

The Impact of Capital Structure on Stock Returns: International Evidence

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Abstract: *This study examines the relationship between capital structure and stock returns of firms in the following eight countries in the Asia Pacific region for a period of 22 years from 1990 to 2012. The methodology is Panel Regression. The results indicate that the effect of capital structure depends on the nature of industry as well as market. In Australia, China, and Korea, return of companies in the Basic Material industry have negative relationship with debt to common equity. Long term debt to common equity positively affects the return of firms in Australia and Korea in the Basic Material industry.*

Keywords: Capital structure, Stock return, Stock market, Industrial sector, Financial ratio, International markets, Panel data

1. Introduction

Capital structure of a firm is one of the major concerns for managers. Theories in finance consider debt as one of the factors for financial risk. Thus, level of debt can alter risk and return of a company. Researchers studied several areas around capital structure for example the impact of capital structure on stocks return, value of companies, performance of firms, etc (Onaolapo and Kajola, 2010, Gemmill, 2001). Some scholars examined the impacts of other factors on capital structure and the determinants of capital structure (Bevan and Danbolt, 2002, Chang et al., 2009). Several researchers examined the role of industry classification on capital structure (Arend, 2009, Barclay et al., 1995, Campello, 2003).

Modigliani and Miller (1958a) introduced the capital structure irrelevance theory, which stated that the amount of debt does not affect market value of a firm. The MM irrelevance theory stimulated other researchers to provide evidences against the MM irrelevance theory. Therefore, two major capital structure theories have developed after the MM irrelevance theory including trade-off and pecking order theories of capital structure. The research by Frank and Goyal (2007) has shown that the MM capital structure irrelevance theory fails under a variety of circumstances such as taxes, transaction costs, bankruptcy costs, agency conflicts, adverse selection, etc. They reviewed the trade-off and pecking order capital structure theories and found that transaction and bankruptcy costs play crucial roles in a firm's financing decisions. They identified the differences among private firms, small and large public firms. They concluded that private firms use retained earnings and bank debt. Small public firms use equity financing and large public firms use retained earnings and corporate bonds.

Kraus & Litzenberger (1973) introduced the classical trade-off capital structure theory, which refers to the idea that a firm trade off the benefits and drawbacks of both debt and equity. Hence, managers try to find a balance between costs and benefits of leverage. Furthermore, agency costs (Jensen and Meckling, 1976) play an important role in deciding about the balance. Myers (1984) declared that firms have target leverage ratio and during time they move toward this ratio. Several scholars provided discussions about aspects of Myers' definition. Therefore, Myers's definition about target leverage ratio was broken into two parts including static and dynamic (target adjustment) trade-off theories. If a firm's leverage ratio is identified by single period trade-off, it was called static trade-off theory. A firm is said to exhibit dynamic (target adjustment) behavior if the firm has a target level of leverage and if deviations from that target are gradually removed over time (Frank and Goyal, 2007). Moreover, several scholars studies the tax effect on leverage (Dhaliwal et al., 2006, Graham, 2000, Martin and Sloane, 1980, Miller, 1977).

Myers (1984) argued that firms prefer internal compared to external financing. Based on pecking order capital structure theory, managers choose retained earnings first, then debt and finally equity financing. The motivation for the pecking order theory is adverse selection developed by Myers and Majluf (1984) and Myers (1984).

The remainder of the paper is organized as follows. Section 2 provides a summary of the literature review. Section 3 presents the data and industry classifications, followed by the methodology in section 4, empirical results in section 5, implications for managers in section 6, and concluding remarks in section 7.

2. Literature review

DeAngelo and DeAngelo (2006) provided evidence against Miller and Modigliani (1961). They found that payout policy is not irrelevant and investment policy of a firm is not the only determinant of value, even in frictionless capital markets. They declared that when one relaxes the assumptions of Miller and Modigliani to allow retention, pay out policy comes into effect in exactly the same way that investment policy does.

The second proposition of Miller and Modigliani (1958b, 1963) stated that increasing in financial leverage would lead to increase in expected stock returns. Nevertheless, several scholars provide results contradicted to this proposition. Korteweg (2004) used time series approach and Fama French 3 factor model and found evidences against the MM Proposition 2 that stock returns decline when gearing increases.

There are increasing researches that capital structure affects stock returns and the results are mixed (Dimitrov and Jain, 2008, Hamada, 1972, Korteweg, 2010, Masulis, 1983, Bhandari, 1988). Fama and French (1992) and Strong and Xu (1997) used size and book-to-market equity to examine the cross sectional variation in stock returns. They found that market and book gearing are positively and negatively related to stock returns respectively. Masulis (1983) found that two of the major factors that explain stock returns are leverage multiplied by senior security claims outstanding and variation in debt tax shields.

Most of researches tested the relationship between capital structure and stock returns only for one way causality; either capital structure affects stock returns or vice versa. Yang, Lee, Gu, and Lee (2010) considered two way causalities and as a result they treated the capital structure and stock returns as endogenous variables by utilizing simultaneous equations. They extended Titman and Wessels (1988) study that used a single equation model to find out the capital structure determinants. They concluded that the main factors affecting stock returns are leverage, expected growth, profitability, value, and liquidity.

Therefore, some researchers examined the impacts of stocks return on capital structure (Baker and Wurgler, 2002a, Lucas and McDonald, 1990, Welch, 2004). M. Baker and J. Wurgler (2002b) stated that companies issue new equity when the market values are relatively

high, and repurchase equity when the market values are low. They concluded that capital structure heavily depends on the past market values. Welch (2004) tested the impact of stock price on capital structure and found that firms in the United States (U.S.) neither issue nor repurchase debt or equity to counteract the effects of stock returns on their debt equity ratios. Moreover, he concluded that stock returns explain around 40 percent of debt ratio changes.

