banking, Investment Banking, Corporate Banking, Treasury & Markets, and Group Strategy & Strategic Investments. Its core markets are in Malaysia, Indonesia, Singapore, and Thailand. At the same time, its businesses operate in parallel with CIMB Islamic, in line with the group's dual banking model (CIMB group, 2016).

From Table 1.5, it shows that CIMB group registered increases in net income from 2010 to 2013 but both its share price declined by 12.5% from RM8.50 on 1 January 2011 to RM7.44 on 31 December 2011, leading to a drop in its market capitalization. Subsequently, both share price and market capitalization fluctuated along the next two years. In 2014, the group's share price dropped dramatically from RM7.62 in 2013 to RM5.56 in 2014 and was vastly due to the deterioration of provincial and international market position, the decline in operational financial performance, and unpredictable developments regarding proposed merger talks, which in turn caused a drop in its market capitalisation too (CIMB group, 2014). Also, weaker non-interest income as well as increased corporate banking provisions and goodwill impairment were the main reasons why the net profit of the group dropped from RM4,540.4 in 2013 to RM3,106.8 in 2014 (CIMB group, 2014). The similar factors affecting the performance of CIMB in 2014 continued to make impacts on its performance in 2015.

Table 1.5: Net Income, Share Prices, and Market Cap for CIMB Group Holdings Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	3,500.8	4,030.8	4,344.8	4,540.4	3,106.8	2,849.5
Share Price (RM)	8.50	7.44	7.63	7.62	5.56	4.54
Market Capitalization (RM' million)	63,178.6	55,299.8	56,712.0	58,897.6	46,836.0	38,713.8

Adapted from: Bloomberg (2016)

1.1.3.5 Hong Leong Financial Group Berhad

In September 1968, Hong Leong Financial Group Berhad (HLFG) was incorporated in Malaysia as a private limited company known as Office Products Sdn Bhd. Subsequently, the company was converted into a public company as Sovran Industries Berhad in 1969. The company was officially listed under the Kuala Lumpur Stock Exchange (KLSE, currently known as Bursa Malaysia) in 1969 and had its current name in 2006 (Hong Leong Financial Group, 2016). The financial group incorporates suitable conventional and Islamic financial products and services that enable them to connect to both local and foreign customers. Specifically, the group is able to provide comprehensive services in terms of personal financial services, business banking, treasury, transaction banking, wealth management and others.

Corporate financing is important to a financial sector's development, thus Hong Leong Bank has undergone various merging and acquisitions (M&A). One of the major activities was the merging of Hong Leong bank with EON Bank Group in 2011. The merger actively transformed the bank into a banking group comprising of more than RM145 billion worth of assets. As a result, in the following year, the group was able to launch a sub-brand (Mach) that brings together "bricks and clicks" offerings to Gen-Y community (Hong Leong Bank Berhad, 2016).

The group's earnings and profits are mainly contributed from the Hong Leong Bank Berhad (Hong Leong Financial Group, 2015). Table 1.6 shows the trend for the net income earned by the group which also contributes to its share price as well as its market capitalization. It can be seen that the current net

income in 2015 has declined since 2014 by at least RM 100 million. This influenced the share price to decrease to RM 14.90 per share and the market capitalization to RM 15,925.4 millions.

Table 1.6: Net Income, Share Prices, and Market Cap for Hong Leong Financial Group Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	860.8	1,673.6	1,233.6	1,487.7	1,706.9	1,620.7
Share Price (RM)	8.26	12.95	12.03	14.21	15.86	14.90
Market Capitalization (RM' million)	8,708.9	13,667.4	12,726.7	15,077.9	16,908.5	15,925.4

Adapted from: Bloomberg (2016)

1.1.3.6 Malayan Banking Berhad (Maybank)

Established in 1960, Malayan Banking Berhad (Maybank) is currently the largest company in terms of market capitalization (RM82 billion) as stated in Bursa Malaysia. Maybank was listed in 1962 and is the largest company on the exchange. According to Forbes Global 2000, Maybank is listed as the top 500 companies in the world (Malayan Banking Berhad, 2016). The bank provides a comprehensive range of financial products and services under the three business pillars: Community Financial Service (consumer banking, business banking, and SME), Global banking (Corporate banking, investment, and global transactions), and Insurance & Takaful (Malayan Banking Berhad, 2015).

In 2000, Maybank conducted an acquisition on Pacific Bank berhad and Phileo Allied Bank berhad, which was then merged under its sole operation.

Recently, parts of Maybank's subsidiaries, namely the insurance and takaful businesses (Etiqa) have emerged as the largest takaful provider after acquiring AsianLife and General assurance Corporation in the Philippines in 2014.

Malayan Banking Berhad, unlike other listed banks in Malaysia, has a much broader range in terms of its operations because the market base for Maybank comprises of 3 different countries which are Malaysia, Singapore, and Indonesia. From Table 1.7, it can be seen that despite experiencing some increment in net income during the year 2015, Maybank's share price and market capitalization saw a decreased. This is due to the fall in the KLCI market index in August (Malayan Banking Berhad, 2015).

Table 1.7: Net Income, Share Prices, and Market Cap for Malayan Banking Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	3,818.2	4,450.3	5,745.9	6,552.4	6,716.5	6,835.9
Share Price (RM)	7.56	8.94	9.20	9.94	9.17	8.40
Market Capitalization (RM' million)	53,509.6	66,855.2	77,648.4	88,089.1	85,455.5	81,998.7

Adapted from: Bloomberg (2016)

1.1.3.7 Public Bank Berhad

Tan Sri Dato' Sri Dr. Teh Hong Piow was the founder and chairman of Public Bank Group in 1966 and had its headquarters located in Kuala Lumpur. Today, the Group is the third largest banking group listed on Bursa Malaysia, with a total asset size of over RM 363.76 billion and market capitalisation of about RM 71.9 billion. Public Bank provides a comprehensive range of

financial products and services. It is the second largest local bank in Malaysia after Maybank and is the largest corporation with no government-linked in its operations (World Finance, 2016). Dow Jones and Company (2016) mainly engages in commercial banking and other related financial services like hire purchase, retailing, corporate lending, capital market, fund management, treasury and others.

Throughout the period since its establishment, the earliest acquisition that had been made was on PB Securities Sdn Bhd (known as GP Securities Sdn Bhd) in 1987, which marked Public Bank Group's entry in stockbroking activities. Following in 2004, the Group completed the merger of the finance company business of Public Finance Berhad with the commercial businesses of Public Bank. Subsequently, it also merged PBB's ordinary shares of RM1 that are listed on the main market of Bursa Malaysia (Public Bank Berhad, 2015).

Public Bank Berhad (2015) claimed that the group is acknowledged for its high performance and ability to achieve a high net return on equity, lowest cost to income ratio, and the best quality among the Malaysian banking industry. Based on overall performance (from Table 1.8), the net income due contributes to the increase in share price throughout the 6 years, except for the year 2013-2014, where the share price dropped by RM 0.50. This is due to the increased in the number of shares outstanding after the shares for the Public Bank Local and the Public Bank foreign shares merged with each other in April 2014 (Public Bank Berhad, 2014).

Table 1.8: Net Income, Share Prices, and Market Cap for Public Bank Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	3,048.2	3,684.3	3,826.8	4,064.7	4,518.8	5,062.2
Share Price (RM)	12.62	12.97	15.78	18.80	18.30	18.52

Market Capitalization (RM' million)	45,597.9	46,858.4	57,014.6	67,941.2	70,665.3	71,514.9

Adapted from: Bloomberg (2016)

1.1.3.8 RHB Capital Berhad

RHB Capital Berhad is the investment holding company for RHB Banking Group. The Group was first founded in 1994 under the name DCB Holdings Berhad and was based in Kuala Lumpur (EMIS, 2016). Following the end of 1994, it presumed its current name and was listed on Bursa Malaysia. The Group is known for its fourth largest fully integrated financial services in Malaysia which comprise of various financial activities. Unlike most banks, RHB Capital's business segments were mostly in terms of investing or financing large corporations, such as retail banking, corporate and investment banking (CIB), group investment banking, group treasury, business banking, and group international business (Reuters, 2016).

One of the major merging and acquisition activities done by RHB Capital Berhad was the acquisition of OSK Investment Bank in 2012 via RHB Investment Bank. The subsidiary of OSK Investment, OSK Holdings Hong Kong Limited was renamed to RHB Hong Kong Limited and is now a wholly owned subsidiary of RHB Group. Thus, since the investment banking activities of OSK has now been merged together with RHB Investment, it accounts to the largest investment bank in Malaysia with a total shareholder's fund of over US$650 million (RHB, 2016).

Despite other Malaysian listed banks having a great performance, RHB Capital Berhad showed an opposite outcome. From Table 1.9, in year 2015, the bank experienced its lowest share price in the period of 6 years although there were some fluctuations in their overall net income and market

capitalization. The plunged in the share price was due to the reputational risk that the bank was undergoing. This risk was related to the internal structure of the bank and was reflected by the group's conduct and business practices and associations which adversely affected its revenues and share price (RHB Capital Berhad, 2015).

Table 1.9: Net Income, Share Prices, and Market Cap for RHB Capital Berhad

	2010	**2011**	**2012**	**2013**	**2014**	**2015**
Net income (RM' million)	1,420.3	1,687.9	1,784.7	1,831.2	2,038.0	1,511.4
Share Price (RM)	8.41	7.22	7.42	7.62	7.35	5.67
Market Capitalization (RM' million)	18,778.3	16,492.0	19,180.5	20,120.6	19,602.1	17,433.4

Adapted from: Bloomberg (2016)

1.1.4 Fundamental Factors and Stock Prices

Fundamental factors involving firm-specific information have been proven to be capable of predicting stock price movements. Relevant fundamental information is normally incorporated into stock prices through news releases as public information or through private information which are often missed out by the press (Durnev, Morck, Yeung & Zarowin, 2001). This private information contains information about future earnings and growth prospect and is used by arbitrageurs when trading. This induces firm-specific price movements and fluctuations, which in turn indicates that the stock price is moving in tandem with its fundamental value. However, fundamental values are not always reflected in stock prices as individual investors tend to succumb to irrational trading, often prolonging losses unnecessarily (Irresberger, Mühlnickel & Weiß, 2015). However, if investors knew the

concept of a share's fundamental value, they may not be easily swayed by uncertainties.

Studying the effects of fundamental factors on stock prices is meaningful because prices generated by stock markets help in resource allocation and assist in investment decisions. When stock prices vary closely to their fundamental value, capital flows efficiently from those who supply capital to those who demand it and is said to be priced accurately in all its uses. Besides, all the information generated would provide a form of feedback to managers since stock prices change in accordance to the decisions they make. Realizing these two effects would help the economy to efficiently allocate capital within and across firms. In other words, a functioning stock market is one that allocates capital goods efficiently and this is made possible when the stock prices tail firm fundamentals closely (Durnev et al., 2003).

1.2 Problem Statement

With the advancement of technology and an increasingly integrated global economy, the current banking systems are not immune to the charms and destructions of globalization. According to Gola and Spadafora (2015), banking crises are capable of generating "significant regional and international spillovers". A notable example was the 1997 Asian Financial Crisis, where the devaluation of Thai baht instantly jeopardized the financial standings of its neighbouring countries with "a speed and magnitude which took virtually all observers by surprise".

1.2.1 The Main Cause of Financial Crises and How They Affects Investors

The main motive for conducting this study is due to the fact that most financial crises are either triggered by a currency crisis or a banking crisis (Corsetti, Pesenti & Roubini, 1999). However, according to Kaminsky and Reinhart (1999), systemic banking crises are often found to be more severe and protracted compared to the effects of currency crises. According to them, the effects of currency devaluation are often small and short-lived, and mostly associated with reduced outputs or economic slowdown, compared to banking crises such as the one in 2008.

The financial sector accounts for the largest GDP in Malaysia. The performance of finance stocks in Malaysia highly influences the effectiveness of allocating capital across different domestic financial institutions such as commercial banks and insurance companies (Kok & Munir, 2015). They highlighted the fact that finance stocks are more vulnerable compared to other stocks and this vulnerability may not be reflected in the stock market in times of uncertainty, especially during financial and banking crises, which poses a potential contagion effect. They further explained that banks, due to their "inherent maturity mismatch on their balance sheet", are more sensitive compared to other institutions as this exposes them to bank runs. Another reason behind strong and rapid contagion in the banking sector is that banks have the deepest interaction with the real economy in the financial institution (Narayan, Narayan & Ahmad, 2015).

In addition, Irresberger, Mühlnickel and Weiß (2015) found that irrational market-wide crisis sentiment led to noise trading, which substantially drove the losses of bank stocks during these volatile periods. However, we must not be quick to judge these individual investors who contribute to market imperfections as they are also badly affected by financial crises. Hoffmann, Post and Pennings (2013) found that during the sample period that included September and October 2008, where shocking events like the fall of Lehman Brothers and the bailing out of AIG occurred, individual investors' portfolio

were reduced by almost 50 percent following months of adverse double-digit stock market returns. Thus, this study strives to determine the most relevant accounting ratios that are commonly used among investors, also deemed as fundamental values of banks in the hopes that more rational trading among individual investors could be encouraged. The reason is that if an investor knows that a stock is inherently of good nature, they would not be easily susceptible to noise trading and might use an economic downturn as a way to snatch up undervalued bank stocks. With a better understanding of the fundamental of bank stocks, this study also hopes to encourage more individual investors' stock market participation. This is important for them due to the "increasing self-responsibility for building up retirement wealth" (Hoffmann, Post & Pennings, 2013).

1.2.2 Macroeconomic Variables' Reliability in Predicting the Stock Market

The usage of macroeconomic variables to determine the prices of stock go way back to the 1980s. Various researches such as Fama (1981), Chen, Roll and Ross (1986), and Mukherjee and Naka (1995) tested on the relevant relationships between the changes in stock prices and macroeconomic variables such as inflation rate, interest rate, money supply, exchange rate, and real GNP. They argued that there is a long term relationship between macroeconomic variables and stock market. To date, various literatures have indicated that stock returns have a negative relationship to inflation and money growth. Although previous researches have showed that inflation and money supply are related to equity returns, Flannery and Protopapadakis (2002) stated that evidence for other macroeconomic variables are still less compelling.

Moreover, it is said that the stock market and some macroeconomic variables lack of causal relationship, forming a huge question mark as to their linkage (Barakat, Elgazzar & Hanafy, 2015). In this regard, Bhunia stated that the direction of causality between macroeconomic variables and stock prices has not yet come to a conclusion, even though there are theoretical and empirical studies done to investigate their relationship (as cited in Barakat, Elgazzar & Hanafy, 2015). In addition, from the previous studies, there are some showing empirical evidence proving causality while others showing no causal relationship between macroeconomic variables and stock prices. This further causes confusion in their exact relationship and makes empirical findings vague.

In addition, during a recession, most stocks tend to perform poorly, regardless of its financial standing and business plans. A recession may also influence macroeconomic factors, which is hardly reliable in determining the true financial health of a stock. This can be seen from the study from Chan, Karceski and Lakonishok (as cited in Flannery & Protopapadakis, 2002) that dismiss the relevance of macroeconomic factors in explaining equity returns. These authors claim that macroeconomic factors have very pathetic explanatory power, which deems it as effective as a "randomly generated series of numbers in picking up return covariation", and are simply dumbfounded in elucidating this weak performance.

1.2.3 The Importance of Using Accounting Information in Explaining Stock Price

Investors are usually drawn to investments in shares listed on the stock market because of the possibility of high positive returns received in the form of either dividends or capital appreciation. Capital appreciation is derived from

the increased in price of a capital asset over time. Short term investors and speculators concern themselves greatly with the movement of share prices as they emphasize on capital gains (Lee & Lee, 2008). As stated by Othman, Ponirin and Ghani (2009), financial ratios are useful to assess the performance of a company and to identify if an investment is worthwhile. In addition, Al-Shubiri (2010) stated that stock prices are not only determined by the forces of supply and demand but also by the various effects of accounting ratios such as EPS, P/E ratio and the likes.

A relevant issue identified by Menaje (2012) is in regards to the many previous studies that aimed to predict the drivers of stock prices or returns. According to the author, many results of similar studies have reached different conclusions, thus casting a doubt on investors regarding the accuracy and relevancy of such researches. In order to reduce the discrepancy, Menaje (2012) predicts that more and more studies on such topics will be conducted by various researchers who wish to bridge this gap and to continue finding the related variables that are able to affect stock prices.

As highlighted above, the overall market cannot accurately reflect the true state of vulnerable firms, like banks. Plus, the causation relationship between macroeconomic variables and economic growth remains ambiguous. In order to determine whether a bank stock is performing poorly due to its business operations, or merely temporarily affected by the cloud of recession, the researchers of this study resort to utilizing fundamental factors, which can be obtained via accounting numbers, to determine its effectiveness in predicting market values. According to Irungu (2013), the corporate financial reports play an important role in providing information to individual investors when making investment decisions. He explained that due to the increasing competitiveness, companies tend to focus on creating better value for their shareholders by keeping track on their past performances. Both accounting ratios and macroeconomic variables played respective roles in predicting the

stock price fluctuations (Kwag & Kim, 2013). Accounting ratios help determine a business' efficiency and effectiveness, whereas macroeconomic variables look into the sustainable growth in earnings under different conditions (Kwag & Kim, 2013). However, the forecast under macroeconomic studies tend to differ among countries due to their differences in politics, economies, and social environment (Barakat, Elgazzar & Hanafy, 2015). They explained that tax and interest rate implementations may not be the same in different countries, thus these affect the stock price fluctuations especially among multinational companies.

1.2.4 Lack of Research

Empirical researches pertaining to the relationship between accounting information and stock prices are quite limited when it comes to the banking industry, as Tsatsaronis and Yang (2012) put it, "while the banking sector depicts the general trend in bank equity prices, it is silent about the drivers of their performance". Financial health, in this case, refers to the stock prices of banks. Vardar (2013) as well as Aygören, Yeşilyurt, Güloğlu and Küçükkaplan (2015) describe that researchers usually prefer to use bank efficiency rather than the stock price as the dependent variable since it is able to provide more information; and efficiency estimate is derived from several frontier techniques like the Stochastic Frontier Technique (SFA). Other efficiency measures include the use of return on assets (ROA), return on equity (ROE), net interest margin (NIM), and economic value added (EVA) as the dependent variable (Almajali, Alamro & Al-Soub, 2012; Jha & Hui, 2012; Laing & Dunbar, 2015; Said & Tumin, 2011; San & Heng, 2013). Nevertheless, stock price still plays an important role in the creation of value and stability to the shareholders' wealth (Vardar, 2013). Moreover, Lee and Lee (2008) note that many previous studies regarding the explanatory power of accounting ratios on stock returns are mostly focused on the U.S. and

various other developed stock markets. Developing markets such as Malaysia are rarely researched upon. All in all, most of the previous researches in the context of the banking industry are more beneficial to banks and policy makers, but not so useful for individual investors to make investment decisions.

