Foreign Ownership and Capital Structure in Times of Crises: Case of South Korea

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Abstract

This paper presents the results of analysis of the role of foreign investors in capital structure choice. The analysis is conducted using regression analysis of panel data. Operating with data of 809 companies listed in the South Korean market in 1997-2020, we demonstrate that the debt-to-equity ratio of companies with foreign investors is lower than in the rest of the firms. In this case, foreign investors' monitoring of a company's performance can be a substitute for debt financing as a disciplining mechanism for management. Foreign investors also indirectly affect the capital structure by impacting the speed of adjustment to the target leverage. The results of our study show that the speed of adjustment to the target debt-to-equity ratio increases along with a rise in foreign investor participation. The results are most pronounced for over-leveraged firms. Whereas during financial crises, we observe no effect of the presence of foreign investors on the changes in the target debt-to-equity ratio, we find a significant increase in the speed of adjustment to the target leverage in companies with foreign investors. During the current coronavirus crisis, corporate debt of companies with foreign investors is decreasing even more, while the speed of adjustment decreases. We attribute these effects to the non-financial nature of the crisis, which makes the role of foreign investors in monitoring management less meaningful. In practice, results can be used by company managers when facing crises or other macroeconomic shocks. The results obtained can also be used by public authorities in shaping policies to stimulate foreign investment.

Keywords: capital structure, foreign ownership, crisis, dynamic trade-off theory, South Korea

Introduction

The world has been regularly experiencing global crises: the Great Depression in the 1930s, the Post-war crisis, the global financial crisis in 2007-08, the recent COVID-19 crisis. Even though crises appear to be an old problem, each one provides the world with new lessons about the actions required to prevent the repetition of their consequences. Before the COVID-19 turmoil, the world experienced financial crises that resulted in massive defaults. The severity of previous crises has led economists to explore the macro patterns and causes of crises. It also emphasised the importance of firm-level responses, specifically, capital structure policy. Although many papers are devoted to capital structure determinants and theories, implications for debt-to-equity choice in crisis have not yet been developed.

The COVID-19 pandemic has made evident the deep global integration of the modern economy in the goods and capital markets, which increases trade gains and exposure to external shocks. As the markets grow even more integrated, foreign participation gains greater significance. An analysis of foreign investment in the macroeconomic context is of little use to individual companies that need to deal with the consequences of crisis in the absence of stabilising policies. On the contrary, foreign ownership allows assessing the firm-level effect of foreign participation.

This paper investigates the relationship between capital structure and foreign ownership in a crisis framework. We conducted our analysis on the data from 1997 to 2020 for 809 companies listed on the Korea Stock Exchange. Our paper aims to fill the gap in literature on microeconomic responses with regard for global integration. The implications could help in facilitating the recovery and reducing the severity of the recent crises' effects.

Our key results show that foreign ownership has a significant negative impact on corporate leverage. The effect is even more pronounced for over-leveraged firms. Another finding reveals that foreign ownership facilitates a higher speed of adjustment to the target leverage level, especially during financial crises, but not during the COVID-19 crisis.

The rest of the paper is organised as follows: the introduction includes literature review and hypotheses. The methodology part presents the stages of the research and describes the data. We then provide the results and their discussion, which are followed by the conclusion.

Literature review

An overview of the South Korean market

South Korea has become an economic miracle mainly due to its export-oriented industrialisation. First, taking advantage of the demand for cheap, labour-intensive and later for capital-intensive goods, its economic growth has been export-driven. The case of South Korea captures the attention of researchers with its significant economic performance improvement and much greater capital inflows since 1996 [1]. Korean stock market is considered one of the fastest-growing [2].

Before the recent COVID-19 crisis, South Korea was hit hard by two financial crises: the 1997 Asian financial crisis and the 2008 global financial crisis. The country was one of the few countries that successfully overcame the 2008 crisis and quickly pulled out of the recession. According to IMF data, while many OECD economies are still experiencing the consequences of that recession, South Korea entered a positive output gap by 2010[1].

Asian Financial Crisis

The Asian financial crisis originated in 1997 with Thailand abandoning fixed exchange rates, which allowed to preserve the stability of the currency system and ensured the confidence of foreign investors. Currency declines spread rapidly throughout East Asia, and South Korea also abandoned its pegged exchange rate in 1997 [3].

Chaebols, large business groups in South Korea, are considered vital in understanding the country's growth and consequent crisis development [4–6]. In the second half of the 1990s, the top-5 chaebols accounted for 10 per cent of GDP [7].

Financial liberalisation started in the 1980s, with the first attempts resulting in both currency and banking crises in 1997-1998. Before the crisis, chaebols had excessive debt, including foreign debt. Lee et al. [8] and Claessens et al. [9] consider this to be one of the primary reasons for the 1997 Korean crisis and its severity. Their high leverage also prevented Korean companies from adapting quickly to the recession and the credit crunch that followed the crisis.

Global Financial Crisis

South Korea was not directly involved in the U.S. subprime market crisis. However, the credit crunch hit the Korean financial markets severely. The credit crunch induced foreign and domestic liquidity crises and a currency collapse [10]. The currency depreciation was a by-product of the global deleveraging of households and financial businesses, which began with the U.S. subprime crisis in 2007 and deepened after Lehman's collapse in September 2008. As the crisis unfolded, there was a massive capital outflow between September 2008 and December 2008, estimated as 30% of the gross capital inflow since 1998 [10].