Some scholars found positive relationship between capital structure and stock returns (Bhandari, 1988, Hamada, 1972, Dhaliwal et al., 2006). Bhandari (1988) asserted that there is a positive relationship between capital structure and stock returns. He found that this relationship neither is sensitive to variations in the market proxy nor estimation technique.

Conversely, several researchers found that capital structure negatively affects the stock returns (Dimitrov and Jain, 2008, Korteweg, 2010, Muradoglu and Sivaprasad, 2009, Penman et al., 2007). Dimitrov and Jain (2008) argued that variations in financial leverage can provide better information about economic performance of a firm compared to the information from earnings and cash flows. Thus, they did not view financial leverage as measure of risk. They documented on how changes in gearing ratios affect the stock returns. They found that changes in financial leverage and growth in assets are value relevant beyond the information in accounting earnings, operating cash flows, and accruals. They focused on contemporaneous stock returns and argued that there is a negative relationship between financial leverage and risk-adjusted stock returns.

Korteweg (2010) studied the net benefits to leverage that identified from market values and betas of a firm's debt and equity for a panel data from 1994 to 2004. He found that the net benefit to leverage for median firm is up to 5.5% of firm value. The results about small and profitable companies to have high optimal leverage ratios are not consistent with theory. He concluded that firms are on average marginally under levered compared to the optimal leverage ratio. In addition, Penman, et al. (2007) decomposed book-to-price ratio into two components including enterprise and leverage, which explains operating and financing risks respectively. They found that the enterprise part is positively related to stock returns. For the leverage component, they controlled for size, estimated beta, return volatility, momentum, and default risk. Unlike the enterprise component, the leverage part is adversely related to stock returns.

Furthermore, there are several studies examined the relationship between financial leverage and stocks return. Hovakimian, Opler, and Titman (2001) proclaimed that firms encounter barriers for setting their target debt ratios. Furthermore, target debt ratio may changes during time since the profitability and stock price of a firm change. Garlappi and Yan (2011) considered equity valuation model to study the relationship between financial distress and asset returns. They found that leverage for firms with high level of financial distress can explain the changes in stock returns.

Strong and Xu (1997) examined the relationship between expected returns for the United Kingdom (U.K.) equities and several exogenous variables for the period of 1973 to 1992. They found that expected returns are positively affected by beta, book-to-market equity, and market leverage. Nevertheless, their results indicated that expected returns of the U.K. firms are adversely related to market value and book leverage. They used several combinations for exogenous variables and found that either market-to-book equity or the leverage factors cause market value to become insignificant. They concluded that either book leverage and market leverage or book-to-market equity are the only consistently exogenous variables for the average expected returns. Conversely, the explanatory power of any combination of exogenous variables for average returns is low.

Ho, Strange, and Piesse (2006) provided evidence asserting conditional pricing effects of beta, size, and book-to-market equity in the Hong Kong market. They improved their earlier work by adding another factor, namely financial leverage with regard to market

situation meaning that market trend is upward or downward (Ho et al., 2008). Their results indicated that market leverage shows conditional pricing relationship with returns. Their findings on a non-U.S. market are consistent with results of Pettengill, Sundaram, and Mathur (1995, Pettengill et al., 2002) for the U.S. market.

Gomes and Schmid (2010) studied the relationship between financial leverage and stock returns and found that the relationship is more complex compared to the one in static textbook. They declared that the relation between leverage and stock returns depends on the investment opportunities available to the firm. They stated that when financial market imperfections exist, financial leverage and investment opportunities are correlated meaning that firms with high leverage are also mature firms with more book assets and fewer growth opportunities. Moreover, they found that book gearing does not significantly affect the stock returns. However, stock returns are positively impacted by market gearing. George and Hwang (2010) stated that companies with high level of cost consider low leverage to avoid financial distress; however, they still expose to the systematic risk of bearing such costs in low states. Moreover, firms with low gearing suffer more than firms with gearing in the case of financial distress. They found that returns are adversely associated with financial distress and leverage.

Several researches referred to the role of industry on capital structure since the optimum of capital structure heavily depends on industry that a firm operates. Thus, industry characteristics is one of the major factors that change the capital structure (Arend, 2009, Barclay et al., 1995, Bradley et al., 1984, Campello, 2003). Hence, this study inspects the relationship between capital structure and stock returns separately for each industry. The relationship between gearing and abnormal return is negative for companies in non-regulated industries (Muradoğlu and Sivaprasad, 2012). MacKay and Phillips (2005) studied the importance of industry to financial aspect of firms. They expressed that financial leverage is higher in concentrated industries. Furthermore, Hou and Robinson (2006) found that firms in highly concentrated industries earn lower returns.

Miao (2005) examined the equilibrium model of capital structure and industry dynamics. He declared that high growth industries have lower level of leverage. Campello (2003) studied firm and industry level impacts on capital structure. He found that leverage adversely affects the sales growth in industries that competitors are relatively unlevered during bearish market, but not bullish trend. Hull (1999) studied the stock value by how a firm changes the capital structure in relation to industry leverage ratio norm. He found that stock returns for firms moving away from industry norm is significantly more negative than returns for companies moving closer to industry norms. Hence, there is an adverse relationship between gearing and stock returns.

This research contributes to the literature on capital structure and stock returns in two major ways. First, by considering eight markets in the Asia Pacific region, that there is lack of study on this area. Second, this study examines the relationship between capital structure and stock returns separately for industrial sectors in each market. Thus, results can be helpful for managers and investors in each industrial sector.

