Role of Cash Flows in Firm-Level Leveraged Returns within Industry in Bursa Malaysia

Wei Theng Lau[1], Siong Hook Law[1*], Annuar Md Nassir[2] & Tamat Sarmidi[3]
[1]*Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia*
[2]*Department of Accounting and Finance, Faculty of Economics and Management, Universiti Putra Malaysia*
[3]*School of Economics, Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia*

Abstract: This study examines the role of cash flow in the financial leverage-stock return nexus in Bursa Malaysia. The analysis, as conducted, is based on 12 sectors, and covers a sample of firms from the period 1986-2012. Panel regressions show that industry-specific analysis matters due to various marginal effects of leverage conditional on cash flow across sectors. Data relating to cash flow from operating activities, cash flow for capital expenditure, and free cash flow are employed. The results suggest that each adopted cash flow exhibits an important role in affecting the leverage impact on returns in most of the sectors. In most circumstances, leverage is deemed counter-productive under the existence of cash flow. The results are robust to market and book measures of leverage, net or inclusion of cash position, and to dynamic estimation. The conditional leverage impacts remain robust even though the firm effects and time effects are present in the model specification as controls.

Key words: Financial leverage, Cash flow, Stock returns, Panel regressions
JEL classification: G12, G32

1. Introduction

Despite various theories related to capital structure that have tried to rationalise the impact of leverage, past literature has provided mixed empirical evidence on the role of leverage in return predictability. Some have suggested that leverage has a positive relationship with average returns while others have suggested the opposite. Albeit various reasons have been argued on such mixed impacts, this paper aims to contribute to the current literature by investigating the relationship within specific industries from the cash-flow perspective.

Stock return, instead of other firm performance indicators, is to be studied in this paper as it is the most direct measurement of shareholder's wealth maximisation and is useful in capital market applications. In earlier empirical search, Hamada (1972) Masulis (1983) and Bhandari (1988) find that expected stock returns are positively related to leverage across firms. Fama and French (1992) discover that the relation between average returns and market leverage is strong but turns negative when book leverage is used. Their findings are later supported by Strong and Xu (1997). Dimitrov and Jain (2008) argue that changes in financial leverage not only contribute directly to risk factors as usually claimed, such as that proven by Choi *et al.* (2012), but are value-relevant beyond earnings. Dhatt *et al.* (1999) find that the debt-to-equity ratio is positively related to returns for one section of stocks, but insignificant for another section. Gomes and Schmid (2010) find returns to be positively related to market leverage but not to book leverage. Similarly, Ho *et al.* (2008) find that factors as usually claimed, such as that proven by Choi *et al.* (2012), but are value-relevant only market leverage

* Corresponding author: Siong Hook Law. Tel.: +603-89467768. Email: lawsh@upm.edu.my

exhibits conditional pricing relations. On the other hand, George and Hwang (2010) attribute the negative relation to the sensitivity of high levered firms to financial distress risks. By examining the abnormal stock returns, Muradoglu and Sivaprasad (2012) further show that investing in low-leverage firms is value-added. However, consistent with the claim by Fama and French (1992), Penman *et al.* (2007) suggest that book-to-price ratio is able to capture the component of leverage. Dang (2013) and Strebulaev and Yang (2013) also try to explain the reasons as to why many zero-leverage firms have been able to perform consistently well over the years.

While the importance of leverage on stock returns still needs further academic attention, this study aims to address some basic yet overlooked issues. In the studies of capital structure theories, attention has been focused on the relevance of cash flows. There is an essential relationship between leverage and cash flow, which fundamentally affects the decision to adjust leverage (Faulkender *et al.* 2012). Nevertheless, so far, there has been little discussion on how the variability of these cash flows may affect the impact of leverage on stock returns. If such a role of cash flow is found to be significant, the marginal effects of leverage on stock return in response to the changes of cash flow can be identified and the net effect of leverage can be determined to improve the decision making process. This is especially useful in differentiating value-additive leverage and value-destructive leverage.

Different capital structure theories suggest varying implications on cash flows. The trade-off theory implies that volatility of cash flow tends to affect the financial distress cost, which would make firms reluctant to borrow (see, for e.g., Keefe and Yaghoubi 2016). Signalling theory implies that firms with higher cash flow signal their performance with a higher leverage, thus a positive relationship should exist (Ross 1977; Harris and Raviv 1991). The pecking order theory proposes a negative relationship in which firms with higher internally generated cash flow require less borrowing. Free cash flow, however, frequently implies low growth opportunities and hence higher over-investment problems such as suggested by Chen *et al.* (2016). The theory of the agency, as proposed by Jensen and Meckling (1976), implies that debt can be used for firms with excess free cash flow but with low growth opportunities to monitor the agency relationship between managers and shareholders. Stulz (1990) also advocates the positive relation between leverage and free cash flow. D'Mello and Miranda (2010) further confirm that leverage helps in reducing excess investments in firms that have the highest agency problems, especially for those with poor investment opportunities. Fatma and Chichti (2011) also show that firms with a more severe overinvestment problem have higher levels of leverage and the impact of it on free cash flow is significantly negative, which is later supported by the studies of Khan *et al.* (2012) and Park and Jang (2014). On the assumption that investments are value-added, empirical evidence supports that stock prices normally do well in those years in which capital expenditures increase. Besides, earnings of high leveraged firms may have lower valuation impact due to the fact that the present value of future cash flows is low caused by a high systematic risk (Martikainen 1997). Furthermore, DeAngelo and DeAngelo (2006) argue that high leverage reduces financial flexibility because the utilisation of the current borrowing capacity translates into less availability in the future.

Besides, while some recent studies start to include the industry-level leverage in regressions, this study aims to test the specific relationship within industries, acknowledging the fact that the generalisation of leverage effects across industries may make no practical sense. Industry effect is an important determinant of firm performance (Cheng *et al.* 1998; Goddard *et al.* 2009). Luo and Xie (2012) also report that an industry-specific factor could affect the stock returns co-movement within industries. Even very early empirical research (see Schwartz and Aronson 1967; Baker 1973; Scott 1976; Bradley *et al.* 1984) suggests similarities in financial leverage ratios within industries while noting persistent differences concentration of suppliers and customers tend to have higher debt ratios. In concentrated

across industries. In a study on Malaysian firms, Annuar and Shamsher (1993) also find significant difference in the leverage ratios across industries. Hovakimian *et al.* (2001) provide further evidence with firms actively adjusting their debt ratios towards the industry average. Mackay and Phillips (2005) conclude that industry-related factors other than industry fixed effects partly explain the variations of financial structures among industries.

Industry-specific factors that may affect the capital structure within certain industries are, for example, asset structures, stability of earnings, product market strategy, characteristics of product inputs, entry barriers, concentration of suppliers and customers (see Schwartz 1959; Harris and Raviv 1991; Campello 2003; Hou and Robinson 2006; Kale and Shahrur 2007). While in regulated industries, leverage is high and less related to firm performance (Ovtchinnikov 2010). Muradoglu and Sivaprasad (2012) further find a negative relationship between returns and leverage within non-regulated and low concentration industries. As suggested by Miao (2005), Muradoglu and Sivaprasad (2012) agree that the industry leverage should be considered in the study of leverage-returns relationship. In short, empirical evidence has confidently suggested that the relationship between leverage and returns is only meaningful if the tests are within industry groupings.

Last but not least, this study looks into Malaysia as a global emerging market which has received less coverage to date. Most of the recent Malaysian studies have mainly centred on the determinants of leverage (see, for e.g., Pandey 2001; Baharuddin 2011; Ting and Lean 2011; Abdeljawad *et al.* 2013; Haron *et al.* 2013; Jamal *et al.* 2013; Saarani and Shahadan 2013; Ebrahim *et al.* 2014; Haron 2014), which generally have a different focus as compared to this paper. Ahmad *et al.* (2012) and Matemilola *et al.* (2013) study the impact of leverage but mainly on firm's financial performance. A survey by Mansor (2008) has shown that, over years Malaysian firms are employing more long-term debt in their capital structure. Whether this increase of leverage is able to increase the value to equity holders is therefore subject to further investigation.

Theories and empirical models show that cash flows significantly affect capital structure decisions. However, it is especially useful to determine whether investors value leverage differently by judging the variations of cash flow. By acknowledging the important implications of cash flow and the significant role of industry in a firm's financing decision, the main hypothesis proposed by this paper is that the role of cash flow is significant in moderating the relationship between leverage and stock returns within industries. In this paper, Section 2 covers the empirical model, estimation methods, and data. Section 3 discusses the empirical findings and Section 4 provides a summary and conclusion.

2. Methodology and Data

2.1 Empirical Model

The impact of leverage on returns could be conditional and might not be as straightforward as suggested by theories due to the complex relationships in the real world. The inclusion of product terms from variables in a regression is quite reasonable for testing and estimating indirect or interaction effects (Brambor *et al.* 2006). If there is any possibility of a conditional relationship, it is always desirable to include such multiplicative terms in the analysis (Wright 1976; Friedrich 1982). Since an influential study by Rajan and Zingales (1998), the estimation of models with interaction effects have become very common in applied economics and finance research.

To analyse the importance of a firm's cash flows for financial leverage on return, an interaction term between leverage and cash flow is included in the regression. In a regression with interaction terms, the main terms (leverage and cash flow) should always be included in a regression with interaction terms (Brambor *et al.* 2006; Balli and Sorensen 2010) to avoid omitted variable bias.

$$R_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 CF_{it} + \beta_3 (LEV_{it} \; X \; CF_{it}) + \; \varepsilon_{it} \quad (1)$$

where R_{it} is the firm-level adjusted returns measured as firm return minus risk-free return; LEV_{it} is the financial leverage; CF_{it} is the firm's cash flow, and ε_{it} is the error term. Three cash flow proxies will be tested in this study, i.e. operating cash flow, investing cash flow and free cash flow.