1.3 Research Questions

There are five specific questions to be researched under this study. They are shown as below:

i. Is there any significant relationship between a Malaysian bank' D/E ratio to its stock price?

ii. Is there any significant relationship between a Malaysian bank's DY to its stock price?

iii. Is there any significant relationship between a Malaysian bank's diluted EPS to its stock price?

iv. Is there any significant relationship between a Malaysian bank's LDR to its stock price?

v. Is there any significant relationship between a Malaysian bank's P/E ratio to its stock price?

1.4 Research Objectives

1.4.1 General Objectives

This study aims to provide meaningful and up-to-date information to investors, fund managers, and policy makers on the use of accounting information to evaluate and predict stock prices. As was highlighted in the problem statement, this study seeks to produce more rational individual investors, not only to prevent unnecessary devaluation or overvaluation of bank stocks, but also to help investors gain returns due to the increasing economic significance in accumulating retirement wealth.

1.4.2 Specific Objectives

The five specific objectives in this study are listed out as follow:

i. To determine whether there is a significant relationship between a Malaysian bank's D/E ratio and its stock price.

ii. To identify whether there is a significant relationship between a Malaysian bank's DY and its stock price.

iii. To evaluate whether there is a significant relationship between a Malaysian bank's diluted EPS and its stock price.

iv. To investigate whether there is a significant relationship between a Malaysian bank's LDR and its stock price.

v. To verify whether there is a significant relationship between a Malaysian bank's P/E ratio and its stock price.

1.5 Hypotheses of the Study

1.5.1 Debt-to-equity (D/E) Ratio

H_{0a}: There is no significant relationship between a Malaysian bank's D/E ratio and its stock price.

H_{1a}: There is a significant relationship between a Malaysian bank's D/E ratio and its stock price.

Myers (2001), Foong and Goh (2013), and Ameer (2007) defined that D/E ratio is used to measure a firm's debt financing in relative to its equity financing. According to Shabib-ul-Hasan, Farroq and Muddassir (2015), some studies argue that D/E ratio can explain stock returns better and has a significant relationship with stock price. There are a few scholars who agree on this statement. Bhandari (1988), Barbee, Mukherjee and Raines (1996) together with Leledakis and Davidson (2001) demonstrated that D/E ratio has a significant relationship with and is positively related to stock returns. Nevertheless, in a related study by Mukherjee, Dhatt and Kim (as cited in Shabib-ul-Hasan, Farroq & Muddassir, 2015), it is stated that D/E ratio is negatively related with share price, which was found in the Korean Stock Exchange. On the other hand, Rahmani, Sheri and Tajvedi (as cited in Shabib-ul-Hasan, Farroq & Muddassir, 2015) showed that there is no significant relationship between the D/E ratio and stock price after they conducted the study on the Tehran Stock Exchange. This also happened to Athens Stock Exchange which was proven by Michailidis, Tsopoglou and Papanstasiou

(2007). This insignificant relation has been consistent with the study by Shabib-ul-Hasan, Farooq and Muddassir (2015).

As a conclusion, the hypothesized relationship between D/E ratio and bank stock price in this study is assumed to be significant and positive. According to the leverage effect, corporate sectors with a high level of leverage will lead to a high level of systematic risk, resulting in higher volatility of stock returns (Bhatti, Majeed, Rahman & Khan 2010). This has also been proven by Bhandari (1988), Barbee, Mukherjee and Raines (1996) as well as Leledakis and Davidson (2001). When a firm possesses a high D/E ratio, it will have a higher risk on its common equity and the investors would request for higher share prices as compensation.

1.5.2 Dividend Yield (DY)

H_{0b}: There is no significant relationship between a Malaysian bank's DY and its stock price.

H_{1b}: There is a significant relationship between a Malaysian bank's DY and its stock price.

DY is used to compute the amount of dividends a company pays out each year relative to its share price. It indicates the cash flow received for each dollar of equity invested and reveals the revenues on share investment considering that the revenues are in the form of total dividends declared by the company during the year. In short, it is effectively the return on investment for a stock (Malhotra & Tandon, 2013). Fama and French (1988), Nelson and Kim (1993), and Campbell and Shiller (1988) have found that DY has succeed in forecasting the future stock prices and returns to a certain extent. It has the ability to capture the expectations on the dividend growth and expected

returns. Besides, Ang and Bekaert (2007) have looked at the predictive components in excess returns and realized that DY has the best predictive power of stock prices along a short horizon. Moreover, Lewellen (2004) did point out that DY plays a significant role in predicting stock prices. In the Istanbul Stock Exchange, Aydogan and Güney (1997) said that the DY is a good indicator for predicting future stock returns and has a negative relationship with the stock market prices. This result is statistically significant for six emerging market countries, namely Brazil, Malaysia, Mexico, Philippines, Russia, and South Africa (Aras & Yilmaz, 2008).

Therefore, this study draws an inference that the hypothesized relationship between DY and bank stock price is significant and negatively related. A high DY might be a signal that the stock price is undervalued because when a company distributes relatively high dividends to its shareholders, this will result in a lower stock price, which shows that the company's retained earnings is getting lesser (Aras & Yilmaz, 2008). This has also been concluded in the research of Baskin (1989), Aydogan and Güney (1997) as well as Sharif, Purohit and Pillai (2015).

1.5.3 Diluted Earnings per Share (diluted EPS)

H_{0c}: There is no significant relationship between a Malaysian bank's diluted EPS and its stock price.

H_{1c}: There is a significant relationship between a Malaysian bank's diluted EPS and its stock price.

It is generally known that EPS is an important factor when considering stock prices to arrive at a firm's value. Many individual investors take into context the EPS value in order to make their investment decisions. EPS calculation

can either be based on the basic EPS or the diluted EPS method. Diluted EPS is a better measure and vastly cited by authors and researchers (Islam, Khan & Adnan, 2014). It consists of consideration for the conversion of securities such as warrants, stock options and other convertible securities into common stock, causing a dilution. The overall relationship of EPS and stock returns or price is said to be positive (Chu, 1997; Hunjra, Shahzad, Chani, ul Hassan & Mustafa, 2014; Ball & Brown, 1968; Baskin, 1989). According to Lamont (1998), the aggregate stock price rises in response to a hike in aggregate earnings. However, EPS and stock price may not necessarily move at the same rate as stated by Chang, Chen, Su and Chang (2008), Islam, Khan and Adnan (2014) reached a conclusion that EPS moves faster than stock prices. While most previous researches have certified that there is a significant relationship between EPS and stock price, Menaje (2012) found no relationship whatsoever between the two variables.

For this study, the hypothesized relationship between diluted EPS and stock price is positive and significant. This hypothesis is made based on the results obtained by previous researches who have conducted similar studies of EPS to stock prices on banks (Al-Shubiri, 2010; Masum, 2014). The results by these authors indicate that shareholders of banks are generally concern about the EPS as it will affect stock prices positively.

1.5.4 Loan-to-Deposit Ratio (LDR)

H_{0d}: There is no significant relationship between a Malaysian bank's LDR and its stock price.

H_{1d}: There is a significant relationship between a Malaysian bank's LDR and its stock price.

LDR is a common ratio used in assessing the liquidity of a bank. Vong and Chan (2009) commented that deposits and loans are major banking activities and represent the most important balance sheet indicators. Bank loans are the main revenue earning activities for banks and are expected to affect profits positively, which will indirectly increase stock prices. Thus, it is recorded that LDR and stock prices possess a positive relationship (Abreu & Mendes, 2001). In support, Sufian and Chong (2008) noted that the loan market is especially risky and will therefore generate higher returns, showing a positive relationship between LDR and stock price. Another research study conducted by Rengasamy (2014) showed that majority of the banks in his study showed positive insignificant results. Only one bank showed a negative insignificant result while another bank showed a positive and significant impact of LDR on stock price. In contradiction, Hassan and Bashir (2003) as well as Staikouras and Wood (2003) derived that a higher loan ratio affects profits negatively, classifying the relationship between LDR and stock price negatively.

In this study, the hypothesized relationship between LDR and stock price is positive and significant. As stated by Duncan (1989), LDR informs the public about the potential for an increase in bank performance. It is implied that the higher the loan volume, the greater the profit generated from interest income.

1.5.5 Price-to-Earnings (P/E) Ratio

H_{0e}: There is no significant relationship between a Malaysian bank's P/E ratio and its stock price.

H_{1e}: There is a significant relationship between a Malaysian bank's P/E ratio and its stock price.

Price-to-earnings ratio, also commonly expressed as P/E ratio, is the relationship between market price or share price of a firm to its EPS. It reflects the extent to which its share price could be covered by its earnings which is an approximate of the time required for an investor to recover his or her investment in a company's share (Sharma, 2011; Srinivasan, 2012; Malhotra & Tandon, 2013). In other words, P/E ratio helps investors gauge whether the price is overpriced, underpriced, or fairly valued (Almumani, 2014). He also suggests that a high price-to-earnings ratio implies higher expected earnings growth compared to companies with a lower ratio. Ikoku, Hosseini and Okany (2010) emphasized the importance of P/E ratio as its ability to gauge whether an asset is underpriced or overpriced can help central banks ensure financial stability by detecting bubbles before they burst.

Almumani (2014) examined the share price for listed banks in the Amman Stock Exchange over the period of 2005 to 2011 using linear multiple regression models and found a significant positive relationship between P/E ratio and market price. Malhotra and Tandon (2013) analyzed the factors that determined the stock prices of NSE 100 companies for the period of seven years from 2007 to 2012, also using linear regression models, found a significant positive relationship between its P/E ratio and market price. In the context of equity share prices in India, Sharma (2011), who used backward elimination model of regression, found that P/E ratio was significantly and positively related to market prices in twelve years out of sixteen years. However, this was not the case for Zahir and Khanna who found that the earnings-price multiplier remotely influences the share prices of 101 industries in India from 1976 to 1978 (as cited in Srinivasan, 2012).

In a theoretical sense, P/E should be positively related to stock prices because according to the constant growth model, P/E ratio has a negative relationship with the retention rate but a positive function of the growth rate of earnings (Ikoku, Hosseini & Okany, 2010). Thus, judging from past researches in the

context of the banking industry, this study hypothesizes a positive relationship between P/E ratio and bank stock prices.

1.6 Significance of the Study

Today, plenty of individual investors, businesses and governmental institutions pour investments into emerging financial markets (Allahawiah & Al-Amro, 2012). Therefore, it is imperative to promote a well understanding on how the market works. This study attempts to analyze the relationship between the influencing fundamental factors of the Malaysian banking sector and its stock market prices. Through this study, various parties may find it useful in making wise and better investment decisions.

1.6.1 Investors

According to Sherlita, Ibrahim and Sarumpaet (2010), a company's internal information will give some clues to the investors on the optimal allocation of their capital resources. If the accounting information shows a company is doing well, the investor may invest more by accumulating more shares of that particular listed firm. Besides, Abedini and Razmi (2014) also mentioned that investors should identify the explanatory variables of price changes which can ultimately lead to improved investment decision. The investors should have sufficient knowledge and be able to interpret financial information in order to change their mentality on important factors of the stock market, after identifying what influences a company's share price the most. This fact is also echoed by Srinivasan (2012).

1.6.2 Company's Management

From a company's point of view, evaluating the achievement of its management is crucial and provides valuable information regarding its future prospect. Therefore, to assess a company's management, financial personnel can resort to the analysis of financial ratios in order to determine the financial affairs of the company and the performance of its management (Maskun, 2012). Apart from that, Hunjra et al. (2014) stated that as the share price is the biggest concern for companies and it is the indicator of the overall strength of a firm, they should pay more attention on the fundamental factors to build up a strong base in facing any challenges. Moreover, Pirie and Smith (2008) mentioned that it should be of interest to the managers who currently use, or are planning to use the accounting-based measures to monitor and forecast business performance.

1.6.3 Financial System

Last but not least, this study will contribute to the financial system in terms of accurate share pricing. Due to more precise pricing which can be obtained through the analysis of fundamental factors, the capital market appeals and develops and will eventually benefit countries that lack of liquidity (Abedini & Razmi, 2014). Sornette (2009) noted that fundamental factors are sometimes the reason for market crashes. Increasing market instability is often translated into ascending market prices and later on price collapses. Thus, by conducting this study, an overall understanding on the drivers of bank stock prices in Malaysia can be achieved. It is possible that relevant government and agencies may use our results to maintain the soundness of financial institutions and to preserve the confidence of the masses to the general health of our financial system.

1.7 Chapter Layout

In this section, the five chapters in this study are highlighted as follow:

1.7.1 Chapter 1

Chapter one gives an overview of this study which consists of the introduction, research background, problem statement, research question, general and specific objectives, hypotheses, significance of the study as well as conclusion.

1.7.2 Chapter 2

Chapter two conducts a review of literatures on topics which are related or similar to this study. It also documents the results for other past studies in order for the researchers of this study to hypothesize their expected results. It also explores in detail the available secondary sources of data and suitable theoretical models and frameworks.

1.7.3 Chapter 3

Chapter three explains how this research is conducted which encompasses the research design, data collection method, sampling techniques, and a flow chart for data processing. Scale measurements are used to make sure that the nature of data used in this study is appropriate for further analysis. Lastly, under the section of inferential analysis, potential panel data models, namely Pooled

OLS, Fixed Effect Model, and the Random Effect Model is described. These analyses are important to ensure the validity of the results.

1.7.4 Chapter 4

Chapter four presents the results and interpretation for the regression model of this study after data analysis is carried out. This includes the descriptive analysis of the data sample, and the results and interpretation of the aforementioned scale measurements and inferential analysis. Gaps in expected and actual results were also documented in this chapter.

1.7.5 Chapter 5

In chapter five, there will be a brief report of the major findings and an analysis on the difference in results. Also, the implications, limitations as well as recommendations for this study will be discussed in order to benefit future researchers.

1.8 Conclusion

This chapter has narrated the background of the banking sector in Malaysia and how it was affected by the 1997 Asian Financial Crisis. Research objectives and the significance of this study have also been discussed in this chapter. The dependent and independent variables, along with relevant theoretical models will be further discussed in Chapter 2.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Generally, the main objective of conducting a literature review is to review, analyze, and summarize the empirical and theoretical studies conducted by previous researchers regarding the research topic. This should give the researchers a better and deeper understanding in comparing different outcomes and results of the previous researchers' studies.

This chapter aims to review previous studies on how to evaluate and predict stock prices by the use of accounting information. The empirical results of relevant accounting variables that include debt-to-equity (D/E) ratio, dividend yield (DY), diluted earnings per share (diluted EPS), loan-to-deposit ratio (LDR), and price-to-earning (P/E) ratio have been highlighted. Besides, this chapter states the theoretical model and framework used to determine stock prices.

2.1 Reviews on the Literature

2.1.1 Dependent Variable: Stock Price

The stock price or share price is the price of a single share of a company's stock. Also, it can be the price where a corporation's shares of stock is above par or stated value when the corporation is publicly listed (Menaje, 2012).

Stock prices can deliver messages to different users. In an efficient market, stock prices are trustable since all information is reflected in stock prices and the buyer's willingness to buy and the seller's willingness to sell determine stock prices. Plus, arbitrageurs cannot get any abnormal gains since there is no more valuable information on mispricing available (Lai & Wong, 2015). The relationship between fundamental factors such as dividends and stock price changes has continued to be the focus area of interest for various parties namely, investors, fund managers as well as market analysts (Almumani, 2014). Besides, according to Srinivasan (2012), investors' understanding regarding the influence of various fundamental variables on stock price is very helpful for them as it will aid them in choosing profitable investment.

Additionally, most market players agree that the share price roughly estimates a corporation's intrinsic value. Besides, the stock price is the primary concern for both owners and investors of publicly listed companies. Investors (any individual or firms) who have some excess cash expect to receive more from the return of the stock investment than the return from a regular bank deposit. This return can be either in the form of capital gain from trading securities (for short term investors) or dividend income (for long term investors). Thus, the share price's movement and direction are crucial to investors since any movement of the share price can be a gain or loss to them (Menaje, 2012).

Malhotra and Tandon (2013) examined 95 companies from the National Stock Exchange (NSE) from the period of 2007 to 2012 and found that DY, EPS, and P/E ratio significantly influenced stock prices. 30 companies were from the banking and financing sector. There are similar studies on stock markets which have been conducted by Srinivasan (2012), Abedini and Razmi (2014), and Sharif et al. (2015) that also employed stock prices as their dependent variable.

There are various empirical studies which have examined the correlation between accounting information and banks' stock prices. Mohan and John (2011) examined the value relevance of accounting information in India with a group of 21 banks listed in the Bombay Stock Exchange (BSE) during 2006-2010 with a dependent variable of market price per share. Furthermore, Menaje (2012) studied the impact of accounting variables and the macroeconomic variables on share price of 10 public listed banks in the Philippines from 2002 to 2008. Also, Almumani (2014) studied the impact of the internal factors or quantitative factors on the share prices for the listed banks in Amman Stock Exchange during the period 2005 to 2011. He employed stock prices as the dependent variable. There are similar studies on banking or financial sectors conducted by Uddin (2009), Al-Shubiri (2010), and Silviana and Rocky (2013) that also used stock prices as their dependent variable.

In this study, the impacts of five fundamental variables are examined on eight publicly listed Malaysian Banks' stock price movement from 2010 to 2015. These variables include D/E ratio, DY, diluted EPS, LDR and P/E ratio. Furthermore, the stock prices of eight publicly listed Malaysian Banks (Affin Holdings Berhad, AMMB Holdings Berhad, Alliance Financial Group, CIMB Group Holdings Berhad, Hong Leong Financial Group Berhad, Malayan Banking Berhad, Public Bank Berhad, and RHB Capital Berhad) are obtained from the Kuala Lumpur Stock Exchange.