3. Data collection and industry classification

This study examines the relationship between capital structures and returns of the firms in the following eight countries in the Asia Pacific region: Australia, China, Hong Kong, Japan, Malaysia, Singapore, South Korea, and Taiwan. The sample in this study comprises 1082 firms for a period of 22 years from 1990 to 2012 on an annually basis. The total number of observation for the whole sample is 24,222. All the data were collected from Datastream database. In each country, industrial sectors were different based on the availability of data. Table 1 demonstrates the number of sample for each industrial sector.

Table 1- Number of samples for each market and industrial sector

Australia		China		Hong Kong		Japan	
Sectors	Sample	Sectors	Sample	Sectors	Sample	Sectors	Sample
Basic Material	30	Basic Material	56	Consumer Goods	12	Basic Material	84
Consumer Service	18	Consumer Goods	84	Ind. Gds and Svs	14	Consumer Goods	136
Ind. Gds and Svs*	21	Consumer Service	17			Consumer Service	127
Oil and Gas	10	Health Care	25			Health Care	52
		Ind. Gds and Svs	45			Ind. Gds and Svs	141
		Technology	10			Technology	59
		Utilities	13				
Malaysia		Singapore		South Korea		Taiwan	
Sectors	Sample	Sectors	Sample	Sectors	Sample	Sectors	Sample
Consumer Goods	16	Consumer Goods	10	Basic Material	10	Ind. Gds and Svs	10
Consumer Service	16	Ind. Gds and Svs	13	Consumer Goods	13	Technology	15
				Ind. Gds and Svs	25		

*Industrial Goods and Services

The endogenous variable in this study is the return of a company:

$$R_{it} = Ln \left(\frac{SP_{it}}{SP_{i(t-1)}} \right)$$

Where R is the return and SP denotes the Stock Price of company i at time t.

The regressors in this study are Market Value (MV), Long Term Debt to Capital (LDC), Debt to Capital (DC), Debt to Asset (DA), Debt to Common Equity (DCE), and Long Term Debt to Common Equity (LDCE).

4. Methodology

Panel regression carried out to examine the relationship between the variables. This study controlled for the size of firms, which was measured by market value of a company. For statistical tests, Levin-Lin-Chu unit root test conducted to control for stationarity of data. Multicollinearity test carried out and variables with Variance Inflation Factor (VIF) higher than 10 were removed from regression analysis. Moreover, heteroskedasticity and serial correlation of the error term in regression equation were controlled. A regression equation with all the regressors is as follows:

$$R_{it} = \alpha + \beta_1 MV_{it} + \beta_2 LDC_{it} + \beta_3 DC_{it} + \beta_4 DA_{it} + \beta_5 DCE_{it} + \beta_6 LDCE_{it} + \varepsilon_t$$

Where R is Return, MV demonstrates Market Value, LDC denotes Long Term Debt to Capital, Debt to Capital presented by DC, DA is Debt to Asset, DCE presents Debt to Common Equity, and LDCE shows Long Term Debt to Common Equity for company i at time t.

5. Results and discussion

This study considers five capital structure ratios that either debt or long term debt is nominator and either capital, asset, or common equity is denominator. For example, the debt to common equity ratio indicates what portion of debt and common equity a company is using. A high debt to common equity ratio indicates that a firm uses debt financing and generally, the risk of bankruptcy increases. However, debt to common equity ratio and other capital structure ratios should be compared with the average industry that a company operates. Thus, the mean of these ratios in each industry can be very useful for managers. For example,

capital intensive industries, such as the Oil and Gas, are more leveraged compared to other industries.

5.1 Empirical results of Australia

Tables 2 to 5 present the regression results for Australia. In Australia, four industrial sectors were considered including Basic Material, Consumer Service, Industrial Goods and Services, and Oil and Gas. The lowest and highest R-squared values are approximately 7% and 33% for the Basic Material and Oil and Gas sectors respectively. The total number of observations for Australia is 1,738.

Table 2 illustrates the regression results for the Basic Material sector in Australia. The total number of observation is 630. Unlike debt to common equity, market value and long term debt to common equity positively influence the return of firms.

Table 2- Regression results for Basic Material sector in Australia

Return	Coef.	Std. Err.	t	P-Value
D.MV	3.01E-05	6.44E-06	4.68	0.000
LDC	-0.06357	0.0987372	-0.64	0.520
DC	0.024876	0.0212668	1.17	0.243
DA	-0.11714	0.1099261	-1.07	0.287
DCE	-0.03852	0.0113043	-3.41	0.001
LDCE	0.057761	0.0284837	2.03	0.043
Constant	0.100957	0.0319351	3.16	0.002

* "D." indicates the first differenced of a variable throughout the paper.

Table 3 indicates the regression outcome for the Consumer Service sector. Market value and debt to asset affect the return of companies significantly at 5% and 10% significance level respectively. Debt to asset negatively influences the return.

Table 3- Regression results for Consumer Service sector in Australia

Return	Coef.	Std. Err.	t	P-Value
D.MV	9.17E-05	8.53E-06	10.76	0.000
LDC	0.027182	0.1955099	0.14	0.890
DC	0.147853	0.1496754	0.99	0.324
DA	-0.53174	0.3069797	-1.73	0.084
LDCE	0.026139	0.0425577	0.61	0.539
Constant	0.070207	0.0327373	2.14	0.033

For Industrial Goods and Services, only market value significantly affects the return. In Oil and Gas sector, four variables significantly influence the return including market value, debt to capital, debt to asset, and long term debt to common equity. Debt to capital and debt to asset negatively affect the return of firms.

