Leverage and Firm Performance: Empirical Evidence from East Asia – China, Japan, and Korea

by

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Abstract

Based on the capital structure theories, it can be stated that financial leverage influences profitability. Previous research has shown variant results of the effect of leverage influences on firm performance in different market. This study will explore how financial leverage influences firm performance of listed firms in China, Japan and Korea. The regression analyses are conducted with panel data over the period of 2000-2019 using OLS, fixed-effect, and random-effect models. Results reveal that leverage will negatively contribute to firm performance. This negative impact could be attributed to tax shield, agency problems and information asymmetry that East Asian firms suffer from. Practically, the results suggests that governments should put efforts in developing the bond markets and promoting alternative privately owned loan creditors to state-owned banks.

1 Introduction

The financing decisions made by firms are important in achieving the optimal capital structure. Firms usually set which can maximize firm value. Debt financing involves the trade-off between financing costs and benefits of tax shields (Harris and Raviv, 1991), and there is a general level of debt surpassing which costs are higher than benefits. Therefore, reaching the optimal capital structure is crucial for firms to not only improve firm values but also increase profitability.

Several theories have been explained the relationship between leverage and performance. According to Modigliani and Miller (1958), financing choices have no impact on firm values based on some assumptions. For instance, investors' homogeneous expectations, information symmetry, no transaction costs and no taxes. Later Modigliani and Miller (1963) suggested that firms can benefit from the tax-deductible interest payments as debt increases, but the MM proposition still has been challenged by the limitations of the assumption of the perfect world. The real capital market is much more complex, and the assumptions do not hold in reality. Jensen and Meckling (1976) questioned the assumption by presenting the agency cost model. Financing choices also convey different information about the firm's prospects to potential lenders and equity (q)holders, due to seniority and other differences between debt and equity (Stiglitz, 1988). Bankruptcy cost also plays a role in determining firm values (Warner, 1977). And the financial market is also associated with other critical issues, such as moral hazard (Greenwald and Stiglitz, 1993).

Recent studies have shown that East Asian capital markets share characteristics in common, but not fully converged yet. Financial integration among China, Japan, and Korea, reflected by international risk sharing through financial market channels, is similar to those in the OECD and EU countries. And most of the East Asian countries have less developed markets with high transaction costs, information asymmetry, restriction on capital flows (Kim et al, 2006). In terms of financial stock market efficiency, the overall level is high within East Asia, but with China the least correlated (Chi et al, 2006). Azad (2009) also suggests the joint inefficiency in the cointegrating sense, but with Chinese equity market being informationally inefficient. All the literature shows a tendency that East Asian markets converge in many facets. Nevertheless, there are differences among the capital market. Since the Chinese capital market is still immature, domestically listed companies are more inclined to equity-financing with asset-liability ratios lower than the global average, which suggests a high debt ratio in the Chinese market (Zhu, 2020).

According to Kester (1986), Japanese companies are more heavily owned by banks and other corporations, which prefer debt financing rather than equity financing, compared with more mature markets, such as the US market. Data shows that the Korean economy has transformed from an input-driven to an innovation-driven economy, which means increasing research & development expenditures play an important role in capital structure (Kim, 2020).

This study will examine empirically the relationship between financing decisions: accounts payable (AP), short-term debt (STD), and long-term debt (LTD); and firm performance, such as return on assets (ROA), return on equity (ROE) and EPS over the period of 2000 to 2019 of listed companies in China, Japan, and South Korea separately using panel data. The empirical results are expected to provide significant information for both policy makers and firm decision makers in East Asia, one of the largest and fastest growing economy.

The structure of the paper is as follows. In the second section, theoretical background, literature review, and hypothesis are briefly discussed. The third section introduces the research methodology, including data and model. And this is followed by the empirical results of the study. The implications and conclusions are outlined in the fifth section.

2 Theoretical framework and literature review

2.1 Theoretical background

According to Modigliani and Miller (1963), financial leverage effect firm profitability through tax shield, agency costs, bankruptcy costs, financial distress, and information asymmetry. The tradeoff theory states that external debt could bolster firm profitability because the interest payment on debt is tax deductible (Modigliani and Miller, 1963). In the meanwhile, it also suggests that taking more debt results in an extra interest payment, and this burden could bring about default risk (Modigliani and Miller, 1963; Myers, 2001). Based on the pecking order theory, cost of financing increases with asymmetric information (Myers, 1984). It is demonstrated that firms prefer external debt to equity financing due to lower information costs of debt financing, compared to equity financing (Serrasqueiro and Rogão, 2009). Agency cost theory implies contradicting results of leverage influences on performance. On the one hand, increasing debt will probably encourage manager to act more in terms of the interest of shareholders (Myers, 1977; Grossman and Hart, 1982; Williams, 1987), while on the other hand, it raises more conflict of interest between shareholders and creditors, creating a negative impact on firm performance (Myers, 1977; Grossman and Hart, 1982; Williams, 1987).

Theoretically, we can come to the conclusion that, according to tradeoff theory, pecking order theory, and agency cost theory, financial leverage may have either a positive or negative influence on firm performance.

2.2 Literature review

The literature on the impact of leverage on firm performance shows contradicting results in both developed and developing countries, such as the US, Sweden, India, Malaysia, and etc.

Roden and Lewellen (1995) investigates the capital structure of 48 US firms from 1981 to 1990 and found a positive relation between profitability and capital structure. Similar results were also documented by Champion (1999) and Gosh et al. (2000). In another study, Hadlock and James (2002) suggest firms with high profitability are associated with high level of debts. However, a study adopts a sample of 700 large US firms from 1989 to 1993 reveals that the effect of financial leverage on firm profitability could be positive or negative, which depends on whether the corporations are in a stable operation or not (Simerly and Li, 2000).

Goddard et al. (2005) uses the system-generalized method of moments to explore the determinants of profitability for manufacturing and service firms in Belgium, France, Italy and the UK during 1993-2001. Financial leverage, in terms of gearing ratio, has a negative impact on profitability. Weill (2008) adopts MLE (maximum likelihood estimation) to analyze how financial leverage influences firm performance, using 11,836 manufacturing firms operating in seven European countries from 1998 to 2000. The results imply that financial leverage, noted as total liabilities to total assets, is related to firm performance positively in Spain and Italy but negatively in Germany, France, Belgium and Norway of high significance.

Yazdanfar and Öhman (2014) use three-stage least squares (3SLS) and fixed-effects models to analyze a cross-sectoral sample of 15,897 Swedish SMEs (small and medium-sized enterprises) operating in five industry sectors during the 2009-2012 period. The study confirms that debt ratios, in terms of trade credit, short-term debt and long-term debt, negatively affect firm performance. As a high debt ratio is likely to increase agency costs and default risk of firms, SME owners and managers tend to finance their businesses with equity capital to a fairly high degree.

Majumdar and Chhibber (1999) use regression to examine the relationship between debt ratio and performance, measured by return on net value of total assets, using 1,043 Indian companies in various industry sectors over 1988-1994. The results suggest a significant negative relationship between debt ratio and firm performance.

Mesquita and Lara (2003) used the OLS (ordinary least squares) to study the impact of long-term, short-term debt and the rate of equity capital on return on equity (ROE) among 70 Brazilian industrial and service companies over 1995-2001. The results reveal that long-term debt negatively but insignificantly affected ROE, although short-term debt and equity capital on rate of return have a significantly positive impact. He explains that short-term debt is a common practice among the most profitable companies who could easily finance working capital.

Abor (2005) adopt a regression model to explore the relationship between capital structure and performance of 22 listed firms in Ghana over 1998-2002. Well aligned with Mesquita and Lara (2003), the study of Abor (2005) demonstrates that short-term and total debt could positively influence firm performance in terms of profitability. Furthermore, Abor (2007) also performs a generalized least squares regression on a sample of 160 Ghanaian and 200 South African SMEs over the same period. The results point out that long-term and total debt ratios are negatively associated with firm performance.

Salim and Yadav (2012) investigate the relationship between capital structure and firm performance, using panel data for a sample of 237 Malaysian listed companies during 1995-2011.The study uses four performance measures, including return on equity (ROE), return on asset (ROA), Tobin s Q and earning per share (EPS). The results indicate that short-term debt and long-term debt have a negative relationship with performance measured by ROA, ROE, and EPS. And Tobin's Q reports a significantly positive relationship with short-term debt and long-term debt.