2.1.2 Explanatory Variables: Debt-to-Equity (D/E) ratio

According to Myers (2001), Foong and Goh (2013) and Ameer (2007), D/E ratio measures the amount of a firm's debt financing relative to its equity financing. CFA Programme Curriculum (2016) stated that D/E ratio is the ratio of:

$$D/E = \frac{total\ debt}{total\ equity}$$

A ratio of 1.0 would indicate equal amounts of debt and equity (CFA Programme Curriculum, 2016). D/E ratio is positively related to the risk of a firm's common equity. Thus, a firm with a higher D/E ratio always has higher risk on its common equity since the firm-level risk may vary and has a higher probability of bankruptcy (Bhandari, 1988). Plus, corporate sectors with a high level of leverage will lead to a higher level of systematic risk, causing the volatility of stock returns to increase (Bhatti, Majeed, Rahman & Khan 2010). Also, since financial risk (a risk in which a firm is not able to meet its financial obligations) is generally linked to the form of financing undertaken by the firm, the higher the amount of debt the firm acquires, the greater the financial risk (Acheampong, Algalega & Shibu, 2014).

On top of that, the frequently used models for prediction of share price include the Capital Assets Pricing Model (CAPM), Arbitrage Pricing Model (APT) and the Factor Model. In addition to these models, long term D/E ratio is one of the numerous variables which can be used to predict the share price with greater precision (Safania, Nagaraju & Roohi, 2011). Also, Leledakis and Davidson (2001) concluded in their study that D/E ratio has a positive impact on average stock returns. Their findings are similar to Bhandari (1988)'s study which mentioned that the expected returns on common shares are positively related to the D/E ratio.

By contrast, Pech, Noguera and White (2015) conducted their research by using panel regression analysis and tested the relationship between financial ratios and leading stock returns from 1995 to 2011. Data was from recommendation reports done by equity analysts and historical financial statement data as well as share prices from publicly traded Mexican corporations. They concluded that net D/E ratio is statistically insignificant to

explain stock returns. Pech et al. (2015)'s result is similar to the research done by Safania et al. (2011) and Shabib-ul-Hasan et al. (2015).

2.1.3: Explanatory Variables: Dividend Yield (DY)

DY indicates the revenues on share investment. Those revenues are in the form of total dividends declared by the company during the year. In short, it is the return gained by a shareholder by way of dividends (Malhotra & Tandon, 2013). According to Malhotra and Tandon (2013) and Sharif et al. (2015), DY is calculated as follows:

$$DY = \frac{dividend\ per\ share}{share\ price} \times 100\%$$

In the study done by Pech et al. (2015), one of the most preferred ratios of financial analysts is DY. Companies with high DY are usually huge, established and matured companies with low growth. A high DY might be a signal that the stock price is undervalued since a high dividend yield indicates that the stock price has been lowered (Aras & Yilmaz, 2008). Also, DY is the return on investment for stocks without the presence of any capital gains. Plus, it is a method to evaluate the amount of cash flow that returns for every dollar that has been invested in a company. In other words, investors who are looking for a stream of cash flows from their portfolio can invest in stocks that give relatively high, stable dividend yields (Malhotra & Tandon, 2013). Nonetheless, especially in limited observations or samples, using only dividend can be problematic to forecast returns on stock market. This is because DY is often manipulated by the company which makes them become poor indicators of the true value-relevant of future cash flows (Aras & Yilmaz, 2008).

Based on empirical studies, Irfan and Nishat (2002) found that DY has a significant effect on the stock market prices in Karachi Stock Exchange from 1981 to 2000. Besides, Sharif et al. (2015) investigated eights variables, which are EPS, DY, and P/E ratio, to name a few, on the share prices of the companies listed in the Bahrain Stock Exchange from 2006 to 2010. This study's estimation method is based on pooled OLS regression, fixed effects model, and random effects models. The result indicated that DY has a negatively significant impact on the share prices. Similar studies conducted by Baskin (1989) and Okafor and Mgbame (2011) as well as Masum (2014) also found a negative relationship between dividend yield and stock prices.

Additionally, Lee and Lee (2008) also used DY in their study as a predictor of stock returns. They concluded that DY is able to forecast share returns in the Malaysian stock market and has the ability to provide for profitable trading as well as enhancing portfolio decisions.

2.1.4: Explanatory Variables: Diluted Earnings per Share (Diluted EPS)

EPS can be defined as part of a company's performance indicator. According to Midani (1991), measurement of EPS reflects the productivity of the company's assets portfolio and efficiency of its financing and operating policies. According to Foong and Goh (2013) and Silviana and Rocky (2013), EPS is known as the earnings available for common shareholders divided by the number of shares outstanding. According to CFA Programme Curriculum (2016), the formula for EPS is given as:

$$EPS = \frac{Net\ Income - Preferred\ Dividends}{Weighted\ Average\ Number\ of\ Shares\ Outstanding}$$

According to CFA Programme Curriculum (2016), the formula for diluted EPS is given as:

$$Diluted\ EPS = \frac{Net\ Income - Preferred\ Dividends}{\begin{array}{c}[Weighted\ Average\ Number\ of\ Shares\ Outstanding + \\ (New\ Shares\ that\ would\ have\ been\ issued\ at\ option\ exercised - \\ Shares\ that\ could\ have\ been\ purchased\ with\ cash\ received\ upon \\ exercise) \times (Proportion\ of\ year\ during\ which\ the\ financial \\ instruments\ were\ outstanding)]\end{array}}$$

Besides dividend, EPS is another important aspect for an investor to acquire a particular share. Thus, it is arguable that some researchers suggest that the stock price is determined based on the demand of investors on a share by reviewing the expected earnings in the future (Gordon, 1959).

EPS is the most broadly used metric to gauge an entity‘s profitability per unit of shareholder ownership. It also functions as the industry standard in determining corporate profitability for shareholders. Therefore, accounting standards usually prefer to include the measurement of EPS as a driver of the company’s share price and is denoted as the denominator in the frequently cited P/E ratio (Menaje, 2012). EPS provides securities analysts or investors a way to estimate the variation of stock prices under long run investment strategy. Plus, the most fundamental factor affecting stock prices is the firm’s future profit and the earnings information which constitute the greatest informational content of all the accounting information. The reason is that it consists of the vital discussion relating to the relationship between accounting earnings and stock prices (Chang et al., 2008). Despite the useful function of EPS, it has been criticized because it acts only as an indicator and is subjected to accounting changes and manipulation as well as restatements (Menaje, 2012). Nevertheless, researchers argued that there are better indicators such as cash flows since the measurement is able to provide empirical evidence towards earnings.

In general, despite having some arguments, researchers still use EPS as a key measurement because the net income is traditional information to measure a firm's profitability, and this amount gives additional meaning when included the number of shares outstanding to obtain EPS ratio (Menaje, 2012). Empirical studies examined on the correlation between EPS and stock price, Pirie and Smith (2008) stated that earnings meaningfully explain share price, and show a useful role in forecasting future returns. Plus, accounting earnings is related positively to stock returns (Chu, 1997). The study of Silviana and Rocky (2013) showed that EPS has more influence on stock price compared to return on assets (ROA) while in Hunjra et al. (2014)'s study, they concluded that EPS has a significant and positive impact on stock price. It is consistent with the study done by Lewellen (2004); Adesola and Okwong (2009); Khanagha, Mohamad, Hassan and Sori (2011); Maskun (2012); Masum (2014). Adesola and Okwong (2009) also mentioned that shareholders rated companies higher when they have high values of EPS.

Chang et al. (2008) have conducted their research with Taiwanese data from 1997 to 2006, which were collected from Taiwan Economic Journal (TEJ) database. Usage of panel cointegration test to determine the relationship between stock prices and EPS in the long term has reached a conclusion that EPS has impact on share prices. EPS has less impact on stock prices in a firm with a high growth rate while has a strong impact on stock prices in a firm with a lower growth rate. Although stock prices move with EPS in the long run, they do not necessarily move at the same rate. In contrast, Menaje (2012) has applied Multiple Linear Regression and proposed that EPS has no significant effect on share price. The researcher explained that the study period of seven years might be the reason why his study was unable to confirm the relationship between EPS and share price.

From the banking perspective, valuation on EPS is similar to any non-banking industries. EPS variables is one of the most crucial determinants of share

prices under manufacturing, pharmaceutical, energy, infrastructure as well as commercial banking sectors (Almumani, 2014). Hence, the share price increases as the value of EPS increases.

Previous researchers, Ball and Brown (1968) and Baskin (1989), have found that in theory, EPS and stock price have a positive relationship. However, it is said that mere EPS does not project an accurate picture of a firm's financial condition. Thus, diluted EPS is a more favorable measure to be used as it takes into account the securities such as bonds that can be converted into common stocks (Islam, Khan & Adnan, 2014).

It is useful to note that there are several different calculations of EPS, namely the basic EPS, primary EPS and fully diluted EPS. Basic EPS has the simplest calculation among the three types of EPS where the earnings available to common shareholders are divided by the outstanding weighted-average number of common shares; Primary EPS just assumes that those securities and options with a higher chance to be converted and have a dilutive effect on earnings to be converted or exercised already; whereas the fully diluted EPS is similar to primary EPS with the exception that all dilutive securities eligible to be converted or exercised are taken into account in the calculation of EPS (Scott & Wier, 2000).

Resuming the previous issue, by using diluted EPS, investors will also be better informed of the possibility of dilutions in a company's earnings through the conversion of certain preferred stocks and convertible bonds. Therefore, this provides more meaningful information to investors and prevents them from being misled by or placing undue emphasis on the stand-alone EPS figure (Rice, 1974). Balsam and Lipka (1998) found that while the explanatory power between basic and primary earnings per share has no significant differences, there is strong evidence in favour of the fully diluted earnings per share being the most informative measure of them all.

2.1.5: Explanatory Variables: Loan-to-Deposit Ratio (LDR)

Liquidity ratios are the life of commercial banks. Liquidity is very crucial to banking services because it can be a source of bank insolvency (as cited in Said & Tumin, 2011). They depict that in order to avoid insolvency, banks are encouraged to hold liquid assets such as cash and cash equivalent. From a general perspective, the liquidity ratio is an indicator to measure a company's ability to meet its short term liability based on its short-term asset. This includes ratios like the current ratio and quick ratio (Lev, 1969). Both ratios reflect the current assets to current liabilities, with the exception of quick ratio, where the less liquid assets like inventories are excluded from the calculation.

On the other hand, Yeager and Seitz (1989) defined liquidity ratio as the ratio that measures a financial institution's ability in meeting all legitimate demands for funds. Therefore, the components under these ratios differ from non-financial institutions. Financial institutions like banking industries utilise a number of sources to meet their liquidity needs, which include new deposits, maturing assets, borrowed funds, or using discount window. There are various ways a bank can calculate its liquidity such as net loans to total asset ratio, net LDR and borrowing, net LDR and others (Kumbirai & Webb, 2010). Kashyap, Rajan and Stein (2002) stated that banks prefer to implement LDR because both depository and lending activities require intermediary services, as opposed to arm's-length securities. According to Fadare (2011), the LDR is a preferable measure of bank liquidity because bank loans consist of the largest portion of liquid assets as well as deposits as the largest portion of short-term liabilities. The formula is denoted as:

$$LDR = \frac{total\ loans}{total\ deposits} \times 100\%$$

According to Shamsudin, Mahmood and Ismail (2013), stock prices can be reflected from the businesses' performance. A business' good performance will increase the demand for its stock, thus will help increase its stock price. They explained that the banking environment was similar to the Hong Kong stock market due to its high volatility; hence liquidity is considered as an important element for pricing returns after taking into consideration the asset pricing factors (Lam & Tam, 2011; Shamsudin, Mahmood & Ismail, 2013). LDR was used as a liquidity indicator in the financing industry and had a negative relationship to the returns. The negative relationship is further explained by Kumbirai and Webb (2013) in terms of bank solvency when the bank encountered liquidity problems, which indicated the bank's poor performance. Subsequently, when depositors start closing out their accounts, the bank will have insufficient cash available given the large amount of uncollected debts (loans). Therefore, the bank risk will increase causing its stock price to be pushed downwards (Kumbirai & Webb, 2013).

Similar research has been conducted previously by Abdullah (2003) regarding the positive relationship between LDR and the risk measurement. He stated that a bank with a higher risk indicates that it is having some problems managing its liquidity, which lowers investors' confidence to invest in that particular bank. Thus, the stock price is affected negatively. The negative relationship between the liquidity ratio and returns were also discussed in Acharya and Pedersen (2005); Salehi, Talebnia and Ghorbani (2011). On the contrary, Amaliawiati and Lasmanah (2014) stated that the relationship between LDR and stock returns can be positive from the profitability perspective. LDR can be used as a measurement of the banks' financing rate of expansion. Increasing LDR shows that the banks are effectively carrying out its main source of revenue which is lending activities. An active bank tends to gain investors' interest into investing, followed by the increment in its stock price (Amaliawati & Lasmanah, 2014).

2.1.6: Explanatory Variables: Price-to-Earnings (P/E) Ratio

For many decades, P/E ratio has been commonly used by researchers as a fundamental factor to predict the future stock returns based on the stock's fair value. P/E is defined as the ratio for valuing a corporation given that the measure of the current share price is relative to its EPS (Investopedia, 2016). According to Malhotra and Tandon (2013), the formula given is denoted as:

$$P/E = \frac{Share\ Price}{Earnings\ Per\ Share\ (EPS)}$$

The ratio enables investors to appropriately judge the time required to cover their total investments. Since P/E ratio expresses the relationship between the market price and its EPS, it helps indicate the extent to which earnings are covered by the share price itself (Malhotra & Tandon, 2013). Similar to EPS, P/E ratio may not be the best indicator to measure an investment's performance assuming it is measured as a single metric. However this ratio cannot be neglected as it has its traditional functions and is relatively important in the banking industry (Srinivasan, 2012).

Theoretically, in an efficient market, security prices are fully reflected from available information (fundamental values) and there is no possibility in earning excess return. However, the price-ratio hypothesis, which claimed that there is a tendency for stocks with low P/E ratio to outperform those of high P/E ratio, remained questionable regarding its validities, indicating that the findings may be biased. Subsequently, the analysis conducted by Basu (1977) measuring P/E ratio on the investment performance within the monthly period of September 1956 to August 1971 on 1,400 different industrial firms were estimated using ordinary least squares (OLS). The research proved that low P/E stocks were able to earn a higher absolute and risk-adjusted rate of return compared to those with high P/E ratio. The study by Liem and Basana (2012)

stated that low P/E stocks were predicted to be sold at a cheaper price and was expected to generate high returns in the future.

On the contrary, the relationship was said to be only applicable in the U.S. market which is a highly developed market and not any emerging market. P/E ratio was said to be not an absolute appropriate measure because different markets operate under different institutional, regulatory, accounting, and tax environment. Under these environments, the price of the stocks may differ and do not reflect the actual valuations (undervalued or overvalued). The criticism was also explained by Aono and Iwaisako (2011) which state that the performance of P/E ratio is generally weaker in forecasting stock returns in Japan. They explained that the U.S. real time corporate earnings data was highly volatile and tends to be noisy; similarly in Japan, the prolonged fluctuations have caused the prolonged stagnation in the Japanese economy. Therefore, the Tokyo Stock Exchange used a simple average of EPS on individual assets rather than weighted averages, causing the P/E to be biased. Although some researchers argued that P/E ratio is not a relatively appropriate measure, there are still researchers who claimed that this fundamental role cannot be ignored in the future prediction of the stock return. This is because earnings-related strategies that use P/E ratio to make investment decisions have a long tradition in the investment community, indicating that even with a minor role, the ratio should not be excluded or replaced (Aras & Yimaz, 2008).

Furthermore, many other recent researchers have applied the Ordinary Least Square (OLS) method to estimate the relationship between P/E ratio and stock return. Most of the results produced indicated that both variables were negatively related. Shen (2000) explained that the given relationship of both variables help determine the long term predictability of a particular return, signifying a slow or fast pace in the long term growth of stock prices. Even though the forecast is applicable in the long run, the short-term estimation

must also be taken into consideration. Shen (2000) stated that in the short term, high P/E ratio also signals slower growth in stock prices. He explained that economists believed that short-term performance can be predicted through the inverse relationship of P/E ratio (E/P ratio), known as earnings yield, hence comparing it to some market interest rates measurements. In addition, these economists argue that, the smaller the spread between E/P and market rates, the stock prices will eventually fall (Shen, 2000). The reason was that given a smaller spread, it was expected that the stocks are more expensive compared to some other investments such as T-bills or any money market funds, causing investor to choose other investment rather than stocks (slower growth). Lastly, Mayur (2015) states that when P/E ratio increases, although the prices of the stock will increase, the yields will decline. However, the research was only applicable among blue-chip firms with large market capitalization and not to mid or small cap firms.

2.2 Theoretical Model

2.2.1 The Concept of Value Relevance

A financial statement is required to possess certain qualitative characteristics in order to communicate information which is relevant to investors' decision making (Ernest & Oscar, 2014).

According to Francis and Schipper (1999), value relevance is measured by:

> "*The ability of financial statement information to capture or summarize information, regardless of source, that affects share values*."

Ball and Brown (1968) were the pioneers of literatures in documenting the association of accounting information and stock returns. Literatures pertaining to value relevance that included both balance sheet measures of asset and liabilities and income statement measures of earnings have expanded significantly since the introduction of the Ohlson model (1995). Ohlson (1995) presents the market value of a firm as a linear function of book value and the present value of expected abnormal earnings. Abnormal earnings are defined as the current earnings less a capital charge (risk-free rate) multiplying with the opening book value. Studies in value relevance primarily use price models instead of return models (Al-Hares, AbuGhazaleh & Haddad, 2012). According to Kothari and Zimmerman (1995), stock prices are regressed against EPS in a price model, whereas returns are regressed on scaled earnings variables in a return model.

According to Al-Hares et al. (2012), the Ohlson (1995) valuation model was initially estimated as a two-factor model by several researchers. An example of the formula is as below:

$$MV_{it} = a_0 t + a_1 BV_{it} + a_2 E_{it} + \varepsilon_{it}$$

Where

MV_{it} = market value of common stock

BV_{it} = book value of common stock

E_{it} = earning before extraordinary and exceptional items of firm i in year t

ε_{it} = the error term

Most empirical studies today (Chen, Chen & Su, 2001; Ballas & Hevas, 2005; Al-Hares et al., 2012) adopt the valuation framework provided by Ohlson (1995) as a theoretical benchmark. Unlike developed markets, emerging markets are still plagued with market imperfections and the lack of sources to provide trustworthy information, which makes value relevance so important in

emerging markets. Because of the possibility that stock prices might fail to reflect all available information completely, accounting numbers will be seen as the credible and powerful component in decision making.