Table 4- Regression results for Industrial Goods and Services sector in Australia

F-stat	29.06	No. of obs	441	
P-Value	0.00	R-squared	0.2504	
Return	Coef.	Std. Err.	t	P-Value
D.MV	0.000138	1.16E-05	11.89	0.000
LDC	-0.07798	0.1148739	-0.68	0.498
DC	0.055582	0.072056	0.77	0.441
DA	-0.20664	0.1402418	-1.47	0.141
LDCE	0.018672	0.0225527	0.83	0.408
Constant	0.094994	0.0276651	3.43	0.001

Table 5- Regression results for Oil and Gas sector in Australia

F-stat	25.26	No. of obs	210	
P-Value	0.00	R-squared	0.3272	
Return	Coef.	Std. Err.	t	P-Value
D.MV	8.98E-05	2.04E-05	4.39	0.000
DC	-0.34241	0.1421921	-2.41	0.017
DA	-0.16214	0.0188077	-8.62	0.000
LDCE	0.105897	0.0509047	2.08	0.039
D.LDC	-0.13865	0.3949978	-0.35	0.726
Constant	0.144462	0.0444962	3.25	0.001

Table 6 shows the summary of results for Australia. Managers and investors in Australia will find the results of this study useful because it enables adjusting portfolios. In all of the industrial sectors, market values of companies positively affect the returns. In Basic Material sector, debt to common equity and long term debt to common equity affects the return negatively and positively respectively. For Oil and Gas sector, debt to capital and debt to asset have negative relationship with the return. Conversely, long term debt to common equity was shown to have positive relationship with the return.

Table 6- Summary of Regression results for Australia

Basic material	Sign
D.MV	+
DCE	-
LDCE	+
Consumer Service	Sign
D.MV	+
DA	-
Industrial Goods and Services	Sign
D.MV	+
Oil and Gas	Sign
D.MV	+
DC	-
DA	-
LDCE	+

5.2 Empirical results of China

Tables 7 to 13 show the regression outcomes for China. Lowest to highest R-squared values are approximately 7%, 31%, 38%, 43%, 45%, 49%, and 54% for the following sectors Basic Material, Consumer Goods, Utilities, Industrial Goods and Services, Technology, Healthcare, and Consumer Service respectively. The total number of observations for China is 5,500.

In the Basic Material sector, the returns of firms are negatively impacted by long term debt to capital and debt to common equity. On the other hand, market value has a positive relationship with the return.

Table 7- Regression results for Basic Material sector in China

F-stat	303.29	No. of obs	1176	
P-Value	0.00	R-squared	0.0685	
Return	Coef.	Std. Err.	t	P-Value
MV	6.86E-06	2.67E-06	2.57	0.013
LDC	-0.41494	0.1813189	-2.29	0.026
DC	0.000362	0.0002255	1.6	0.115
DA	-0.0807	0.0715922	-1.13	0.265
D.DCE	-0.00315	0.0002675	-11.77	0.000
LDCE	0.124986	0.089016	1.4	0.166
Constant	0.029311	0.0212215	1.38	0.173

In the Consumer Goods sector, market value and debt to capital positively influence the returns of the companies. Alternatively, long term debt to common equity negatively affects the return. In healthcare industry, increase in market value will lead to increase in the return, while debt to capital has an adverse relationship with the return.

Table 8- Regression results for Consumer Goods sector in China

F-stat	211.89	No. of obs	1764	
P-Value	0.00	R-squared	0.3096	
Return	Coef.	Std. Err.	t	P-Value
D.MV	1.96E-05	1.96E-06	10.04	0.000
DC	0.029275	0.0013631	21.48	0.000
DA	-0.02506	0.0790579	-0.32	0.751
LDCE	-0.09577	0.0478994	-2	0.046
Constant	0.052414	0.0156199	3.36	0.001

Table 9- Regression results for Healthcare sector in China

F-stat	18.88	No. of obs	525	
P-Value	0.00	R-squared	0.4906	
Return	Coef.	Std. Err.	t	P-Value
D.MV	6.94E-05	8.47E-06	8.2	0.000
D.DA	0.180494	0.2624055	0.69	0.492
DC	-0.00336	0.0020062	-1.68	0.094
LDCE	-0.07555	0.0465901	-1.62	0.105
Constant	0.046777	0.0148938	3.14	0.002

For the Industrial Goods and Services, unlike market value, debt to asset negatively affects the return. In the Technology sector, market value and debt to asset positively affect the return. Conversely, debt to common equity has shown a negative relationship with the return.

Table 10- Regression results for Industrial Goods and Services sector in China

F-stat	8.85	No. of obs	945	
P-Value	0.00	R-squared	0.4295	
Return	Coef.	Std. Err.	t	P-Value
D.MV	2.86E-05	4.76E-06	5.99	0.000
LDC	0.032216	0.0318596	1.01	0.312
DC	-0.00172	0.0032921	-0.52	0.601
DA	-0.12227	0.0680984	-1.8	0.073
D.LDCE	-0.06732	0.0629787	-1.07	0.285
Constant	0.070804	0.0198022	3.58	0.000

Table 11- Regression results for Technology sector in China

F-stat	12.03	No. of obs	210	
P-Value	0.00	R-squared	0.4507	
Return	Coef.	Std. Err.	t	P-Value
D.MV	5.27E-05	9.64E-06	5.47	0.000
D.LDC	0.831028	0.7744738	1.07	0.285
D.DCE	-0.8734	0.3742766	-2.33	0.021
D.DA	1.989671	0.8997981	2.21	0.028
Constant	0.034851	0.0235421	1.48	0.140

In the Consumer Service and Utilities sectors, the only factor that affects the return is market value, which has a positive relationship with the return.

