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

by

Yuejiao Qiu

An honors thesis submitted in partial fulfillment of the requirements for the degree of Bachelor of Science Business and Economics Honors Program NYU Shanghai

May 2021

Professor Marti G. Subrahmanyam         Professor Guodong Chen
Professor Christina Wang                Professor Wendy Jin
Professor Wendy Jin                     Thesis Advisor
Faculty Advisers
Acknowledgement

The one-year research experience is meaningful to me, starting from New York and ending in Shanghai, where I learned a lot developing my thesis and gain an in-depth understanding of the capital market in East Asia. Particularly, I want to express my gratitude towards those who offered me great support during this program.

Firstly, I am grateful to have Professor Guodong Chen to guide me for the entire research process in his busy schedule, including data collection, model formulation, result interpretation. I would not achieve writing such an insightful thesis without him.

I also want to say special thanks to all the faculty advisors, Professor Marti G. Subrahmanyam, Professor Jens Leth Hougaard, Professor Christina Wang, and Professor Ye Jin, who spare no efforts to make sure the program going well and following up each student's work closely. Moreover, I appreciate what Xinyi Yang, the teaching assistant, has done for the program, as she arranges seminars and coordinate with professors and students every week.

Particularly, I would like to express my gratefulness towards Professor Sang Bin Lee, who helped me select the research topic and provided detailed insights regarding the Korean market.

Besides, I want to deliver special thanks to Professor Julia Hur, whom I worked with for more than two years as a research assistant. This is my first research-related position, where I firstly learned essential research skills and shaped my vision on individual research.
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.


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 Bonacorsidi 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-robust 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 signif-
cant, 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:**

\[
\text{PERFORM}_{i,t} = \alpha_t + \beta_1 \text{STD}_{i,t} + \beta_2 \text{LTD}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{GROW}_{i,t} + \beta_5 \text{INVEST}_{i,t} + \beta_6 \text{SGAE}_{i,t} + \mu_{it}
\]

**Fixed-effect model:**

\[
\text{PERFORM}_{i,t} = \alpha_t + \beta_1 \text{STD}_{i,t} + \beta_2 \text{LTD}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{GROW}_{i,t} + \beta_5 \text{INVEST}_{i,t} + \beta_6 \text{SGAE}_{i,t} + \eta_i + \mu_{it}
\]

**Random-effect model:**

\[
\text{PERFORM}_{i,t} = \alpha_t + \beta_1 \text{STD}_{i,t} + \beta_2 \text{LTD}_{i,t} + \beta_3 \text{SIZE}_{i,t} + \beta_4 \text{GROW}_{i,t} + \beta_5 \text{INVEST}_{i,t} + \beta_6 \text{SGAE}_{i,t} + \eta_i + \mu_{it}
\]

where:

- \( \alpha_t \) = constant
- \( \text{PERFORM}_{i,t} \) = 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;
- \( \text{STD}_{i,t} \) = short-term debt to total asset
- \( \text{LTD}_{i,t} \) = long-term debt to total asset
- \( \text{SIZE}_{i,t} \) = size of firm at time \( t \), measured as the natural logarithm of the firm’s book
  value of total assets;
- \( \text{GROW}_{i,t} \) = the percentage change in sales in time \( t \) from \( t-1 \)
- \( \text{INVEST}_{i,t} \) = capital expenditure to the book value of total assets;
- \( \text{SGAE}_{i,t} \) = selling, general and administrative expense to the book value of total assets;
- \( \mu_{it} \) = error term; and
- \( \eta_i \) = 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