This study adopts the Ohlson (1995) model to determine the value relevance of D/E ratio, DY, diluted EPS, LDR, and P/E ratio in explaining market values of bank stocks. Because Ohlson (1995) model is a price model where stock prices are regressed against EPS as mentioned earlier, this gives a rationale for this study to use stock prices of the commercial banks in Malaysia as a dependent variable instead of its stock return.

2.2.2 Capital Assets Pricing Model (CAPM)

After the construction of Modern Portfolio Theory by Markowitz (1952), various models have been developed to explain the relationship between the excess portfolio returns and excess market portfolio returns (Eraslan, 2013). A popular model used to demonstrate the relation of both the elements is the Capital Asset Pricing Model (CAPM) which was developed by Sharpe (1964) and Lintner (1965). CAPM is among the very first forefathers of modern finance. As explained by the theory-based model, in an efficient market condition, there is a positive relationship between the required return and the expected return on an investment with the market beta (Peña, Forner & López-Espinosa, 2010). It is proven that the covariance of portfolio return with the market portfolio return is highly related to the variations on the excess portfolio return (Eraslan, 2013). According to Perold (2004), CAPM is the fundamental contributor to our understanding of the determinants of stock asset prices. CAPM is usually employed in determining the fundamental value of an investment. This value is achieved through the computation of a stock asset's rate of return using CAPM, and using this rate of return to discount future cash flows from the investment to its present value.

The CAPM equation is as follow:

$$E(R_i) = R_f + \beta_i [E(R_M - R_f)]$$

where

$E(R_i)$ = Expected rate of portfolio return.

R_f = Risk-free rate of return.

R_M = Expected excess return of the market portfolio beyond the risk-free rate, often called the equity risk premium.

CAPM is widely applied by researches to valuate an asset and to explain the returns for both individual as well as a portfolio of assets. However, this model was later proven to be lacking as it ignores various fundamental parameters which also have some effects on the return behavior of the stock or portfolio (Sharma & Mehta, 2013). Hence, the gap between the predicted and realized returns has been a source of controversy for this model and needed to be further evaluated (Sharma & Mehta, 2013).

2.2.3 Fama-French Three Factor Model

Fama and French (1992) documented 70% of portfolio return being explained by the beta and the rest of the 30% return being justified by some other factors. Fama and French further elaborated the return behaviour of different types of portfolios which can be explained using firm-specific characteristics and explained that one market factor does not describe the return behaviour of the stocks in a significant manner, yet a blend of market factors with the size and book-to-market ratio together has more power to unravel the behaviour of stock returns (Sharma & Mehta, 2013). Besides, there is extensive U.S. evidence of the market beta being unable to fully capture the cross-sectional differences in average stock returns in the way that the CAPM model predicts

(Peña et al., 2010). According to Fama and French (1996) as well as Lawrence et al. (2007), they demonstrated that this three-factor model can explain the average returns of U.S. stocks better than the CAPM which has been given rational support from a number of studies. Apart from that, the good performance of this model has also been confirmed in subsequent works in other non-U.S. markets (Peña et al., 2010).

The Fama and French equation:

$$E(R_i) - R_f = \beta_i [E(R_M - R_f)] + s_i E(SMB) + h_i E(HML)$$

where

$E(R_i)$	= Expected rate of portfolio return.
R_f	= Risk-free rate of return.
$E(R_M - R_f)$	= Expected rate of excess market portfolio return.
$E(SMB)$	= Expected value of the difference between the excess return on a portfolio of small stocks and the excess return on a portfolio of big stocks.
$E(HML)$	= Expected value of the difference between the excess return on a portfolio of high-book-to-market stocks and the excess return on a portfolio of low-book-to-market stocks.

Small-minus-big (SMB) is a method of assessing the additional returns an investor receives by investing in stocks of a small-cap company. These additional returns are referred to as "size premium". On the other hand, high-minus-low (HML) measures the "value premium" offered to investors of high book-to-market companies. The main function of this model is to help investors weigh their portfolios' specific risk factors and subsequently target different levels of expected returns accurately (Sharma & Mehta, 2013).

In a consistently rising Indian stock market, it was proven that, instead of just taking any single or two factors into account, it would be advantageous for investors if all of the three factors were regressed jointly when investigating the return behaviour of various portfolios (Sharma & Mehta, 2013). Furthermore, there is evidence for pervasive market, size, and value risk factors in the Moroccan stock market where the findings are partially consistent with the empirical results (Aguenaou, Abrache & Kadiri, 2011). It has been verified that high book-to-market ratio stocks outperform low book-to-market ratio stocks, even though it is to be found that the small capitalization stocks do not earn higher returns than big capitalization stocks, which goes to show that Fama-French Three Factor Model does not fully hold in the domestic market of Morocco (Aguenaou, Abrache & Kadiri, 2011).

2.2.4 Modigliani-Miller (MM) Propositions

Corporate debt is an important variable in order to determine the optimal capital structure for a firm. Debt values also help detect the possibility of a default payment and a potential bankruptcy (Leland, 1994). Schwartz (1984) stated that corporations can increase their value by increasing their income and by issuing the right mix of debt and equity securities. However, under the very first MM hypothesis, corporations cannot increase their value by altering their capital structures (Modigliani & Miller, 1958). This has stirred various controversies and skepticisms from researches and finance economists, partly because this theory had assumptions that were impractical in the real world, some of which included assumptions of a perfect world with the non-existence of taxes, agency conflicts, and asymmetric information (Ross, 1988). Nonetheless, the MM theorem has been verified over the years and widely applied beyond the corporate finance field (Lally, 2004). Harris and Raviv (1991) expressed that the MM theory is the father of all modern theories of capital structure.

Proposition I of MM states that even though the cost of borrowings will increase with the amount of debt, the average cost of funds from all sources will still be independent of leverage, except in the instance of a tax effect (Modigliani & Miller, 1958). This is because the leverage in any financial structure can be undone through the purchasing of the right combination of stocks and bonds, thus the average cost of capital from all sources is the same for all firms in a given class. Moreover, the proportion of debt and equity financing does not matter to a firm and has no material effect on the value of the firm (Myers, 2001). In that case, a firm is indifferent to its D/E ratio.

Proposition II is derived from proposition I and indicates the relationship between common stocks and leverage. It is said that the expected yields on common stocks increase together with leverage, showing a linear and positive relationship. High leverage will thus drive the cost of equity up as shareholders of the company will demand a higher return in light of the increase in risk borne by them when the company increases its leverage holding (Modigliani & Miller, 1958). The MM second proposition illustrates that when the firm's D/E ratio increases, it will lead to an increase in the firm's cost of equity but the weighted average cost of capital is not affected (Villamil, 2008). Once again, bankruptcy cost, agency cost, and asymmetric of information are ignored to validate the MM theorem (Alifani & Nugroho, 2013).

In a nutshell, as stated by Ross (1988) and Miller (1999), it is not possible for firms to gain by issuing what seems to be a low-cost debt rather than a high-cost equity. This is the case as the interest rate on the debt will rise when firms try to replace their high-cost equity with lower cost debt. Subsequently, the required return on equity will decrease until all incentives to switch between capital structures are completely eliminated. Once again this illustrates that the D/E level is of no significance to firms' value in a perfect world.

However, in the presence of taxes, it is to note that the value of leverage will increase by the marginal corporate tax rate (Modigliani, 1988). Therefore corporations can employ a higher leverage capital structure to secure a better tax shield.

2.2.5 Market-Timing Theory

Market-timing theory is known as the practice of first issuing shares at a higher price and later buying them back at a lower price. This method aims at predicting future market value movement in order to take advantage of the fluctuations in the cost of equity (Baker & Wurgler, 2002). In a survey conducted by Graham and Harvey (2001), corporate executives seem to engage proactively in market timing when making financing decisions. Two-thirds of corporate executives stated that "the amount by which our stock is undervalued or overvalued was an important or very important consideration" when deciding on the appropriateness of equity issuance.

According to Alti (2006), firms tend to raise capital through the issuance of equity when their market valuations are high relative to their book value. In agreement, Chen and Zhao (2004) found that firms with higher market-to-book ratio tend to have more access to the external markets, and have a higher tendency to issue equity. This is the case as a higher market-to-book ratio indicates a lower equity financing cost. In addition, Pagano, Panetta and Zingales (1998) stated that the market-to-book ratio acts as a proxy for mispricing as well as growth opportunities and is one of the important factors used by Italian firms to make the decision on whether to go public.

2.2.6 Gordon's Wealth Growth Model

Gordon's wealth growth model, also known as the constant growth model, is used to price stocks of firms that pay dividends and have a stable growth. According to Damodaran (as cited in Nhleko & Musingwini, 2015), this model is based on the underlying assumption that dividends grow at a constant rate to infinity, but due to the impracticality where dividend projections cannot be made easily, other variations of the dividend discount models have been invented. Thus, Gordon's wealth growth model is considered as the "simplest forms of dividend discount models" (Nhleko & Musingwini, 2015).

This model assumes that the present value of all the predicted future cash flows (in the form of dividend payments) is equal to the stock price. It is also useful during the stock pricing to note that the growth rate in nominal gross domestic product (GDP) is similar to the dividend growth rate for mature companies (Nhleko & Musingwini, 2015).

This Gordon's wealth growth model has several shortcomings. According to Nhleko and Musingwini (2015), one of which is the huge challenge in deriving unbiased and reliable estimates for future dividends, the timing of these dividends and growth patterns.

The equation below is a typical representation of the Gordon's wealth growth model (Ikoku, Hosseini & Okany, 2010):

$$P_0 = \frac{D_1}{r - g}$$

where

P_0 = current price of common stocks

D_1 = expected dividends

g = growth rate of earnings

r = required rate of return on equities

In order to illustrate the relationship between P/E ratio and stock prices, suppose the dividend can be illustrated as a function of earnings E_1 with a constant retention ratio, a:

$$D_1 = E_1(1 - a)$$

Then by rearranging the equation, the P/E ratio can be expressed as follows:

$$\frac{P_0}{E_1} = \frac{(1 - a)}{r - g}$$

The equation above illustrates a negative relationship between P/E ratio with the retention rate and also the required rate of return but a positive relationship with the growth rate of earnings. So, the higher the expected earnings, the higher the price of the stocks will be, ceteris paribus. Thus, P/E ratio, which indicates the degree of investors' willingness to pay for a unit of a firm's income, is positively related to a stock's future expected earnings, and is therefore positively related to the stock prices (Ikoku, Hosseini & Okany, 2010).

2.3 Theoretical Framework

Figure 2.1 Theoretical Framework

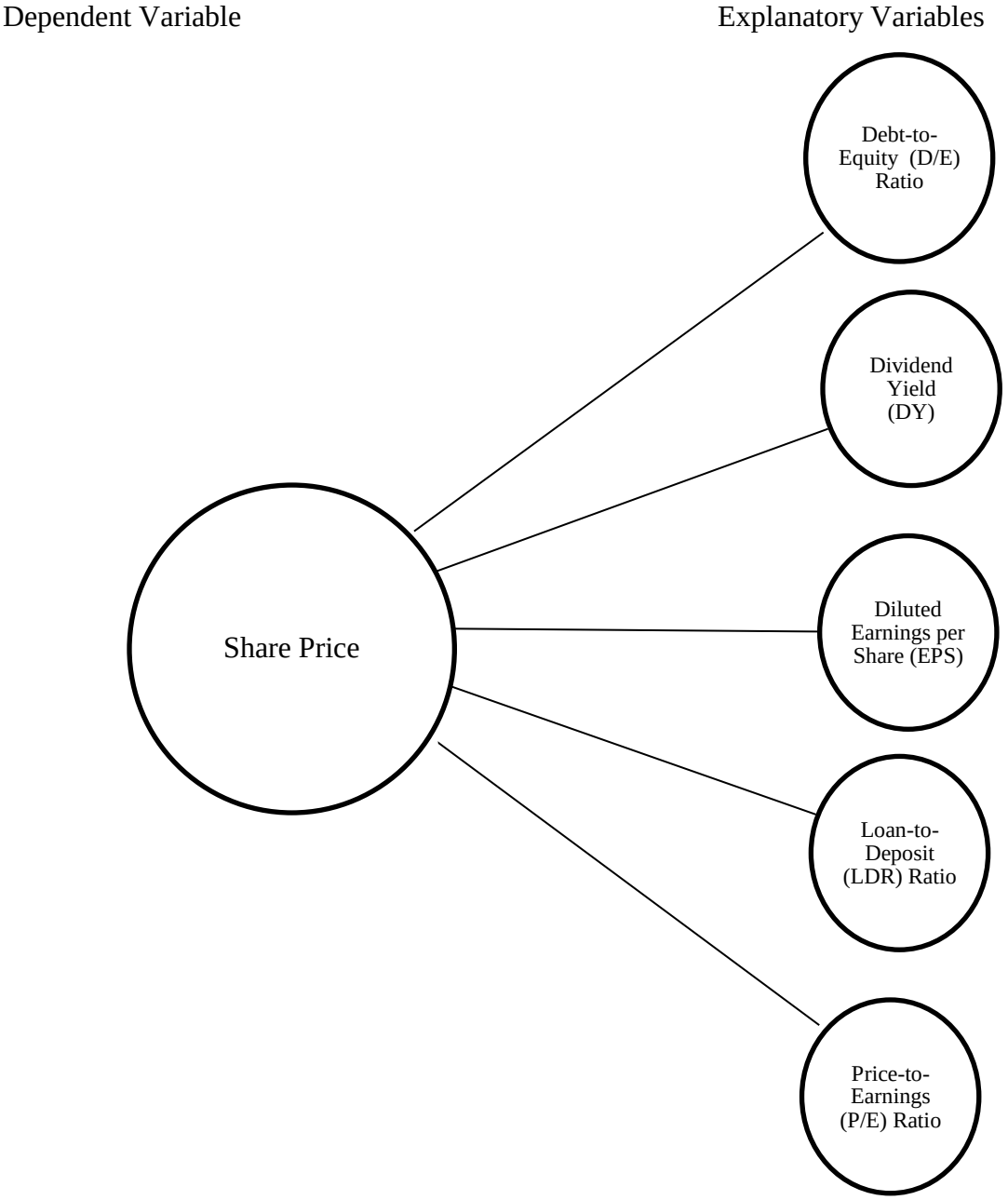


Figure 2.1 illustrates the relationship between stock price and five selected explanatory variables which are D/E Ratio, DY, Dilute EPS, LDR, and P/E Ratio. As mentioned in Chapter 1, the hypothesized relationships for D/E ratio, diluted EPS, LDR and P/E ratio to stock price are positive and significant while DY is hypothesized to have a negative and significant relationship to stock price.

This study scope is within the listed banking industries that are available in Malaysia. The period for this study begins from the year 2010 to 2015. The expected econometric model is assumed to be:

$$Stock\ Price_{it} = \beta_0 + \beta_1 D/E_{it} + \beta_2 DY_{it} + \beta_3 EPS_{it} + \beta_4 LDR_{it} + \beta_5 P/E + e_{it}$$

where

Stock Price = Price of Stocks of each bank

D/E = Debt-to-Equity Ratio

DY = Dividend Yield

EPS = Earnings Per Share

LDR = Loan-to-Deposit (LDR) Ratio

P/E = Price-to-Earnings Ratio

it = number of banks in the period between 2010 to 2015

e = error terms

2.4 Conclusion

In this chapter, the researchers of this study surmised the relationship between the independent variables and the dependent variable. Therefore, the nature of these variables has been determined. Expected signs for the relationships have also been hypothesized. Theoretical models used by past researchers to study asset pricing have also been reviewed. Through these processes, a theoretical framework for this study could be created to facilitate the understanding of readers.

In the next section, the discussion will be conducted to understand and apply certain research methodologies into the study.

CHAPTER 3: METHODOLOGY

3.0 Introduction

Research methodologies play an important role in identifying an accurate relationship between the dependent variable and independent variables. In the past, many theoretical facts have failed to manifest itself in empirical researches due to incorrect research designs or data processing. According to Crisan and Borza (2015), while the theories reflect the purposes and premises of the research activities, research methodology is responsible for validating the aforementioned theories by accentuating the system of rules, techniques, and methods. In this chapter, methods pertaining to a panel data regression are used to examine the impacts of accounting information towards the stock price of banks. This chapter also identifies the type of data that the researchers should be looking into and the sources for obtaining the aforementioned data. Last but not least, this chapter explains to readers the flow of data processing and the type of econometric software used in the analysis and diagnostic checking of data, i.e. EViews 8.

3.1 Research Design

Research design is directing a piece of research in a logical and systematic way by turning the research question into a testing project. Every design has its positive and negative sides. The best research design has always been dependent on the research question where it has to deal with the problems such as what to study, what data is relevant, what data to collect, and how to analyse the result. There are two types of research design: quantitative and qualitative. This study uses quantitative data in the

form of exploratory statistics to analyse the firm's fundamental factors that affect stock prices. The secondary data on debt-to-equity (D/E) ratio, dividend yield (DY), diluted earnings per share (diluted EPS), loan-to-deposit ratio (LDR), and price-to-earning (P/E) ratio are being employed to test how and why they affect the bank stock prices. Samples of eight banks in Malaysia over the period of six years, from 2010 to 2015, with a total of 48 observations, are adopted in this study. The latest information or source available on Bloomberg followed by each bank's annual reports are collected in order to make the findings more reliable. Panel data is used instead of cross-sectional data and time series data because it can provide a more informative and efficient data for this study.

3.2 Data Collection Methods

This study was conducted by collecting a list of secondary data and structured into a set of panel data. The data was mainly collected from Bloomberg. Secondary data was preferred in this study because the data was readily available and less costly and time consuming in comparison to primary data. Furthermore, primary data cannot be used in this study because suitable and appropriate respondents or institutions with sufficient accounting and financial knowledge were required and hard to identify. This study uses panel data instead of time series or cross-sectional data because Gujarati and Porter (2009) elucidated that panel data estimations are able to explain the heterogeneity which is bound to exist in different variables. Hsiao (2007) stated that a combination of both time series and cross-sectional data provides a more informative explanation with lesser collinearity among the independent variables, and usually had more degree of freedom. He explained that with higher degree of freedom, the correlations between the variables can be reduced. This sample gives a total of 48 observations consisting of eight listed banks in Malaysia from 2010 to 2015.