Table 12- Regression results for Consumer Services sector in China

F-stat	39.66	No. of obs	357	
P-Value	0.00	R-squared	0.5432	
Return	Coef.	Std. Err.	t	P-Value
D.MV	3.07E-05	2.82E-06	10.86	0.000
DCE	-0.01118	0.0082715	-1.35	0.177
DA	-0.11189	0.126179	-0.89	0.376
DC	0.00849	0.018582	0.46	0.648
D.LDC	-0.38567	0.2925891	-1.32	0.188
D.LDCE	0.0073	0.009636	0.76	0.449
Constant	0.093962	0.0414191	2.27	0.024

Table 13- Regression results for Utilities sector in China

F-stat	33.12	No. of obs	273	
P-Value	0.00	R-squared	0.3828	
Return	Coef.	Std. Err.	t	P-Value
D.MV	0.000022	1.73E-06	12.68	0.000
D.DCE	-0.01356	0.0641792	-0.21	0.833

D.DC	-0.19866	0.3311025	-0.6	0.549
D.LDC	-0.02639	0.529828	-0.05	0.960
D.DA	0.60161	0.7947113	0.76	0.450
Constant	0.010821	0.0216329	0.5	0.617

Managers in China, consider market values of firms to have positive relationship with the return regardless of the industrial sector. In the Basic Material sector, long term debt to capital and debt to common equity negatively affect the return. In the Consumer Goods, debt to capital and long term debt to common equity have shown positive and negative relationship with the return. For the Healthcare sector, debt to capital adversely affects the returns of firms. While it positively affects the returns of companies in the Consumer Goods sector. Debt to common equity and debt to asset affect the returns of firms in the Technology sector negatively and positively respectively. In the Industrial Goods and Services, debt to asset ratio has negative relationship with the returns of firms, while it indicates positive relationship with the return in the Technology sector.

Table 14- Summary of Regression results for China

Basic Material	Sign
MV	+
LDC	-
D.DCE	-
Consumer Goods	Sign
D.MV	+
DC	+
LDCE	-
Consumer Service	Sign
D.MV	+
Healthcare	Sign
D.MV	+
DC	-
Industrial Goods and Services	Sign
MV	+
DA	-
Technology	Sign
MV	+
DCE	-
DA	+
Utilities	Sign
MV	+

5.3 Empirical results of Hong Kong

In Hong Kong, the R-squared values are approximately 28% and 27% for the Consumer Goods and the Industrial Goods and Services sectors respectively. The total number of observations for Hong Kong is 572. In the Consumer Goods sector, market value and long term debt to capital positively affect the return. On the other hand, debt to capital and debt to asset negatively affect the returns of the firms. In the Industrial Goods and Services sector, the only variable that influences the return is market value.

Table 15- Regression results for Consumer Goods sector in Hong Kong

F-stat	7.93	No. of obs	252		
P-Value	0.00	R-squared	0.282		
Return	Coef.	Std. Err.	t	P-Value	
D.MV	2.35E-05	4.20E-06	5.59	0.000	
LDC	0.492743	0.2661205	1.85	0.065	
DC	-0.2104	0.1071879	-1.96	0.051	
D.DA	-0.86852	0.5242975	-1.66	0.099	
LDCE	-0.00374	0.0030641	-1.22	0.224	
Constant	0.052254	0.0501547	1.04	0.299	

Table 16- Regression results for Industrial Goods and Services sector in Hong Kong

F-stat	7.85	No. of obs	294		
P-Value	0.00	R-squared	0.2666		
Return	Coef.	Std. Err.	t	P-Value	
D.MV	8.84E-06	1.87E-06	4.71	0.000	
DC	-0.35087	0.3727529	-0.94	0.347	
LDCE	0.148046	0.2322499	0.64	0.524	
Constant	0.101964	0.0468378	2.18	0.030	

In Hong Kong, an increase in market value of a firm will lead the return to rise. In Consumer Goods sector, long term to capital positively affects the returns of companies; however, debt to capital and debt to asset have shown negative relationship with the return.

Table 17- Summary of Regression results for Hong Kong

Consumer Goods	Sign
D.MV	+
LDC	+
DC	-
D.DA	-
Industrial Goods and Services	Sign
D.MV	+

5.4 Empirical results of Japan

Tables 18 to 23 show the regression outcomes for Japan. The R-squared values for the following three sectors are approximately 2%: Basic Material, Consumer Goods, and Technology. Furthermore, the R-squared values for the Consumer Service and Healthcare

sectors are roughly 1%. Industrial Goods and Services have shown the highest R-squared value for about 3%. The total number of observations for Japan is 13,178.

Table 18 indicates the regression results for the Basic Material sector in Japan. Unlike market value, debt to asset and long term debt to common equity ratios adversely influence the return of firms. Moreover, the returns of firms have most affected debt to asset ratio.

Table 18- Regression results for Basic Material sector in Japan

Return	Coef.	Std. Err.	t	P-Value
MV	1.07E-07	2.49E-08	4.28	0.000
LDC	0.81906	0.1010513	0.81	0.418
DC	0.008888	302493945	0.36	0.716
DA	-0.24587	0.1207748	-2.04	0.042
LDCE	-0.00631	0.0026578	-2.37	0.018
Constant	0.0079	0.0174901	0.45	0.652

In the Consumer Goods sector, four factors of capital structure significantly affect the return of companies including market value, debt to capital equity, long term debt to capital, and debt to capital. The two former variables have shown positive relationship with the return, while the later ones negatively affect the return of firms. Among these four factors, long term debt to capital ratio affects the return the most.

Table 19- Regression results for Consumer Goods sector in Japan

Return	Coef.	Std. Err.	t	P-Value
MV	1.85E-08	7.89E-09	2.34	0.021
LDC	-0.08401	0.0491749	-1.71	0.090
DC	-0.02858	0.0109232	-2.62	0.010
DA	-0.0697	0.0565032	-1.23	0.220
DCE	0.002214	0.0004409	5.02	0.000
LDCE	-0.00597	0.0055891	-1.07	0.287
Constant	0.009197	0.0067312	1.37	0.174

In the Consumer Service and Healthcare sectors, debt to asset and long term debt to common equity ratios affect the return of firms negatively respectively. However, in both sectors, market value positively related with the return of companies.