However, there is limited research investigating the relationship between financial leverage and firm performance in China, Japan, and Korea. Among these studies of Chinese firms, Holz (2002) finds a positive relationship. And Ruan et al. (2011) find that financial leverage has a negative impact on firm performance. It is also found that financial leverage acts as an intermediary variable of managerial ownership on firm performance (Ruan et al., 2011). Kim (2006) examines the impact of capital structure on productivity performance of *chaebol* (large business groups) and *non-chaebol* firms in Korea. The results show that high debt reliance (or low equity–asset ratio) is shown to be negatively related to productivity performance in *non-chaebol* firms but positively in *chaebol* firms. This study also indicates that family ownership concentration plays an important

role in firm performance. Kochhar (1997), who conducts research on Japanese firms, finds that firms should be financed primarily through equity because they are likely to suffer increased costs and decreased performance without adopting proper governance structures.

After carefully reviewing the previous studies, it can be concluded that previous studies had diverse structures, used various proxies for firm performance and different control variables with different samples of firms in various countries, which brings in the mixed results of the impact of financial leverage on firm performance. This also reveals that how leverage will influence performance significantly depends on the specific context (Le and Phan, 2017). Therefore, the actual relationship between financial leverage and performance of East Asian firms in general is still unclear. Therefore, it is relevant to study this topic, and it will also have practical implications for policy makers to regularize the capital market.

3 Research methodology

3.1 Sample and data collection

The sample of the study is composed of listed firms in China, Japan and Korea. The annual financial data ranges from 2000 to 2019. The Japanese and Korean firm financial data is obtained from the Compustat Global database, and information of companies listed in China is acquired from Wind Terminal. The sample of each country includes all companies listed in the stock exchange of the corresponding country. Initially, 4,064 firms with 85,995 observations, 4,311 firms with 56,929 observations, and 1,920 firms with 16,856 observations are obtained for sub-samples of China, Japan and Korea. After eliminating the firms with missing, extreme, and abnormal data, unbalanced panels of 22,948 firm-year of 4,407 firms, 53,462 firm-year of 4,171 firms, and 15,758 firm-year of 1,895 firms are finally obtained for Chinese, Japanese, and Korean market.

3.2 Variable selection

3.2.1 Dependent and independent variables

According to Zhu and Jiao (2013), especially in China, stock markets are not as efficient as the US market, so that the market value of a firm will not reflect its real performance. Therefore, using accounting-based measures is better than applying market measures (Zhu and Jiao, 2013). In line with the previous studies, this study will use book measures for leverage, controls, and performance.

The dependent variable, performance, can be measured in several ways. Many scholars (Abor, 2007; Salim and Yadav, 2012) use ROA, ROE, and EPS as variables to express firm performance. In line with the common practice, ROA, ROE, and EPS will be used as a proxy for firm performance. ROA and ROE are defined as the firm's book value of net income after tax divided by total assets and total shareholders' equity. And basic EPS without dilution is used to measure earnings per share.

The independent variable, financial leverage is divided into two categories - short-term debt and long-term debt. Following previous researchers (Majumdar and Chhibber, 1999; Abor, 2007; Salim and Yadav, 2012), debt ratios will be used as proxy for leverage. The short-term debt ratio (STD) is calculated as debt repayable within one year to total assets, and long-term debt ratio (LTD) is defined as debt that has a maturity of 12 months or longer to total assets.

As discussed in the theoretical background of the impact of financial leverage on firm performance, when firms take more external debt, conflicts of interest between creditors and

shareholders are likely to negatively influence firm profitability; therefore, the following hypothesis is formulated:

H1. Financial leverage, represented by short-term and long-term debt ratios, negatively contributes to firm performance.

3.2.2 Control variables

Majumdar and Chhibber, 1999; Jermias, 2008, Ebaid 2009, suggest that firm's size may influence its performance, since larger firms may enjoy economies of scale and have more capabilities to diversify their products. Correspondingly, here comes the second hypothesis:

H2. Firm size positively contributes to firm performance.

Firm size can be represented in various ways, such as total assets, sales, number of employees, and etc. (Majumdar and Chhibber, 1999; Berger and Bonaccorsi di Patti, 2006; Sheikh and Wang, 2011). Following the common practice, this study will adopt natural logarithm of the book value of firm's total assets as a proxy for firm size (Campello, 2006; Salim and Yadav, 2012).

Sales growth must be justified because growth option effects a firm's ability to raise external funding (He et al., 2017). Myers and Majluf (1984) propose a negative correlation between debt and profitability, arguing that firms with favorable growth prospects will exhaust internal sources of funds before seeking exterior financing. It also represents future growth prospects and investment opportunities, which is very likely to affect firm performance positively (Claessens et al., 2002; Maury, 2006; King and Santor, 2008). Therefore, one must control sales growth in the empirical model. According to Hill et al., sales growth (GROW) is defined as the percentage change in sales in the current year from the previous year. Accordingly, the third hypothesis is as follows:

H3. Sales growth positively contributes to firm performance.

Recent study shows that capital investments have statistically significant negative effect on the short-term performance, but positive effect on the long-term performance (Grozdić et al., 2020). And investment tends to take place under lower debt burdens (Myers, 1977). Therefore, the relationship must take account of the investment spending. The gauge of investment (INVEST) is capital expenditure over the book value of total assets. And the hypothesis is following:

H4. Investment negatively contributes to firm performance.

Campello (2006) asserts that a firm’s sales performance may be influenced by its past sales efforts, for instance, advertising and use of promotions, which are very likely to be associated with the financial leverage. And it is necessary to introduce controls to capture the relationship between debt and performance. Sales-related expenditures (SGAE) is calculated by selling, general and administrative expense over book total assets. The corresponding hypothesis is formulated as:

H5. Selling, general and administrative expense positively contributes to firm performance.

3.3 Model specification

Panel data methodology is used in this study for the following advantages it has. According to Hsiao (2003), it is able to control for heterogeneity that is hard to observe, reduce estimation bias and data multicollinearity. And it could provide more variability and efficiency (Hsiao, 2003). Baltagi (1995) also suggests that panel data methodology produces stronger evidence base because it allows researchers to control for unobservable firm-specific effects. However, panel data also involves the problem of autocorrelation (Simon, 2015). Although Simon indicates that a limited

range of years will not make it less severely influenced by autocorrelation, I will perform the estimation under clusters-rhobust to control autocorrelation.

It is noticeable that prior literature has also shown a reverse causality between profitability and financial leverage that financial leverage affects firm performance (Rajan and Zingales, 1995; Sheikh and Wang, 2011), while evidence mentioned in the previous section proves financial leverage has an impact on firm performance (Majumdar and Chhibber, 1999; Majumdar and Chhibber, 1999; Abor, 2005; Salim and Yadav, 2012). Therefore, Granger causality test is adopted in this study to check whether a reverse causality exists.

There will be three panel data methods used in this study: pooled OLS model, fixed-effect model, and random-effect model. The reason for introducing the fixed-effect and random-effect model is that they could control the stable characteristics of individual firms during the test period (Kachlami and Yazdanfar, 2016). And several statistical tests will be performed in model selection. F-test is adopted to choose between OLS and fixed-effect models, which indicates that fixed-effect model is a better fit than the OLS. Breusch-Pagan Lagrange multiplier (LM) test is conducted to distinguish random-effect model from the OLS. As the LM test is highly statistically significant, random-effect model is preferred relatively to the OLS model. Then Hausman test is performed in order to compare the fixed-effect model with the random-effect model, and the results are in favor of the fixed-effect model. As a consequence, the models are formulated as follows:

OLS model:

$$PERFORM_{i,t}=\alpha_t+\beta_1 STD_{i,t}+\beta_2 LTD_{i,t}+\beta_3 SIZE_{i,t}+\beta_4 GROW_{i,t}$$
$$+\beta_5 INV\ EST_{i,t}+\beta_6 SGAE_{i,t}+\mu_{it}$$

Fixed-effect model:

$$PERFORM_{i,t}=\alpha_t+\beta_1 STD_{i,t}+\beta_2 LTD_{i,t}+\beta_3 SIZE_{i,t}+\beta_4 GROW_{i,t}$$
$$+\beta_5 INV\ EST_{i,t}+\beta_6 SGAE_{i,t}+\eta_i$$

Random-effect model:

$$PERFORM_{i,t}=\alpha_t+\beta_1 STD_{i,t}+\beta_2 LTD_{i,t}+\beta_3 SIZE_{i,t}+\beta_4 GROW_{i,t}$$
$$+\beta_5 INV\ EST_{i,t}+\beta_6 SGAE_{i,t}+\eta_i+\mu_{it}$$

where:

α_t	=	constant
$PERFORM_{i,t}$	=	ROA, defined as the book value of net income (after tax), divided by total assets; ROE, defined as the book value of net income (after tax), divided by total shareholders' equity; EPS, basic earnings per share;
$STD_{i,t}$	=	short-term debt to total asset
$LTD_{i,t}$	=	long-term debt to total asset
$SIZE_{i,t}$	=	size of firmiat timet, measured as the natural logarithm of thefirm's book value of total assets;
$GROW_{i,t}$	=	the percentage change in sales in time t from $t-1$
$INVEST_{i,t}$	=	capital expenditure to the book value of total assets;
$SGAE_{i,t}$	=	selling, general and administrative expense to the book value of totalassets;
μ_{it}	=	error term; and
η_i	=	unobservable heterogeneity (individual effects) specific for each firm.