Operating cash flow is usually used to proxy the quality of earnings [1]. Earnings accompanied by high accruals suggest low-quality earnings (Chan *et al.* 2006). Higher accrual may indicate receivable collection problems. Poor working capital management could cause finance difficulties despite growing accounting profits. Operating cash flow also helps capture the non-operating gains that appear in the profit and loss which may mislead investors. Its ratio is computed as:

$$\text{Operating Cash Flow Ratio, } \text{OCF}_{\text{it}} = \left[\frac{\text{Operating Cash Flow} + \text{Total Assets}}{\text{Total Assets}}\right]_{\text{it}} \quad (2)$$

Cash flow from investing activities, represented by the additions to fixed assets, however captures the capital expenditures needed for growth purposes or payments for fixed assets investment. Higher rates of investing cash flow or capital expenditures may imply future income growth expectations. The test is to determine whether investing cash flow, which represents investment opportunities, affects the impact of leverage on stock returns. The cash flow ratio is computed as:

$$\text{Investing Cash Flow Ratio, } \text{ICF}_{\text{it}} = \left[\frac{\text{Capital Expenditure}}{\text{Total Assets}}\right]_{\text{it}} \quad (3)$$

Free cash flow is the cash flow in excess of that required to fund all positive NPV projects (Jensen 1986). Managers may use free cash flow to invest in negative NPV projects due to low growth opportunities rather than returning the cash to shareholders. Debt financing can be used for firms with excess free cash flow but with low growth opportunities for agency-relationship monitoring purposes. The test is to determine whether free cash flow, which represents low positive NPV investment opportunities (but at the same time it indicates strong cash flow generating capabilities), affects the impact of leverage on stock returns. Free cash flow ratio in this study is computed as:

$$\text{Free Cash Flow Ratio, } \text{FCF}_{\text{it}} = \text{OCF}_{\text{it}} - \text{ICF}_{\text{it}} \quad (4)$$

There are other factors that would affect stock return expectations as suggested by previous literature. First, the impact of overall market conditions on firm-level stock returns at a point in time is taken into account by using the market risk premium as a proxy to the overall macro environment impact. Second, the difference between the book and market equity is accounted for by using a book-to-market ratio as a risk factor, which can also be used to proxy a firm's growth opportunities. Its popularity as the determinant of stock returns has been confirmed in previous studies (see Rosenberg *et al.* 1985; Chan *et al.* 1991; Fama and French 1992; Penman *et al.* 2007; Dempsey 2010; Lin *et al.* 2012). Besides, firm size is significant on returns as reported in many empirical findings on the U.S. market (see, for e.g., Banz 1981; Basu 1983; Fama and French 1992) and Asian markets (see, for e.g., Wong 1989;

[1] Yang *et al.* (2014) for more explanations on earnings quality.

Rouwenhorst 1999; Shum and Tang 2005). Finally, the price-to-earnings ratio (the reciprocal of earnings yield) is a conventional stock valuation technique that has been widely discussed in the literature (Basu 1977, 1983; Jaffe *et al.* 1989, Choi *et al.* 2012), providing support for predictive power of earnings yield on stock returns. Therefore, Equation (1) is extended to incorporate these determinants:

$$R_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 CF_{it} + \beta_3 (LEV_{it} \; X \; CF_{it}) + \beta_4 MRP_t + \beta_5 SIZE_{it} + \beta_6 BM_{it} + \beta_5 EY_{it} + \varepsilon_{it} \quad (5)$$

where R_{it} and LEV_{it} ,CF_{it} and ε_{it} are as defined above; MRP_t is the market risk premium over risk-free return; $SIZE_{it}$ is the firm size represented by market capitalisation; BM_{it} is the ratio of book-to-market value; EY_{it} is the earnings yield.

2.2 Estimation Methods

A survey by Petersen (2009) shows that 42% of the finance papers in corporate finance and asset pricing empirical work did not adjust standard errors for possible dependence in the residuals. There are two general forms of dependence commonly seen in finance panel data sets, where ordinary least squares standard errors can be biased. The residuals of a given firm may be correlated across years, known as firm effect. Alternatively, the residuals of a given year may be correlated across different firms, known as time effect. This study will contribute to considering these effects by adjusting the standard errors accordingly. For robustness checks, the standard errors will be clustered by firm and by time to avoid biased standard errors if firm fixed effect or time effect (see Petersen 2009) are present.

To provide some exploratory insights as to whether the joint impact of leverage and cash flow on stock returns expectation is empirically important, the marginal effects of leverage using cash flow with the respective standard errors are to be calculated and interpreted (Brambor *et al.* 2006). With a basic interaction term of leverage and cash flow as expressed in Equation (1), the marginal effect of leverage on stock returns can be calculated as $\partial R_{it}/\partial LEV_{it} = \beta_1 + \beta_3 CF_{it}$. The standard error of this quantity of interest can thus be obtained by calculating $\hat{\sigma}=[var(\hat{\beta}_1) + CF_{it}^2 \, var(\hat{\beta}_3) + 2CF_{it} \, cov(\hat{\beta}_1 \hat{\beta}_3)]^{1/2}$.

2.3 Data

The main firm-level data source is Thomson Reuters DataStream. The Main Market of Bursa Malaysia for the period of 1986-2012 is of interest in this study. Financial firms, including banks, investment companies, insurance and life assurances, are excluded because the leverage presented through their balance sheets do not carry the same meaning as for nonfinancial firms. Close-end-fund and real estate investment trusts are also excluded. The firm must be listed on the Bursa Malaysia Main Market before 1 January 2002 and not be suspended for more than 12 months. The previous discussion suggests that industry classification is a good proxy for business risk. Panel regressions will therefore be applied for each identified industry. According to the Industrial Classification Benchmark (ICB) of Dow Jones and FTSE, the firms in the Bursa Malaysia can be categorised as in Table 1.

Leverage is normally defined as ratio of debt, for instance total assets to total equity, total liabilities to total equity, total debt to total equity, and total long-term debt to total equity. In previous studies, it was not unusual to find statements that the key results were robust to alternative but had similar-sense leverage definitions. Most studies focus on a single measure of leverage due to such robustness claims. While the broad definitions of leverage in financial management might lead to various computations, this study focuses on the financing leverage and defines firm leverage (expressed as a ratio) as total financing to total equity of the firm:

$$\text{Leverage, } LEV_{it} = \left[\frac{\text{Total Equity+Total Debt}}{\text{Total Equity}}\right]_{it} \quad (6)$$

$$\text{Leverage, } LEV_{it} = \left[\frac{\text{Total Equity+LongTerm Debt+ShortTerm Debt}}{\text{Total Equity}}\right]_{it} \quad (7)$$

Table 1: Sector classification of Bursa Malaysia based on industrial classification benchmark

Industry	Supersector	No. of Observations	Percentage
0001 Oil & Gas	0500 Oil & Gas	-	-
1000 Basic Materials	1300 Chemicals	195	3.2%
	1700 Basic Resources	473	7.7%
2000 Industrials	2300 Construction & Materials	861	14.0%
	2700 Industrial Goods & Services	1282	20.8%
3000 Consumer Goods	3300 Automobiles & Parts	206	3.3%
	3500 Food & Beverage	910	14.8%
	3700 Personal & Household Goods	516	8.4%
4000 Health Care	4500 Health Care	-	-
5000 Consumer Services	5300 Retail	280	4.6%
	5500 Media	-	-
	5700 Travel & Leisure	359	5.8%
6000 Telecommunications	6500 Telecommunications	180	2.9%
7000 Utilities	7500 Utilities		
8000 Financials	8300 Banks	-	-
	8500 Insurance	-	-
	8600 Real Estate	637	10.4%
	8700 Financial Services	-	-
9000 Technology	9500 Technology	253	4.14%

By general definition, total debt financing used in this paper includes current and non-current portions of long-term debt, plus all short-term debt, as indicated by Equation (7). Total equity can be expressed in market value or book value. Market equity is used when examining the dynamic effect of leverage which will fluctuate due to market conditions, thus being able to respond and reflect the changing relative costs of capital. Book equity is in focus when examining the effect of leverage together with cash flows since the book value could better represent the ability of managers to understand the actual financing needs. Promoters of book leverage say that managers focus on it because debt is better supported by assets in place than by growth opportunities. Most of them do not rebalance capital structure in response to equity market movements (Graham and Harvey 2001). Supporters of market leverage, however, argue that the book value is primarily a plug in accounting number but is not particularly managerially relevant (Welch 2004). Besides this, the book number is backward looking as opposed to the forward-looking financial market. This study aims to cover both measures. While there is no reason as to why these two measures should match or be interpreted as the same (Barclay *et al.* 2006), both are well accepted in literature.

The only dependent variable of main interest is firm-level stock returns. Previous studies use various measurements of returns such as return on assets (Hall and Weiss 1967); accounting profit (Hamada 1972); inflation-adjusted returns (Bhandari 1988); risk-adjusted returns (Dimitrov and Jain 2008; Korteweg 2010), market-adjusted returns (Muradoglu and Sivaprasad 2009), and abnormal returns (Adami *et al.* 2010, Muradoglu and Sivaprasad 2012).

This study adopts the adjusted returns in excess of risk-free rate since the intuition for its use is straight forward and can easily be practised in decision making. For control variables, the FBMKLCI index is used as a proxy for overall market portfolio while the market interest rate is taken as the risk-free rate. The market risk premium is the excess return of overall market portfolio to risk-free rate. Following Fama and French (1992), book-to-market value is measured by a company's net asset divided by its share value. Firm size is represented by a firm's market value in natural logarithm form. Market value of equity is calculated by using the share price multiplied by the total number of ordinary shares outstanding. Earnings yield, which reflects accounting profitability, is computed by dividing the earnings per share using share price.

