DETERMINANTS OF FINANCIAL LEVERAGE: THE CASE OF LARGEST AIRLINES IN ASIA

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Abstract

This study is developed to examine the determinants of financial leverage of capital structure of airlines industry in Asia for the period from 2012 to 2016. Airlines industry is selected as sample of this study as it reflects the highest energy intensive industry based on the largest amount of fuel consumption on the business (Bratlie, 2012). This study defined airline as an operation entity that provides services to carry people and freight by air with schedule routes provided. This study, using panel data analysis, reports that size and growth have a positive relationship to financial leverage. In contrast, profitability and age are negatively related. Regardless of the signs, all the explanatory variables in this study are strongly significant in determining financial leverage (measured by debt to equity ratio).

Keywords: Capital Structure, Airlines Industries, Asia

1. Introduction

The airline industry is one of the largest contributors to country's economy and its contribution has been increasing globally. This industry has become more competitive as it influenced persistently by several factors such as competition of capitally intensive and technology-driven rivals, volatility of fuel price and investments of infrastructural that have resulted in for the airlines to respond quickly in order to survive in the industry (See & Abdul Rashid, 2016). The airline industry is recognized as a resource-intensive industry (Low & Lee, 2014). As such, the airlines industry should consider closely the technological advancements by regularly upgrading their equipment and facilities to sustain its position in the industry and become more competitive despite long gestation period of capital investments.

Air Transportation Action Group (2013) reported that the global economic development is getting positively significant due to the advancement of air transport business as several benefits can be felt. First, the increasing of relationship between cities has encouraged high flow of goods, capital, ideas people and technology. Secondly, the cost of airlines transportation after adjusting for inflation is expected to be lower as compared to previous years due to the increment in competition among market players. Moreover, all lenders of the airline industry usually are rewarded significantly for their capital as this industry was able to generate high profits when its business cycle was above the average.

Despite its favorable impacts to the economy and people, airline industry is considered as a business that have highest debt because its nature of operation. The airlines need to spend a large amount of budgets regularly to purchase aircraft and make repayment for their purchases loans that cause the airlines to depend too much on debt financing to increase their funds for operations. Due to that, airlines business should rely on external financing at most of the times. The higher amount of external financing to be relied on, the more is possibility that the airlines business obligated to the cost of debt (Moon, Lee, & Dattilo 2015). This study focuses on the largest airlines in Asia as its sample as this category of airlines business is considered as companies which their profits will be much relied on capital structure decision. Worldatlas (2017) describes fleet size as one of the characteristics to defined largest airlines. Next, number of passengers carried (including international passengers), earnings from the services, value of assets, market capitalization of the airlines; and countries covered by the airlines are also in the list of the definition for largest airlines.

Based on Chadha and Sharma (2015), capital structure is the most critical decisions executed by the finance manager of a company as it involves third party and shareholder's capital. The financial manager must signify an accurate capital structure as the additional funds to finance new project or even to start the operation of a firm will influence its overall cost of capital. Generally, to maximize the firm's market value and minimize the cost of capital are the main perspectives of every firm's financial in capital structure. The wise decision is needed as the change in capital structure may expose an airline business to the risk of losing its market value. As argued in Handoo & Sharma (2014) that capital structure is significant in determining value and risk. Past studies believed that firm's characteristics such as fixed-assets, non-debt tax shields, investment opportunities and firm size are the primary factors that influence the optimal capital structure decision. All the factors have been tested in more than one theories and models which are Static Trade off Model, Pecking Order Hypothesis, and The Agency Cost Model (Capobianco & Fernandes, 2004). The debt to equity ratio usually has been used to determine capital structure in most previous studies. Even though some researchers state that debt to equity ratio is misguided and will cause poor result in determining capital structure, Al-Najjar and Husainey, (2011) proved that firm's characteristics such as firm size, business risk, growth rate, profitability and tangibility actually have effect on capital structure.