Table 20- Regression results for Consumer Services sector in Japan

Return	Coef.	Std. Err.	t	P-Value
MV	9.06E-08	2.68E-08	3.39	0.001
DC	0.002383	0.0021634	1.1	0.273
DA	-0.07606	0.0317659	-2.39	0.018
DCE	-0.00025	0.0018297	-0.14	0.892
LDCE	-0.0063	0.0072802	-0.87	0.388

DLDC	-0.01895	0.0174091	-1.09	0.279
Constant	0.003375	0.0095882	0.35	0.725

Table 21- Regression results for Healthcare sector in Japan

F-stat	2.87	No. of obs	1144	
P-Value	0.0321	R-squared	0.0102	
Return	Coef.	Std. Err.	t	P-Value
MV	2.41E-08	1.08E-08	2.22	0.031
LDC	1.29E-01	1.00E-01	1.29	0.204
DC	-0.03807	0.0370441	-1.03	0.309
LDCE	-0.05654	0.0287097	-1.97	0.054
Constant	-0.00667	0.009168	-0.73	0.471

In Industrial Goods and Services sector, market value and debt to capital equity affect the return of firms positively. On the other hand, long term debt to capital equity and debt to asset ratios adversely influence the return. Among these four factors, debt to asset affects the returns of firms the most. For the Technology sector, market value is the only variable that significantly affects the return.

Table 22- Regression results for Industrial Goods and Services sector in Japan

F-stat	203.42	No. of obs	3102	
P-Value	0.00	R-squared	0.0308	
Return	Coef.	Std. Err.	t	P-Value
MV	9.58E-08	1.53E-08	6.26	0.000
DC	-0.00011	0.0003723	-0.29	0.770
DA	-0.21803	0.0216144	-10.09	0.000
DCE	0.002679	0.000264	10.15	0.000
LDCE	-0.00252	0.0011514	-2.19	0.030
Constant	-0.02258	0.0082929	-2.72	0.007

Table 23- Regression results for Technology sector in Japan

F-stat	2.67	No. of obs	1298	
P-Value	0.0308	R-squared	0.0191	
Return	Coef.	Std. Err.	t	P-Value
MV	6.90E-08	2.20E-08	3.13	0.003
LDC	-1.21E-01	1.12E-01	-1.07	0.288
DC	0.006634	0.0132559	0.5	0.619
DA	0.033986	0.1202404	0.28	0.778
LDCE	-0.00329	0.0138144	-0.25	0.813
Constant	-0.04494	0.0150162	-2.99	0.004

Table 24 shows the summary of results for Japan. Debt to common equity positively affects the return of firms in the Consumer Goods and Industrial Goods and Services sectors. Conversely, long term debt to common equity adversely influences the return of firms in three industrial sectors namely the Basic Material, Healthcare, and Industrial Goods and Services. Market value positively affects the return of firms in all the industrial sectors. Nevertheless,

debt to asset adversely affects the return of companies in the following three industrial sectors Basic Materials, Consumer Service, and Industrial Goods and Services.

Table 24- Summary of Regression results for Japan

Basic Material	Sign
MV	+
DA	-
LDCE	-
Consumer Goods	Sign
MV	+
DCE	+
LDC	-
DC	-
Consumer Service	Sign
MV	+
DA	-
Healthcare	Sign
MV	+
LDCE	-
Industrial Goods and Services	Sign
MV	+
DCE	+
DA	-
LDCE	-
Technology	Sign
MV	+

5.5 Empirical results of Korea

In Korea, the R-squared values are approximately 22%, 26%, and 30% for the Basic Material, Consumer Goods, and the Industrial Goods and Services sectors respectively. The total number of observations for Korea is 1,056.

In the Basic Material sector, market value and long term debt to common equity positively affect the return. Alternatively, long term debt to capital and debt to common equity were shown negative relationship with the return.

Table 25- Regression results for Basic Material sector in Korea

F-stat	9.65	No. of obs	210	
P-Value	0.00	R-squared	0.2219	
Return	Coef.	Std. Err.	t	P-Value
DMV	5.10E-05	1.08E-08	5048	0.000
LDC	-3.24E-01	9.09E-02	-3.56	0.000
DDA	-0.51825	0.4122339	-1.26	0.210

DCE	-0.10607	0.0355487	-2.98	0.003
DDC	0.044859	0.0305764	1.47	0.144
LDCE	0.211084	0.0800168	2.64	0.009
Constant	0.190223	0.0529762	3.59	0.000

In the Industrial Goods and Services sector, market value and debt to capital ratio positively affect the return. Debt to asset ratio affects the return the most with a negative sign for the coefficient. In the Consumer Goods sector, only market value significantly affects the return of firms.

Table 26- Regression results for Industrial Goods and Services sector in Korea

F-stat	16.16	No. of obs	525	
P-Value	0.00	R-squared	0.2992	
Return	Coef.	Std. Err.	t	P-Value
DMV	1.19E-07	2.44E-08	4.88	0.000
DC	9.03E-03	2.25E-03	4.01	0.000
DA	-0.51532	0.1025111	-5.03	0.000
DCE	0.000453	0.0199441	0.02	0.982
LDCE	-0.00161	0.045725	-0.04	0.972
Constant	0.202142	0.0399496	5.06	0.000

Table 27- Regression results for Consumer Goods sector in Korea

F-stat	15.93	No. of obs	273	
P-Value	0.00	R-squared	0.2643	
Return	Coef.	Std. Err.	t	P-Value
DMV	8.53E-08	9.84E-09	8.66	0.000
DC	1.49E-01	9.89E-02	1.5	0.134
DA	-0.41443	0.2547432	-1.63	0.105
DLDC	0.030758	0.0446301	0.69	0.491
DCE	-0.02125	0.0352822	-0.6	0.548
LDC	-0.16639	0.2374908	-0.7	0.484
Constant	0.159273	0.0440766	3.61	0.000

Table 28 demonstrates the summary of results for Korea.