3. Results

3.1 Empirical results

A total of 494 firms are broadly grouped into 12 supersectors as indicated in Table 1. Tables 2-4 report the regression results for the 12 sectors. Table 2 reports the results of testing the role of operating cash flow. Table 3 adopts investing cash flow, whereas Table 4 tests the role of free cash flow.

Overall results in tables 2-4 show that the use of cash flows are important elements in affecting the impact of leverage on stock returns. The leverage impacts are largely mixed across various sectors of which such observations are supported by existing literature. Leverage shows positive relations with stock returns in some sectors, but indicates opposite relations in others. The per-one-percent effects of their interaction with cash flow range from -1.91% to 1.23%. This justifies the importance of industry-specific analysis and is consistent with the claims that much of the variation in firm leverage could be explained by industry classification (Baker 1973; Bradley *et al.* 1984; Mackay and Phillips 2005; Muradoglu and Sivaprasad 2012).

Different definitions of cash flows exhibit different roles in affecting the impact of financial leverage on returns. When operating cash flow is considered, market leverage shows a more prominent role in its interaction effect for the sectors of chemical, construction and materials, automobile and parts, and travel and leisure (refer Table 2). When capital expenditure alone is considered as the investing cash flow, book leverage appears to be more significant in the sectors of construction and materials, industrial goods and services, automobile and parts, food and beverage, retail, travel and leisure, and technology (see Table 3). For firms in the sectors of chemicals, construction and materials, personal and household goods, retail, and travel and leisure, utilities and communication, and real estate, the measure of market leverage is more important when free cash flow is considered, as can be compared in Table 4. In practical terms, managers and investors should be more aware of such differences in the consideration of various cash flows.

Relationships are examined by including both book leverage and market leverage to distinguish the probable different leverage effects. Tables 2-4 show that some industries show consistent relationships across the use of book value and market value. This is despite what the literature emphasises that the different computations of the two could cause the opposite impact on returns. This study also shows that most of the interactions effects of leverage and cash flow are consistent in terms of signs across the use of book leverage and market leverage.

Control variables in the models are mostly significant or within expectations. Book to market and market risk premium are often positive and significant to stock returns as claimed by most of the empirical findings. However, it is not consistent with results of other studies, for instance by Fama and French (1992), Strong and Xu (1997), Penman *et al.* (2007) and Lewellen (2015) in the way that book-to-market value should have absorbed the premium of leverage. In many sectors, the direct effect of leverage remains significant even when

Table 2: Regression results for the interaction between financial leverage and operating cash flow

Coefficient Estimates	Chemical	Basic Resources	Construction & Materials	Industrial Goods & Services	Automobile & Parts	Food & Beverage	Personal & Household Goods	Retail	Travel & Leisure	Utilities & Telecommunication	Real Estate	Technology
Leverage used: Total Book Leverage												
Total Book Leverage	0.6123	0.2807	0.1774	-0.3863	-1.0466	-0.1877	0.4713	0.4813	0.7858	-0.7228	0.4846	0.4295
	(0.4427)	(0.1476)*	(0.1368)	(0.1278)***	(0.4261)**	(0.0831)**	(0.1566)***	(0.1375)***	(0.3478)**	(0.3806)*	(0.1951)**	(0.2088)**
Operating Cash Flow	1.1447	0.7994	0.5190	-0.1825	-0.9838	0.1178	1.0842	1.5589	1.2081	-0.1123	0.8102	1.7247
	(0.5524)*	(0.3162)**	(0.2313)**	(0.2092)	(0.7424)	(0.2005)	(0.3077)***	(0.3878)***	(0.5890)**	(0.6071)	(0.2582)***	(0.5856)***
Interaction	-0.6295	-0.2859	-0.1815	0.3692	1.0048	0.1737	-0.4186	-0.4757	-0.7580	0.7027	-0.4927	-0.4095
	(0.4573)	(0.1424)*	(0.1342)	(0.1288)***	(0.3890)**	(0.0821)**	(0.1445)***	(0.1323)***	(0.3264)**	(0.3631)*	(0.1856)***	(0.1886)**
Book-to-Market	0.0658	0.0370	0.0740	0.0754	0.0206	0.0659	0.0286	0.0369	0.0030	0.1847	0.0528	0.0238
	(0.0436)	(0.0165)**	(0.0123)***	(0.0126)***	(0.0054)***	(0.0163)***	(0.0128)**	(0.0203)*	(0.0014)**	(0.0707)**	(0.0192)***	(0.0505)
Firm Size	0.0391	0.0019	0.0277	0.0086	0.0227	0.0375	-0.0008	-0.0203	0.0325	-0.0047	0.0131	0.0111
	(0.0121)***	(0.0121)	(0.0087)***	(0.0065)	(0.0133)	(0.0076)***	(0.0117)	(0.0158)	(0.0136)**	(0.0085)	(0.0135)	(0.0303)
Earnings Yield	-0.2979	-0.0108	0.0447	0.2220	-0.0678	0.0638	0.1208	0.0622	-0.0303	-0.1804	-0.0227	-0.1356
	(0.0731)***	(0.0844)	(0.0381)	(0.0439)***	(0.1081)	(0.0502)	(0.0683)*	(0.0501)	(0.0311)	(0.1557)	(0.0793)	(0.1050)
Market Risk Premium	1.0267	1.3348	1.1279	1.0315	1.0108	0.9327	0.9154	1.1379	1.2992	0.8612	1.3387	1.4724
	(0.1117)***	(0.084)***	(0.0497)***	(0.0482)***	(0.1061)***	(0.0609)***	(0.0927)***	(0.0922)***	(0.0925)***	(0.1596)***	(0.0655)***	(0.2404)***
Constant	-1.7208	-0.9251	-1.0532	-0.0805	0.6472	-0.6487	-1.3099	-1.4653	-1.7359	-0.0304	-1.0885	-2.0624
	(0.4664)***	(0.3484)**	(0.2430)***	(0.2245)	(0.8222)	(0.2268)***	(0.3369)***	(0.4554)***	(0.6088)***	(0.7680)	(0.3023)***	(0.4132)***
Leverage used: Total Market Leverage												
Total Market Leverage	0.6856	0.241	0.2047	-0.1654	-0.7264	-0.3483	0.3200	0.2912	0.5517	-0.5305	0.1028	0.3963
	(0.1365)***	(0.1162)**	(0.1041)*	(0.0847)*	(0.1916)***	(0.1971)*	(0.1527)**	(0.1326)**	(0.1847)***	(0.5744)	(0.0439)**	(0.2678)
Operating Cash Flow	1.5589	0.7377	0.6176	0.1165	-0.6238	-0.0694	0.8764	1.2029	1.0287	0.5502	0.2496	1.6051
	(0.2927)***	(0.2361)***	(0.2190)***	(0.1540)	(0.5257)	(0.3007)	(0.2202)***	(0.3468)**	(0.3575)***	(0.5563)	(0.0979)**	(0.7019)**
Interaction	-0.6696	-0.2324	-0.2023	0.1569	0.675	0.3505	-0.3172	-0.2828	-0.5338	0.4937	-0.1012	-0.4145
	(0.1489)***	(0.1160)*	(0.1108)*	(0.0864)*	(0.1875)***	(0.2022)*	(0.1403)**	(0.1256)**	(0.1791)***	(0.5693)	(0.0386)**	(0.2743)
Book-to-Market	0.0538	0.0364	0.071	0.0737	0.0268	0.0628	0.0321	0.0302	0.0018	0.1749	0.0521	0.0712
	(0.0366)	(0.0149)**	(0.0148)***	(0.0143)***	(0.0062)***	(0.0194)***	(0.0204)	(0.0255)	(0.0059)	(0.0693)**	(0.0192)***	(0.0425)
Firm Size	0.0287	0.0017	0.0273	0.008	0.0259	0.04	-0.0127	-0.013	0.0250	-0.0258	0.0094	-0.0052
	(0.0147)*	(0.0113)	(0.0092)***	(0.0069)	(0.0125)*	(0.0072)***	(0.0124)	(0.0164)	(0.0133)*	(0.0193)	(0.0131)	(0.0354)
Earnings Yield	-0.2898	0.1076	0.0246	0.1387	-0.1291	0.0778	0.0649	0.0476	-0.0422	-0.241	-0.0901	-0.0692
	(0.0659)***	(0.0556)*	(0.0194)	(0.0536)**	(0.0989)	(0.0491)	(0.0464)	(0.0349)	(0.0335)	(0.1488)	(0.0870)	(0.0864)
Market Risk Premium	1.0253	1.2437	1.1402	1.0335	1.0974	0.9348	0.8788	1.0523	1.2959	0.9217	1.3501	1.2653
	(0.1091)***	(0.0776)***	(0.0503)***	(0.0482)***	(0.1146)***	(0.0606)***	(0.0849)***	(0.0821)***	(0.0901)***	(0.1691)***	(0.0659)***	(0.1696)***
Constant	-2.0554	-0.9136	-1.1510	-0.3812	0.2768	-0.5156	-0.9018	-1.2103	-1.4514	-0.3257	-0.4859	-1.8783
	(0.2365)***	(0.3048)***	(0.2149)***	(0.1694)**	(0.5591)	(0.3261)	(0.2896)***	(0.3998)***	(0.3697)***	(0.7748)	(0.1638)***	(0.5564)***
No. of observations	147	412	841	1184	186	759	502	229	281	151	581	209

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the financial leverage, operating cash flow, interaction of leverage-cash flow, book-to-market ratio, firm size, earnings yield and market risk premium, with standard errors clustered by firm. A total of 494 firms are classified into 12 sectors according to the Industrial Classification Benchmark of Dow Jones and FTSE, for a sample period of 1986-2012. Financial leverage is refined as total book leverage and total market leverage. The numbers in parentheses are adjusted standard errors. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels respectively.