4 Empirical results

4.1 Descriptive statistics and empirical results

Table I presents the descriptive statistics of the variables. As Table I shows, the mean values of ROA are 0.0456, 0.0150, and -0.0146 for China, Japan, and Korea respectively, while the median values are 0.0387, 0.0229, and 0.0438. The mean values of ROE and EPS are 0.0693 and 0.3960 (Chinese Yuan) for firm listed in China, and -0.0094 and 686.4524 (Japanese Yen) in Japan, and -0.0146 and 1464.9704 (Korean Won) in Korea, whereas the median values are 0.0878 and 0.3100, 0.0523 and 38.4700, and 0.0438 and 317.0000 respectively. In terms of leverage, the mean values of STD and LTD are 0.1435 and 0.090 for China, 0.1163 and 0.1056 for Japan, and 0.1634 and 0.0824 for Korea; the median values are 0.1231 and 0.0552, 0.0837 and 0.0667, and 0.1429 and 0.0512 of STD and LTD for firms in China, Japan, and Korea respectively.

Aligned with previous studies of Chinese firms (Chen, 2004; Kasseeah, 2008; Dalci, 2018), the descriptive statistics imply that Chinese firms are comprised of short-term debt, and long-term debt has a very low proportion. And the same is true for Korean firms that a major portion of debt financing consists of short-term debt (Gul and Cho, 2018). This is because of information asymmetry. Compared with capital markets in developed countries, capital markets in developing countries, such as China and Korea, are less efficient (Eldomiaty, 2007; Kasseeah, 2008; Ebaid, 2009; Dawar, 2014; Dalci, 2018). Specifically, the bond market in China remains underdeveloped, and the legal system is relatively incomplete, which leads to high level of information asymmetry (Shirai, 2002; Kasseeah, 2008; Dalci, 2018). However, short-term debt and long-term debt are roughly at the same level in Japan. The fact is that Japanese companies are more heavily owned by banks and other corporations, which could be classified into three basic types: large “city” banks, trust banks, and long-term credit banks (Kester, 1986). And they form the primary lending base of the long-term debt (Kester, 1986).

Table I: Descriptive statistics

	STD	LTD	SIZE	GROW	INVEST	SGAE	ROA	ROE	EPS
China									
Mean	0.1435	0.0907	22.2921	0.1456	0.057	0.0821	0.0456	0.0693	0.396
SD	0.1168	0.104	1.5024	0.2636	0.0524	0.0713	0.0597	1.5539	0.7499
Median	0.1231	0.0552	22.134	0.1153	0.0419	0.0628	0.0387	0.0878	0.31
Min	0	0	19.1402	-0.5688	0.0003	0.0049	-0.2495	-158.2442	-10.71
Max	0.9662	0.846	27.5518	1.2101	0.2681	0.4809	0.2539	35.3794	32.8
Standard error	0.0008	0.0007	0.01	0.0018	0.0003	0.0005	0.0004	0.0103	0.005
Japan									
Mean	0.1163	0.1056	10.7144	1.0338	0.0339	0.2347	0.015	-0.0094	686.4524
SD	0.1201	0.1199	1.7035	0.1662	0.0356	0.2167	0.1148	4.2186	51330.4189
Median	0.0837	0.0667	10.5417	1.0255	0.0238	0.173	0.0229	0.0523	38.47
Min	0	0	3.8501	-9.1364	-0.0015	0	-6.0126	-710.6064	-891430.26
Max	0.9817	0.9273	20.1381	1.9992	0.7014	11.3861	6.7883	356.1333	11645660
Standard error	0.0005	0.0005	0.0074	0.0007	0.0002	0.001	0.0005	0.0186	222.4912
Korea									
Mean	0.1634	0.0824	12.6928	1.0478	0.046	0.1447	0.0037	-0.0146	1464.9704
SD	0.1325	0.0933	1.5835	0.2237	0.044	0.123	0.0925	0.2684	4133.5397
Median	0.1429	0.0512	12.3495	1.0425	0.0318	0.1054	0.0193	0.0438	317
Min	0	0	9.9803	0.2603	0.0005	0.0184	-0.5648	-2.5416	-9197
Max	0.5648	0.51	18.2445	1.8017	0.2321	0.8112	0.1865	0.5735	33414
Standard error	0.0011	0.0007	0.0127	0.0018	0.0004	0.001	0.0008	0.0022	33.6539

4.2 Correlation analysis

Table II presents the correlations between the study variables in different country groups. It is observed that both LTD have statistically significant negative relationship with ROA, ROE, and EPS in all countries. However, ROE seems not to be a good measure for performance in China, with the relationship between STD and ROE less statistically significant. And STD has a weak correlation with EPS among Japanese firms. Among the firm-specific controls, GROW has a positive correlation with all performance measures in all countries. Except that SIZE is negatively correlated with ROA in China, SIZE is positively correlated with all performance measures. INVEST is also positively correlated with all performance measures, with the exception that it has a weak negative correlation with ROE in the sample of Japanese firms. SGAE is observed to be positively correlated with EPS but negatively correlated with ROE in all countries, whereas it has a positive correlation with ROA in China and negative correlation with ROA in Japan and Korea. Correlations among other variables can be seen in Table II:

Table II: Correlations among study variables

	STD	LTD	SIZE	INVEST	SGAE	GROW	ROA	ROE	EPS
China									
STD	1	0.031***	0.035***	0.014	-0.117***	-0.071***	-0.305***	-0.01	-0.256***
LTD		1	0.361***	0.115***	-0.250***	-0.01	-0.174***	-0.022**	-0.082***
SIZE			1	-0.164***	-0.280***	-0.029***	-0.218***	0.003	0.042***
INVEST				1	0.094***	0.121***	0.228***	0.019*	0.103***
SGAE					1	0.031***	0.239***	-0.008	0.092***
GROW						1	0.296***	0.070***	0.233***
ROA							1	0.289***	0.681***
ROE								1	0.091***
Japan									
STD	1	0.297***	-0.029***	-0.003	-0.030***	-0.085***	-0.154***	-0.026***	-0.004
LTD		1	0.228***	0.241***	-0.039***	0.003	-0.075***	-0.022***	0.015**
SIZE			1	0.137***	-0.311***	0	0.121***	0.007	0.005
INVEST				1	0.023***	0.062***	0.003	-0.006	0.020***
SGAE					1	0.022***	-0.184***	-0.01	0.009
GROW						1	0.223***	0.027***	0.015**
ROA							1	0.054***	0.022***
ROE								1	0.003
Korea									
STD	1	0.141***	-0.053***	0.040***	-0.095***	-0.051***	-0.286***	-0.263***	-0.202***
LTD		1	0.346***	0.191***	-0.106***	0.021*	-0.092***	-0.063***	0.036***
SIZE			1	0.101***	-0.124***	0.091***	0.218***	0.200***	0.390***
INVEST				1	-0.004	0.125***	0.138***	0.107***	0.088***
SGAE					1	0	-0.056***	-0.048***	0.008
GROW						1	0.293***	0.255***	0.111***
ROA							1	0.829***	0.341***
ROE								1	0.304***

Note: *p<0.1;**p<0.05;***p<0.01

4.3 Results of causality tests

Granger causality test results are outlined in Table III to determine whether there is a reverse causality between financial leverage and firm performance not not. Therefore, Table III illustrates the results of causality regressions using ROA, ROE, and EPS as different measures of firm performance, and STD, LTD as leverage measures.

The results of Granger causality test demonstrate that the null hypotheses saying ROA does not Granger Cause STD and ROE does not Granger Cause STD are both accepted, whereas the null hypothesis indicating no causality between STD and performance measured by ROA and ROE are highly rejected. This shows that there is not a reverse causality between STD with ROA and

ROE. And the same is true for LTD with ROA and ROE.However, the *F*-statistic reveals that the null hypothesis suggesting no causality between ROA and LTD is not rejected. In terms of EPS, there is a reverse causality using both STD and LTD. And it is statistically significant to accept that STD does not Granger Cause EPS. The results reveal that there is a two-way causality between LTD and performance based on ROA and EPS, while the reciprocal relationship is not observed using other variables.