Debt, common stock and preferred stock are the main terms of capital structure that used to finance firm's long term projects. In other words, capital structure is primarily a combination of debt and equity. There is a difference between equity holders and debt holders. Generally, equity holders are also known as owners of the firm, therefore they will also have a long-term commitment to the firm. On the other hand, debt holders are known as creditors. Unlike equity holders, debt holders have no long-term commitment to the firm as they are more interested for debt repayment including principal and interest income. Generally, equity holders are interested on regular dividend payments from the capital invested, whereas firms intend to have more retained earnings to finance for their future capital cash outflows. Hence, the firm decision on capital structure is very important as it plays a significant impact on its future financial structure (Chadha & Sharma, 2015). Therefore, this study attempts to address capital structure behavior of the selected largest airlines in Asia countries by examining factors associated to the behavior.

2. Literature Review

Two dominant theories usually discussed in studies of capital structure are pecking order theory and trade-off theory.

2.1 Pecking Order Theory
This theory suggests for a negative relationship between capital structure and profitability. It can be explained by high profitable firms are better than lower profitable firms in terms of using retained earnings as their internal financing (Myers & Majluf, 1984). As a result, the firms would not be seeking for external funding because they have enough internal funds to cover for their cash flow. Myers (1984) explained that successful firms will not depend too much on external funding. They rather rely on their internal funding generated from past profits. Therefore, these studies suggest a negative relationship between debt to equity ratio and profitability. Empirical evidence from Harris and Raviv, (1991), Chang, Chen and Liao (2014), Chittenden, Hall and Hutchinson (1996) and Coleman and Cohn (2000) are also consistent with the pecking order theory.

     Size of a firm can be defined as total assets. Large firms tend to have low probability in bankruptcy because the firms have stable cash flow and more diversified. Large firms prefer to issuing equity, thus have low leverage. In other words, firms will only go to external funding when internal reserves are insufficient. Empirical studies by Erdinc, Serkan, Mehmet and Yildirim (2009) pointed that size has a negative effect on capital structure because large firms have less issue on information asymmetry. This theory believes that large firms have lower capital cost than smaller firms. Large firms are estimated to have low debt in overall, especially in long term debt. Large firms also are stronger in financial position, thus they can better operate at cheaper cost in short term debt (Bandyopadhyay & Barua, 2016). This theory is also consistent to the empirical evidence of Huang & Song (2006) where large firms will prefer to choose long-term debt, while small firms prefer to short-term debt.

     Growth opportunities should have a positive relationship with capital structure (Myers, 1984). Most recent studies found that a firm that has positive opportunity to growth will refuse to issue the debt in order to financing new project. The implication of issuing debt will cause a firm to have high leverage (Harris & Raviv, 1991). Nevertheless, Myers (1984) suggested that the cost of asymmetric information will be reduced by internal financing. Usually, firms will prefer to use retained earnings as their first choice. Following with firms with good investment opportunities but have severe in cash flow, debt financing will be their priority. Lastly, firms with good investment opportunities and also great asymmetric information will consider debt as their good quality investment.

2.2 Trade-Off Theory
This theory is contradicted to Pecking Order Theory. According to Chang et al. (2014), in order to maximize tax shield from income, firms should have more external funding. While in pecking order theory, it stated that high profitable firms have no problem to cover their cash outflow because they have enough internal reserves (i.e., retained earnings). Therefore, trade off theory posits a positive relationship between capital structure and profitability (Myers, 1984; Myers & Majluf, 1984; Frank & Goyal, 2003).