Table 3.1: List of Variables and Sources

Dependent Variable	**Proxy**	**Explanations**	**Unit Measurements**	**Source**
Share Price	Price	Share price for each bank	Cents	Bloomberg
Independent Variables	**Proxy**	**Explanations**	**Unit Measurements**	**Source**
Debt-to-Equity Ratio	DE	Total liabilities divided by total equities	Percentage (%)	Bloomberg
Dividend Yield	DY	Dividend per share divided by share price	Percentage (%)	Bloomberg
Earnings Per Share	EPS	Profit or loss attributable to ordinary shareholders divided by the weighted average number of ordinary shares outstanding.	Cents	Bloomberg
Loan-to-Deposit Ratio	LDR	Total loans issued divided by Total deposits	Percentage (%)	Bloomberg
Price-to-Earnings Ratio	PE	Share price divided by EPS	Times	Bloomberg

Source: Developed for the research

3.3 Sampling Design

3.3.1 Target Population

The target population of this study is financial holding companies and banking institutions approved by Bank Negara Malaysia (BNM). Nonetheless, not all financial holding companies and banking institutions are included in this study. The target population of this study is six financial holding companies and two banking institutions, which are:

1. Affin Holdings Berhad
2. Alliance Financial Group Berhad
3. AMMB Holdings Berhad
4. CIMB Group Holdings Berhad
5. Hong Leong Financial Group Berhad
6. Malayan Banking Berhad
7. Public Bank Berhad
8. RHB Capital Berhad

Since these eight financial institutions are publicly listed in Bursa Malaysia (the main reason why they are chosen in this study), their share prices, which are the dependent variable of this study, can be obtained through various sources such as Bloomberg. Besides, public listed companies qualify against the regulatory benchmark, which is a set of rules under the Securities Commission Malaysia Equity Guidelines and Bursa Malaysia's Listing Requirements. Thus, their financial statements are regularly audited by independent auditors before being publicized to the public. Plus, to ensure the accuracy of the data, all data for this study's explanatory variable is retrieved from these audited financial statements.

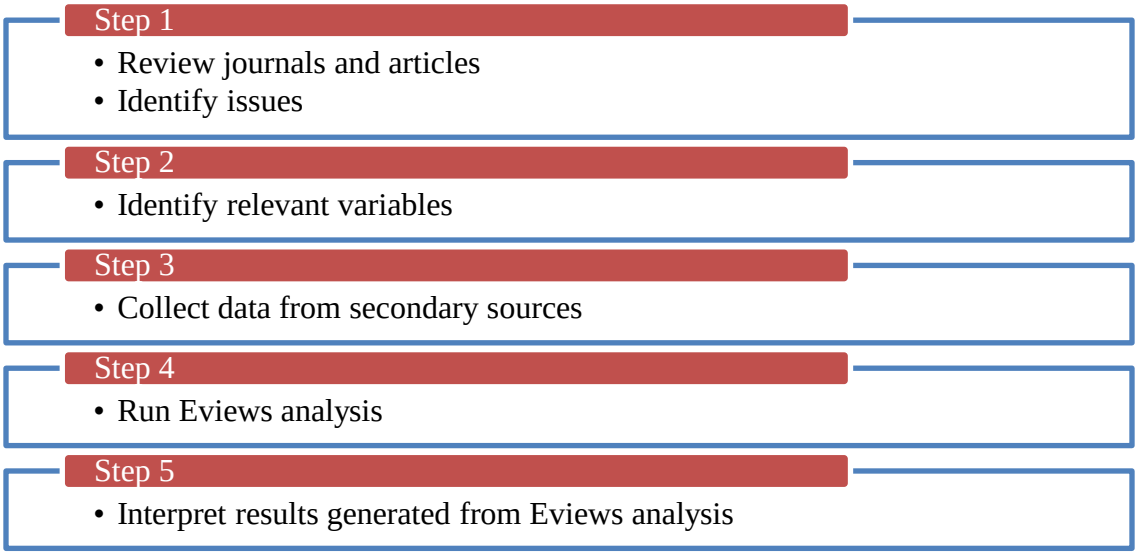
In short, these eight financial institutions represent the focus and interest of this study. The fundamental factors, namely accounting ratios will be studied to determine their ability to explain the stock prices of these banks.

3.3.2 Sampling Technique

In this study, EViews 8 was used to analyze the findings and generate the outputs as it is one of the most popular econometrics software packages around. EViews was chosen as the analysis tool because of its versatility where it can run on both Microsoft Windows and Apple Macintosh. Besides, it is used for general statistical analyses and econometric analyses, such as cross-sectional and panel data analysis and time series estimation and forecasting. EViews enables users to execute regressions and allows them to run the hypothesis testing, diagnostic checking, and correction procedures. Through EViews 8, many empirical and diagnostic tests can be carried out such as Jarque-Bera test, Hausman test, and multicollinearity test. It can also be used to produce analyses for ordinary least squares (OLS) model, pooled ordinary least squares (Pooled OLS) model, fixed effects model (FEM), and random effects model (REM) which enable users to determine the best-fit model.

3.4 Data Processing

Figure 3.1: Flow Chart of Data Processing



Source: Developed for the research

Figure 3.1 illustrates the data preparation process conducted in this study. The first process involved reviewing as many journals and articles as possible in order to determine a suitable issue and motivation to conduct this study.

After identifying the research problem, the researchers of this study proceeded to identify the relevant variables. Variables were selected on the basis of their relevancy to this study, the significance to past researches and supporting theories, and the availability of data or proxies.

The third step involved collecting data from Bloomberg. Annual data for D/E ratio, DY, diluted EPS, LDR and P/E ratio from 2010 to 2015 was collected for this study. Next, the data collected was analyzed via EViews 8. In the course of ensuring the accuracy of the results, the data is tested for econometric problems such as its normality and multicollinearity.

Lastly, the final results generated from the EViews analysis were interpreted. Conclusions were drawn according to the aforementioned interpretations.

3.5 Data Analysis

3.5.1 Descriptive Analysis

3.5.1.1 Pooled Ordinary Least Squares (Pooled OLS)

Pooled OLS is a regression that allows the analysis of *n* units of observations for a total of *t* times. In other words, it analyzes panel data which is a combination of time series and cross sectional data (Baltagi, 2008). Therefore, the variables in a pooled OLS model consist of a double subscript denoted with *i* and *t.* The subscript *i* signifies the individual observation (in this study indicating the selected banks) and represents the cross-sectional dimension whereas the subscript *t* denotes time (in this study indicating the number of years) and represents the time series dimension. Killingsworth (1990) stated that pooled OLS is capable of producing consistent estimates of all the parameters in a model. However, it is noted that it can still struggle with a few limitations such as when the error term of individual units tend to be the same over time. Therefore, Killingsworth (1990) suggests that simple pooled OLS is only appropriate to be used when this unit effect does not exist. Alternatively, the fixed-effects estimation can be used in placed of the pooled OLS since it allows the error term to be specified as an individual-specific time-invariant component.

In this study, the pooled OLS model will examine the relationship between various accounting ratios (fundamental values) and banks' stock prices. The equation is represented as follow:

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it} \ , \ i = 1, 2, \ldots, n \ ; \ t = 1, 2, \ldots, t$$

where:

Y_{it} = Bank's stock prices (dependent variable)

α = Intercept

β = Coefficient of X

X_{it} = Accounting ratios (independent variable)

ε_{it} = Error term

The equation above shows the relationship between Y and X. The intercept, α represents the value of the dependent variable Y when the value of the independent variable X is zero. On the other hand, the coefficient of X, β indicates the change in the dependent variable Y as a result of a unit change in the independent variable X.

3.5.1.2 Fixed effect model (FEM)

Fixed effects regression is similar to the OLS regression with the addition of dummy variables for every cross-sectional unit. To utilise the fixed effects least square, it is necessary to ensure that the n is not too large. The reason for this is because consideration has to be taken for the (n-1) dummies in the regression. Too big the n will cause a great loss in degrees of freedom to the least squares dummy variables (LSDV), and the increased in dummies will aggravate the problem of multicollinearity among the regressors (Baltagi, 2008). Moreover, time invariant variables such as union participation and the likes are not used in this study since FEM cannot estimate the effects of these

time invariant variables. Estimation through fixed effects consist of an individual specific time invariant error term and a random error term that varies across individual observations and over time (Killingsworth, 1990). The equation can be represented as below:

$$Y_{it} = \alpha + \beta X_{it} + \mu_i + \varepsilon_i \ , \ \ i = 1, 2, \ldots , n \ ; \ \ t = 1, 2, \ldots , t$$

where:

Y_{it} = Bank's stock price (dependent variable)

α = Intercept

β = Coefficient of X

X_{it} = Accounting ratios (independent variable)

μ_i = Company fixed effect

ε_i = Error term

According to Baltagi (2008), FEM is rendered a suitable model if we have a specific set of n number of observations. Also, our inference must solely be based on these specific observations, with the subject matters in our analysis being identical and share a common size effect (Borenstein, Hedges, Higgins & Rothstein, 2010). Ordinary least squares (OLS) is then performed to obtain the estimates α, β, and μ.

3.5.1.3 Random effect model (REM)

The random effect model, also known as the error component model, represents its lack of knowledge with regard to the true model through the disturbance term, unlike the fixed effect model which represents the lack of knowledge through its dummy variables (Gujarati & Porter, 2009). The random effect model consist of an intercept β_1 that represents a common mean value for all the independent variables and a composite error term which is

made up of (1) a cross-section, or individual-specific error component, and (2) a combined time-series and cross-section error component (Gujarati & Porter, 2009). This model can be represented as:

$$Y_{it} = \beta_1 + \beta_2 X_{it} + \varepsilon_i + u_{it}$$
$$Y_{it} = \beta_1 + \beta_2 X_{it} + w_{it}\ ,\ i = 1, 2, \dots, n\ ;\ t = 1, 2, \dots, t$$

where

Y_{it} = Bank's stock price (dependent variable)

β_1 = Common mean value for the intercept, assumed to be random

β_2 = Coefficient for X

X_{it} = Accounting ratios (independent variable)

μ_{it} = Combined time series and cross-section error components

ε_{it} = Cross-section, or individual-specific error component

w_{it} = Composite error term

Several assumptions made under the random effect model are that there is no correlation between the individual error components. There is also no autocorrelation between the error components and the cross-section and time series units. Also, the independent variables and w_{it} are not correlated too. However, according to Gujarati and Porter (2009), there is a correlation between the error terms with two different referent points in time in a given cross-sectional unit. Taking this into account, the generalized least square method is the most suitable method to be used here because the OLS estimators would be inefficient.

3.5.2 Scale Measurement

3.5.2.1 Normality Test

According to Gujarati and Porter (2009), in the classical normal linear regression model (CNLRM), the error term is assumed to be normally distributed. Hence, the normality test is used to determine whether the data is normally distributed. It is of utmost importance when the sample size is small in which the observations (n) are less than 100 (Gujarati & Porter, 2009). In this study, the Jarque-Bera (JB) test is being conducted to verify the normality of the error term before conducting further analyses. Otherwise, subsequent tests will be considered invalid. Under the JB test, the null (H_0) and alternative (H_1) hypotheses are stated as below:

H_0: The error term is normally distributed.
H_1: The error term is not normally distributed.

The decision rule concludes that H_0 will be rejected if the p-value for JB test is smaller than the level of significance, α. Otherwise, do not reject H_0, which indicates that the error term follows a normal distribution. If the result shows that the error term is not normally distributed, there is a possibility for the existence of multicollinearity, heteroscedasticity, and autocorrelation problems in the model (Gujarati & Porter, 2009).

The classical skewness and kurtosis coefficients are being used in the JB test to examine its goodness of fit. The formula is shown as below:

$$JB = \frac{n}{6}(S^2 + \frac{1}{4}(K-3)^2)$$

where

n = Sample size

S = Skewness coefficient

K = Kurtosis coefficient

3.5.2.2 Multicollinearity

According to Kumari (2008), among the three basic assumptions under the classical linear regression model (CLRM) is that there is no linear relationship among the independent variables. However, when there is an existence of linear relationships between two or more independent variables in a regression model, this is known as the problem of multicollinearity. For instance, Wang (1996) states that given a regression model:

$$Y = \alpha + bX_1 + cX_2 + dX_3 + \mu$$

where Y represents the dependent variable and μ as the error term has three independent variables, X_1, X_2, and X_3 with a as the constant term. The CLRM assumes that if multicollinearity is very high or perfect, their regression coefficients (b, c, and d) in respective to X are indeterminate with infinite standard errors (Gujarati & Porter, 2009).

Multicollinearity occurs in multiple regression models instead of simple regression with only one independent variable. Gujarati and Porter (2009) indicated that this problem occurs due to several reasons. A possible reasoning is that the model may be overdetermined; this happens where unnecessary explanatory variables are added, thus making the model more complex and increasing the tendency for the variables to be related to each other. Besides, they also state that in a model consisting of time series data, there may be a

possibility that the regressors share a common trend (increasing or decreasing) over time indicating a collinearity among them.

Nevertheless, researchers argue that the presence of multicollinearity may cause a serious forecasting error and make it more difficult in assessing the importance of each explanatory variables (Wang, 1996; Kumari, 2012). The problems of multicollinearity are that the estimated standard error for the coefficients will be large which leads to a biased OLS estimator that complicates the forecasting procedure. Besides, the estimated coefficients may be insignificant or inaccurate which cause a sensitive outcome when data changes (Kumari, 2012). She stated that when the explanatory variables are correlated, the standard errors for their coefficients will be large and lead to a smaller t-statistic value which is likely to produce an insignificant outcome. Furthermore, when the standard errors are large, model users will have difficulty assessing the importance of each independent variables (Kumari, 2012).

According to Kmenta (1986), multicollinearity is a problem that occurs in samples from non-experimental data collection. There are several detection methods for the presence of multicollinearity such as identifying the model with high coefficient of determinations, R^2 with fewer significant partial slope coefficients. The R^2 may become too large ($R^2 > 0.9$) to the extent that the F-statistic test can reject the hypothesis of the coefficients of explanatory variables (H_0) being equals to zero. Next, the indicator of high pair-wise correlation between regressors may be a sign for but not necessarily a strong evidence in proving the existence of multicollinearity. Therefore, further testing such as the used of variance-inflating factor (VIF) and tolerance (TOL) is needed to test for multicollinearity. VIF from Gujarati and Porter (2009) shows how the variance of an estimator is inflated by the existence of multicollinearity whereas TOL is the inverse of VIF (O'brien, 2007). Based on the formula:

$$VIF = \frac{1}{(1 - r_{2,3})} \qquad TOL = \frac{1}{VIF}$$

where $r^2_{2,3}$ is the auxiliary coefficient of determinations between estimators 2 and 3, when $r^2_{2,3}$ approaches to 1, VIF is close to infinity. This shows that when the collinearity increases, the variance of the estimator also rises, and its value can be infinite. Similar case in TOL, when it is close to zero, there is a presence of serious multicollinearity problem. Since both VIF and TOL have intimate connection, therefore both can be used interchangeably.

Therefore, the remedial measure to this problem depends on the situations of the study. Sometimes the researcher themselves can choose whether to ignore the problem or find alternatives to overcome such situations. When researchers do nothing, they follow Farrar and Glauber (1967)'s justification where multicollinearity is a data deficiency problem and there is nothing researchers could do. On the other hand, researchers tend to drop the variables which are highly correlated. However, the disadvantage to this method may be the creation of specification bias.

3.5.3 Inferential Analysis

3.5.3.1 Poolability Test

According to De Jager (2008), poolability is the computation of a common slope and a common intercept across all cross-sections. And in order to test for the presence of individaul effects, the poolability test is used (Kunst, 2009). Poolability test is an extension of the Chow test and is designed to examine the slopes across groups over time. It involves identifying the

suitability of either the pooled OLS or the FEM to conduct the estimation for panel data (Park, 2011).

There are two underlying models in this test. The restrictive model depicts the same coefficient across time and cross-sections. In other words, the slopes is the same for all regressors where $\delta_i = \delta$ for all i, thus this model forms the basis of the null hypothesis. The other unrestrictive model is where some of the intercept and slope coefficients differ across time and cross-sections ($\delta_i \neq \delta$ for all i) (De Jagen, 2008).

The poolability test follows a restricted F-test distribution, and its F-value is computed as follow:

$$F = \frac{(R^2_{FEM} - R^2_{POOL}) \div (K_{FEM} - K_{POOL})}{(1 - R^2_{FEM}) \div [n - (K_{FEM} + 1)]}$$

where

R^2_{FEM} = R-squared of fixed effects model

R^2_{POOL} = R-squared of pooled OLS model

K_{FEM} = Number of independent variables of fixed effects model

K_{POOL} = Number of independent variables of pooled OLS model

n = Number of observations

Our decision rule on whether to reject the null hypothesis is based on the computed value of the F-statistic. If the F-statistic probability value is less than the level of significance, the null hypothesis will be rejected. In this case, our panel data is considered not poolable and FEM would be a more appropriate model to be used instead of the pooled OLS model.

Kapetanios (2003) stated that the poolability test contributed hugely to the development of panel data researches. According to the author, the parameter restriction problems of panel data are solved by the poolability test.

3.5.3.2 Breusch-Pagan LM Test

When the REM model was proposed by Balestra and Nerlove (1966), it was not popular among researchers as they preferred to use dummy variables to allow for individual effects, at the same time omitting the time effects. Breusch and Pagan (1980) inferred that the disinclination for REM was due to the lack of available tests to test for the existence of individual and time effects based on least square residuals. They then demonstrated the use of Lagrange multiplier (LM) statistics to act as that particular test. Therefore, the Breusch-Pagan LM test, also known as the Breusch-Pagan (BP) test, is a formal statistical test for individual and/or time effects based on the outcomes of the Pooled OLS (POLS) model, using the LM tests (Breusch & Pagan, 1980).

This test follows an asymptotic χ_m^2 distribution along with a null hypothesis stating that the variances for the unobserved individual effect, σ_m^2, unobserved time effects, σ_λ^2 or both effects are equal to zero ($H_0: \sigma_\mu^2 = 0$ or $H_0: \sigma_\lambda^2 = 0$ or $H_0: \sigma_\mu^2 = \sigma_\lambda^2 = 0$), where $m = 1, 2$ depending on whether the model is one or two-way. Thus, an REM model would be preferred over a POLS model if the null hypothesis is rejected. If not, POLS would be preferred (Di Lascio, Giannerini, Scorcu & Candela, 2011).