Table 3: Regression results for the interaction between financial leverage and investing cash flow

Coefficient Estimates	Chemical	Basic Resources	Construction & Materials	Industrial Goods & Services	Automobile & Parts	Food & Beverage	Personal & Household Goods	Retail	Travel & Leisure	Utilities & Telecommunication	Real Estate	Technology
Leverage used: Total Book Leverage												
Total Book Leverage	-0.0066	-0.0376	0.0147	0.0152	0.1456	-0.0371	0.0216	0.0120	0.0050	0.0020	-0.0018	-0.0649
	(0.0119)	(0.0151)**	(0.0141)	(0.0155)	(0.0567)**	(0.0076)***	(0.0381)	(0.0053)**	(0.0027)*	(0.0156)	(0.0135)	(0.0169)***
Investing Cash Flow	0.6173	-0.4319	2.2131	0.8628	1.6997	-0.3401	2.7760	0.6558	0.5315	3.9688	0.8885	-1.5069
	(0.5827)	(0.3692)	(0.9725)**	(0.3079)***	(0.8047)*	(0.2632)	(1.5192)*	(0.5271)	(0.4348)	(1.4110)**	(0.2773)***	(0.6111)**
Interaction	-0.6352	0.3128	-1.0683	-0.3782	-1.5578	0.3042	-1.9121	-0.7074	-0.4636	-0.8584	-0.6128	1.2281
	(0.3004)*	(0.0760)***	(0.5174)**	(0.1409)***	(0.4752)***	(0.0887)***	(0.8679)**	(0.2765)**	(0.1346)***	(0.4529)*	(0.1906)***	(0.5595)**
Book-to-Market	0.0576	0.0209	0.0652	0.0616	0.0213	0.0328	0.0228	0.0224	0.0023	0.0975	0.0464	0.0904
	(0.0346)	(0.0141)	(0.0124)***	(0.0116)***	(0.0058)***	(0.0162)**	(0.0108)**	(0.0217)	(0.0013)*	(0.1102)	(0.0174)***	(0.0246)***
Firm Size	0.0444	0.0024	0.0323	0.0082	0.0291	0.0279	0.0126	-0.0030	0.0300	-0.0672	0.0189	0.0285
	(0.0088)***	(0.0117)	(0.0083)***	(0.0067)	(0.0118)**	(0.0062)***	(0.0106)	(0.0168)	(0.0104)***	(0.0232)**	(0.0132)	(0.0259)
Earnings Yield	-0.2769	0.0275	0.0545	0.1942	0.0433	1343	0.0674	0.1436	-0.0247	-0.1427	-0.0875	-0.0135
	(0.0597)***	(0.0520)	(0.0388)	(0.0621)***	(0.0868)	(0.0367)***	(0.0463)	(0.0677)**	(0.0347)	(0.1582)	(0.0876)	(0.0996)
Market Risk Premium	0.952	1.3988	1.1877	1.0637	0.9668	0.8889	0.9196	1.1251	1.2533	0.9643	1.3677	1.0263
	(0.1027)***	(0.0771)***	(0.0509)***	(0.0490)***	(0.1049)***	(0.0549)***	(0.0981)***	(0.0850)***	(0.0889)***	(0.1314)***	(0.0652)***	(0.1076)***
Constant	-0.6088	-0.0378	-0.5950	-0.2763	-0.6153	-0.3394	-0.2784	-0.0128	-0.4376	0.8368	-0.3280	-0.4746
	(0.1457)***	(0.1539)	(0.1062)***	(0.0895)***	(0.2135)**	(0.0934)***	(0.1452)*	(0.2419)	(0.1447)***	(0.4062)*	(0.1611)**	(0.3087)
Leverage used: Total Market Leverage												
Total Market Leverage	0.0241	-0.013	0.0108	0.0024	0.0690	-0.0187	0.0069	0.0614	0.0222	-0.0315	-0.0007	0.0265
	(0.0272)	(0.0175)	(0.0077)	(0.0117)	(0.0364)*	(0.0190)	(0.0202)	(0.0117)***	(0.0189)	(0.0343)	(0.0104)	(0.0205)
Investing Cash Flow	0.9582	-0.3281	1.7474	0.7325	0.7507	-0.7549	1.3117	1.2164	0.4494	3.7508	0.2952	2.1552
	(0.6429)	(0.3429)	(0.8221)**	(0.3162)**	(0.6562)	(0.5882)	(0.7165)*	(0.7622)	(0.5511)	(1.2853)**	(0.0864)***	(0.9180)**
Interaction	-1.0876	0.2202	-0.6287	-0.333	-0.789	0.5094	-0.9177	-0.8719	-0.4966	-0.7784	-0.1775	-1.1085
	(0.5499)*	(0.0808)***	(0.3695)*	(0.1590)**	(0.3114)**	(0.3381)	(0.2840)***	(0.4470)*	(0.2824)*	(0.3790)*	(0.0479)***	(0.6559)
Book-to-Market	0.0496	0.0252	0.0621	0.0659	0.0164	0.0368	0.0356	-0.0227	-0.0058	0.1519	0.0539	0.0663
	(0.0292)	(0.0187)	(0.0151)***	(0.0133)***	(0.0058)**	(0.0211)*	(0.0185)*	(0.0325)	(0.0142)	(0.1025)	(0.0173)***	(0.0389)
Firm Size	0.0413	0.0050	0.0315	0.0062	0.0306	0.0264	0.0131	-0.1275	0.0301	-0.0683	0.0148	0.0437
	(0.0092)***	(0.0133)	(0.0091)***	(0.0066)	(0.0123)**	(0.0089)***	(0.0097)	(0.0170)	(0.0108)***	(0.0236)**	(0.0127)	(0.0216)*
Earnings Yield	-0.2649	0.0788	0.0011	0.167	0.0304	0.1316	0.0599	0.2553	-0.0319	-0.0921	-0.081	-0.1068
	(0.0613)***	(0.0572)	(0.0235)	(0.0612)***	(0.0982)	(0.0433)***	(0.0540)	(0.0535)***	(0.0486)	(0.1088)	(0.0891)	(0.0791)
Market Risk Premium	0.9552	1.387	1.1944	1.0729	1.01	1.0378	0.8938	1.1626	1.256	0.9743	1.3515	1.3771
	(0.0948)***	(0.0767)***	(0.0514)***	(0.0483)***	(0.1134)***	(0.0700)***	(0.0955)***	(0.0960)***	(0.0993)***	(0.1281)***	(0.0636)***	(0.1941)***
Constant	-0.5956	-0.1187	-0.5792	-0.2330	-0.5281	-0.3152	-0.2774	0.0619	-0.4525	0.8631	-0.2910	-0.7480
	(0.1400)***	(0.1730)	(0.1117)***	(0.0882)***	(0.1959)**	(0.1280)**	(0.1247)**	(0.2534)	(0.1524)***	(0.3906)**	(0.1591)*	(0.2573)***
No. of observations	192	473	856	1271	204	884	516	274	349	180	636	219

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the financial leverage, investing cash flow, interaction of leverage-cash flow, book-to-market ratio, firm size, earnings yield and market risk premium, with standard errors clustered by firm. A total of 494 firms are classified into 12 sectors according to the Industrial Classification Benchmark of Dow Jones and FTSE, for a sample period of 1986-2012. Financial leverage is refined as total book leverage and total market leverage. The numbers in parentheses are adjusted standard errors. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels respectively.

Table 4: Regression results for the interaction between financial leverage and free cash flow