Table III: Pairwise Granger causality tests

Null hypothesis	*F*-statistic
STD does not Granger Cause ROA	88.23***
ROA does not Granger Cause STD	2.2647
LTD does not Granger Cause ROA	27.898***
ROA does not Granger Cause LTD	7.3097***
STD does not Granger Cause ROE	14.032***
ROE does not Granger Cause STD	2.0737
LTD does not Granger Cause ROE	6.8488***
ROE does not Granger Cause LTD	0.3904
STD does not Granger Cause EPS	0.8822
EPS does not Granger Cause STD	3.5377**
LTD does not Granger Cause EPS	6.7392***
EPS does not Granger Cause LTD	3.1102**
Note:	*p<0.1; **p<0.05; ***p<0.01

4.4 Results of OLS, fixed-effect, random-effect models

Table IV, Table V, and Table VI summarizes the results of the OLS, fixed-effects, and random-effects with respect to the impact of STD and LTD on ROA, ROE, and EPS accordingly. The coefficients are presented with the corresponding standard-error in the parentheses for OLS, fixed-effect, and random-effect models. First, it can be seen in Table IV, Table V, and Table VI that the F test and Hausman test statistics are statistically significant at 1% significance level. This means that fixed-effect model is preferred to the pooled OLS model and random-effect model. In the sample of firms listed in China and Japan, the LM statistics are not significant when ROE is used as the dependent variable, which indicates that random-effects is not superior to OLS, whereas random-effects is preferred in the Korean sample. Overall, the statistics reveal that fixed-effect model is preferred for all performance measures in all country's samples.

Table IV demonstrates that for firms listed in China, INVEST and GROW have statistically significant positive coefficients with ROA, ROE and EPS under all models. And SIZE has a statistically significant negative influence on ROA but a positive influence on ROE and EPS under all models. SGAE has a statistically significant positive impact on ROA and ROE under all models. When firm performance is measured by EPS, SGAE has a statistically significant negative impact on EPS under fixed-effect model, whereas a statistically significant positive relationship is observed under OLS and random-effect model. In terms of the impact of financial leverage on firm performance in the Chinese market, as Table VI shows, STD has a statistically negative impact on ROA under OLS ($\beta = -0.1458$, $p < 0.000$), fixed-effects ($\beta = -0.1385$, $p < 0.000$), and random-effects ($\beta = -0.1377$, $p < 0.000$). Taking ROE as the dependent variable, STD again has a statistically significant negative influence on ROE under OLS ($\beta = -0.1941$, $p < 0.000$), fixed-

effects (β = -0.2945, p < 0.00), and random-effects (β = -0.1716, p < 0.000). STD also has statistically significant negative coefficients with EPS under OLS (β = -1.4050, p < 0.000), fixed-effects (β = -1.4184, p < 0.000), and random-effects (β = -1.3830, p < 0.000). On the other hand, LTD has statistically significant negative impact on ROA under OLS (β = -0.0761, p < 0.000), fixed-effects (β = -0.0995, p < 0.00), and random-effects (β = -0.0837, p < 0.000). And LTD also has a statistically significant negative effect on ROE under OLS (β = -0.3237, p < 0.000), fixed-effects (β = -0.7153, p < 0.00), and random-effects (β = -0.4664, p < 0.000). In line with the relationship between STD and EPS, the coefficients remain statistically negative under OLS (β = -0.8891, p < 0.000), fixed-effects (β = -0.9033, p < 0.00), and random-effects (β = -0.8331, p < 0.000).

The results of OLS, fixed-effects, and random-effects using the sample of firms listed in Japan are outlined in Table V. Among the control variables, it is obvious that GROW has a statistically significant positive influence on ROA, ROE and EPS, regardless of the models. SGAE has statistically significant negative coefficients with ROA and ROE under OLS, fixed-effects, and random-effects, whereas the coefficients are only marginally significant under fixed-effects and not statistically significant under OLS and random-effects, taking ESP as the dependent variable. INVEST has negative coefficients with ROA, but less statistically significant under OLS and fixed-effects. Taking ROE as the performance measure, it has a marginally significant coefficient under fixed-effects, while the negative coefficients given under OLS and random-effects are not statistically significant. But it does have statistically significant positive effects on EPS under all models. The results with respect to SIZE also vary. With regard to ROA, it has positive impacts on ROA, where the coefficients are statistically significant only under OLS and random-effects. Although the coefficients remain positive regarding ROE, only the coefficient under OLS is marginally significant at 10% significance level. When it comes to the relationship between financial leverage and firm performance in Japan, negative impacts could be roughly observed. STD has statistically negative influences on ROA under OLS (β = -0.1199, p < 0.000), fixed-effects (β = -0.2246, p < 0.00), and random-effects (β = -0.1954, p < 0.000). STD also has statistically significant negative impacts on ROE under OLS (β = -0.6029, p < 0.000), fixed-effects (β = -2.0394, p < 0.00), and random-effects (β = -0.9520, p < 0.000). With regard to EPS, the coefficients are statistically negative under OLS (β = -2,315.8610, p < 0.000), fixed-effects (β = -4,066.1150, p < 0.00), and random-effects (β = -2,886.4390, p < 0.000). Since EPS is measured in Japanese Yen, the coefficients are in a larger scale. In terms of LTD, it also has statistically significant negative impact on ROA that is consistent with STD, under OLS (β = -0.0623, p < 0.000), fixed-effects (β = -0.2103, p < 0.00), and random-effects (β = -0.1326, p < 0.000). However, LTD has a positive coefficient with EPS under OLS (β = 280.7296, p < 0) which is not statistically significant. Under fixed-effects (β = -1,422.3320, p < 0.00) and random-effects (β = -518.0468, p < 0), only fixed-effect model gives a negative relationship that is statistically significant.

Table VI presents the results of OLS, fixed-effects and random-effects concerning the Korean market. As shown in Table VI, among the controls, SIZE, INVEST, and GROW all have statistically significant positive impacts on ROA, ROE, EPS respectively under OLS, fixed-effects, and random-effects; however, SGAE has statistically significant negative coefficients regarding ROA, ROE, and under all models, except the statistically significant positive relationship between LTD and EPS under OLS model. As Table VI portrays, it can be concluded that both STD and LTD has negative impacts on firm performance. STD has a statistically negative effect on ROA under OLS (β = -0.1810, p < 0.000), fixed-effects (β = -0.2178, p < 0.000), and random-effects (β = -0.2142, p < 0.000). On the one hand, the coefficients with regard to ROE also reveal that STD

has a statistically significant negative influence on ROE under OLS (β = -0.4644, p < 0.000), fixed-effects (β = 0.6738, p < 0.00), and random-effects (β = -0.6036, p < 0.000). And STD has statistically significant negative coefficients with EPS under OLS (β = -5400.6400, p < 0.000), fixed-effects (β = -5258.6540, p < 0.000), and random-effects (β = -5434.1840, p < 0.000). On the other hand, LTD has statistically significant negative impact on ROA under OLS (β = -0.1988, p < 0.000), fixed-effects (β = -0.2269, p < 0.00), and random-effects (β = -0.2112, p < 0.000). And LTD also has a statistically significant negative effect on ROE under OLS (β = -0.4398, p < 0.000), fixed-effects (β = -0.5773, p < 0.00), and random-effects (β = -0.4989, p < 0.000). In terms of EPS, the coefficients are statistically negative under OLS (β = -5,248.3480, p < 0.000), fixed-effects (β = -6,692.5900, p < 0.00), and random-effects (β = -5,943.5870, p < 0.000).