The LM test is chosen among the trinity of tests, i.e. LM, Likelihood Ratio (LR) and Wald, to serve as a detector for random effects because it is based on the null, restricted model (Greene & McKensie, 2015). Meaning that the LM test only requires the estimation of the parameters of a restricted model

(Arellano, 2004). The null, restricted model is much simpler to estimate than the alternative, unrestricted one (Greene & McKensie, 2015), unlike Wald tests, which uses unrestricted models to get its estimates, or likelihood ratio tests that are based on both restricted and unrestricted estimates (Arellano, 2004; Kunst, 2009). The null, restricted model, in this case, refers to the POLS model, where it is free from individual and time effects; therefore its two variance parameters σ_{μ}^2 and σ_{λ}^2 can be expressed as $\sigma_{\mu}^2 = \sigma_{\lambda}^2 = 0$, which serves as a simple restriction for the null hypothesis (Kunst, 2009). In a nutshell, the test for zero random individual effects can also be expressed as a test for zero variances of these random effects under the null (Baltagi, Chang & Li, 2015).

The test for random effects is important because its presence in panel data triggers a need for adjustment in order to eliminate the ambiguities in interpreting the parameters (Greene & McKensie, 2015). By acknowledging its presence through the rejection of the null hypothesis, researchers should take into consideration the individual or periodical heterogeneity in the panel. If not, standard errors and test statistics may be biased (Baltagi, Change & Li, 2015).

3.5.3.3 Hausman Test

The Hausman test, also known as a test of the exogeneity assumption, provides a formal statistical method in determining whether a set of panel data is represented by a fixed effects model (FEM) or a random effects model (REM), which is to detect any correlation between the conditioning regressors and the unobserved individual effect (Amini, Delgado, Henderson & Parmeter, 2015). If the exogeneity assumption is rejected, meaning that there is a correlation between the conditioning regressors and the unobserved individual effect, the panel data would prove statistically to be more suited as a fixed effect model. Otherwise, a random effect model would be favored (Amini, et al., 2015).

The Hausman test follows an asymptotic χ^2 distribution along with a null hypothesis stating that there is no significant difference between FEM and REM estimators. Thus, an FEM model would be preferred over an REM model if the null hypothesis was rejected, and vice versa (Gujarati & Porter, 2009).

This rationale behind the decision making is as follows: The general intuition of the Hausman test assumes that the null hypothesis is of no misspecification (the estimators are efficient and consistent), while the alternative hypothesis is of model misspecification (inconsistent estimators). So, if another estimator is found to be consistent under both the null and alternative hypothesis, regardless of its efficiency, a statistical test could be formulated using estimates from both REM and FEM. Since the estimators in an FEM yields consistent results regardless of the correlation between the conditioning regressors and the unobserved individual effect, whereas the same scenario would yield inconsistent results for the estimators of REM, the suitable null hypothesis is that there the is no correlation between the conditioning regressors and the unobserved individual effect (REM), which deems the alternative hypothesis to represent a correlation between the aforementioned variables (FEM) (Amini, et al., 2015).

According to Amini, et al. (2015), it is important to select a suitable econometric framework for a panel data, for if FEMs were treated as REMs, estimation of the REMs will produce biased and inconsistent estimates of the conditional mean; whereas REMs treated as FEMs will produce consistent but inefficient estimates.

Last but not least, Hausman test owes its wide applicability in various econometric fields to its simplicity and generality, which Amini et al. (2015) considers those qualities to be its greatest strength.

3.5.3.4 T-Test

T-test studies on whether each of the independent variables has significant impact on the dependent variable (Gujarati & Porter, 2009). In this study, there are five independent variables used in explaining the dependent variable, which is the stock price. The independent variables are D/E ratio, DY, diluted EPS, LDR, and P/E ratio. The null (H_0) and alternative (H_1) hypotheses are shown as below:

H_0: There is no significant relationship between the independent variable and dependent variable $(\beta_i = 0, i = 1, 2, 3, 4)$.
H_1: There is a significant relationship between the independent variable and dependent variable $(\beta_i = 0, i = 1, 2, 3, 4)$.

Based on the decision rule, H_0 will be rejected if the level of significance, α is larger than the p-value of the T-test. In other words, the explanatory variable has significance towards the dependent variable. Otherwise, H_0 is not rejected.

3.5.3.5 F-test

F-test is employed to determine the overall significance of the model. It can be said that F-test is being used to study the joint effect among all the regressors towards the regressand, instead of individual effect for every single independent variable. If there is one or some of the independent variables that is proven to be statistically insignificant, this does not necessarily mean that it is insignificant in the model as a whole. The null (H_0) and alternative (H_1) hypotheses are provided as below:

H_0: The overall model is insignificant $(\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0)$.
H_1: At least one of the independent variables affects the dependent variable significantly.

Under the p-value approach, the decision rule states that H_0 will be rejected if the p-value for F-test is smaller than the level of significance, α. This suggests that at least one of the independent variables can influence the dependent variable substantially. Otherwise, H_0 will not be rejected.

3.6 Conclusion

This chapter describes the important components involved in a panel data regression which uses secondary data as its source. This chapter also highlights several tests used to determine the best econometric model for this study, like Hausman test, poolability test, and Breusch and Pagan Lagrange Multiplier test. In the following chapter, all the results from Eviews 8 will be analysed and interpreted in detail.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter focuses on presenting and interpreting the empirical results derived from the methodologies explained in Chapter 3 via hypothesis testings. The main highlights of this chapter are the results for scale measurements such as the tests for normality, multicollinearity, Poolability F-Test, Breusch-Pagan LM Test, and Hausman Test; and scale measurement inferential analysis such as the Coefficient of Determination R^2, $\bar{R}^2$ and F-Test.

4.1 Descriptive Analysis

Table 4.1: Summary Descriptive Statistic of All Variables

Sample Banks; N= 8 No. of obs: 48	Mean	Standard Deviation	Min	Max	Skewness	Kurtosis	Jarque - Bera (P-value)
SP	818.8750	445.2765	234.0000	1880.000	0.882968	2.954619	6.241177 (0.04413)
D/E	144.8456	42.68730	66.15165	231.9862	-0.186124	2.252432	1.394851 (0.497865)

DY	3.305625	1.302154	0.790000	7.070000	0.971678	3.849653	8.997077 (0.011125)
EPS	68.43750	37.19523	19.00000	160.0000	0.988054	3.142751	7.850756 (0.019735)
LDR	85.01257	14.84443	0.648711	100.7241	-3.989000	23.08857	934.3983 (0.000000)
P/E	12.12505	2.277106	8.166047	17.45380	0.092737	2.282846	1.097421 (0.577694)

Source: Developed for the research

Notes: The results are based on the 48 annual observations for the period of 2010 to 2015: KLCI annualised share prices in eight Malaysian local banks, debt-to-equity (D/E) ratio, dividend yield (D/Y), earnings per share (EPS), loan-to-deposits (LDR), price-to-earnings (P/E) ratio.

Table 4.1 shows a statistical summary of the dependent and independent variables conducted on eight banks for six years between 2010 and 2015. From the table above, the mean shows the average of the data values; the standard deviation measures the average difference between the mean and a single observation; the minimum tells the smallest data value while the maximum tells the biggest data value; in the data distribution, the skewness measures the degree and direction of asymmetry while the kurtosis measures the tails' heaviness and lastly the Jarque-Bera result indicate whether the variables follow the normal distribution.

4.2 Scale Measurement

4.2.1 Normality Test

Table 4.2: Normality Test

Normality Residuals (Errors) Test	
Jarque-Bera Test Statistic = 1.048423	Probability = 0.592022

Hypothesis:

H_0 = The Error terms is normally distributed

H_1 = The Error terms is not normally distributed

H_0 = The Error terms is normally distributed

H_1 = The Error terms is not normally distributed

Level of Significance, $\alpha = 0.05$

Decision Rule:

1) Reject the null hypothesis when p-value of Jarque-Bera statistics is higher than the level of significance, α
2) Do not reject null hypothesis when p-value of Jarque-Bera statistics is lower than the level of significance, α

Conclusion:

Since p-value of Jarque-Bera statistics is 0.592022 which is higher than $\alpha = 0.05$, do not reject the null hypothesis which indicates that the error term is normally distributed.

4.2.2 Multicollinearity

4.2.2.1 Correlation Analysis

Table 4.3 Correlation Analysis

	SP	DE	DY	EPS	LDR	PE
SP	1.000000	0.259927	-0.104138	0.908177	-0.183564	0.255103
DE	0.259927	1.000000	-0.062611	0.299645	0.207598	0.038573
DY	-0.104138	-0.062611	1.000000	-0.172171	0.203405	0.010247
EPS	0.908177	0.299645	-0.172171	1.000000	-0.367084	-0.119308
LDR	-0.183564	0.207598	0.203405	-0.367084	1.000000	0.351306
PE	0.255103	0.038573	0.010247	-0.119308	0.351306	1.000000

Source: Developed for the research

According to the rule of thumb, if the pair-wise or zero-order correlation coefficient between the two independent variables is high (exceeding 0.8), then there is a serious multicollinearity problem (Gujarati & Porter, 2009). As shown in Table 4.3, there are no serious multicollinearity problem among the independent variables since the pair-wise correlation coefficients among the independent variables are not more than 0.8.

4.2.2.2 Variance-Inflating Factor (VIF) and Tolerance (TOL)

Table 4.4: Each independent variable's VIF and TOL

	DE	DY	EPS	LDR	PE
VIF	1.047316	1.003839	1.089187	1.138416	1.017090

TOL	0.954822	0.996176	0.918116	0.878413	0.983197

Source: Developed for the research

As a rule of thumb, if the VIF exceeds ten, this indicates serious multicollinearity; if the VIF is equal to one, this indicates that the independent variables are not correlated. Besides, when TOL approaches to zero, the greater the degree of collinearity of that variable with the other independent variables. On the contrary, when TOL approaches one, the greater the evidence that X is not collinear with other regressors (Gujarati & Porter, 2009). From Table 4.4, each independent variable's VIF is less than ten and closer to one. Furthermore, each independent variable's TOL is closer to one. Thus, there is no serious multicollinearity problem among the regressors.

4.2.3 Pooled OLS, Fixed Effect Model (FEM), and Random Effect Model (REM)

Table 4.5: Results of Different Regression Outputs

	Pooled OLS	**FEM**	**REM**
Constant	-959.3739 (0.0000)	-590.7541 (0.0006)	-660.7266 (0.0001)
D/E ratio	-0.664347 (0.0526)	-0.690356 (0.0208)	-0.657073 (0.0226)
DY	16.33766 (0.1099)	10.76480 (0.4107)	13.16635 (0.2768)
Diluted EPS	11.98130 (0.0000)	10.98443 (0.0000)	11.20483 (0.0000)

LDR	1.884478 (0.0808)	0.197563 (0.7984)	0.307665 (0.6858)
P/E ratio	69.30250 (0.0000)	58.18512 (0.0000)	60.88775 (0.0000)

Source: Developed for the research

Different regression models illustrate the different outcomes in testing the relationship between the explanatory variables and the dependent variable (share price). Therefore, Table 4.5 indicates the results for pooled ordinary least square, fixed effect, and random effect models. In order to further explain which model is preferable, the following testing is required at a 5% significance level.

4.2.3.1 Poolability Test

Table 4.6: Result of Redundant Fixed Effect

Effect Test	Statistic	Degree of freedom (d.f)	Probability
Cross-Section Chi-square	56.425472	7	0.0000

Source: Developed for the research

The Restricted F-test is used under the poolability test to choose between the regression models of Pooled OLS model or Fixed Effect Model (FEM). From Table 4.6, the probability shows a value of zero which is lesser than the significance level of 5%. Therefore, we reject the null hypothesis stating that the panel data follows the Pooled OLS model. Hence, the FEM is chosen.

4.2.3.2 Breusch-Pagan LM Test

Table 4.7: Result of Lagrange Multiplier test for Panel Data

Method	Cross-section One-sided	Period One-sided	Panel Both
Breusch-Pagan	35.17300 (0.0000)	1.599861 (0.2059)	36.77286 (0.0000)

Source: Developed for the research

Breusch-Pagan LM (BPLM) test is used to test which model, namely the Restricted Panel Model (Pooled OLS) or the Random Effect Model (REM) is more suitable (Gujarati & Porter, 2009). In this test, the results shown under the "Panel" column in Table 4.7 illustrate the probability (0.000) is also less than the 5% significance level. Since the null hypothesis supporting the Pooled OLS model is also rejected, REM is therefore more preferable over the Pooled OLS model.

4.2.3.3 Hausman Test

Table 4.8: Result of Correlated Random Effect- Hausman Test

Test Summary	Chi-Square Statistic	Chi-Square. d.f.	Probability
Cross-section random	1.883857	5	0.8650

Source: Developed for the research

Since both previous tests denied the use of Pooled OLS model, therefore Hausman test is performed. Hausman test helps to decide whether the REM or FEM is preferable. The null hypothesis indicates that the panel data follows the random effect model, and the alternative hypothesis indicates otherwise. The result in Table 4.8 shows that the probability is more than the 5% significance level indicating that the null hypothesis should not be rejected. Therefore, the overall testing shows that the REM is the most suitable compared to Pooled OLS and FEM.

4.3 Inferential Analysis

4.3.1 Coefficient of Determination R^2, $\overline{R}^2$ and F-Test

The coefficient of determination R^2 is described by Gujarati and Porter (2009) as the summary measure which indicates how well the sample regression line fits the data. It is a common measure of the goodness of fit of a regression line. Since this study follows the REM, the R^2 generated from Eviews 8 gives a value of 0.9181. This means that 91.81% of the bank stock prices is able to be explained by the fundamental values. After taking the degree of freedom into consideration, the adjusted value of the coefficient of determination, $\overline{R}^2$: 0.9084 is also considered high, thus indicating a high explanatory power of the fundamental values on stock prices. This means that 90.84% of the banks' share price can be explained by D/E ratio, DY, diluted EPS, LDR, and P/E ratio.

However, the R^2 results are subjected to skepticism by some researchers regarding their reliability (Barrett, 1974). This is because the R^2 value will increase when more independent variables are added into the regression

model, even after taking into account the degree of freedom. Hence, F-test statistic is another method to test the overall model significance. In this study, the probability of the F-test value is 0.0000 which is less than the significance level of 5%. Therefore, the overall model is significant.

4.3.2 Hypothesis Testing

The regression model for this study is as follow:

$$SP_{it} = \beta_0 + \beta_1 D/E_{it} + \beta_2 DY_{it} + \beta_3 EPS_{it} + \beta_4 LDR_{it} + \beta_5 P/E_{it} + \varepsilon_{it}$$

where

SP_{it} = Share price of each bank from 2010-2015

D/E_{it} = Debt-to-equity ratio

DY_{it} = Dividend yield

EPS_{it} = Diluted Earnings per share

LDR_{it} = Loan-to-deposit

P/E_{it} = Price-to-earnings ratio

ε_{it} = Error term

i = banks

t = 2010-2015

Table 4.9: Summary Table

	Coefficient	Standard Deviation	T-test (P-value)
Constant	-660.7266	147.6098	-4.476172 (0.0001)
D/E ratio	-0.657073	0.277578	-2.367166

			(0.0226)
DY	13.16635	11.95049	1.101741 (0.2768)
Diluted EPS	11.20483	0.551098	20.33181 (0.0000)
LDR	0.307665	0.755284	0.407350 (0.6858)
P/E ratio	60.88775	6.748909	9.021865 (0.0000)

Source: Developed for the research

The value in Table 4.9 were extracted from Appendix 5. In this section, this study discusses the relationship between the explanatory variables and its dependant variable, bank stock prices. The overall significance will be based on the p-value, given that the decision rule is to reject the null hypothesis when the p-value is less than the 5% significance level.

4.3.2.1 Debt-to-Equity Ratio

For the D/E ratio in this study, the p-value of 0.0226 is lesser than the significance level of 5%, hence the null hypothesis H_0 is rejected. This means that D/E ratio is significant in determining the share prices of public-listed banks in Malaysia. The coefficient of -2.367166 indicates an inverse relationship between D/E ratio and share prices. When D/E ratio increases by 1 unit, on average, the share price reduces by 2.367166 cents, ceteris paribus.

4.3.2.2 Dividend Yield

For the DY, the p-value of 0.2768 is more than the significance level of 5%, hence the null hypothesis H_0 cannot be rejected. This means that DY is insignificant in determining the share prices of the banks in Malaysia.

4.3.2.3 Diluted Earnings per Share

For the diluted EPS, the p-value of 0.0000 is lesser than the significance level of 5%, hence the null hypothesis H_0 is rejected. This means that EPS is significant in determining the share prices of the banks in Malaysia. The coefficient of 20.33181 indicates a positive relationship between the diluted EPS and share prices. When diluted EPS increases by 1 cent, on average, the share price increases by 20.33181 cents, ceteris paribus.

4.3.2.4 Loan-to-Deposit Ratio

For the LDR, the p-value of 0.6858 is more than the significance level of 5%, hence the null hypothesis H_0 cannot be rejected. This means that LDR is insignificant in determining the share prices of the banks in Malaysia.

4.3.2.5 Price-to-Earnings Ratio

For the P/E ratio, the p-value of 0.0000 is lesser than the significance level of 5%, hence the null hypothesis H_0 is rejected. This means that P/E ratio is significant in determining the share prices of the banks in Malaysia. The coefficient of 9.021865 indicates a positive relationship between the P/E ratio

and share prices. When the P/E ratio increases by 1 unit, on average, the share price increases by 9.021865 cents, ceteris paribus.

4.4 Conclusion

The empirical results have been explained in Chapter 4. Diagnostic checking such as normality test and multicollinearity have been provided and adjusted for econometric problems. Furthermore, the researchers of this study discussed the effect of each regressor to the regressand. Further explanations along with discussions, implications, and recommendations will be presented in the following chapter.

CHAPTER 5: DISCUSSION, IMPLICATION, AND CONCLUSION

5.0 Introduction

In this chapter, a summary will be given on the findings of this study and accompanied by a discussion on the possible reasons for such an outcome. The implications and benefits that various parties can derive from this study will also be presented. Next in line will be the limitations faced and recommendations for future researches on how to improve their own empirical studies.

5.1 Summary of Statistical Analyses

Table 5.1: Summary of Diagnostic Checking

Test for Econometric Problem	**Explanations for the Results**
Normality	The regression model does not have normality problem.
Multicollinearity	There is no serious multicollinearity in the regression model.