Table 28- Summary of Regression results for Korea

Basic Material	Sign
D.MV	+
LDCE	+
LDC	-
DCE	-
Consumer Goods	Sign
D.MV	+
Industrial Goods and Services	Sign
D.MV	+

DC	+
DA	-

5.6 Empirical results of Malaysia

In Malaysia, the R-squared values are 16% and 33% for the Consumer Goods and Consumer Service sectors accordingly. The total number of observations for Malaysia is 704. In the Consumer Goods sector, the only variable that influences the return is market value and the relationship is positive. In the Consumer Service sector, unlike market value, debt to capital negatively affects the returns of firms.

Table 29- Regression results for Consumer Goods sector in Malaysia

F-stat	3.99	No. of obs	336	
P-Value	0.0016	R-squared	0.162	
Return	Coef.	Std. Err.	t	P-Value
D.MV	0.000069	1.68E-05	4.11	0.000
D.DC	-0.13111	0.1508461	-0.87	0.385
LDCE	0.005981	0.0707925	0.08	0.933
DA	-0.01451	0.12732	-0.11	0.909
D.DCE	0.049161	0.0829088	0.59	0.554
Constant	0.067112	0.0231958	2.89	0.004

Table 30- Regression results for Consumer Service sector in Malaysia

F-stat	33.68	No. of obs	336	
P-Value	0.00	R-squared	0.3379	
Return	Coef.	Std. Err.	t	P-Value
D.MV	0.00011	8.94E-06	12.35	0.000
LDC	-0.08925	0.1891995	-0.47	0.637
DC	-0.28954	0.1261232	-2.3	0.022
DA	0.395608	0.328599	1.2	0.229
DCE	-0.00366	0.004579	-0.8	0.425
Constant	0.0712	0.0365053	1.95	0.052

Table 31 illustrates the summary of results for Malaysia.

Table 31- Summary of Regression results for Malaysia

Consumer Goods	Sign
D.MV	+
Consumer Service	Sign
D.MV	+
DC	-

5.7 Empirical results of Singapore

In the Singapore market, the R-squared values are approximately 36% and 43% for the Consumer Goods and the Industrial Goods and Services sectors respectively. The total number of observations for Singapore is 506.

Market value is the only capital structure factor that significantly influence the return. In Industrial Goods and Services, long term debt to common equity and debt to asset ratios adversely affect the return, while market value have shown positive relationship with the return.

Table 32- Regression results for Consumer Goods sector in Singapore

F-stat	21.38	No. of obs	200	
P-Value	0.00	R-squared	0.3553	
Return	Coef.	Std. Err.	t	P-Value
DMV	3.04E-04	2.96E-05	10.27	0.000
DDC	-9.35E-03	2.25E-01	-0.04	0.967
LDCE	-0.06681	0.0782969	-0.85	0.395
DDA	0.21417	0.6094231	0.35	0.726
DDCE	-0.00969	0.131193	-0.07	0.941
Constant	0.038262	0.0365994	1.05	0.297

Table 33- Regression results for Industrial Goods and Services sector in Singapore

F-stat	33.75	No. of obs	273	
P-Value	0.00	R-squared	0.4322	
Return	Coef.	Std. Err.	t	P-Value
DMV	1.36E-04	9.95E-06	13.67	0.000
DDC	2.59E-01	2.96E-01	0.88	0.381
LDCE	-0.04033	0.0221863	-1.82	0.070
DDA	-1.56299	0.8435915	-1.85	0.065
DDCE	0.01062	0.0247721	0.43	0.668
DLDC	0.57478	0.3917169	1.47	0.143
Constant	0.043076	0.0227718	1.89	0.060

Table 34 shows the summary of results for Singapore.

Table 34- Summary of Regression results for Singapore

Consumer Goods	Sign
D.MV	+
Industrial Goods and Services	Sign
D.MV	+
LDCE	-
D.DA	-

5.8 Empirical results of Taiwan

In Taiwan, the R-squared values are approximately 21% and 36% for the Industrial Goods and Services and Technology sectors respectively. The total number of observations for Taiwan is 550. In the both sectors, market value is the only capital structure factor that significantly affect the return.

Table 35- Regression results for Industrial Goods and Services sector in Taiwan

F-stat	13.87	No. of obs	210	
P-Value	0.00	R-squared	0.213	

Return	Coef.	Std. Err.	t	P-Value
DMV	1.98E-06	2.71E-07	7.31	0.000
DC	-2.11E-01	3.12E-01	-0.68	0.498
DA	0.22533	0.6188552	0.36	0.716
LDCE	-0.09763	0.1528073	-0.64	0.524
Constant	0.115199	0.0537692	2.14	0.033

Table 36- Regression results for Technology sector in Singapore

F-stat	34.09	No. of obs	315	
P-Value	0.00	R-squared	0.3555	
Return	Coef.	Std. Err.	t	P-Value
DMV	2.15E-06	1.65E-07	13.02	0.000
DDC	1.32E-01	4.09E-01	0.32	0.748
DDA	-0.27594	0.8230885	-0.34	0.738
DDCE	-0.03763	0.2210036	-0.17	0.865
LDC	-0.02965	0.1860979	-0.16	0.874
Constant	0.046291	0.0274644	1.69	0.093

Table 37 indicates the summary of results for Taiwan.