<table>
<thead>
<tr>
<th>Country</th>
<th>STD</th>
<th>LTD</th>
<th>SIZE</th>
<th>GROW</th>
<th>INVEST</th>
<th>SGAE</th>
<th>ROA</th>
<th>ROE</th>
<th>EPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.1435</td>
<td>0.0907</td>
<td>22.921</td>
<td>0.1456</td>
<td>0.0821</td>
<td>0.0456</td>
<td>0.0693</td>
<td>0.396</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1168</td>
<td>0.104</td>
<td>1.5024</td>
<td>0.2636</td>
<td>0.0524</td>
<td>0.0713</td>
<td>0.0597</td>
<td>0.7499</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1231</td>
<td>0.0552</td>
<td>22.134</td>
<td>0.1153</td>
<td>0.0419</td>
<td>0.0628</td>
<td>0.0387</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.9662</td>
<td>0.846</td>
<td>27.5518</td>
<td>1.2101</td>
<td>0.2681</td>
<td>0.4809</td>
<td>0.2539</td>
<td>32.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0008</td>
<td>0.0007</td>
<td>0.01</td>
<td>0.0018</td>
<td>0.0003</td>
<td>0.0005</td>
<td>0.0004</td>
<td>0.005</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>0.1163</td>
<td>0.1056</td>
<td>10.7144</td>
<td>0.0339</td>
<td>0.2347</td>
<td>0.015</td>
<td>-0.0094</td>
<td>686.4524</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1201</td>
<td>0.1199</td>
<td>1.7035</td>
<td>0.1662</td>
<td>0.0356</td>
<td>0.2167</td>
<td>0.1148</td>
<td>41330.4189</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0837</td>
<td>0.0667</td>
<td>10.5417</td>
<td>1.0255</td>
<td>0.0238</td>
<td>0.173</td>
<td>0.0229</td>
<td>38.47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.9817</td>
<td>0.9273</td>
<td>20.1381</td>
<td>1.9992</td>
<td>0.7014</td>
<td>11.3861</td>
<td>6.7883</td>
<td>11645660</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0005</td>
<td>0.0005</td>
<td>0.0074</td>
<td>0.0007</td>
<td>0.0002</td>
<td>0.001</td>
<td>0.0005</td>
<td>0.0186</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1634</td>
<td>0.0824</td>
<td>12.6928</td>
<td>1.0478</td>
<td>0.046</td>
<td>0.1447</td>
<td>0.0037</td>
<td>1464.9704</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1325</td>
<td>0.0933</td>
<td>1.5835</td>
<td>0.2237</td>
<td>0.044</td>
<td>0.123</td>
<td>0.0925</td>
<td>4133.5397</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1429</td>
<td>0.0512</td>
<td>12.3495</td>
<td>1.0425</td>
<td>0.0318</td>
<td>0.1054</td>
<td>0.0193</td>
<td>317</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.5648</td>
<td>0.51</td>
<td>18.2445</td>
<td>1.8017</td>
<td>0.2321</td>
<td>0.8112</td>
<td>0.1865</td>
<td>33414</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0011</td>
<td>0.0007</td>
<td>0.0127</td>
<td>0.0018</td>
<td>0.0004</td>
<td>0.001</td>
<td>0.0008</td>
<td>33.6539</td>
<td></td>
</tr>
</tbody>
</table>

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:
## 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. 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>
<thead>
<tr>
<th>Null hypothesis</th>
<th>$F$-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD does not Granger Cause ROA</td>
<td>88.23***</td>
</tr>
<tr>
<td>ROA does not Granger Cause STD</td>
<td>2.2647</td>
</tr>
<tr>
<td>LTD does not Granger Cause ROA</td>
<td>27.898***</td>
</tr>
<tr>
<td>ROA does not Granger Cause LTD</td>
<td>7.3097***</td>
</tr>
<tr>
<td>STD does not Granger Cause ROE</td>
<td>14.032***</td>
</tr>
<tr>
<td>ROE does not Granger Cause STD</td>
<td>2.0737</td>
</tr>
<tr>
<td>LTD does not Granger Cause ROE</td>
<td>6.8488***</td>
</tr>
<tr>
<td>ROE does not Granger Cause LTD</td>
<td>0.3904</td>
</tr>
<tr>
<td>STD does not Granger Cause EPS</td>
<td>0.8822</td>
</tr>
<tr>
<td>EPS does not Granger Cause STD</td>
<td>3.5377**</td>
</tr>
<tr>
<td>LTD does not Granger Cause EPS</td>
<td>6.7392***</td>
</tr>
<tr>
<td>EPS does not Granger Cause LTD</td>
<td>3.1102**</td>
</tr>
</tbody>
</table>