Source: Developed for the research

Table 5.1 summarises all results from the study's diagnostic checkings. It shows that the regression model is normally distributed with no serious multicollinearity problem. Autocorrelation was discovered at first but solved by using Newey-West

Standard errors. This indicates that the error term relating to any observation is not influenced by the error term relating to any other observation.

5.2 Discussion on Major Findings

Table 5.2: Summary of Independent Variables on Dependent Variables

Independent Variable	Hypothesis Testing	Conclusion	Hypothesized results	Actual results
Debt-to-Equity Ratio	H_0: Debt-to-equity has no significant relationship with share prices. H_1: Debt-to-equity has a significant relationship with share prices.	Reject H_0. Debt-to-equity has a significant relationship with share prices.	Positive	Negative
Dividend Yield	H_0: Dividend yield has no significant relationship with share prices. H_1: Dividend yield has a significant relationship with share prices.	Do not reject H_0. Dividend yield has no significant relationship with share prices.	Negative	Positive

Diluted Earnings per Share	H_0: Diluted earnings per share has no significant relationship with share prices. H_1: Diluted earnings per share has a significant relationship with share prices.	Reject H_0. Diluted earnings per share has a significant relationship with share prices.	Positive	Positive
Loan-to-Deposit Ratio	H_0: Loan-to-deposit has no significant relationship with share prices. H_1: Loan-to-deposit has a significant relationship with share prices.	Do not reject H_0. Loan-to-deposit has no significant relationship with share prices.	Positive	Positive
Price-to-Earnings Ratio	H_0: Price-to-earnings has no significant relationship with share prices. H_1: Price-to-earnings has a significant relationship with share prices.	Reject H_0. Price-to-earnings has a significant relationship with share prices.	Positive	Positive

Source: Developed for the research

5.2.1 Debt-to-Equity Ratio

The result shows a negative significant relation of D/E ratio on the stock prices. It is found to be aligned with the researches of Mukherjee, Dhatt and Kim (as cited in Shabib-ul-Hasan, Farroq & Muddassir, 2015). Under the Modigliani and Miller theory, if the agency costs, the bankruptcy risk, or other factors are being taken into consideration, an increase in leverage would cause a decrease in the value of invested capital if a firm does not gain from its investment and fails to generate shareholder wealth through the leverage (Aghdaei & Ghasemi, 2012). In other words, the interest expense and credit risk of default destroys the shareholder value. Additionally, the direct relationship between leverage and stock return is assumed only in the context of Efficient Markets Hypothesis (Aghdaei & Ghasemi, 2012).

In contrast, Leledakis and Davidson (2001), Bhandari (1988) proved that D/E ratio has a positive relationship with the stock prices which is not consistent with the results of this study. D/E ratio is positively related to the stock prices because when a firm possesses a higher D/E ratio, it will always have higher risk on its common equity since the firm-level risk may vary and has a higher probability of bankruptcy (Bhandari, 1988). When investors face a higher risk, the share prices will be increasing as a compensation to them. Plus, according to the leverage effect, corporate sectors with a high level of leverage will lead to a high level of systematic risk, resulting in higher volatility of stock returns (Bhatti, Majeed, Rahman & Khan 2010). Since financial risk (a risk where a firm is not able to meet its financial obligations) is generally linked to the form of financing, the higher the amount of debt the firm acquires, the greater the financial risk (Acheampong, Algalega & Shibu, 2014).

On the other hand, Barbee et al. (1996), Safania et al. (2011), Pech et al. (2015) and Rahmani, Sheri and Tajvedi, Michailidis, Tsopoglou and Papanstasiou (as cited in Shabib-ul-Hasan, Farroq & Muddassir, 2015) have found the relationship between D/E ratio and stock prices to be insignificant. They concluded that net D/E ratio is statistically insignificant to explain stock returns.

5.2.2 Dividend Yield

Past researches on the relationship between DY and stock performance have produced inconsistent empirical results, along with different justifications on the influence of DY on stock prices. Nevertheless, there are strong evidences from journals documenting the significant relationship between the aforementioned variables, namely Fama and French (1988), Lewellen (2004), Irfan and Nishat (2002), Ang and Bekaert (2003), Aras and Yilmaz (2008), Khan et al. (2011), Okafor and Mgbame (2011), Masum (2014) as well as Sharif et al. (2015). In the study done by Pech et al. (2015), one of the most preferred ratios for financial analysts is DY. Companies with high DY are usually huge, established and matured companies with low growth. A high DY might be a signal that the market is undervalued (Aras & Yilmaz, 2008). Plus, it is a method to evaluate the amount of returns for each dollar invested in an equity position. Investors who require a slightest stream of cash flow from their investment portfolio can protect this cash flow by investing in stocks paying rather costly, reliable dividend yields (Malhotra & Tandon, 2013).

Nevertheless, the result obtained shows an opposite outcome where there is an insignificant relationship. According to Latif, Shehzad, Fareed, Zulfqar and Shahzad (2014), the relationship between dividend policy and stock prices has incurred different opinions and arguments among the finance scholars for a

couple of decades. Miller and Modigliani did mention that it was the investment policy affecting the stock prices instead of dividend policy. However, the MM theory is often discredited because of its assumptions on a perfect market. Nevertheless, Black and Scholes (1973) derived an explanation from the MM theory can be applied after considering all sorts of 'institutional factors' such as differential taxes on income and capital gains. They explained the 'supply effect' which implied that corporations who are aware of their investors' demand for dividend yield and adjusts their dividend policies accordingly to supply the shares at each level of yield will result in investors being contented with the available range of yields, thus there will be no effect on share prices through the changes in dividend policy. Simply putting it, if a firm could influence its stock price through dividend payout ratio, for example, raising share prices via increasing payout ratio, other firms would follow suit, hence creating an equilibrium in which "marginal changes in a corporation's dividend policy would have no effect on the price of its stock". Also, the insignificancy can be explained by the possibility of a homemade dividend by investors, thus causing them to be indifferent to a firm's dividend policy. It is believed that investors are capable of constructing their own preferred dividend earnings (Tuigong, 2016). An investor who wishes to receive dividends but is part of a company who does not do so can create his own homemade dividend by selling equivalent amounts of his shares to make up for the dividend proportion. The opposite also holds true, that is, if an investor prefers a lower dividend payout ratio than what the company is exercising, the investor can initiate the buying of additional stocks using his surplus dividends (Brigham & Houston, 2011). All these possibilities suggest that investors will not be willing to pay extra for a dividend paying stock and that a company's dividend policy will not affect its share value.

Besides, the result also exhibits that DY has a positive relationship with the stock market prices. According to Uddin (2011), a positive result could reflect

the presence of information regarding the future cash flows of firms in the market price of a stock. The study by Irfan and Nishat (2002) revealed that dividend positively affects the stock price. It has been found that DY were increased during the period 1991 to 2000. This result, however, is inconsistent with the hypothesis drawn earlier, and also inconsistent with the study of Baskin (1989), Aydogan and Güney (1997) and Malhotra and Tandon (2013) which asserted a negative relation between the independent and dependent variables. DY is negatively correlated with stock prices, meaning that decrease in dividend yield results in increasing stock prices. This indicates that larger firms which have high growth will have more investment opportunities as compared to smaller firm because they pay fewer dividends to stockholders (Arslan, 2014).

5.2.3 Diluted Earnings Per Share

From the results, the explanatory variable (diluted EPS) shows a positive and significant relationship with the dependent variable (stock price) and is similar with our hypothesized relationship in Chapter 1.

This result is consistent with the results obtained by previous researches such as Pirie and Smith (2008); Chu (1997); Hunjra et al. (2014); Adesola and Okwong (2009); Khanagha et al. (2011); Maskun (2012); Masum (2014); Adesola and Okwong (2009). The reason proposed by these researchers is that diluted EPS possesses the ability to influence share prices, thus its significance. In addition, it is believed that shareholders will have a better perception of companies with a higher diluted EPS, therefore the positive linkage. Chang et al. (2008) summarizes that earnings have information content and will interact with stock prices positively. Therefore, stock prices will move with EPS in the long run, although not necessarily at the same rate.

In the Nigerian market, dividends no longer have the dominant power to explain stock prices. EPS has now taken over a greater magnitude of explaining stock prices in the Nigerian market (Adesola & Okwong, 2009). Since EPS and stock price have a positive association, Abarbanell (1991) expressed that analysts' future earnings forecast or revision should incorporate the information of price changes.

5.2.4 Loan-to-Deposit Ratio

LDR in our study displayed a positive but insignificant relationship to share price. The positive relationship is in line with the results obtained by various previous researches such as Abreu and Mendes (2001); Sufian and Chong (2008); Rengasamy (2014). Based on Rengasamy (2014), generally banks are unable to generate optimal return when LDR is too low, subsequently when the return is low, the share price of the bank will be reduced indirectly. Therefore, to increase its amount of liquid assets (loans), banks have the tendency to increase the amount of loans to borrowers for aggregate interest revenue in the financial statements. However, looking at an opposite point of view, banks offering more loans to customers may increase its liquidity risk. Thus, results have shown the relationship between LDR and bank performance to be positive but insignificant. A similar research was conducted by Hutabarat and Flora (2015) to determine the relationship between LDR and share prices in four Indonesia state-owned banks which are Bank Mandiri, Bank Tabungan, Bank BRI, and Bank BNI. Results showed that only two of the banks showed positive and significant results, whereas the other two were insignificant. Since some results proved to be insignificant, LDR has no direct relationship on the share prices unless it can be affected by external macroeconomic factors such as the inflation and interest rates.

Although possessing a positive relationship, the overall LDR variable showed no significant relationship to share price. This result is similar to those obtained by Hutabarat and Flora (2015). A possible explanation could be the offsetting effects of loans and deposits as suggested by Gatev, Schuermann and Strahan (2009). According to the authors, banks having more deposits also tend to issue more loans. Liquidity risk exposure as a result of increasing loan commitments is offset by the inflow of more deposits. Bank share prices are therefore unaffected by such changes in ratio.

On the other hand, Pennacchi (2006) presented the idea that government insurance such as deposit insurance helps banks to increase their ability to hedge liquidity risk. For example, the Federal Deposit Insurance Corporation (FDIC) backs up banks during liquidity shocks. This increases the confidence of the masses and eliminates public fear when they deposit their money into banks. Gorton and Pennacchi (1993) showed that money market mutual funds' investors remained unconcerned even when 12 different commercial papers declared default. No panics or runs were detected and this can be interpreted as the high assurance that investors have on the government safety net for banks.

5.2.5 Price-to-Earnings Ratio

Since evidences point towards the rejection of the null hypothesis, it can be concluded that there is a significant relationship between P/E ratio and share prices of commercial banks in Malaysia. This result is consistent with the hypothesis which forecasted a positive relationship between the two variables.

This significant and positive relationship between P/E ratio and share prices (not pertaining solely to bank stocks) is consistent with Almumani (2014), Khan and Amanullah (2012), Malhotra and Prakash (2001), Malhotra and

Tandon (2013), Sharma and Singh (2006), Srinivasan (2012), Metha and Turan (2005); The results are inconsistent with Zahir and Khanna who found a weak relationship between earning-price multiplier (an inverse of the P/E ratio) and share prices (as cited in Srinivasan, 2012). The results are also consistent with the Ohlson (1995) model, this study also confirms the value relevance of price to earnings ratio towards Malaysian bank stocks. Mayur (2015) states that when P/E ratio increases, although the prices of the stock will increase, the yields will decline.

However, the research was only applicable among blue-chip firms with large market capitalization and not to mid or small cap firms which is in line with this study where there are seven out of the eight institutions listed on the FBMKLCI. Thus, it is no surprise that the results from this study is also consistent with the explanation from the Gordon's Wealth Growth Model as the firms in this study have stable growth. The significant and positive relationship can therefore be linked to the direct relationship between investors' confidence towards the earning power of the stock and the stock price.

5.3 Implications of Study

Conducting this study without a doubt will contribute to the better understanding of various parties regarding the predictive power of fundamental values, namely financial ratios on the stock prices of banks. Parties that will benefit from this study include the government (policy makers), companies and analysts, individual investors, and future researches and academicians. Empirical results indicate that D/E ratio, diluted EPS, and P/E ratio are those variables which show significance on the stock prices. In contrast, DY and LDR have no effect on the stock prices.

5.3.1 Government and Policy Makers

Share prices act as an important indicator of market capitalization of the banks. It can help authorities determine which banks are gaining popularity among the general investor population. Financial ratios influencing the share prices, like diluted EPS, P/E ratio, and D/E ratio can serve as a guideline for government authorities to gauge the direction of bank stocks. If the situation points towards the unfavorable, or if it is too favorable to be true, authorities can launch an early investigation on the operations of the banks and therefore detect any premature banking crisis.

If the financial ratios prove to be useful, policy makers can erect laws or regulations for banks to meet a certain criteria in the financial ratios, especially if financial ratios and share prices tend towards shaping the perception of investors. After all, one of the most important criteria of the stability of the financial system lies with investors' perceptions of its well-being.

5.3.2 Companies and Analysts

Financial analysts will benefit from this study as they can formulate their forecasts on the future earnings of banks through the incorporation of their own private information together with the various signals that influence stock prices. Based on the research by Abarbanell (1991), it is said that analysts' forecast revisions are positively related to prior security price changes. Therefore, by observing the impact of certain financial ratios on the changes in stock price, analysts can determine the expectation on earnings. Forecasts and market expectations can then be used by companies when forming their future actions and decisions.

5.3.3 Individual Investors

Investors can now identify the relevant ratios that affect stock prices and conduct their own long run investment decisions. For example, after realizing that diluted EPS contains information content and affects stock prices positively, investors can construct their own method of predicting the variation in future stock prices through identifying the respective firm's earnings. This increases investors' independence without relying on securities analysts to carry out the forecasting on their behalf. Investors can also consider the significant independent variables, namely D/E ratio, diluted EPS, and P/E ratio in this study as a guide to future investment decisions if they want to invest in bank stocks. Individual investors can also make use of their knowledge in fundamental techniques to identify undervalued and strong bank stocks and to refrain themselves from irrational trading should the market enter into a recession.

5.3.4 Future Researchers and Academicians

Through this study, future researches and academicians can enhance their understanding regarding the movement of stock prices as a result of changes in financial ratios. The researchers of this study believe that the additional knowledge from this study could serve as a benchmark for future improvements and modification. Since this study uses panel data, future researches can refer to our study as a guideline on how to carry out their research through the means of panel data usage. They could also consider using the same independent variables used in this study in another research context or using different independent variables in the same research context. Most importantly, this study hopes that it serves as a reminder to future researchers that individual investors also play a very significant role in stabilizing the economy in times of uncertainty, not only firms, corporations,

and government, and they should design their research with the well-being of individual investors in mind.

5.4 Limitations

Imperfection will still happen no matter how perfect an individual attempts to be. It is part of the human experience to be flawed and to make mistakes. However, in the occasion of an imperfection, perfection in various forms will result from it. Same goes to this study, there are several limitations or restrictions confronted and being listed out for revising in the future.

First and foremost, there are a few independent variables which might be influential in explaining the dependent variable (stock price) but had been omitted from this study. One of them is the market-to-book ratio. These factors should have been taken into account as they are important to determine the performance of banks and have been widely used in past researches. Unfortunately in this study, market-to-book ratio had a high correlation with the diluted EPS, which is another indispensable independent variable. Therefore, it is necessary to forsake this variable in order to get a normal regression. Nonetheless, it has been proven to be significant to the stock prices by various previous researchers.

Apart from that, the availability of data was also one of the main constraints faced in this study which could affect the reliability and validity of the result at the end. During the data collection process, this study did not have access to proper research facilities until a much later date and its researchers were forced to use less conventional and more unreliable methods to obtained the data, which was extremely time-consuming. Thankfully, we finally have access to the Bloomberg terminal at the very last minute. Thus, this restriction and constraint has withheld our freedom to conduct a more efficient study.

Another limitation caused by the lack of data was the inability to increase the sample size in this study. Menaje (2012) analyzed the monthly data of a total of 10 publicly listed Philippines commercial banks from 2002 to 2008 which amounted to 280 observations. Butt, Rehman and Ahmad (2007) managed to extract 96 monthly observations from their analysis of market and industry factors towards stock returns. This study uses only 48 annual observations (eight banks and six years), which is a far cry from the two former papers. However, Almumani (2014) also had 49 observations only from seven banks and seven years (annually). From this scenario, one could infer that the reason for a large sample size is the frequency of data in a year. This study was unable to use quarterly data because there were no quarterly dividends, thus the quarterly value for dividend yield could not be derived. Nevertheless, the use of quarterly data is not without its own limitations. According to Menaje (2012), one should be aware that quarterly share price data frequency are not audited yet and may contain significant errors which may impact the results.

5.5 Recommendations

After conducting this study, a few recommendations can be identified to make the future researches better, more reliable, and more efficient. According to Menaje (2012), EPS is a popular measure for a firm's profitability per shareholder ownership. However, he also highlighted critics' concerns about this ratio being subjected to "manipulation, accounting changes, and restatements". Thus, some perceive cash flow as a more reliable profitability measure compared to EPS. In conclusion, future researchers can use more cash flow variables to determine its value relevance so that it may be a possible alternative for investors to assess a bank's profitability.

Future research are also encouraged to expand the scope to this study to other variables which may be significant to bank stocks such as cash flow per share and earnings before interest, tax, depreciation, and amortization (EBITDA) in relations to

share prices. Stock prices can also be substituted for share returns as the dependent variable to accommodate investors who wish to know which direction the share price would go and by what percentage (Menaje, 2012).

5.6 Conclusion

The purpose of this study was to analyze the relationship between the fundamental values of commercial banks in Malaysia, through the proxies of financial ratios, and its corresponding share prices. So far, this study has found evidence concluding that earnings per share, debt-to-equity ratio, and price-to-earnings ratio are significantly related to the share prices of bank stocks in the context of Malaysian commercial banks from the period of 2010 to 2015. The methodologies confirmed that the data used in this study is suitable to be presented as a random effect model with the help of model specification tests such as the Hausman test.

All in all, the research objective in this study can be considered as reasonably achieved, since the study managed to identify several determinants of bank stock prices, even with the presence of certain limitations. Therefore, the researchers of this study sincerely hope that this paper will be the stepping stone to many future researchers for the Malaysian banking industry that will not only benefit banks and authorities, but also the individual investors themselves, who are more often than not deprived of critical information.