Most empirical studies in United States have proven that there is a positive relationship between size and leverage and this result supports the trade-off theory. Chang et al., (2014) made hypotheses that larger firms with more assets tend to have higher leverage and the finding is also consistent with trade-off theory. In fact, large firms have strong and stable cash flow and are able to diversify their funds. This resulted in the larger firms to have low probability in bankruptcy. Next, size may also be an important key of information to the outsiders especially among the potential investors. Matias & Serrasqueiro, (2017) concluded that firm size is relevant in explaining capital structure. Normally, large firms will have positive net cash flow and will result into low probability in bankruptcy. Therefore, the hypothesis where the larger the firm, the higher the capacity of debt can be accepted. Erdinc et al. (2009) stated, according to trade off theory, there should be a positive relationship between capital structure and size as larger firms have more diversified funds and have a low tendency to bankruptcy.

In another instance, Vo (2017) reported that growth is negative and significant in determining capital structure. The result suggests that firms with high growth opportunities will seek for the debt as their backup to have an extra finance when they are not able to issue for new equity. Meanwhile, Rajan and Zingales, (1995) suggested that when firms with more growth opportunities need financing; they could issue for more equities and use less debts in their future financing structure. Therefore, growth is expected to be negatively related to capital structure as high-growth firms may not issue debt as their first choice.

3. Data and Methodology

The sample of this study is the largest airlines in Asia. This study uses panel data which consists of data from 18 airlines firms (attached in Appendix) within 5 years of covering period. The capital structure, employed as dependent variable of this study, is measured by debt to equity ratio. Meanwhile, profitability, size, growth and age are independent variables of this study. All annual data used in this study are sourced from Datastream database and the individual airline's website. The numbers of observation of this study is 90 observations.

3.1 Variables and Measurements

The followings (Table 1) are the list of all variables used in this study and their measurement:

Table 1: Variables and Measurements

Variable	Proxy	Sources	Definition	Unit
Debt to Equity	Total debt to total shareholders' equity	(Feng, Zhengfei, & Robert, 2014)	A financial ratio that measures the degree of the airlines' leverage	Ratio
Profitability	Return on equity. Measured by net income to average total equity	(Basil & Peter, 2008)	Profitability is the revenue that generated from airline's operation	Percent
Size	Logarithm of total assets	(Yomna, 2017)	Size is to determine the total asset of the airlines	Dollars
Growth	Logarithm of net income (a year before)	(M. & John, 2009)	Growth can be measured in term of size, sales or net income of the airlines.	Dollars
Firm's Age	Operation age	(Varun, 2014)	Establishment years	Years

3.2 Regression Equation and Model

The regression model of this study is developed as follows:

$$DER_it = \beta 0 - \beta 1 Prof_it + \beta 2 Size_it + \beta 3 Growth_it - \beta 4 Age_it + e_it \tag{1}$$

Where ;

$DERr_it$	: debt to equity
$Prof_it$	: profitability
$Size_it$	: size
$Growth_it$	: growth
Age_it	: airline's age
$\beta 0$	: intercept or constant
$\beta 1 - \beta 4$	: coefficient for X1…X4
e_it	: error term

In order to validate the regression model of this study, Breusch and Pagan Lagrangian multiplier and Hausman test will be carried out to choose the final appropriate regression approach (Pooled Ordinary Least Square Regression (POLS), Fixed Effect Model (FEM) or Random Effect Model (REM)) of this study.

4. Empirical Findings

4.1 Preliminary Results

According to the descriptive statistics in Table 2, the mean debt to equity ratio is 2.13 times ranging from a minimum of 0.07 and maximum of 9.25. The standard deviation of dependent variable is 1.80. Next, for the first independent variable, profitability, the mean is 5.79 percent ranging from the highest of 63.58 percent to the lowest value of -53.56 percent. The standard deviation of this variable is 17.61. Furthermore, the mean firm's size is USD406, 241 with a maximum of USD489,093 and a minimum of USD219,3267.. Moreover, firm's size has a positive skewness which is 2.88 right and the kurtosis is 10.71 (thick tail).