Table IV: Impact of financial leverage on firm performance in China

	Dependent variable:								
	ROA			ROE			EPS		
	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects
STD	-0.1458***	-0.1385***	-0.1377***	-0.1941***	-0.2945***	-0.1716***	-1.4050***	-1.4184***	-1.3830***
	(0.0030)	(0.0042)	(0.0035)	(0.0499)	(0.0747)	(0.0621)	(0.0394)	(0.0492)	(0.0453)
LTD	-0.0761***	-0.0995***	-0.0837***	-0.3237***	-0.7153***	-0.4664***	-0.8891***	-0.9093***	-0.8331***
	(0.0039)	(0.0051)	(0.0045)	(0.0644)	(0.0923)	(0.0802)	(0.0511)	(0.0609)	(0.0578)
SIZE	-0.0035***	-0.0055***	-0.0075***	0.0115***	0.0651***	0.0141**	0.0726***	0.0944***	0.0407***
	(0.0003)	(0.0008)	(0.0004)	(0.0043)	(0.0144)	(0.0063)	(0.0035)	(0.0095)	(0.005)
INVEST	0.2181***	0.1231***	0.1814***	0.6314***	0.5596***	0.6894***	1.8394***	1.0463***	1.5916***
	(0.0070)	(0.0083)	(0.0073)	(0.1154)	(0.1487)	(0.132)	(0.0916)	(0.0982)	(0.0934)
SGAE	0.0922***	0.0564***	0.0825***	0.2417***	1.3713***	0.4230***	0.7227***	-0.4853***	0.2031**
	(0.0053)	(0.0116)	(0.0073)	(0.0874)	(0.2035)	(0.1229)	(0.0694)	(0.1351)	(0.098)
GROW	0.0560***	0.0422***	0.0489***	0.1992***	0.1503***	0.1938***	0.5722***	0.4039***	0.4721***
	(0.0013)	(0.0013)	(0.0012)	(0.0222)	(0.0226)	(0.0221)	(0.0176)	(0.0149)	(0.015)
Constant	0.1226***		0.2161***	-0.2042**		-0.2765*	-1.1877***		-0.3977***
	(0.0060)		(0.0083)	(0.0987)		(0.1425)	(0.0784)		(0.1133)
Observations	20,766	20,766	20,766	21,070	21,070	21,070	20,891	20,891	20,891
R2	0.2726	0.151	0.2621	0.0085	0.0105	0.0082	0.1496	0.1084	0.1264
Adjusted R^2	0.2724	−0.0468	0.2619	0.0082	−0.2176	0.0079	0.1493	−0.0993	0.1262
F Statistic	1,296.4650***	499.0790***	6,020.4650***	30.1919***	30.2265***	170.2486***	612.1886***	343.1766***	2,547.7650***
F-test	F (3917, 16842) = 4.275***			F (3941, 17122) = 2.9057***			F (3940, 16944) = 6.0813***		
LM (chi2)		5067.7***			1.3795			4355.7***	
Hausman (chi2)		498.19***			113.76***			432.12***	

Note: *p<0.1; **p<0.05; ***p<0.01

Table V: Impact of financial leverage on firm performance in Japan

	Dependent variable:								
	ROA			ROE			EPS		
	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects
STD	-0.1199***	-0.2246***	-0.1954***	-0.6029***	-2.0394***	-0.9520***	-2,315.8610***	-4,066.1150***	-2,886.4390***
	(0.0043)	(0.0060)	(0.0053)	(0.1806)	(0.3202)	(0.2293)	(267.7061)	(461.4268)	(338.0913)
LTD	-0.0623***	-0.2103***	-0.1326***	-0.7903***	-1.6892***	-1.1895***	280.7296	-1,422.3320***	-518.0468
	(0.0046)	(0.0067)	(0.0061)	(0.1943)	(0.3573)	(0.2567)	(287.5272)	(515.8330)	(381.2568)
SIZE	0.0059***	0.0003	0.0041***	0.0218*	0.0120	0.0180	81.0639***	-717.3138***	67.6083**
	(0.0003)	(0.0015)	(0.0007)	(0.0130)	(0.0772)	(0.0216)	(19.2531)	(109.4351)	(33.4198)
INVEST	-0.0184	-0.0257*	-0.0399***	-0.3949	1.3101*	-0.2670	2,167.7710**	2,589.3780**	2,854.2240***
	(0.0136)	(0.0139)	(0.0141)	(0.5699)	(0.7422)	(0.6616)	(848.2643)	(1,081.8840)	(969.6556)
SGAE	-0.0935***	-0.4746***	-0.2673***	-0.2246**	-0.9203***	-0.3107**	-61.2993	583.2674*	24.7771
	(0.0023)	(0.0055)	(0.0040)	(0.0986)	(0.2915)	(0.1481)	(142.0368)	(334.1376)	(207.9409)
GROW	0.1697***	0.0959***	0.1194***	0.6840***	0.4622***	0.5908***	2,740.3660***	2,402.7270***	2,384.3110***
	(0.0032)	(0.0027)	(0.0027)	(0.1330)	(0.1434)	(0.1341)	(197.8325)	(208.6679)	(193.6571)
Constant	-0.1809***		-0.0513***	-0.7372***		-0.5093*	-3,339.7060***		-2,815.6300***
	(0.0048)		(0.0079)	(0.2036)	(0.2819)		(301.6478)		(426.0166)
Observations	48,449	48,449	48,449	48,449	48,449	48,449	49,870	49,870	49,870
R_2	0.1278	0.218	0.1655	0.0017	0.002	0.0016	0.0069	0.0068	0.0054
Adjusted R^2	0.1277	0.1502	0.1654	0.0016	−0.0846	0.0015	0.0068	−0.0766	0.0053
F Statistic	1,183.0400***	2,071.4800***	9,668.0690***	13.8855***	14.7353***	78.8612***	57.4863***	52.6180***	273.6450***
F-test	F (3860, 44582) = 11.898***			F (3860, 44582) = 3.0508***			F (3859, 46004) = 3.6987***		
LM (chi2)		10545***			0.18537			1999.9***	
Hausman (chi2)		2164.4***			61.423***			126.9***	

Note: *p<0.1; **p<0.05; ***p<0.01

Table VI: Impact of financial leverage on firm performance in Korea

	Dependent variable:								
	ROA			ROE			EPS		
	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects	OLS	Fixed-effects	Random-effects
STD	-0.1810***	-0.2178***	-0.2142***	-0.4644***	-0.6738***	-0.6036***	5-,400.6400***	-5,828.6540***	-5,434.1840***
	(0.0051)	(0.0072)	(0.0062)	(0.0145)	(0.0224)	(0.0180)	(243.0641)	(330.5167)	(276.0484)
LTD	-0.1988***	-0.2269***	-0.2112***	-0.4398***	-0.5773***	-0.4989***	-5,248.3480***	-6,692.5900***	-5,943.5870***
	(0.0080)	(0.0094)	(0.0087)	(0.0230)	(0.0291)	(0.0257)	(386.8906)	(430.4176)	(381.2598)
SIZE	0.0134***	0.0168***	0.0153***	0.0332***	0.0493***	0.0381***	1,170.7340***	766.1451***	966.7756***
	(0.0005)	(0.0017)	(0.0008)	(0.0013)	(0.0052)	(0.0021)	(22.5627)	(76.3256)	(37.3299)
INVEST	0.2574***	0.1343***	0.2091***	0.5269***	0.2591***	0.4576***	6,674.4630***	3,712.2960***	4,749.5730***
	(0.0152)	(0.0162)	(0.0155)	(0.0431)	(0.0497)	(0.0461)	(730.683)	(738.6844)	(678.4594)
SGAE	-0.0486***	-0.1906***	-0.1021***	-0.1139***	-0.4946***	-0.2335***	1,400.1570***	-2,853.4340***	-831.7524**
	(0.0055)	(0.0119)	(0.0081)	(0.0154)	(0.0360)	(0.0222)	(260.9207)	(523.9264)	(366.4996)
GROW	0.0986***	0.0706***	0.0812***	0.2384***	0.1678***	0.2021***	912.3854***	806.3528***	883.6736***
	(0.0031)	(0.0027)	(0.0027)	(0.0088)	(0.0083)	(0.0081)	(147.4885)	(123.5422)	(116.1918)
Constant	-0.2260***		-0.2207***	-0.5746***		-0.5638***	-13,464.0700***		-10,495.7100***
	(0.0066)		(0.0103)	(0.0186)		(0.0279)	(318.3279)		(485.4442)
Observations	13,529	13,529	13,529	13,558	13,558	13,558	13,536	13,536	13,536
R2	0.2495	0.1745	0.1964	0.195	0.1384	0.164	0.2181	0.052	0.0818
Adjusted R^2	0.2491	0.0513	0.196	0.1946	0.01	0.1636	0.2177	−0.0915	0.0814
F Statistic	749.1456***	414.6640***	3,289.0980***	546.9437***	315.8931***	2,595.8090***	628.8381***	107.5704***	1,290.4670***
F-test	F (1751, 11771) = 6.0828***			F (1752, 11799) = 4.2248***			F (1774, 11755) = 7.4066***		
LM (chi2)		2695.1***			1282.4***			22301***	
Hausman (chi2)		281.88***			502.48***			79.145***	

Note: *p<0.1; **p<0.05; ***p<0.01

4.5 Interpretations

Overall, the empirical results indicate that the increase in debt ratio negatively influences firm performance in terms of ROA, ROE, and EPS of firms listed in East Asian market. In other words, firms with a lower debt ratio may appear better on performance, which is in favor of agency cost theory. Thus, the first hypothesis of this study is confirmed. Moreover, the findings are consistent with recently studies on the capital markets in developing countries, such as Malaysia (Salim and Yadav, 2012), Vietnam (Nguyen and Nguyen, 2020), and Pakistan (Rehan and Karaca, 2020) that financial leverage is adversely linked with firm performance. The relationship between financial leverage and firm performance of firms in East Asia can be explained as follows:

First of all, there have been decreases of the corporate tax rate in China, Japan, and Korea. According to Wu and Yue (2009), The Ministry of Finance in China banned the application of local government tax rebate (LGTR) policy and hence increased the corporate income tax (CIT) rate for listed firms from 15 percent to 33 percent, starting from the beginning of 2002. And the reform of corporate taxation in 2008 reduced the CIT rate from 33 percent to 25 percent (Tang, 2020). The same is true for Japan and Korea. According to the tax summaries of Japan and Korea by PwC, CIT rate decreased from 42 percent to 30.62 percent in the past two decades in Japan, while it decreased from 28 percent to 25 percent, then to 22 percent and jumped back to 25 percent in Korea. In light of the tax reforms, the decrease in corporate tax rate weakens the tax advantage of debt, therefore, it has a negative impact on firm performance.