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

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 EPS 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 ($\beta = -0.1199, p < 0.000$), fixed-effects ($\beta = -0.2246, p < 0.00$), and random-effects ($\beta = -0.1954, p < 0.000$). STD also has statistically significant negative impacts on ROE under OLS ($\beta = -0.6029, p < 0.000$), fixed-effects ($\beta = -2.0394, p < 0.00$), and random-effects ($\beta = -0.9520, p < 0.000$). With regard to EPS, the coefficients are statistically negative under OLS ($\beta = -2.315.8610, p < 0.000$), fixed-effects ($\beta = -4.066.1150, p < 0.00$), and random-effects ($\beta = -2.886.4390, p < 0.00$). 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 ($\beta = -0.0623, p < 0.000$), fixed-effects ($\beta = -0.2103, p < 0.00$), and random-effects ($\beta = -0.1326, p < 0.000$). However, LTD has a positive coefficient with EPS under OLS ($\beta = 280.7296, p < 0$) which is not statistically significant. Under fixed-effects ($\beta = -1,422.3320, p < 0.00$) and random-effects ($\beta = -518.0468, p < 0$), 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 ($\beta = -0.1810, p < 0.000$), fixed-effects ($\beta = -0.2178, p < 0.000$), and random-effects ($\beta = -0.2142, p < 0.000$). On the one hand, the coefficients with regard to ROE also reveal that STD
has a statistically significant negative influence on ROE under OLS ($\beta = -0.4644, p < 0.000$), fixed-effects ($\beta = 0.6738, p < 0.00$), and random-effects ($\beta = -0.6036, p < 0.000$). And STD has statistically significant negative coefficients with EPS under OLS ($\beta = -5400.6400, p < 0.000$), fixed-effects ($\beta = -5258.6540, p < 0.000$), and random-effects ($\beta = -5434.1840, p < 0.000$). On the other hand, LTD has statistically significant negative impact on ROA under OLS ($\beta = -0.1988, p < 0.000$), fixed-effects ($\beta = -0.2269, p < 0.00$), and random-effects ($\beta = -0.2112, p < 0.000$). And LTD also has a statistically significant negative effect on ROE under OLS ($\beta = -0.4398, p < 0.000$), fixed-effects ($\beta = -0.5773, p < 0.00$), and random-effects ($\beta = -0.4989, p < 0.000$). In terms of EPS, the coefficients are statistically negative under OLS ($\beta = -5,248.3480, p < 0.000$), fixed-effects ($\beta = -6,692.5900, p < 0.00$), and random-effects ($\beta = -5,943.5870, p < 0.000$).
Table IV: Impact of financial leverage on firm performance in China

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>ROA</th>
<th>ROE</th>
<th>EPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS Fixed-effects</td>
<td>Random-effects</td>
<td>OLS Fixed-effects</td>
</tr>
<tr>
<td>STD</td>
<td>-0.1458*** (0.0030)</td>
<td>-0.1385*** (0.0042)</td>
<td>-0.1377*** (0.0035)</td>
</tr>
<tr>
<td>LTD</td>
<td>-0.0761*** (0.0039)</td>
<td>-0.0995*** (0.0051)</td>
<td>-0.0837*** (0.0045)</td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.0035*** (0.0003)</td>
<td>-0.0055*** (0.0008)</td>
<td>-0.0075*** (0.0004)</td>
</tr>
<tr>
<td>INVEST</td>
<td>0.2181*** (0.0070)</td>
<td>0.1231*** (0.0083)</td>
<td>0.1814*** (0.0073)</td>
</tr>
<tr>
<td>SGAE</td>
<td>0.0922*** (0.0053)</td>
<td>0.0564*** (0.0116)</td>
<td>0.0825*** (0.0073)</td>
</tr>
<tr>
<td>GROW</td>
<td>0.0560*** (0.0013)</td>
<td>0.0422*** (0.0013)</td>
<td>0.0489*** (0.0012)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.1226*** (0.0060)</td>
<td>0.2161*** (0.0083)</td>
<td>-0.2042*** (0.0097)</td>
</tr>
<tr>
<td>R2</td>
<td>0.2726 0.151 0.2621 0.0085 0.0105 0.0082 0.1496 0.1084 0.1264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.2724 -0.0468 0.2619 0.0082 -0.2176 0.0079 0.1493 -0.0993 0.1262</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Statistic</td>
<td>1.296.4650*** 499.0790*** 6020.4650*** 3019.199*** 30226.69*** 1702.4868*** 6121.8886*** 3431.766*** 2547.7650***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-test</td>
<td>F (3917, 16842) = 4.275***</td>
<td>F (3941, 17122) = 2.9057***</td>
<td>F (3940, 16944) = 6.0813***</td>
</tr>
<tr>
<td>LM (chi²)</td>
<td>5067.7*** 1.3795 4355.7***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hausman (chi²)</td>
<td>498.19*** 113.76*** 432.12***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p<0.1; **p<0.05; ***p<0.01
Table V: Impact of financial leverage on firm performance in Japan