Table 37- Summary of Regression results for Taiwan

Industrial Goods and Services	Sign
D.MV	+
Technology	Sign
D.MV	+

6. Implication for managers

This section provides the implication for managers separately for each industrial sector. In all markets and all industrial sectors, market value positively affects the return of firms.

6.1 Basic Material

Managers that their companies operate in the Basic Material industry consider the negative relationship between debt to common equity and the return of firms in Australia, China, and Korea. Long term debt to common equity positively affect the return of firms in Australia and Korea; however, the relationship is opposite in Japan. The return of firms negatively impacted by long term debt to capital in China and Korea.

Table 38- Summary of results for the Basic Material sector

Australia	Sign	China	Sign	Japan	Sign	Korea	Sign
DCE	-	LDC	-	DA	-	LDCE	+
LDCE	+	D.DCE	-	LDCE	-	LDC	-
						DCE	-

6.2 Consumer Service

Managers in the Consumer Service sector might know that debt to asset negatively affects the return of firms in Australia and Japan. Malaysian managers consider debt to capital ratio, which has an opposite relationship with the return.

Table 39- Summary of results for the Consumer Service sector

Australia	Sign	Japan	Sign	Malaysia	Sign
DA	-	DA	-	DC	-

6.3 Industrial Goods and Services

Managers in the Industrial Goods and Services sector could be aware that the return of their firms negatively impacted by debt to asset ratio in Korea, China, Japan, and Singapore. Moreover, long term debt to common equity adversely affects the return of companies in the Industrial Goods and Services in Japan and Singapore.

Table 40- Summary of results for the Industrial Goods and Services sector

Korea	Sign	China	Sign	Japan	Sign	Singapore	Sign
DC	+	DA	-	DCE	+	LDCE	-
DA	-			DA	-	D.DA	-
				LDCE	-		

6.1. Consumer Goods

Managers that their firms operate in the Consumer Goods sector might know that debt to capital negatively affects the return in Hong Kong and Japan. Alternatively, return of firms positively impacted by debt to capital ratio. Long term debt to common equity and debt to asset adversely affect the return of firms in China and Hong Kong respectively.

Table 41- Summary of results for the Consumer Goods sector

China	Sign	Hong Kong	Sign	Japan	Sign
DC	+	LDC	+	DCE	+
LDCE	-	DC	-	LDC	-
		D.DA	-	DC	-

6.2. Oil and Gas

In this study, the only Oil and Gas sector is in Australia. Return of firms in this sector negatively impacted by debt to capital and debt to asset. On the other hand, long term debt to common equity positively affects the return of firms.

Table 42- Summary of results for the Oil and Gas sector

Australia	Sign
DC	-
DA	-
LDCE	+

6.4 Healthcare

Debt to capital and long term debt to common equity adversely affect the return of firms in the Healthcare industry in China and Japan.

Table 43- Summary of results for the Healthcare sector

China	Sign	Japan	Sign
DC	-	LDCE	-

6.5 Technology

Return of firms in the Technology industry negatively and positively impacted by debt to common equity and debt to asset respectively in China. Market value is the only factor that significantly affects the return of firms in this sector in Japan and Taiwan.

Table 44- Summary of results for the Technology sector

China	Sign
DCE	-
DA	+

6.6 Utilities

In this study, the only Utilities sector is in China. Market value is the only factor that significantly affects the return of firms in this sector in China.

7. Conclusion

This study examines the relationship between capital structure ratios and returns of firms in the following countries Australia, China, Hong Kong, Japan, South Korea, Malaysia, Singapore, and Taiwan from 1990 to 2012. The results of this study differ for the countries as well as the industrial sectors.

In Australia, in the Basic Material industry, adverse relationship between debt to common equity and the return of a firm was observed. Furthermore, debt to capital of companies in the Oil and Gas industry has shown a negative relationship with the return. Debt to asset in the both Consumer Service and Oil and Gas industries negatively affects the return of firms. Thus, an increase in the value of these ratios would decline the return of a firm. Conversely, in the both Basic Material and Oil and Gas industries, the return of firms positively affected by long term debt to common equity. In the Basic Material industry, debt to common equity and long term debt to common equity negatively and positively affect the return of firms respectively. Therefore, managers may consider the positive effect of long term debt on the return of firms.

In China, debt to common equity in the both Basic Material and Technology industries adversely affect the return of firms. In addition, long term debt to capital and long term debt to common equity negatively affect the return of companies in the Basic Material and the Consumer Goods industries respectively. In the Consumer Goods industry, debt to capital positively affects the return. Alternatively, return of firms in the Healthcare industry adversely affected by debt to capital. Furthermore, debt to asset has negative impacts on the return of firms in the Industrial Goods and Services industry. On the other hand, debt to asset positively affects the return of companies in the Technology industry.

In Hong Kong, long term debt to capital and debt to capital positively and negatively affect the return of firms respectively. Hence, managers may consider the positive effect of long term debt on the return of firms.

In Japan, debt to asset and long term debt to common equity adversely affect the return of firms in the both Basic Material and Industrial Goods and Services industries. In addition, the return of companies in the Consumer Service and the Healthcare industries negatively impacted by debt to asset and long term debt to common equity respectively. Debt to common equity positively affects the return of firms in the both Consumer Goods and Industrial Goods

and Services industries. Conversely, the return of companies in the Consumer Goods industry negatively impacted by long term debt to capital and debt to capital ratios.

In Korea, in the Basic Material industry, the return of firms negatively impacted by long term debt to common equity, debt to common equity, and long term debt to capital. In the Industrial Goods and Services sector, debt to capital and debt to asset affect the return of companies positively and negatively respectively.

In Singapore, both long term debt to common equity and debt to asset adversely affect the return of firms in the Industrial Goods and Services sector.

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