Agency problem, especially in China and Korea, could partially account for the relationship. On the one hand, the governance structure of East Asian corporations significantly differs from those in developed markets, such as the US market. In Korea, there are now 45 conglomerates that fit the traditional definition of a *chaebol* (family-run conglomerates), according to Korea's Fair Trade Commission. The top 10 own more than 27% of all business assets in South Korea. The owner-managers of *chaebols* have almost full control over all the member firms, which means they can easily expropriate minority shareholders for their own benefits. And the Japanese economy still bears the vestige of *zaibatsu*, which is family-run conglomerates in Japanese (Lessambo, 2014). And similar to Korean firms, corporations are still either owned by big families or financed by big banks. On the other hand, the state-owned lending in China results in ineffective monitoring of the managers because state-owned banks have not been able to impose considerable influence on managers and enforcement of firm managers to act in the shareholders' interests is very limited in China. Therefore, it is less likely for managers to act for the benefits of shareholders and make efforts for maximizing firm performance (Chen, 2004).

Aside from the factors mentioned above, the high reliance on short-term debt in East Asian countries might also have a negative impact of firm performance. The descriptive statistics has shown that listed firms in China and Korea rely heavily on short-term debt because of less information asymmetry of short-term debt, whereas long-term debt has a relatively minimal proportion. Therefore, it could push firms to the risk of refinancing (Le and Phan, 2017). Additionally, these firms might lose long-term investment opportunities with long-term debt (Le and Phan, 2017).

5 Conclusions

This study examines how listed firms' capital structure influences performance in China, Japan, and Korea, using three accounting based measures (ROA, ROE, and EPS). According to the results of the fixed-effect models, both STD and LTD have highly statistically negative impact on ROA, ROE, and EPS regardless of countries. The results are consistent with Ruan et al. (2011),

who find that financial leverage has a negative impact on firm performance. But they are also in contrast with Holz (2002) who documents a positive result. This reverse relationship may be the result of the deducted tax rate in the past two decades. And research also outlines that family-owned corporate structure and state-owned nature of lending lead to severe agency problems, which brings about a negative impact on firm performance. Due to the high reliance on short-term debt, firms, especially in China and Korea, are likely lose investment opportunities made with long-term debt, which might weaken firm performance.

Several practical implications can be drawn from this study as well. First of all, the governments in East Asia could put effort in developing a more diverse bond market that promotes long-term borrowing and private loans. This will enable the listed companies in East Asia to rely on less expensive short-term debt and raise more long-term debt through the issuance of bonds in the capital market. Eventually, firms are free of the risk of refinancing and will not miss the long-term investment opportunities. Moreover, for firm managers, they should be aware that certain level of debt could lead to bankruptcy and financial distress, so they should always keep in mind to find a moderate capital structure. In this way, optimal capital structure and moderate level of debt in capital structure become important tasks for these managers.

Reference

Abor, J. (2005), "The effect of Capital structure on profitability: an empirical analysis of listed firms in Ghana", The Journal of Risk Finance, Vol. 6 No. 5, pp. 438-445.

Abor, J. (2007), "Debt policy and performance of SMEs: evidence from Ghanaian and South Africa firms", Journal of Risk Finance, Vol. 8 No. 4, pp. 364-379.

Allen, F., Qian, J. and Qian, M.J. (2005), "Law, finance, and economic growth in China", Journal of Financial Economics, Vol. 77 No. 1, pp. 57-116.

Al-Najjar, B. and Taylor, P. (2008), "The relationship between capital structure and ownership structure: new evidence from Jordanian panel data", Managerial Finance, Vol. 34 No. 12, pp. 919-933.

Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", The Review of Economic Studies, Vol. 58 No. 2, pp. 277-297.

Arellano, M. and Bover, O. (1995), "Another look at the instrumental variable estimation of errorcomponents models", Journal of Econometrics, Vol. 68 No. 1, pp. 29-51.

Bae, J., Kim, S.J. and Oh, H. (2017), "Taming polysemous signals: the role of marketing intensity on the relationship between financial leverage and firm performance", Review of Financial Economics, Vol. 33 No. 1, pp. 29-40.

Ba~nos-Caballero, S., García-Teruel, P.J. and Martínez-Solano, P. (2014), "Working capital management,corporate performance, and financial constraints", Journal of Business Research, Vol. 67 No. 3,pp. 332-338.

Baker, M. and Wurgler, J. (2002), "Market timing and capital structure", Journal of Finance, Vol. 57 No. 1, pp. 1-32.

Baker, H.K., Saadi, S., Dutta, S. and Gandhi, D. (2007), "The perception of dividends by Canadian managers: new survey evidence", International Journal of Managerial Finance, Vol. 3 No. 1, pp. 70-91.

Balakrishnan, S. and Fox, I. (1993), "Asset specificity, firm heterogeneity, and financial leverage", Strategic Management Journal, Vol. 14 No. 1, pp. 3-16.

Baltagi, B. (1995), Econometric Analysis of Panel Data, John Wiley and Sons, New York, NY.

Beaver, W.H., McAnally, M.L. and Stinson, C.H. (1997), "The information content of earnings and prices: a simultaneous equations approach", Journal of Accounting and Economics, Vol. 23 No. 1, pp. 53-81.

Beltratti, A., Bortolotti, B. and Caccavaio, M. (2012), "The stock market reaction to the 2005 split share structure reform in China", Pacific Basin Finance Journal, Vol. 20 No. 4, pp. 543-560.

Berger, A.N. and Bonaccorsi di Patti, E. (2006), "Capital structure and firm performance: a new approach to testing agency theory and an application to banking industry", Journal of Banking and Finance, Vol. 30 No. 4, pp. 1065-1102.

Bhabra, H.S., Liu, T. and Tirtiroglu, D. (2008), "Capital structure choice in a nascentmarket: evidence from listed firms in China", Financial Management, Vol. 37, pp. 341-364.

Booth, L., Aivazian, V., Demirguc-Kunt, A. and Maksimovic, V. (2001), "capital structures in developing countries", Journal of Finance, Vol. 56 No. 1, pp. 210-219.

Bradley, M., Jarrell, G.A. and Kim, E.H. (1984), "On the existence of an optimal capital structure: theory and evidence", Journal of Finance, Vol. 39 No. 3, pp. 857-878.

Breusch, S. and Pagan, R. (1980), "The Lagrange multiplier test and its applications to model specification in econometrics", Review of Economic Studies, Vol. 47 No. 1, pp. 239-253.