Coefficient Estimates	Chemical	Basic Resources	Construction & Materials	Industrial Goods & Services	Automobile & Parts	Food & Beverage	Personal & Household Goods	Retail	Travel & Leisure	Utilities & Telecommunication	Real Estate	Technology
Leverage used: Total Book Leverage												
Total Book Leverage	0.5679	0.2873	0.1268	-0.1880	-1.5491	-0.0587	0.4094	0.1537	0.2301	0.7393	0.3368	0.2711
	(0.4331)	(0.0626)***	(0.1330)	(0.0896)**	(0.4116)***	(0.0814)	(0.1476)***	(0.1953)	(0.2052)	(0.4514)	(0.1694)*	(0.1771)
Free Cash Flow	1.1174	0.7775	0.3878	-0.0024	-1.6271	0.1870	0.9721	1.1935	0.5232	2.1631	0.6331	1.206
	(0.5872)*	(0.2430)***	(0.2312)*	(0.1773)	(0.6893)**	(0.2081)	(0.2943)***	(0.4215)***	(0.4741)	(1.0009)*	(0.2305)***	(0.6105)*
Interaction	-0.5970	-0.3137	-0.1248	0.1983	1.597	0.0512	-0.3666	-0.1573	-0.2465	-0.7424	-0.3390	-0.2825
	(0.4499)	(0.0684)***	(0.1336)	(0.0884)**	(0.4099)***	(0.0882)	(0.1407)**	(0.1940)	(0.2045)	(0.4517)	(0.1578)**	(0.1726)
Book-to-Market	0.0642	0.0323	0.0750	0.0691	0.0217	0.0612	0.0272	0.0306	0.0061	0.1612	0.0579	0.0384
	(0.0407)	(0.0153)**	(0.0121)***	(0.0125)***	(0.0048)***	(0.0176)***	(0.0132)**	(0.0241)	(0.0013)***	(0.0586)**	(0.0193)***	(0.0573)
Firm Size	0.0393	0.0007	0.0313	0.0088	0.0238	0.0369	0.0016	-0.0190	0.0216	0.0159	0.0129	0.0194
	(0.0109)***	(0.0124)	(0.0085)***	(0.0067)	(0.0131)*	(0.0083)***	(0.0113)	(0.0174)	(0.0133)	(0.0146)	(0.0132)	(0.0238)
Earnings Yield	-0.2993	0.0350	0.0670	0.1857	-0.0152	0.0826	0.1298	0.0420	-0.0512	-0.2926	-0.0614	-0.1043
	(0.0741)***	(0.0583)	(0.0394)*	(0.0525)***	(0.0919)	(0.0468)*	(0.0694)*	(0.0650)	(0.0284)*	(0.1933)	(0.0926)	(0.1091)
Market Risk Premium	1.0244	1.3437	1.1553	1.0413	1.0042	0.9599	0.9268	1.1507	1.2875	0.7892	1.3804	1.3331
	(0.1125)***	(0.0864)***	(0.0529)***	(0.0501)***	(0.1064)***	(0.0660)***	(0.0929)***	(0.0919)***	(0.1015)***	(0.1306)***	(0.0678)***	(0.2380)***
Constant	-1.6696	-0.8327	-0.9608	-0.2767	1.1785	-0.6939	-1.1855	-1.0537	-0.8167	-2.5556	-0.9129	-1.5739
	(0.5529)**	(0.2712)***	(0.2350)***	(0.1976)	(0.6970)	(0.2388)***	(0.3153)***	(0.4462)**	(0.4247)*	(1.1672)*	(0.2706)***	(0.5081)***
Leverage used: Total Market Leverage												
Total Market Leverage	0.6619	0.2267	0.2308	-0.1794	-0.7104	-0.2434	0.3301	0.3332	0.7432	0.6402	0.1123	0.1819
	(0.1591)***	(0.0772)***	(0.1138)**	(0.0776)**	(0.2461)**	(0.1864)	(0.0700)***	(0.1307)**	(0.1623)***	(0.2339)**	(0.0496)**	(0.2526)
Free Cash Flow	1.561	0.7008	0.602	0.0482	-0.5618	-0.0533	0.8693	1.5037	1.1956	1.8737	0.3168	0.9717
	(0.4002)***	(0.2361)***	(0.2158)***	(0.1561)	(0.5116)	(0.2925)	(0.1866)***	(0.3913)***	(0.3578)***	(0.6150)**	(0.1073)***	(0.8166)
Interaction	-0.6657	-0.2291	-0.2291	0.1761	0.7244	0.2513	-0.3408	-0.3294	-0.7516	-0.6641	-0.1236	-0.1707
	(0.1702)***	(0.0876)**	(0.1217)*	(0.0821)**	(0.2663)**	(0.1955)	(0.0650)***	(0.1287)**	(0.1700)***	(0.2314)**	(0.0436)***	(0.2484)
Book-to-Market	0.0517	0.0329	0.0686	0.0725	0.0251	0.0599	0.0294	0.0254	0.0160	0.1539	0.0552	0.073
	(0.0348)	(0.0194)*	(0.0146)***	(0.0142)***	(0.0053)***	(0.0203)***	(0.0183)	(0.0280)	(0.0086)*	(0.0536)**	(0.0186)***	(0.0503)
Firm Size	0.0284	0.0026	0.0296	0.0084	0.0291	0.0386	-0.0113	-0.0158	0.0087	-0.0085	0.0159	0.0145
	(0.0141)*	(0.0137)	(0.0087)***	(0.0069)	(0.0128)**	(0.0080)***	(0.0128)	(0.0187)	(0.0178)	(0.0136)	(0.0134)	(0.0285)
Earnings Yield	-0.2892	0.0799	0.0328	0.1401	-0.0588	0.093	0.0736	0.0385	-0.0772	-0.2909	-0.0807	-0.0536
	(0.0656)***	(0.0588)	(0.0216)	(0.0567)**	(0.0935)	(0.0496)*	(0.0460)	(0.0325)	(0.0298)**	(0.1339)*	(0.0876)	(0.1026)
Market Risk Premium	1.0221	1.3327	1.1587	1.0362	1.0991	0.9627	0.8712	1.1332	1.2871	0.8707	1.3577	1.2376
	(0.1150)***	(0.0852)***	(0.0530)***	(0.0486)***	(0.1155)***	(0.0660)***	(0.0814)***	(0.0871)***	(0.1025)***	(0.1484)***	(0.0654)***	(0.1437)***
Constant	-2.0034	-0.8252	-1.1461	-0.3049	0.0996	-0.4951	-0.8671	-1.4337	-1.3434	-1.8371	-0.6157	-1.3693
	(0.3320)***	(0.2994)***	(0.2194)***	(0.1708)*	(0.4784)	(0.3226)	(0.2075)***	(0.4031)***	(0.2396)***	(0.7483)**	(0.1909)***	(0.5598)**
No. of observations	147	421	846	1184	185	761	501	230	284	149	577	206

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the financial leverage, free cash flow, interaction of leverage-cash flow, book-to-market ratio, firm size, earnings yield and market risk premium, with standard errors clustered by firm. A total of 494 firms are classified into 12 sectors according to the Industrial Classification Benchmark of Dow Jones and FTSE, for a sample period of 1986-2012. Financial leverage is refined as total book leverage and total market leverage. The numbers in parentheses are adjusted standard errors. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels respectively.

controlling for book-to-market ratio. Whereas for size and earnings yield, the impacts and significance levels show some mixed results. For some industries, investors value growth more than value. For others, the opposite holds true. This, nevertheless, confirms the validity of our model specifications.

If both the individual and indirect effects show negative relations, it can be inferred that the financial leverage has a net negative effect on the stock returns. However, if the individual term of leverage and the multiplicative term carry opposite signs, the net marginal effect is inconclusive subject to the level of moderating variable. Figure 1 shows the estimated marginal effects with respective confidence intervals calculated and graphed as suggested by Brambor *et al.* (2006) for selected industries and results where both the coefficients of leverage and its interaction with cash flow show at least a 5% significance level.

In considering the role of cash flow, the impact of leverage should not only be judged directly as individual effect. The marginal effects shown in Figure 1 take into consideration both the interactive term and the constitutive term of leverage. Each solid sloping line shows how the marginal effect of financial leverage changes with the levels of cash flow measured in ratio. The steeper slope implies a higher sensitivity of marginal effect to cash flow changes. For instance, we can infer that for firms in the industry of industrial goods and services, the impact of leverage is positive conditional on the increase of operating cash flow. Nevertheless, such a condition holds only when the operating cash flow is proxied by the ratio of the sum of operating cash flow and total assets to total assets rise above 1.04634 (by solving $\partial Rit/\partial LEVit = -0.3863 + 0.3692CF_{it} > 0$, refer Table 2 for respective coefficients estimated). It could also imply that the Malaysian market only appreciates the use of debt when the firms in an industry are able to generate healthy operating cash flow. It is noted that when the combined effect moves farther from the x-axis intercept, the larger the standard error is hence ending with a wider confidence interval. This suggests that the marginal relationship should only hold well around the very first few percentages of increase or decrease in cash flows.

For many industries, the interactive term of leverage-cash flow shows a negative relationship with returns. Such observations do not refute the argument that healthy and positive cash flows should add value for the firm. This is especially true when most of the cash flow individual terms exhibit a positive relationship with returns, except for automobiles and parts and technology (see Table 3 and Table 4 where book leverage is employed). Therefore, we could infer that their marginal effects are adversely affected by the increase in leverage. Meanwhile, there is no evidence in any industry that shows that both the direct and indirect impacts of leverage are positive on returns.

Our overall findings support the claims of existing theories and empirical models on cash flow considerations. According to the signalling theory, firms with high free cash should be accompanied by high leverage. However, for pecking order theory, firms with higher internally generated cash flow should require less leverage. While the nature of this study is cross sectional analysis by design, the market would think that a firm that has sufficient of cash flow would not need significant borrowings. When the high cash flow, especially the free cash flow, is associated with low growth opportunities, it becomes sensible that an additional dollar increase in debt will not be better accompanied by an additional dollar increase in free cash flow. Higher leverage accompanied by higher free cash flow may imply less growth opportunities, therefore adversely affecting the return expectations. This could be attributed to the mostly opposite effects between the constitutive terms and their interaction term, as can be observed from tables 2-4.

When operating cash flow is conditional, both the direct and indirect roles of total book leverage show significance of at least a 5% level in eight sectors (see Table 2). In the sectors