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>ROE</th>
<th>EPS</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>STD</td>
<td>-0.1199***</td>
<td>-0.2246***</td>
<td>-0.6029***</td>
<td>-2.0394***</td>
<td>-0.9520***</td>
<td>-2.3158610***</td>
<td>-4.066.1150***</td>
<td>-2.886.4390***</td>
</tr>
<tr>
<td>LTD</td>
<td>-0.0623***</td>
<td>-0.2103***</td>
<td>-0.7903***</td>
<td>-1.6892***</td>
<td>-1.1895***</td>
<td>280.7296</td>
<td>-1,422.3320***</td>
<td>-518.0468</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.0059***</td>
<td>0.0003</td>
<td>0.0041***</td>
<td>0.0218*</td>
<td>0.0120</td>
<td>81.0639***</td>
<td>-717.3138***</td>
<td>67.6083*</td>
</tr>
<tr>
<td>INVEST</td>
<td>-0.0184</td>
<td>-0.0257*</td>
<td>-0.0399***</td>
<td>-0.3949</td>
<td>1.3101*</td>
<td>2,167.7710**</td>
<td>2,589.3780**</td>
<td>2,854.2240**</td>
</tr>
<tr>
<td>SGAE</td>
<td>-0.0935***</td>
<td>-0.4746***</td>
<td>-0.2673***</td>
<td>-0.2246**</td>
<td>-0.9203***</td>
<td>-61.2993</td>
<td>583.2674*</td>
<td>24.7771</td>
</tr>
<tr>
<td>GROW</td>
<td>0.1697***</td>
<td>0.0959***</td>
<td>0.1194***</td>
<td>0.6840***</td>
<td>0.4622***</td>
<td>2,740.3660***</td>
<td>2,402.7270***</td>
<td>2,384.3110***</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.1809***</td>
<td>-0.0513***</td>
<td>-0.7372***</td>
<td>-0.5093*</td>
<td>-3,339.7060***</td>
<td>-2,815.6300***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>ROA</th>
<th>ROE</th>
<th>OLS</th>
<th>ROE</th>
<th>EPS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>STD</td>
<td>(0.0043)</td>
<td>(0.0060)</td>
<td>(0.0053)</td>
<td>(0.1806)</td>
<td>(0.3202)</td>
<td>(267.7061)</td>
<td>(461.4268)</td>
<td>(338.0913)</td>
</tr>
<tr>
<td>LTD</td>
<td>(0.0046)</td>
<td>(0.0067)</td>
<td>(0.0061)</td>
<td>(0.1943)</td>
<td>(0.3573)</td>
<td>(287.5272)</td>
<td>(515.8330)</td>
<td>(381.2568)</td>
</tr>
<tr>
<td>SIZE</td>
<td>(0.0003)</td>
<td>(0.0015)</td>
<td>(0.0007)</td>
<td>(0.0130)</td>
<td>(0.0772)</td>
<td>(19.2531)</td>
<td>(109.4351)</td>
<td>(33.4198)</td>
</tr>
<tr>
<td>INVEST</td>
<td>(0.0136)</td>
<td>(0.0139)</td>
<td>(0.0141)</td>
<td>(0.5699)</td>
<td>(0.7422)</td>
<td>(848.2643)</td>
<td>(1,081.8840)</td>
<td>(969.6556)</td>
</tr>
<tr>
<td>SGAE</td>
<td>(0.0023)</td>
<td>(0.0055)</td>
<td>(0.0040)</td>
<td>(0.0986)</td>
<td>(0.2915)</td>
<td>(142.0368)</td>
<td>(334.1376)</td>
<td>(207.9409)</td>
</tr>
<tr>
<td>GROW</td>
<td>(0.0032)</td>
<td>(0.0027)</td>
<td>(0.0027)</td>
<td>(0.1330)</td>
<td>(0.1434)</td>
<td>(197.8325)</td>
<td>(208.6679)</td>
<td>(193.6571)</td>
</tr>
<tr>
<td>Constant</td>
<td>(0.0048)</td>
<td>(0.0079)</td>
<td>(0.2036)</td>
<td>(0.2819)</td>
<td>(301.6478)</td>
<td>(426.0166)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Observations | 48,449 | 48,449 | 48,449 | 48,449 | 48,449 | 48,449 | 49,870 | 49,870 | 49,870 |
| R²       | 0.1278 | 0.218  | 0.1655 | 0.0017  | 0.002  | 0.0016 | 0.0069 | 0.0068 | 0.0054 |
| Adjusted R² | 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