Buffet, W. (1999) “Mr. Buffet on the stock market”, Fortune, (November 22).
Campello, M. (2006), “Debt financing: does it boost or hurt firm performance?”, Journal of Financial Economics, Vol. 82 No. 1, pp. 135-172.
Chang, C. (1999), “Capital structure as optimal contracts”, North American Journal of Economics and Finance, Vol. 10 No. 2, pp. 363-385.
Chang, C., Chen, X. and Liao, G. (2014), “What are the reliably important determinants of capital structure in china?”, Pacific-Basin Finance Journal, Vol. 30, pp. 87-113.
Chen, J. (2004), “Determinants of Capital structure of Chinese listed companies”, Journal of Business Research, Vol. 57 No. 12, pp. 1341-1351.
Chen, J., Jiang, C. and Lin, Y. (2014), “What determine firms’ capital structure in China?”, Managerial Finance, Vol. 40 No. 10, pp. 1024-1039.
Cheng, Y.S., Yi-Pei Liu, Y.P. and Chien, C.Y. (2010), “Capital structure and firm value in China: a panel threshold regression analysis”, African Journal of Business Management, Vol. 4 No. 12, pp. 2500-2507.
Chiang, Y.H., Chan, P.C.A. and Hui, C.M.E. (2002), “Capital structure and profitability of the property and construction sectors in Hong Kong”, Journal of Property Investment & Finance, Vol. 20 No. 6, pp. 434-453.
Cuong, N.T. (2014), “Threshold effect of capital structure on firm value: evidence from seafood processing enterprises in the Sout Central region of Vietnam”, International Journal of Finance and Banking Studies (2147-4486), Vol. 3 No. 3, pp. 14-29.
Davidson, R. and MacKinnon, J.G. (2004), Econometric Theory and Methods, Oxford University Press, New York, NY.
Dawar, V. (2014), “Agency theory, capital structure and firm performance: some Indian evidence”, Managerial Finance, Vol. 40 No. 12, pp. 1190-1206.
Detthamrong, U., Chancharat, N. and Vithessonthi, (2017), “Corporate governance, capital structure and firm performance: evidence from Thailand”, Research in International Business and Finance, Vol. 42, pp. 689-709.
Duais, F.A. (2016), “An empirical study on capital structure and corporate performance of Chinese listed companies”, Journal of Commerce and Accounting Research, Vol. 5 No. 3, pp. 18-21.
Ebaid, I.E. (2009), “The impact of Capital structure choice on firm performance: empirical evidence from Egypt”, Journal of Risk Finance, Vol. 10 No. 5, pp. 477-487.
Eldomiaty, T. (2007), “Determinants of corporate Capital structure: evidence from an emerging economy”, International Journal of Commerce and Management, Vol. 17 Nos 1/2, pp. 25-43.
Foong, S.Y. and Idris, R. (2012), “Leverage, product diversity and performance of general insurers in Malaysia”, The Journal of Risk Finance, Vol. 13 No. 4, pp. 347-361.
Frank, M.Z. and Goyal, V.K. (2003), “Testing the pecking order theory of Capital structure”, Journal of Financial Economics, Vol. 67 No. 2, pp. 217-248.
Gill, A.B.N. and Mathur, N. (2011), “The effect of Capital structure on profitability: evidence from the United States”, International Journal of Management, Vol. 28 No. 4, Part 1, pp. 3-15.
Gleason, K., Mathur, L. and Mathur, I. (2000), “The interrelationship between culture, capital structure, and performance: evidence from European retailers”, Journal of Business Research, Vol. 50 No. 2, pp. 185-191.
Goddard, J., Tavakoli, M. and Wilson, J.O.S. (2005), “Determinants of profitability in European manufacturing and services: evidence from a dynamic panel model”, Applied Financial Economics, Vol. 15 No. 18, pp. 1269-1282.

Graham, J.R. (2000), "How big are the tax benefits of debt?", Journal of Finance, Vol. 55 No. 5, pp. 1901-1941.
Greene, W. (2003), Econometric Analysis, 5th ed., Prentice-Hall International, NJ.
Grossman, S. and Hart, O. (1982), "Corporate financial structure and managerial incentive", in McCall, J. (Ed.), The Economics of Information and Uncertainty, University of Chicago Press, Chicago, IL, pp. 107-140.
Hausman, J. (1978), "Specification tests in econometrics", Econometrica, Vol. 46 No. 6, pp. 1251-1271.
He, W., Mukherjee, T.K. and Baker, H.K. (2017), "The effect of the split share structure reform on working capital management of Chinese companies", Global Finance Journal, Vol. 33, pp. 27-37.
Holz, C.A. (2002), "The impact of the liability–asset ratio on profitability in china's industrial state-owned enterprises", China Economic Review, Vol. 13 No. 1, pp. 1-26.
Hsiao, C. (2003), "Analysis of panel data", Econometric Society Monographs, Vol. 34, Cambridge University Press, Cambridge.
Huang, G. and Song, F.M. (2006), "The determinants of capital structure: evidence from China", ChinaEconomic Review, Vol. 17 No. 1, pp. 14-36.
Jaisinghani, D. and Kanjilal, K. (2017), "Non-linear dynamics of size, Capital structure and profitability:empirical evidence from Indian manufacturing sector", Asia Pacific Management Review, Vol. 22 No. 3, pp. 159-165.
Jang, S. and Tang, C.H. (2009), "Simultaneous impacts of international diversification and financial leverage of profitability", Journal of Hospitality and Tourism Research, Vol. 33 No. 3, pp. 347-368.
Jensen, M.C. (1986), "Agency costs of free cash flow, corporate finance and takeovers", American Economic Review, Vol. 76, pp. 323-329.
Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", Journal of Financial Economics, Vol. 3 No. 4, pp. 305-360.
Kachlami, H. and Yazdanfar, D. (2016), "Determinants of SME growth: the influence of financing pattern: an empirical study based on Swedish data", Management Research Review, Vol. 39 No. 9, pp. 966-986.
Kasseeah, H. (2008), "What determines the leverage decisions of chinese firms?", Journal of the Asia Pacific Economy, Vol. 13 No. 3, pp. 354-374.
Klapper, L.F. Sarria-Allende, V. and Sulla, V. (2002), "Small and medium-sized enterprise financing in Eastern Europe", World Bank Policy Research Working Paper, No. 2933.
Köksal, B. and Orman, C. (2015), "Determinants of capital structure: evidence from a major developing economy", Small Business Economics, Vol. 44 No. 2, pp. 255-282.
Koop, G. and Steel, M. (2001), "Bayesian analysis of stochastic frontier models", in Baltagi, B. (Ed.), A Companion to Theoretical Econometrics, Blackwell Publishers, Blackwell, Oxford, pp. 520-573.
Kraus, A. and Litzenberger, R.H. (1973), "A state-preference model of optimal financial leverage", Journal of Finance, Vol. 28 No. 4, pp. 911-922.
Krishnan, V.S. and Moyer, R.C. (1997),"Performance, capital structure and home country: an analysis of Asian corporations", Global Finance Journal, Vol. 8 No. 1, pp. 129-143.
Krugman, P. (1994), "The myth of Asia's economic miracle", Foreign Affairs, Vol. 73 No. 6, pp. 62-78.

Kyerboah-Coleman, A. (2007), "The impact of capital structure on the performance of microfinance institutions", Journal of Risk Finance, Vol. 8 No. 1, pp. 56-71.
Le, T.P.V. and Phan, T.B.N. (2017), "Capital structure and firm performance: empirical evidence from a small transition country", Research in International Business and Finance, Vol. 42, pp. 710-726.
Lin, F.L. and Chang, T. (2011), "Does debt affect firm value in Taiwan? A panel threshold regression analysis", Applied Economics, Vol. 43 No. 1, pp. 117-128.
Lin, Y.R. and Fu, X.M. (2017), "Does institutional ownership influence firm performance? Evidence from China", International Review of Economics and Finance, Vol. 49, pp. 17-57.
McConnell, J.J. and Servaes, H. (1990), "Additional evidence on equity ownership and corporate value",Journal of Financial Economics, Vol. 27 No. 2, pp. 595-612.
Majumdar, R. (2014), "The determinants of indebtedness of unlisted manufacturing firms in India: a panel data analysis", Management Research Review, Vol. 37 No. 9, pp. 833-854.
Majumdar, S.K. and Chhibber, P. (1999), "Capital structure and performance: evidence from a transition economy on an aspect of corporate governance", Public Choice, Vol. 98 Nos 3/4, pp. 287-305.
Margaritis, D. and Psillaki, M. (2007), "Capital structure and firm efficiency", Journal of Business Finance and Accounting, Vol. 34 No. 9, pp. 1447-1469.
Marsh, P. (1982), "The choice between equity and debt: an empirical study", Journal of Finance, Vol. 37 No. 1, pp. 121-144.
Mathuva, D. (2014), "An empirical analysis of the determinants of the cash conversion cycle in Kenyan listed non-financial firms", Journal of Accounting in Emerging Economies, Vol. 4 No. 2, pp. 175-196.
Mesquita, J.M.C. and Lara, J.E. (2003), "Capital structure and profitability: the Brazilian case", Academy of Business and Administration Sciences Conference, pp. 11-13.
Miller, M. (1977), "Debt and taxes", Journal of Finance, Vol. 32, pp. 262-275.
Modigliani, F. and Miller, H.M. (1963), "Corporate income taxes and the cost of capital: a correction", The American Economic Review, Vol. 53 No. 3, pp. 433-443.
Mok, V., Yeung, G., Zhaozhou Han, Z. and Li, Z. (2007), "Leverage, technical efficiency and profitability: an application of DEA to foreign-invested toy manufacturing firms in China", Journal of Contemporary China, Vol. 16 No. 51, pp. 259-274.
Molina, C.A. (2005), "Are firms underleveraged? An examination of the effect of leverage on default probabilities", The Journal of Finance, Vol. 60 No. 3, pp. 1427-1459.
Mun, S.G. and Jang, S. (2015), "Working Capital, cash holding, and profitability of restaurant firms", International Journal of Hospitality Management, Vol. 48, pp. 1-11.
Myers, S. (1977), "The determinants of corporate borrowing", Journal of Financial Economics, Vol. 5 No. 2, pp. 147-175.
Myers, C.S. (1984),"The Capital structure puzzle", The Journal of Finance, Vol. 39 No. 3, pp. 574-592.
Myers, S.C. (2001),"Capital structure", Journal of Economic Perspectives, Vol. 15 No. 2, pp. 81-102.
Myers, C.S. and Majluf, N.S. (1984), "Corporate financing and investment decisions when firms have information that investors do not have", Journal of Financial Economics, Vol. 13 No. 2, pp. 187-221.