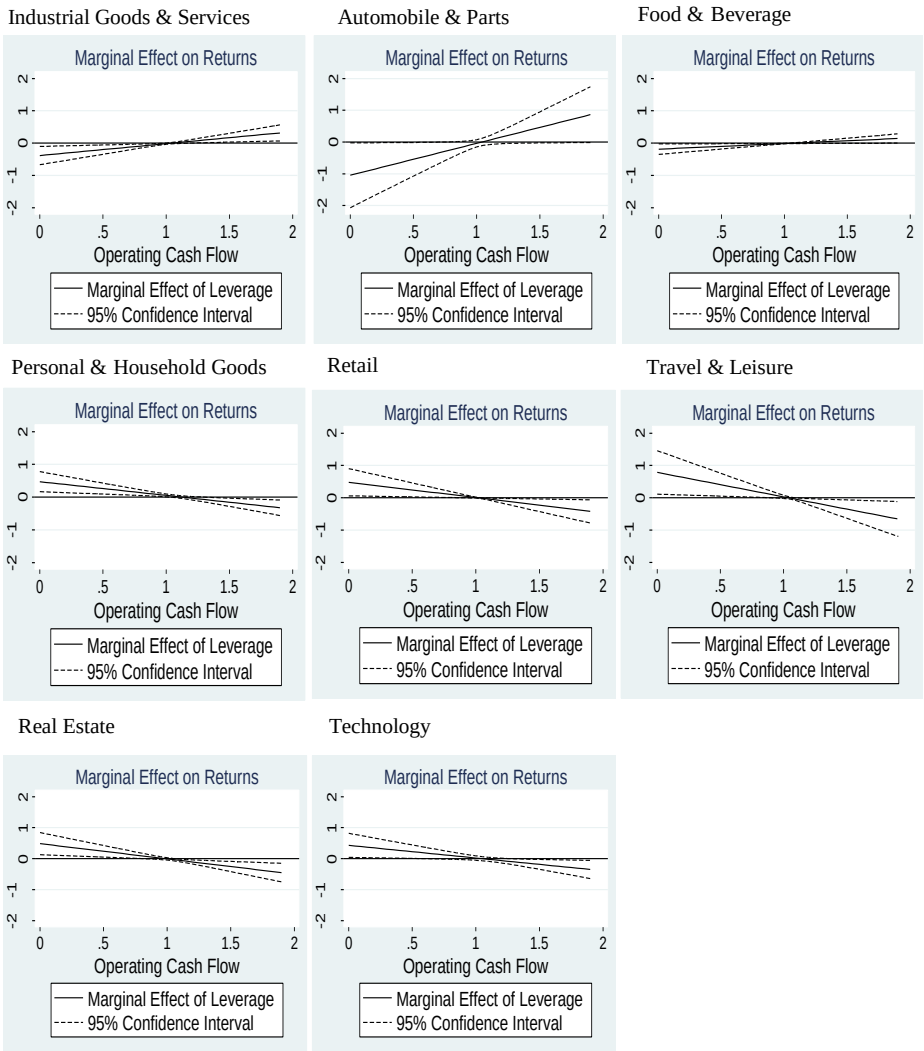

Figure 1: Marginal effects of financial leverage on stock returns with respective confidence intervals calculated and graphed as according to the steps suggested by Brambor, Clark and Golder (2006) for selective industries, which exhibit significance of at least 5% level for both coefficients of total book leverage and its interaction with operating cash flow.

of industrial goods and services, automobile and parts, and food and beverage, total book leverage has a negative direct impact on returns and a positive moderating impact via operating cash flow channel, which is in line with the signalling theory. The opposite is observed in the sectors of travel and leisure, personal and household goods, retail, real estate, and technology. When market leverage is tested with operating cash flow, most industries show a positive significant direct relationship with returns except for automobile and parts. Such findings should be highlighted as many previous studies find a negative relationship with returns when book leverage is used, but a positive relationship when market leverage is used. This study suggests that the negative impact of leverage may be indirect in some cases

and that the net impact could be conditional on cash flow. It is also worth noting that the interactive terms exhibit consistent signs most of the time regardless of the use of book leverage or market leverage. As discussed earlier, the negative slope in the marginal effect graphs may imply that the net benefit of leverage is significant only if the firm is in a real need of external finance when operating cash flow is weak. This is consistent with the pecking order theory. As a result of such negative interactive terms, the positive effect of cash flow diminishes along with the increase of leverage.

When investment cash flow is considered, there are very few sectors in which financial leverage significantly exhibits both a direct and indirect relationship with stock returns. For basic resources, food and beverage, and technology, book leverage carries a significant negative direct relationship and a positive indirect relationship with returns, this supports the signalling theory. The opposite happens for the sectors of automobile and parts and retail. In most of the sectors, the role of cash flow outpaces the role of leverage in their individual terms. Leverage carries an insignificant coefficient in most industries. Such observations may imply that the market participants value capital expenditures positively in general, but conditional on the increase of leverage where the benefit may be more than offset by excessive borrowings.

When free cash flow is considered together with the use of total book leverage, the marginal effects of leverage can be plotted for four sectors including basic resources, automobile and parts, and personal and household goods. When market leverage is used, marginal effects of leverage can be graphed for nine sectors (except for construction and materials, food and beverage, and technology, which do not show significant impacts for all individual and multiplicative terms). There are seven sectors that show a negative leverage impact, when subjected to the level of free cash flow. For these seven sectors, the direct effect of free cash flow is, however, positive and significant. The positive impact of cash flow could be compromised as leverage increases. Such observed negative impacts of the interaction terms mean that the benefit of debt on shareholders' wealth diminishes as free cash flow increases. This result is still consistent with the pecking order behaviour and the argument of the theory of agency. Furthermore, if high free cash flow is related to low growth opportunities, the market may think that the use of debt will not do better accompanied by an additional dollar increase in free cash flow.

3.2 Robustness Checks

3.2.1 Adjusted standard error for firm-level financial data

Following the suggestion by Petersen (2009), this study considers both firm and time effects by adjusting the standard errors for possible dependence in the residuals. Such comparisons for different standard errors, which may have an impact on the significance of coefficients, serve to provide supports to the robustness. While we could not argue that all findings are robust to the results in Tables 2-4, we can still confidently conclude that the overall findings, including the significance of the interaction terms estimated, are robust. For some sectors, firm fixed effects are more prominent. In others, time effects may be present. White corrected standard errors (robust standard errors) and panel corrected standard errors are also presented for comparison purposes. For example, the coefficients of interaction terms between total leverage and operating cash flow are shown in Table 5.

3.2.2 Panel Interactions for misspecification

The robustness of the results is also carried out for some samples following the guidelines suggested by Balli and Sorensen (2010) for a proper analysis in the panel regressions of interaction terms. One rule of thumb is to test for robustness with misspecification using quadratic terms (i.e. leverage^2 and cash flow^2) for this study to confirm that the interaction terms are not spuriously significant. Table 6 shows that when the quadratic terms of leverage

and cash flow are also included in the regression models for selected industries, the results of the interaction terms remain robust. Coefficients that are originally significant remain significant with consistent signs.

Table 5: Robustness test (Regression results for the interaction terms between total leverage and operating cash flow)

	By using Total Book Leverage			By using Total Market Leverage		
Adjusted standard errors	White	Clustered by Time	PCSE / GLS	White	Clustered by Time	PCSE / GLS
Chemical	-0.6295	-0.6295	-0.6295	-0.6696	-0.6696	-0.6696
	(0.4133)	(0.2279)**	(0.2411)**	(0.1458)***	(0.1306)***	(0.2751)**
Basic Resources	-0.2859	-0.2859	-0.2859	-0.2324	-0.2324	-0.2324
	(0.1542)*	(0.1636)*	(0.1330)**	(0.1362)*	(0.1293)*	(0.0736)***
Construction &	-0.1815	-0.1815	-0.1815	-0.2023	-0.2023	-0.2023
Materials	(0.1327)	(0.1511)	(0.0925)**	(0.0914)**	(0.0878)*	(0.0955)*
Industrial Goods &	0.3692	0.3692	0.3692	0.1569	0.1569	0.1569
Services	(0.1423)***	(0.1847)*	(0.1302)***	(0.0870)*	(0.1265)	(0.0926)*
Automobile & Parts	1.0048	1.0048	1.0048	0.6750	0.6750	0.6750
	(0.5066)**	(0.3080)**	(0.5019)**	(0.3385)**	(0.2290)**	(0.2785)**
Food & Beverage	0.1737	0.1737	0.1737	0.3505	0.3505	0.3505
	(0.1348)	(0.1091)	(0.1530)	(0.1999)*	(0.1751)*	(0.2136)
Personal &	-0.4186	-0.4186	-0.4186	-0.3172	-0.3172	-0.0371
Household Goods	(0.2131)**	(0.1844)**	(0.1623)***	(0.1343)**	(0.1418)**	(0.1314)**
Retail	-0.4757	-0.4757	-0.4757	-0.2828	-0.2828	-0.2828
	(0.2101)**	(0.1702)**	(0.1754)***	(0.2046)	(0.1598)*	(0.1456)*
Travel & Leisure	-0.7580	-0.7580	-0.7580	-0.5338	-0.5338	-0.5338
	(0.3253)**	(0.3897)*	(0.2871)***	(0.1901)***	(0.2151)**	(0.1314)***
Utilities &	0.7027	0.7027	0.7027	0.4937	0.4937	0.4937
Telecommunication	(0.3969)*	(0.3622)*	(0.4099)*	(0.5104)	(0.4717)	(0.3725)
Real Estate	-0.4927	-0.4927	-0.4927	-0.1012	-0.1012	-0.1012
	(0.1755)***	(0.2091)**	(0.1817)***	(0.0417)**	(0.0477)**	(0.0457)**
Technology	-0.4095	-0.4095	-0.4095	-0.4145	-0.4145	-0.4145
	(0.1800)**	(0.2281)*	(0.0898)***	(0.2179)*	(0.1595)**	(0.1261)***

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the leverage, operating cash flow, interaction of leverage-cash flow, book-to-market ratio, firm size, earnings yield and market risk premium, with adjustments for White standard errors, standard errors clustered by time, and with panel corrected standard errors (PCSE) / generalised least squares (GLS) estimates (see Petersen 2009). A total of 494 firms are classified into 12 sectors according to the Industrial Classification Benchmark of Dow Jones and FTSE, for a sample period of 1986-2012. Leverage is refined as total book leverage, and total market leverage. The figures in parentheses are adjusted standard errors. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively.

3.2.3 Adjusted leverage for cash holdings

Net leverage can be an equally important gauge as compared to total leverage which might be due to the significance of cash position in the balance sheet. Besides, the market might also value the cash portion differently for different sectors. Net leverage considers the cash position, which could better proxy the financial flexibility and health of firms. While there is no clear economic method in handling cash holdings, the role of cash is important in leverage measurement (Welch 2011). Net leverage can be defined as:

$$\text{Net Leverage, } NLEV_{it} = \left[\frac{\text{Total Equity+Total Debt-Cash \& Cash Equivalent}}{\text{Total Equity}}\right]_{it} \quad (8)$$

The regression when repeated using net book leverage and net market leverage suggest robust findings in terms of signs, magnitudes and significance levels in the relationship (not tabulated). It can also be also attributed to the case where some firms may adjust their gearing based on the availability of cash. In fact, in some sectors, like basic resources, construction and materials, food and beverage, and technology, net leverage plays a more prominent role

in affecting the relationship where the interaction with net leverage tends to result in a higher significance level or slope. This could imply that net leverage can be a preferred measure of leverage for market practitioners for decision making purposes.