Table 2: Descriptive Statistics of Variables

Variable	N	Mean	Std. Dev	Min	Max	Skew	Kurt
DER (%)	90	2.13	1.75	0.07	9.25	1.61	5.89
Prof (%)	90	5.78	17.60	-53.56	63.58	-0.71	6.01
Size (USD '000)	90	406,241	100.46	219,326	489,093	2.88	10.70
Growth (RM)	90	360,512	98.01	-478,149	849,215	6.55	54.12
Age (Years)	90	37	21	5	70	0.27	1.55

Note: DER represents debt to equity ratio for airline i at time t, Prof represents profitability for airline i at time t, Size represents size of airline i at time t, Growth represents growth of airlines i at time t, and Age represents of the airline's age i at time t.

In addition, the average value for Growth is USD360,512 with a maximum value of USD849,215 while the minimum value of -USD478,149. The standard deviation of Growth is 98.01. Growth has skewed to the right with 6.56 and has a thick tail (kurtosis) at 54.12. Meanwhile, the average value for airline's age is 36.83 years with the longest operation age is 70 years and the shortest operation age among the airlines is 5 years which belongs to Singapore Airlines. The standard deviation of airline's age is 21.12. Similar to growth, airline's age also has skewed to the right at 0.27 with flat tail kurtosis (flatykurtotic) is 1.56.

Table 3: Correlation Coefficients Matrix of Variables

Variables	Debt to Equity	Profitability	Size	Growth	Age
Debt to Equity	1.00				
Profitability	-0.33	1.00			
Size	0.26	-0.29	1.00		
Growth	-0.09	0.42	0.13	1.00	
Age	-0.31	-0.16	0.58	0.30	1.00

The correlation coefficients matrix in Table 3 shows that all variables have low correlation with one another which all correlations are reported to be less than the cut-off point of 0.8. The highest correlation of only 0.5826 is found between firm's size and age. In a way based on Table 3, this study concludes that there is no severe multicollinearity issue exists. Since there is no severe multicollinearity issue shown, this study concludes that there is no independent variables with redundant information employed in this study. In other words, all variables are independent by themselves.

4.2 Main Empirical Results

Prior to the estimation of the regression model of this study, the Redundant Fixed Effects Tests was first conducted to the Fixed Effect Model (FEM). The Redundant Fixed Effects Tests produces a significant p-value of 0.00 indicating that the estimates in FEM model is preferred to be employed. However, before a concrete conclusion is drawn, the Hausman test also was applied to Random Effect Model (REM) and Fixed Effect Model (FEM). The result of p-value in Hausman test is also significant at 5 percent confidence level with the p-value of 0.0223. The result indicated that the employment of Fixed-Effect Model (FEM) in this study is better than employment of Random Effect Model (REM) (Table 4).

Table 4: Redundant Fixed Effects Test

Redundant Fixed Effects Tests		**Hausman Test**		**Appropriate Model**
F	p-value	Chi-Sq. Statistics	p-value	Fixed Effect Model
F(17,51)= 12.73	0.00	11.41	0.02	

Based on Table 5, the adjusted R-Squared is reported at 50.04 percent indicating that the variation in capital structure of the airlines explained by the independent variables which are profitability, size, growth and airline's age. Therefore, the remaining 49.96 percent variation of capital structure of firms in the model is captured by other variables. Based on the coefficient

values, the result indicates that size and growth have a positive relationship to debt to equity ratio. Meanwhile, the other two variables which are profitability and age have negative relationship to debt to equity ratio.

Table 5: Regression Results

Independent Variables	Coefficient	P-value
Profitability	-0.0352	0.003***
Size	0.3094	0.0000***
Growth	0.2124	0.0259**
Age	-0.0446	0.0000***
Constant	-4.8430	0.0009
Adjusted R- Squared	0.5004	
F-Stats	14.034	
P-value	0.0013	

Size and age are shown to be very significant in explaining capital structure. Specifically, this study shows that size is positively related to the capital structure of sampled airlines. The coefficient of firm's size shows that an increment in 1 percent of size will increase the debt to equity ratio by 30.94 percent. This findings is consistent with previous studies where there should be a positive impact between size and capital structure. This explains that large firms have low tendency of bankruptcy because of the firms have more diversified funds. Therefore, as their tendency of bankruptcy is low, they have good opportunities to borrow funds from creditors or lenders (Omet & Mashharawe, 2002).