Nunes, P.M. and Serrasqueiro, Z. (2015), "Profitability determinants of Portuguese knowledge-intensive business services: empirical evidence using panel data models", Applied Economics Letters, Vol. 22 No. 1, pp. 51-56.
Opler, T.C. and Titman, S. (1994), "Financial distress and corporate performance", The Journal of Finance, Vol. 49 No. 3, pp. 1015-1040.
Pattitoni, P., Petracci, B. and Spisni, M. (2014), "Determinants of profitability in the EU-15 area", Applied Financial Economics, Vol. 24 No. 11, pp. 763-775.
Phillips, P.A. and Sipahioglu, M.A. (2004), "Performance implications of capital structure; evidence from quoted UK organizations with hotel interests", Service Industries Journal, Vol. 24 No. 5, pp. 31-51.
Pi, L. and Timme, S. (1993), "Corporate control and bank efficiency", Journal of Banking and Finance, Vol. 17 Nos 2/3, pp. 515-530.
Prevost, A.K., Rao, R.P. and Hossain, M. (2002), "Determinants of board composition in New Zealand: a simultaneous equation approach", Journal of Empirical Finance, Vol. 9 No. 4, pp. 373-397.
Rajan, R.G. and Zingales, L. (1995), "What do we know about capital structure? Some evidence from international data", Journal of Finance, Vol. 50 No. 5, pp. 1421-1460.
Rehman, A. and Wang, M. (2015), "Corporate cash holdings and adjustment behaviour in chinese firms: an empirical analysis using generalized method of moments", Australasian Accounting, Business and Finance Journal, Vol. 9 No. 4, pp. 20-37, doi: 10.14453/aabfj.v9i4.3.
Rehman, A., Wang, M. and Mirza, S.S. (2017), "How do Chinese firms adjust their financial leverage: an empirical investigation using multiple GMM models", China Finance and Economic Review, Vol. 5 No. 8, pp. 1-30.
Ritter, J.R. (2005), "Economic growth and equity returns", Pasific-Basin Finance Journal, Vol. 13 No. 5, pp. 489-503.
Roy, T.S. and Witt, R.C. (1976), "Leverage, exposure ratios and the optimal rate of return on Capital for the insurer", The Journal of Risk and Insurance, Vol. 43 No. 1, pp. 53-72.
Ruan, W., Tian, G. and Ma, S. (2011),"Managerial ownership, Capital structure and firm value: evidence from China's civilian-run firms", Australasian Accounting Business and Finance Journal, Vol. 5 No. 3, pp. 73-92.
Ruland, W. and Zhou, P. (2005), "Debt, diversification and valuation", Review of Quantitative Finance and Accounting, Vol. 25 No. 3, pp. 277-291.
Salama, F.M. and Putnam, K. (2015), "Accounting conservatism, capital structure, and global diversification", Pacific Accounting Review, Vol. 27 No. 1, pp. 119-138.
Scott, J. (1977), "Bankruptcy, secured debt, and optimal Capital structure", The Journal of Finance, Vol. 32 No. 1, pp. 1-19.
Serrasqueiro, Z.M.S. and Rogão, M.C.R. (2009), "Capital structure of listed Portuguese companies: determinants of debt adjustment", Review of Accounting and Finance, Vol. 8 No. 1, pp. 54-75.
Sheikh, N.A. and Wang, Z. (2011), "Determinants of capital structure: an empirical study of firms in manufacturing industry of Pakistan", Managerial Finance, Vol. 37 No. 2, pp. 117-133.
Sheikh, N.A. and Wang, Z. (2013), "The impact of capital structure on performance: an empirical study of non-financial listed firms in Pakistan", International Journal of Commerce and Management, Vol. 23 No. 4, pp. 354-368, available at: https://doi.org/10.1108/IJCoMA-11-2011-0034
Shin, H.H. and Soenen, L. (1998), "Efficiency of working capital management and corporate profitability", Financial Practice and Education, Vol. 8 No. 2, pp. 39-45.

Shirai, S. (2002), “Bank’s lending behaviour and firms’ corporate financing pattern in the People’s Republic of China”, ADB Institute Research Paper, 43.
Siegel, J. (1999), “The shrinking equity premium: historical facts and future forecasts”, The Journal of Portfolio Management, Vol. 26 No. 1, pp. 10-17.
Simon, K. (2015), “Key determinants of China’s outward FDI to Africa”, Journal of Economics and Sustainable Development, Vol. 6 No. 6, pp. 216-234.
Stulz, R.M. (1990), “Managerial discretion and optimal financing policies”, Journal of Financial Economics, Vol. 26 No. 1, pp. 3-27.
Su, L.D. (2010), “Ownership structure, corporate diversification and capital structure: evidence from china’s publicly listed firms”, Management Decision, Vol. 48 No. 2, pp. 314-339.
Titman, S. and Wessels, R. (1988), “The determinants of capital structure choice”, Journal of Finance, Vol. 43 No. 1, pp. 1-19.
Tsai, H.F., Lin, T.J. and Hung, J.H. (2015), “The effects of the split share structure reform on Chinese listed
firms’ leverage decisions”, The Quarterly Review of Economics and Finance, Vol. 57, pp. 86-100.
Tse, C.B. and Rodgers, T. (2014), “The Capital structure of Chinese listed firms: is manufacturing industry special?”, Managerial Finance, Vol. 40 No. 5, pp. 469-486. Wald, J.K. (1999), “How firm characteristics affect capital structure: an international comparison”, Journal of Financial Research, Vol. 22 No. 2, pp. 161-187.
Weill, L. (2008), “Leverage and corporate performance: does institutional environment matter?”, Small Business Economics, Vol. 30 No. 3, pp. 215-265.
Williams, J. (1987),“Perquisites, risk, and Capital structure”, Journal of Finance, Vol. 42 No. 1, pp. 2949.
Williamson, O. (1988), “Corporate finance and corporate governance”, Journal of Finance, Vol. 43 No. 3, pp. 567-591.
Windmeijer, F. (2005), “A finite sample correction for the variance of linear efficient two-step GMM estimators”, Journal of Economics, Vol. 126 No. 1, pp. 25-51.
Wooldridge, J.M. (1995/2002), Econometric Analysis of Cross Section and Panel Data, Vol. 5 No. 1, The MIT Press, Cambridge, p. 5.
Wu, L. and Yue, H. (2009), “Corporate tax, Capital structure, and the accessibility of bank loans: evidence from China”, Journal of Banking and Finance, Vol. 33 No. 1, pp. 30-38.
Xu, J. (2012), “Profitability and capital structure: evidence from import penetration”, Journal of Financial Economics, Vol. 106, pp. 427-446.
Xu, B., Bhuiyan, M.B.U. and Rahman, A. (2016), “Underlying profit in New Zealand”, Pacific Accounting Review, Vol. 28 No. 2, pp. 111-134.
Xu, W., Wang, K. and Anandarajan, A. (2012), “Quality of reported earnings by chinese firms: the influence of ownership structure”, Advances in Accounting, Incorporating Advances in International Accounting, Vol. 28 No. 1, pp. 193-199.
Yazdanfar, D. and Ohman, P. (2015), “Debt financing and firm performance: an empirical study based on Swedish data”, Journal of Risk Finance, Vol. 16 No. 1, pp. 102-118.
Young, A. (1995), “The tyranny of numbers: confronting the statistical realities of the East Asian growth experience”, Quarterly Journal of Economics, Vol. 110 No. 3, pp. 641-680.
Zeitun, R. and Tian, G.G. (2007), “Capital structure and corporate performance: evidence from Jordan”, Australasian Accounting, Business and Finance Journal, Vol. 1 No. 4, pp. 40-61.
Zhang, D. and Liu, D. (2017), “Determinants of the capital structure of Chinese non-listed enterprises: is TFP efficient?”, Economic Systems, Vol. 41 No. 2, pp. 179-202.

Zhengwei, W. (2013), “Optimal capital structure: case of SOE versus private listed corporation”, Chinese Management Studies, Vol. 7 No. 4, pp. 604-616.
Zhu, S. and Jiao, H. (2013), “Organizational structure and corporate performance: insights from 6,065 listed corporations”, Chinese Management Studies, Vol. 7 No. 4, pp. 535-556.