Table 6: Robustness test (Regression results for the interaction terms between leverage and cash flows for certain sectors when quadratic terms of leverage and cash flow are included**)**

	By using Operating Cash Flow		By using Investing Cash Flow	
Interaction with	Total Book Leverage	Total Market Leverage	Total Book Leverage	Total Market Leverage
Travel & Leisure	-0.7420	-0.6527	-0.6090	-0.4932
	(0.3453)**	(0.2292)***	(0.3305)*	(0.2392)**
Interaction with	Total Book Leverage	Total Market Leverage	Net Book Leverage	Net Market Leverage
Construction & Materials	-0.1560	-0.2084	-1.7983	-0.6988
	(0.1361)	(0.1028)**	(0.6240)***	(0.5580)
Interaction with	Net Book Leverage	Net Market Leverage	Net Book Leverage	Net Market Leverage
Personal & Household Goods	-0.5267	-0.3540	-1.7558	-1.3094
	(0.2295)**	(0.1493)**	(0.8038)**	(0.4717)***

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the leverage, operating cash flow or investing cash flow, interaction of leverage-cash flow, quadratic terms of leverage and cash flow, book-to-market ratio, firm size, earnings yield and market risk premium, with white standard errors. The numbers in parentheses are t-statistics. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels respectively.

3.2.4 Test for Dynamic Estimation

Robustness checks are also carried out on whether the relationships between variables are dynamic. The dynamic panel models are estimated by using a two-step difference panel generalised method of moments (GMM) estimation (Arellano and Bond 1991), this procedure eliminates firm-specific effects through first-differencing as well as avoiding endogeneity through the use of instruments. To avoid possible biases in estimation, sectors with a comparable larger sample size are tested. Non-rejection of the null hypothesis using Sargan tests suggests that the instruments are valid and non-rejection of the null hypothesis in second-order serial correlation tests suggests that there is no autocorrelation in first-differenced errors for the samples selected.

As shown in Table 7, the estimations reveal that while some sectors (e.g. industrial goods and services) may exhibit significant dynamic behaviour and some (e.g. food and beverage) may not, the estimated coefficients of the main variables of interest, including leverage, cash flow and their interaction term, are largely robust with the original estimation specified in the previous sections (refer to Table 2 and Table 3). Such consistency supports the significant relationships among stock returns, leverage, and cash flow as proposed.

4. Conclusion

This study supports the significant role of cash flow in the relationship between leverage and stock returns in the sectors under study. The results also confirm the mixed impacts of leverage on returns, and that sector-specific analysis is crucial. Almost all regression results show that cash flows exhibit a positive relationship with returns. In most circumstances, leverage is deemed counter-productive under the existence of cash flow. The study provides some insight of the marginal effect of leverage conditional on cash flow and the possible existence of indirect relationships is not due to a spurious relationship. The cash flow implications are further supported by conventional capital structure theories, despite there not being a single theory that can be applied to all scenarios.

Table 7: Robustness test (Dynamic panel estimation using two-step difference GMM)

Sector	Industrial Goods & Services	Food & Beverage	Real Estate
	(LEV: total book leverage; CF: operating cash flow)	(LEV: total book leverage; CF: operating cash flow)	(LEV: total market leverage; CF: investing cash flow)
Return $_{t-1}$	-0.1143	0.0125	-0.1136
	(0.0304)***	(0.0446)	(0.0628)*
LEV	-0.3154	-0.2299	0.0124
	(0.1768)*	(0.0690)***	(0.0412)
CF	-0.2565	-0.3238	0.6219
	(0.3244)	(0.2728)	(0.1797)***
LEV x CF	0.3054	0.2295	-0.4085
	(0.1761)*	(0.0680)***	(0.1141)***
BM	0.2066	0.2787	0.1756
	(0.0482)***	(0.0448)***	(0.0519)***
SIZE	-0.1333	-0.0549	-0.1470
	(0.0400)***	(0.0450)	(0.0480)***
EY	-0.0332	0.0420	-0.1558
	(0.0988)	(0.0802)	(0.0953)
MRP	0.7766	0.7369	1.0186
	(0.0576)***	(0.0769)***	(0.0624)***
Sargan test (p-value)	0.2259	0.3813	0.7631
2nd order serial correlation (p-value)	0.3065	0.1473	0.1863
No. of firms	105	63	55
No. of observations	1004	682	556

Notes: The results is obtained by regressing the yearly firm-level data of stock returns on the leverage, cash flow, interaction of leverage-cash flow, book-to-market ratio, firm size, earnings yield and market risk premium for a sample period of 1986-2012. All standard error for the difference GMM are robust. Sargan test are shown only as if they are GMM-type errors. The figures in parentheses are standard errors. The asterisks ***, **, and * indicate rejection of the null hypothesis at the 1%, 5%, and 10% significance levels, respectively

This study delivers some new firm-level evidence on the leverage-returns study for Malaysia as one of the important emerging markets. The empirical results are robust to market and book measures of leverage, be it net or inclusive of available cash holdings. The conditional leverage impacts remain robust to firm effects and time effects in handling the financial data when different adjusted standard errors are considered. The implication of the overall results is that market participants should properly consider cash flow factors in using leverage information for their financing and investment decisions. Such a study can be further extended to develop more specific financing and investment strategies to improve firm value, shareholders' wealth, or stock returns.

References

Abdeljawad, I., F. Mat-Nor, L. Ibrahim and R. Abdul-Rahim. 2013. Dynamic capital structure trade-off theory: Evidence from Malaysia. *International Review of Business Research Papers* 9(6): 102-110

Adami, R., O. Gough, G. Muradoglu and S. Sivaprasad. 2010. The leverage effect on stock returns. Retrieved on December 19, 2016, from *http://ssrn.com/abstract=1690183*.

Ahmad, Z., N.M.H. Abdullah and S. Roslan. 2012. Capital structure effect on firms performance: Focusing on consumers and industrials sectors on Malaysian firms. *International Review of Business Research Papers* 8(5): 137-155.

Annuar, M.N. and Shamsher, M. 1993. An empirical study of the capital structure of Malaysian listed firms. *Capital Markets Review* 1: 96-108.

Arellano, M. and S. Bond. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies* 58: 277 – 297.

Baharuddin, N.S., Z. Khamis, W.M.W. Mahmood and H. Dollah. 2011. Determinants of capital structure for listed construction companies in Malaysia. *Journal of Applied Finance and Banking* 1(2): 115-132.

Baker, S.H. 1973. Risk, leverage and profitability: An industry analysis. *Review of Economics and Statistics* 55(4): 503–507.

Balli, H.O. and B.E. Sorensen. 2010. Interaction effects in econometrics. *C.E.P.R. Discussion Papers No.7929*.

Banz, R.W. 1981. The relationship between return and market value of common stocks. *Journal of Financial Economics* 9: 3-18.

Barclay, M.J., E. Morellec and C.W. Jr. Smith. 2006. On the debt capacity of growth options. *Journal of Business* 79: 37-59.

Basu, S. 1977, Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *Journal of Finance* 32: 663-682.

Basu, S. 1983. The relationship between earnings yield, market value and return for NYSE common stocks: Further evidence. *Journal of Financial Economics* 12: 129-156.

Bhandari, L.C. 1988. Debt/Equity ratio and expected common stock returns: Empirical evidence. *Journal of Finance* 43(2): 507-528.

Bradley, M., G. Jarrell and E. Kim. 1984. On the existence of an optimal capital structure: Theory and evidence. *Journal of Finance* 39(3): 857–878.

Brambor, T., W.R. Clark and M. Golder. 2006. Understanding interaction models: Improving empirical analyses. *Political Analysis* 14(1): 63–82

Campello, M. 2003. Capital structure and product markets interactions: Evidence from business cycles. *Journal of Financial Economics* 68(3): 353–378.

Chan, L.K.C., Y. Hamao and J. Lakonishok. 1991. Fundamentals and stock returns in Japan. *Journal of Finance* 46: 1739-1764.

Chan, K., L.K.C. Chan, N. Jegadeesh and J. Lakonishok. 2006. Earnings Quality and Stock Returns. *Journal of Business* 79(3): 1041–1082.

Chen, X., Y. Sun and X. Xu. 2016. Free cash flow, over-investment and corporate governance in China. *Pacific-Basin Finance Journal* 37: 81-103.

Cheng, L., J. Fung and K. Lam. 1998. An examination of the determinants of stock price effects of US-Chinese joint venture announcements. *International Business Review* 7: 151-161.

Choi, T.H., E. Lee and J. Pae. 2012. The equity premium puzzle: Empirical evidence for the "Korea Discount". *Asia-Pacific Journal of Accounting and Economics* 19(2): 143-166.

Dang, V.A. 2013. An empirical analysis of zero-leverage firms: New evidence from the UK. *International Review of Financial Analysis* 30: 189-202.

DeAngelo, H. and L. DeAngelo. 2006. The irrelevance of the MM Irrelevance Theorem. *Journal of Financial Economics* 79: 293–315.

Dempsey, M. 2010. The book-to-market equity ratio as a proxy for risk: Evidence from Australian markets. *Australian Journal of Management* 35(1): 7-21.