<table>
<thead>
<tr>
<th>Dependent variable:</th>
<th>OLS</th>
<th>ROA</th>
<th>ROE</th>
<th>EPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed-effects</td>
<td>Random-effects</td>
<td>Fixed-effects</td>
<td>Random-effects</td>
</tr>
<tr>
<td>STD</td>
<td>-0.1810***</td>
<td>-0.2178***</td>
<td>-0.2142***</td>
<td>-0.4644***</td>
</tr>
<tr>
<td></td>
<td>(0.0051)</td>
<td>(0.0072)</td>
<td>(0.0062)</td>
<td>(0.0145)</td>
</tr>
<tr>
<td>LTD</td>
<td>-0.1988***</td>
<td>-0.2269***</td>
<td>-0.2112***</td>
<td>-0.4398***</td>
</tr>
<tr>
<td></td>
<td>(0.0080)</td>
<td>(0.0094)</td>
<td>(0.0087)</td>
<td>(0.0230)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.0134***</td>
<td>0.0168***</td>
<td>0.0153***</td>
<td>0.0332***</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(0.0017)</td>
<td>(0.0008)</td>
<td>(0.0013)</td>
</tr>
<tr>
<td>INVEST</td>
<td>0.2574***</td>
<td>0.1343***</td>
<td>0.2091***</td>
<td>0.5269***</td>
</tr>
<tr>
<td></td>
<td>(0.0152)</td>
<td>(0.0162)</td>
<td>(0.0155)</td>
<td>(0.0431)</td>
</tr>
<tr>
<td>SGAE</td>
<td>-0.0486***</td>
<td>-0.1906***</td>
<td>-0.1021***</td>
<td>-0.1139***</td>
</tr>
<tr>
<td></td>
<td>(0.0055)</td>
<td>(0.0191)</td>
<td>(0.0081)</td>
<td>(0.0154)</td>
</tr>
<tr>
<td>GROW</td>
<td>0.0986***</td>
<td>0.0706***</td>
<td>0.0812***</td>
<td>0.2384***</td>
</tr>
<tr>
<td></td>
<td>(0.0031)</td>
<td>(0.0027)</td>
<td>(0.0027)</td>
<td>(0.0088)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.2260***</td>
<td>-0.2207***</td>
<td>-0.5746***</td>
<td>-0.5638***</td>
</tr>
<tr>
<td></td>
<td>(0.0066)</td>
<td>(0.0103)</td>
<td>(0.0186)</td>
<td>(0.0279)</td>
</tr>
</tbody>
</table>

| Observations       | 13,529     | 13,529     | 13,529     | 13,529     | 13,529     | 13,529     | 13,529              | 13,529              | 13,529              |
| R²                  | 0.2495     | 0.1745     | 0.1964     | 0.195      | 0.1384     | 0.164      | 0.2181             | 0.052               | 0.0818              |
| Adjusted R²         | 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***         | 107.5070***         | 1,290.4670***       |
| F-test              | F (1751,11771) = 6.0828*** | F (1751, 11771) = 4.2248*** | F (1774, 11755) = 7.4066*** |
| LM (chi²)           | 2695.1***  | 1282.4***  | 22301***   | 22301***   | 22301***   | 22301***   | 22301***            | 22301***            |
| Hausman (chi²)      | 281.88***  | 502.48***  | 79.145***  | 79.145***  | 79.145***  | 79.145***  | 79.145***           | 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