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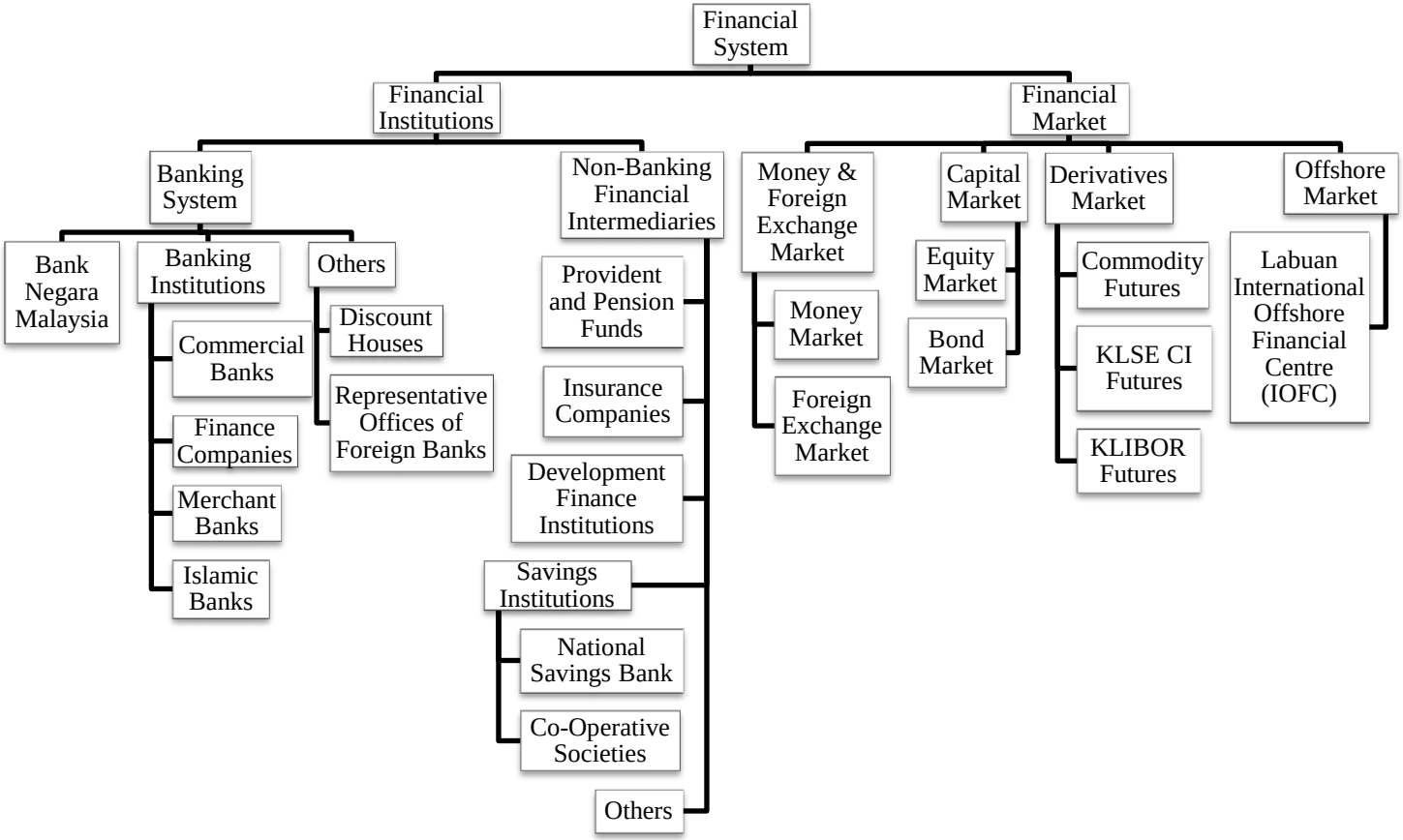
APPENDICES

APPENDIX 1: MALAYSIA'S FINANCIAL SYSTEM



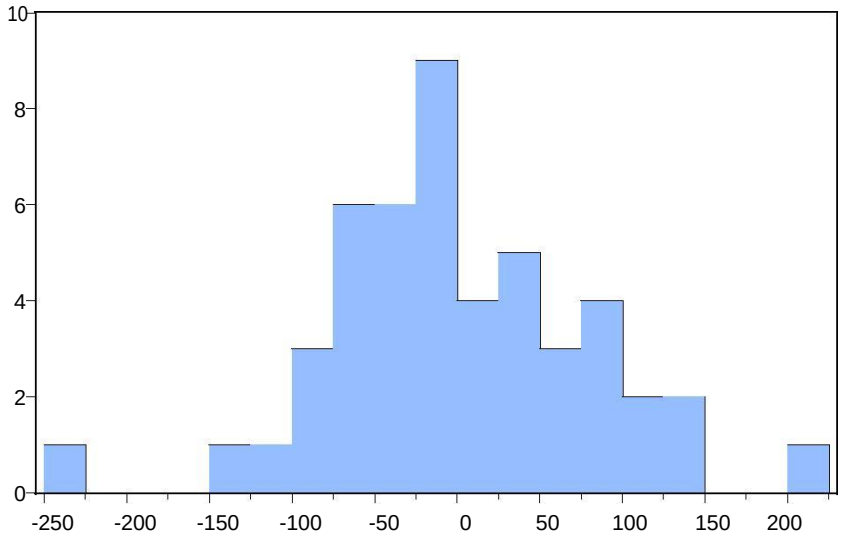
Adapted from: KPMG (2016)

APPENDIX 2: DESCRIPTIVE ANALYSIS

Date: 06/12/16 Time: 16:26
Sample: 2010 2015

	SP	DE	DY	EPS	LDR	PE
Mean	818.8750	144.8456	3.305625	68.43750	85.01257	12.12505
Median	743.0000	147.1022	3.065000	59.50000	88.26774	12.33390
Maximum	1880.000	231.9862	7.070000	160.0000	100.7241	17.45380
Minimum	234.0000	66.15165	0.790000	19.00000	0.648711	8.166047
Std. Dev.	445.2765	42.68730	1.302154	37.19523	14.84443	2.277106
Skewness	0.882968	-0.186124	0.971678	0.988054	-3.989000	0.092737
Kurtosis	2.954619	2.252432	3.849653	3.142751	23.08857	2.282846
Jarque-Bera	6.241177	1.394851	8.997077	7.850756	934.3983	1.097421
Probability	0.044131	0.497865	0.011125	0.019735	0.000000	0.577694
Sum	39306.00	6952.589	158.6700	3285.000	4080.603	582.0023
Sum Sq. Dev.	9318745.	85643.66	79.69338	65023.81	10356.78	243.7050
Observations	48	48	48	48	48	48

APPENDIX 3: NORMALITY TEST (JARQUE-BERA TEST)



Series Standardized Residuals
Sample 2010 2015
Observations 48

Mean	2.44e-13
Median	-10.29596
Maximum	207.2321
Minimum	-241.4765
Std. Dev.	81.76514
Skewness	-0.074214
Kurtosis	3.708647
Jarque-Bera	1.048423
Probability	0.592022

APPENDIX 4: MULTICOLLINEARITY

- **Pair-Wise Correlation Coefficients**

	SP	DE	DY	EPS	LDR	PE
SP	1.000000	0.259927	-0.104138	0.908177	-0.183564	0.255103
DE	0.259927	1.000000	-0.062611	0.299645	0.207598	0.038573
DY	-0.104138	-0.062611	1.000000	-0.172171	0.203405	0.010247
EPS	0.908177	0.299645	-0.172171	1.000000	-0.367084	-0.119308
LDR	-0.183564	0.207598	0.203405	-0.367084	1.000000	0.351306
PE	0.255103	0.038573	0.010247	-0.119308	0.351306	1.000000

- **Variance Inflation Factors (VIF)/ Tolerance (TOL)**

  - Auxiliary Regressions on D/E

    Dependent Variable: DE
    Method: Panel Least Squares
    Date: 06/12/16 Time: 16:28
    Sample: 2010 2015
    Periods included: 6
    Cross-sections included: 8
    Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DY	-2.262836	4.567082	-0.495466	0.6228
EPS	0.490221	0.167928	2.919224	0.0056
LDR	1.137469	0.449910	2.528218	0.0152
PE	-0.913263	2.715620	-0.336300	0.7383
C	33.15037	47.75772	0.694136	0.4913

R-squared	0.212552	Mean dependent var	144.8456
Adjusted R-squared	0.139301	S.D. dependent var	42.68730
S.E. of regression	39.60265	Akaike info criterion	10.29400
Sum squared resid	67439.91	Schwarz criterion	10.48892
Log likelihood	-242.0560	Hannan-Quinn criter.	10.36766
F-statistic	2.901698	Durbin-Watson stat	1.218664
Prob(F-statistic)	0.032705		

  - Auxiliary Regressions on DY

Dependent Variable: DY
Method: Panel Least Squares
Date: 06/12/16 Time: 16:29
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EPS	-0.002666	0.006107	-0.436606	0.6646
LDR	0.019113	0.015788	1.210601	0.2327
PE	-0.041294	0.090319	-0.457208	0.6498
DE	-0.002509	0.005063	-0.495466	0.6228
C	2.727297	1.543984	1.766403	0.0844

R-squared	0.061841	Mean dependent var	3.305625
Adjusted R-squared	-0.025429	S.D. dependent var	1.302154
S.E. of regression	1.318606	Akaike info criterion	3.489360
Sum squared resid	74.76505	Schwarz criterion	3.684277
Log likelihood	-78.74464	Hannan-Quinn criter.	3.563019
F-statistic	0.708614	Durbin-Watson stat	0.610670
Prob(F-statistic)	0.590501		

- Auxiliary Regressions on diluted EPS

Dependent Variable: EPS
Method: Panel Least Squares
Date: 06/12/16 Time: 16:30
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	-1.111168	0.362374	-3.066356	0.0037
PE	0.361635	2.255224	0.160355	0.8734
DE	0.337405	0.115580	2.919224	0.0056
DY	-1.655329	3.791356	-0.436606	0.6646
C	115.1161	35.76621	3.218572	0.0025

R-squared	0.286154	Mean dependent var	68.43750
Adjusted R-squared	0.219749	S.D. dependent var	37.19523
S.E. of regression	32.85522	Akaike info criterion	9.920431
Sum squared resid	46417.01	Schwarz criterion	10.11535
Log likelihood	-233.0903	Hannan-Quinn criter.	9.994090
F-statistic	4.309263	Durbin-Watson stat	0.816779

Prob(F-statistic) 0.005093

- Auxiliary Regressions on LDR

Dependent Variable: LDR
Method: Panel Least Squares
Date: 06/12/16 Time: 16:30
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PE	1.883090	0.810613	2.323045	0.0250
DE	0.113772	0.045001	2.528218	0.0152
DY	1.724429	1.424441	1.210601	0.2327
EPS	-0.161478	0.052661	-3.066356	0.0037
C	51.05154	13.04128	3.914612	0.0003

R-squared	0.348693	Mean dependent var	85.01257
Adjusted R-squared	0.288106	S.D. dependent var	14.84443
S.E. of regression	12.52481	Akaike info criterion	7.991633
Sum squared resid	6745.451	Schwarz criterion	8.186550
Log likelihood	-186.7992	Hannan-Quinn criter.	8.065292
F-statistic	5.755261	Durbin-Watson stat	1.916508
Prob(F-statistic)	0.000843		

- Auxiliary Regressions on P/E

Dependent Variable: PE
Method: Panel Least Squares
Date: 06/12/16 Time: 16:31
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.002872	0.008541	-0.336300	0.7383
DY	-0.117155	0.256241	-0.457208	0.6498
EPS	0.001653	0.010306	0.160355	0.8734
LDR	0.059215	0.025490	2.323045	0.0250
C	7.781281	2.417836	3.218283	0.0025

R-squared	0.129627	Mean dependent var	12.12505
Adjusted R-squared	0.048662	S.D. dependent var	2.277106
S.E. of regression	2.221011	Akaike info criterion	4.532135
Sum squared resid	212.1143	Schwarz criterion	4.727051
Log likelihood	-103.7712	Hannan-Quinn criter.	4.605794
F-statistic	1.601025	Durbin-Watson stat	0.975165
Prob(F-statistic)	0.191408		

	R^2	VIF = $1/(1-R^2)$	TOL = 1/ (VIF)
D/E	0.212552	1.047316	0.954822
DY	0.061841	1.003839	0.996176
EPS	0.286154	1.089187	0.918116
LDR	0.348693	1.138416	0.878413
P/E	0.129627	1.017090	0.983197

APPENDIX 5: ECONOMETRIC MODEL

- **POOLED ORDINARY LEAST SQUARE**

Dependent Variable: SP
Method: Panel Least Squares
Date: 08/17/16 Time: 00:56
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.664347	0.333069	-1.994624	0.0526
DY	16.33766	10.00330	1.633228	0.1099
EPS	11.98130	0.401471	29.84351	0.0000
LDR	1.884478	1.053142	1.789386	0.0808
PE	69.30250	5.938920	11.66921	0.0000
C	-959.3739	104.8894	-9.146532	0.0000

R-squared	0.966281	Mean dependent var	818.8750
Adjusted R-squared	0.962267	S.D. dependent var	445.2765
S.E. of regression	86.49529	Akaike info criterion	11.87453
Sum squared resid	314220.3	Schwarz criterion	12.10843
Log likelihood	-278.9886	Hannan-Quinn criter.	11.96292
F-statistic	240.7165	Durbin-Watson stat	0.915003
Prob(F-statistic)	0.000000		

- **FIXED EFFECT RANDOM**

Dependent Variable: SP
Method: Panel Least Squares
Date: 08/17/16 Time: 00:59
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.690356	0.285053	-2.421853	0.0208
DY	10.76480	12.92902	0.832608	0.4107
EPS	10.98443	0.624855	17.57917	0.0000
LDR	0.197563	0.767654	0.257360	0.7984
PE	58.18512	7.311356	7.958184	0.0000
C	-590.7541	157.2672	-3.756372	0.0006

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.989592	Mean dependent var	818.8750
Adjusted R-squared	0.986024	S.D. dependent var	445.2765
S.E. of regression	52.64048	Akaike info criterion	10.99066
Sum squared resid	96985.70	Schwarz criterion	11.49745
Log likelihood	-250.7759	Hannan-Quinn criter.	11.18218
F-statistic	277.3275	Durbin-Watson stat	1.940724
Prob(F-statistic)	0.000000		

- **RANDOM EFFECT MODEL**

Dependent Variable: SP
Method: Panel EGLS (Cross-section random effects)
Date: 06/12/16 Time: 16:41
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.657073	0.277578	-2.367166	0.0226
DY	13.16635	11.95049	1.101741	0.2768
EPS	11.20483	0.551098	20.33181	0.0000
LDR	0.307665	0.755284	0.407350	0.6858
PE	60.88775	6.748909	9.021865	0.0000
C	-660.7266	147.6098	-4.476172	0.0001

Effects Specification	S.D.	Rho
Cross-section random	111.7465	0.8184
Idiosyncratic random	52.64048	0.1816

Weighted Statistics

R-squared	0.918117	Mean dependent var	154.6470
Adjusted R-squared	0.908369	S.D. dependent var	167.3243
S.E. of regression	50.65005	Sum squared resid	107747.9
F-statistic	94.18554	Durbin-Watson stat	1.766537
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.958997	Mean dependent var	818.8750
Sum squared resid	382100.0	Durbin-Watson stat	0.596884

APPENDIX 6: TEST FOR BEST FIT MODEL

- **POOLABILITY TEST**

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	11.199309	(7,35)	0.0000
Cross-section Chi-square	56.425472	7	0.0000

Cross-section fixed effects test equation:
Dependent
Variable: SP
Method: Panel Least Squares
Date: 06/12/16 Time: 16:40
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DE	-0.664347	0.333069	-1.994624	0.0526
DY	16.33766	10.00330	1.633228	0.1099
EPS	11.98130	0.401471	29.84351	0.0000
LDR	1.884478	1.053142	1.789386	0.0808
PE	69.30250	5.938920	11.66921	0.0000
C	-959.3739	104.8894	-9.146532	0.0000

R-squared	0.966281	Mean dependent var	818.8750
Adjusted R-squared	0.962267	S.D. dependent var	445.2765
S.E. of regression	86.49529	Akaike info criterion	11.87453
Sum squared resid	314220.3	Schwarz criterion	12.10843
Log likelihood	-278.9886	Hannan-Quinn criter.	11.96292
F-statistic	240.7165	Durbin-Watson stat	0.915003
Prob(F-statistic)	0.000000		

- **BREUSCH-PAGAN LM TEST**

Lagrange multiplier (LM) test for panel data
Date: 06/12/16 Time: 16:06
Sample: 2010 2015
Total panel observations: 48
Probability in ()

Null (no rand. effect) Alternative	Cross-section One-sided	Period One-sided	Both
Breusch-Pagan	35.17300	1.599861	36.77286
	(0.0000)	(0.2059)	(0.0000)
Honda	5.930683	-1.264856	3.299238
	(0.0000)	(0.8970)	(0.0005)
SLM	9.547700	-1.098505	--
	(0.0000)	(0.8640)	--

- **HAUSMAN TEST**

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.883857	5	0.8650

Variable	Fixed	Random	Var(Diff.)	Prob.
DE	-0.690356	-0.657073	0.004206	0.6078
DY	10.764795	13.166346	24.345277	0.6265
EPS	10.984429	11.204828	0.086734	0.4542
LDR	0.197563	0.307665	0.018838	0.4224
PE	58.185118	60.887746	7.908156	0.3365

Cross-section random effects test equation:
Dependent Variable: SP
Method: Panel Least Squares
Date: 06/12/16 Time: 16:41
Sample: 2010 2015
Periods included: 6
Cross-sections included: 8
Total panel (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-590.7541	157.2672	-3.756372	0.0006
DE	-0.690356	0.285053	-2.421853	0.0208
DY	10.76480	12.92902	0.832608	0.4107
EPS	10.98443	0.624855	17.57917	0.0000
LDR	0.197563	0.767654	0.257360	0.7984
PE	58.18512	7.311356	7.958184	0.0000

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.989592	Mean dependent var	818.8750
Adjusted R-squared	0.986024	S.D. dependent var	445.2765
S.E. of regression	52.64048	Akaike info criterion	10.99066
Sum squared resid	96985.70	Schwarz criterion	11.49745
Log likelihood	-250.7759	Hannan-Quinn criter.	11.18218
F-statistic	277.3275	Durbin-Watson stat	1.940724
Prob(F-statistic)	0.000000		