Dhatt, M.S., Y.H. Kim and S. Mukherji. 1999. Relations between stock returns and fundamental variables: Evidence from a segmented market. *Asia-Pacific Financial Markets* 6: 221-233.

Dimitrov, V. and P.C. Jain. 2008. The value relevance of changes in financial leverage beyond growth in assets and GAAP earnings. *Journal of Accounting, Auditing and Finance* 23(2): 191-222.

D'Mello, R. and M. Miranda. 2010. Long-term debt and overinvestment agency problem. *Journal of Banking and Finance* 34: 324-335.

Ebrahim, M.S., S. Girma, M.E. Shah and J. Williams. 2014. Dynamic capital structure and political patronage: The case of Malaysia. *International Review of Financial Analysis* 31: 117-128.

Fama, E.F. and K.R. French. 1992. The cross-section of expected stock returns. *Journal of Finance* 47: 427- 465.

Fatma, B.M. and J. Chichti. 2011. Interactions between free cash flow, debt policy and structure of governance: Three Stage Least Square Simultaneous Model Approach. *Journal of Management Research* 3(2): 1-34.

Faulkender, M., M.J. Flannery, K.W. Hankins and J.M. Smith. 2012. Cash flows and leverage adjustments. *Journal of Financial Economics* 103(3): 632–646.

Friedrich, R.J. 1982. In defense of multiplicative terms in multiple regression equations. *American Journal of Political Science* 26(4): 797-833.

George, T.J. and C.Y. Hwang. 2010. Are solution of the distress risk and leverage puzzles in the cross section of stock returns. *Journal of Financial Economics* 96(1): 56–79.

Goddard, J., M. Tavakoli and J.O.S. Wilson. 2009. Sources of variation in firm profitability and growth. *Journal of Business Research* 62(4): 495–508.

Gomes, J.F. and L. Schmid. 2010. Levered returns. *Journal of Finance* 65(2): 467–494.

Graham, J.R. and C. Harvey. 2001. The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics* 60: 187-243.

Hall, M. and L. Weiss. 1967. Firm size and profitability. *Review of Economics and Statistics* 49(3): 319–331.

Hamada, R.S. 1972. The effect of the firm's capital structure on the systematic risk of common stocks. *Journal of Finance* 27(2): 435-452.

Haron, R. 2014. Capital structure inconclusiveness: Evidence from Malaysia, Thailand and Singapore. *International Journal of Managerial Finance* 10(1): 23-38.

Haron, R., K. Ibrahim, F.M. Nor and I. Ibrahim. 2013. Factors affecting speed of adjustment to target leverage: Malaysia evidence. *Global Business Review* 14(2): 243-262.

Harris, M. and A. Raviv. 1991. The theory of capital structure. *Journal of Finance* 46(1): 297–355.

Ho, R.Y.W., R. Strange and J. Piesse. 2008. Corporate financial leverage and asset pricing in the Hong Kong market. *International Business Review* 17(1): 1–7.

Hou, K. and D.T. Robinson. 2006. Industry concentration and average stock returns. *Journal of Finance* 61(4): 1927–1956.

Hovakimian, A., T. Opler and S. Titman. 2001. The debt-equity choice. *Journal of Financial and Quantitative Analysis* 36(1): 1-24.

Jaffe, J., D.B. Keim and R. Westerfield. 1989. Earnings yields, market values, and stock returns. *Journal of Finance* 44: 135-148.

Jamal, A.A.A., C. Geetha, R. Mohidin, M.R.A. Karim, T.S. Lim and Y. Ch‟ng. 2013. Capital structure decisions: Evidence from large capitalized companies in Malaysia. *Interdisciplinary Journal of Contemporary Research in Business* 5(5): 30-49.

Jensen, M.C. 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* 76: 323-329.

Jensen, M.C. and W. H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305-360.

Kale, J.R. and H. Shahrur. 2007. Corporate capital structure and the characteristics of suppliers and customers. *Journal of Financial Economics* 83(2): 321–365.

Keefe, M.O.C. and M. Yaghoubi. 2016. The influence of cash flow volatility on capital structure and the use of debt of different maturities. *Journal of Corporate Finance 38*: 18-36.

Khan, A., A. Kaleem and M.S. Nazir. 2012. Impact of financial leverage on agency cost of free cash flow: Evidence from the manufacturing sector of Pakistan. *Journal of Basic and Applied Scientific Research* 2(7): 6694-6700.

Korteweg, A.G. 2010. The net benefits to leverage. *Journal of Finance* 65(6): 2137–2170.

Lewellen, J. 2015. The cross section of expected stock returns. *Critical Finance Review* 4: 1-44.

Lin Y-L., T-C. Chang and S-J. Yeh. 2012. Default risk and equity returns: Evidence from the Taiwan equities market. *Asia Pacific Financial Markets* 19: 181-204.

Luo, T. and W. Xie. 2012. Industry information uncertainty and stock return co-movement. *Asia-Pacific Journal of Accounting and Economics* 19(3): 330-351.

Mackay, P. and G.M. Phillips. 2005. How does industry affect firm financial structure? *Review of Financial Studies* 18(4): 1433–1466.

Mansor, M.I. 2008. Corporate finance practices in Malaysia: A survey analysis. *Capital Markets Review* 16(2): 53-73.

Martikainen, M. 1997. Accounting losses and earnings response coefficients: The impact of leverage and growth opportunities. *Journal of Business Finance and Accounting* 24(2): 277-292.

Masulis, R.W. 1983. The impact of capital structure change on firm value: Some Estimates. *Journal of Finance* 38: 107-126.

Matemilola, B.T., A.N. Bany-Ariffin and W.N.W. Azman-Saini. 2013. Impact of leverage and managerial skills on shareholders' return. *Procedia Economics and Finance* 7: 103-115.

Miao, J. 2005. Optimal capital structure and industry dynamics. *Journal of Finance* 60(6): 2621–2659.

Muradoglu, G. and S. Sivaprasad. 2009. Leverage, stock returns, taxes and industry concentration. Retrieved on December 19, 2016, from *http://ssrn.com/abstract=1031987*.

Muradoglu, G. and S. Sivaprasad. 2012. Capital structure and abnormal returns. *International Business Review* 21(3): 328–341.

Myers, S.C. 1977. Determinants of corporate borrowing. *Journal of Financial Economics* 5(2): 147-75.

Ovtchinnikov, A.V. 2010. Capital structure decisions: evidence from deregulated industries. *Journal of Financial Economics* 95(2): 249–274.

Pandey, I.M. 2001. Capital structure and the firm characteristics: Evidence from an emerging market. *IIMA Working Paper No. 2001-10-04*. Retrieved from http://ssrn.com/abstract=300221 or http://dx.doi.org/10.2139/ssrn.300221.

Park, K. and S.S. Jang. 2013. Capital structure, free cash flow, diversification and firm performance: A holistic analysis. *International Journal of Hospitality Management* 33: 51-63.

Penman, S.H., S.A. Richardson and I. Tuna. 2007. The book-to-price effect in stock returns: Accounting for leverage. *Journal of Accounting Research* 45(2): 427-467.

Petersen, M. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies* 22(1): 435-480.

Rajan, R.G. and L. Zingales. 1995. What do we know about capital structure? Some evidence from international data. *Journal of Finance* 50(5): 1421-1460.

Rosenberg, B., K. Reid and R. Lanstein. 1985. Persuasive evidence of market inefficiency. *Journal of Portfolio Management* 11: 9-17.

Ross, S.A. 1977. The determination of financial structure: The incentive-signalling approach. *Bell Journal of Economics* 8(1): 23-40.

Rouwenhorst, K.G. 1999. Local return factors and turnover in emerging stock markets. *Journal of Finance* 54(4): 1439-1464.

Saarani, A.N. and F. Shahadan. 2013. The determinant of capital structure of SMEs in Malaysia: Evidence from Enterprise 50 (E50) SMEs. *Asian Social Science* 9(6): 64-73.

Schwartz, E. 1959. Theory of the capital structure of the firm. *Journal of Finance* 14(1): 18–39.

Schwartz, E. and J.R. Aronson. 1967. Some surrogate evidence in support of the concept of optimal financial structure. *Journal of Finance* 22(1): 10-18.

Scott, J.H. 1976. A theory of optimal capital structure. *The Bell Journal of Economics* 7(1): 33-54.

Shum, W.C. and Gordon. Y.N. Tang. 2005. Common risk factors in returns in Asian emerging stock markets. *International Business Review* 14(6): 695–717.

Strebulaev, I.A. and B. Yang. 2013. The mystery of zero-leverage firms. *Journal of Financial Economics*, 109(1): 1-23.

Strong, N. and X.G. Xu. 1997. Explaining the cross-section of UK expected stock returns. *British Accounting Review* 29(1): 1–23.

Stulz, R. 1990. Managerial discretion and optimal financing policies. *Journal of Financial Economics* 26(1): 3–27.

Ting, I.W.K. and H.H. Lean. 2011. Capital structure of government-linked companies in Malaysia. *Asian Academy of Management Journal of Accounting and Finance* 7(2): 137-156.

Welch, I. 2004. Capital structure and stock returns. *Journal of Political Economy* 112(1): 106-131.

Welch, I. 2011. Two common problems in capital structure research: The financial debt-to-asset ratio and issuing activity versus leverage changes. *International Review of Finance* 11(1): 1–17.

Wong, K.A. 1989. The firm size effect on stock returns in a developing stock market. *Economics Letters* 30: 61-65.

Wright, G.C. Jr. 1976. Linear models for evaluating conditional relationships. *American Journal of Political Science* 20(2): 349-373.

Yang, Y.J., Q.L. Kweh and R.C. Lin. 2014. Earnings quality of Taiwanese group firms. *Asia-Pacific Journal of Accounting and Economics* 21(2): 134-156.