Meanwhile, in contrast to the result of size, this study found that age is negatively related to capital structure. This result similar to Amjad, Tanveer and Xianzh (2016). According pecking order theory, the established and experienced firms will usually have enough internal funds available to finance their projects internally as such reducing their dependency on external funds. Hence, a negative relationship was expected between firm age and leverage. Based on Table 4, it shows that an increase in 1 percent of age will decrease debt to equity ratio by 4.46 percent. The Airline's age also is strongly in explaining capital structure as it is very significant with p-value is 0.0000.

Profitability is also reported to be significant in explaining capital structure of airlines industry. This results confirm the negative relationship between profitability and leverage, which is consistent to pecking-order theory predictions in which implies that highly profitable firms tend to have lower leverage because the firms will usually have a high level of retained earnings which can assist to fund for future investment, rather than external borrowing. The coefficient value shows that an increase in 1 percent of profitability will reduce 3.52 percent of debt to equity ratio. This finding is consistent to Huang & Song (2006) that found a negative relationship between profitability and leverage. Moreover, this finding is also consistent to Salim and Yadav (2012) and Yomna (2017) that shown a negative significant influence of firm's performance on capital structure.

Furthermore, this study reported that growth is positively significant on debt to equity ratio as capital structure. An increment of 1 percent value of growth will increase debt to equity ratio by 21.24 percent and this variable is found significant at p-value of 0.0259. This result is consistent to Yomna (2017) that growth should have a positive impact on capital structure. The other previous study conducted by Harris and Raviv (1991) stands with points that firms which have a high potential of growth opportunities will usually refuse to borrow or use the external

funds (issuing debt) as the implication of issuing debt will lead to less value in collateral assets in the event of the decline in business. This result is consistent with Pecking Order Theory as mentioned in the Literature Review section of this study.

5. Conclusion and Recommendations

This study analyzed capital structure adopted by largest airlines in Asia. The analysis of the airlines' capital structure revealed based on the examination of profitability, size, growth and the airline's age. The finding of this study reports that size and growth have a positive relationship to debt to equity. In contrast, profitability and age are negatively related. Regardless of the sign, all the explanatory variables in this study are strongly significant in determining debt to equity ratio. There are only eighteen airlines that were selected to this scope of study. The others 37 airlines are excluded since some of the data were not revealed to public. Therefore, conclusions drawn from this study are limited to only eighteen largest airlines in Asia. This study recommends future studies to increase the sample by enlarging it to all the airlines in Asia. In fact, more analysis can be done for all the airlines. The covering period also should be longer to increase the number of observations in the study. This study also suggests the inclusion of other explanatory variables such as tangibility, liquidity, cash flow or tax shield of the airlines.

Despite the issue of generaliziblity, this study helps a firm in investment decision for its potential growth. Pecking order theory stated that internal funding is the preferable strategy to the company to raise funds. However, trade off theory suggests to obtain debt from external funding rather than internal funding which helps the company to reduce tax payments based on borrowed by the company (tax shield). Different sector has different capital structure objectives. For example, real estate companies usually will closely deal with banks in order to provide financing facility to their clients. However, capital intensive industry such as chemical industry need to obtain funds to finance for their business development. Meanwhile, transportation and utilities are the industries that operates mainly on activities on short product life cycle that require large funds to operate their business. Regardless of industries, the central issue should on the dependancy of debt and equity (Hardiyanto, Sembel & Ahmad-Maulana 2014). Therefore, the examination on the determinants of capital structure can help the firms to execute a good investment decision that will positibely impact on profitability and cost.

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