COVID-19 crisis

Unlike the previous crises in Korea, the COVID-19 turmoil is not a result of a system failure; it is a purely exogenous macroeconomic shock [11]. The pandemic and the resulting lockdown disrupted the business operations of many companies. With declining revenues and accruing expenses, even financially sound firms found them-

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[1] https://www.economywatch.com/economic-statistics/Korea/Output_Gap_Percent_of_Potential_GDP/

selves in a liquidity crisis [12; 13]. Testing, tracking and an early lockdown allowed South Korea to slow down the rapid pandemic spread faster than in many other developed countries[2]. However, such measures may not be the only reason for a successful struggle with the COVID-19 pandemic. Apart from them, the Korean government and the BOK have implemented relatively numerous policies during 2020 to support the economy and the nation[3]. Financing needed for firms to stay afloat is likely to change companies' balance sheets significantly.

Capital structure during crises. The severity of the previous crises has led many economists to explore their macroeconomic patterns and causes. However, microeconomic responses remain less thoroughly studied. For instance, capital structure analysis has acquired new significance since the crisis of 1997, when the high debt ratio of East Asian firms at the outset of the crisis implied subsequent sharp declines in the region's investment and growth [14]. The financial crisis ignited in 2007-08 has witnessed a series of corporate bankruptcies mainly owing to sub-optimal investing by firms fueled by their sub-optimal capital structure [15], thus emphasising the role of crises' effects on corporate capital structure.

Even though theories and determinants are common in literature on capital structure, it is essential to understand that these theories consider the demand side only, implicitly assuming a perfect elasticity of capital supply. This is primarily irrelevant during crises, even with well-functioning financial intermediaries. The agents' unwillingness to lend given economic uncertainty or scrutinising borrowers makes it difficult to take out loans and decrease overall lending. Therefore, it is possible that the firm indeed targets leverage, and it is optimal to increase debt, but there are insufficient funds in the market [16].

The existing papers prevailingly find the negative effect of crises on a firm's leverage [15–17]. For South Korea, debt ratios were expected to decrease after the Asian financial crisis, as high leverage was one of the main drivers of the crisis. The same pattern is expected for the global financial crisis, but the reason falls behind the credit crunch, which impedes debt financing, so the choice is shifted towards equity financing. On the contrary, the recent crisis can be expected to have a positive effect on the level of capital structure due to the absence of a credit crunch, increasing number of loan programs, the necessity to cover expenses under conditions of halted business activities.

Foreign ownership. This study focuses on firm-level foreign ownership. The literature on the determinants of investors' decisions to invest in a particular company is minimal, especially for foreign investors. In South Korea, there are some restrictions on foreign investors. Among the 1145 industrial sectors identified in the Korean Standard Industrial Classification, the Foreign Investment Promotion Act (FIPA) lists 61 exclusive sectors with no foreign investment and 28 restricted sectors[4]. Min and Bowman [18] draw attention to book-to-market ratio, dividend payout ratio, current ratio, and liquidity when analysing foreign ownership.

Foreign ownership and capital structure. Traditional theories outline the importance of agency costs, asymmetric information for leverage choice, and the role of monitoring in reducing market inefficiencies. The effectiveness of monitoring can affect the severity of firms' agency costs [19; 20]. For example, it may reduce the conflicts of interest between shareholders and managers, influencing capital structure decisions. Effective monitoring can lead to more efficient leverage levels, as debt financing is often used to discipline managers.

Ferreira and Matos [21] find that foreign investors monitor corporations worldwide based on a sample of 27 countries. Similarly, the results of Aggarwal et al. [22] suggest that international portfolio investment promotes good corporate governance practices around the world, analysing 23 countries.

Besides the monitoring role of foreign ownership, foreign investors may provide a broader set of credit sources [4], which is especially valuable during credit crunches. Eppinger and Smolka [23] conclude that foreign ownership provides companies with a financial advantage. Both the 1997 Asian and the 2008 global crises resulted in the deterioration of credit conditions, while no problems with credit supply were present during the 2020 COVID-19 crisis, which prompts investigating the role of foreign ownership as an additional channel of financing i.e., a direct substitute of debt.

The most recent papers on capital structure analysis use the dynamic trade-off theory [24; 25]. It is also often used in papers focusing on South Korea [26; 5]. Tsoy and Heshmati [5] use the dynamic trade-off theory to investigate the impact of crises on the capital structure in South Korea. Since it is suggested that foreign ownership reduces market inefficiencies, it is reasonable to assume that it increases the speed of adjustment of actual leverage towards the target [4]. The intuition is also consistent with Kim et al. [27], who show that firms with a higher share of foreign investments adjust rapidly towards their optimal level of capital structure.

Hypotheses

Based on literature review, we formulate the following hypotheses.

Hypothesis 1: Companies with foreign investors tend to have lower leverage ratios.

The hypothesis is based on the evidence that foreign investors are likely to engage in effective monitoring [21; 22].

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[2] https://www.nytimes.com/2020/03/23/world/asia/coronavirus-south-korea-flatten-curve.html

[3] OECD Economic Surveys: Korea 2020.

[4] Regulation for Foreign Investment and Technology Introduction, Ministry of Industry, Trade and Energy, 2018.

The monitoring decreases the incentives to use debt for its disciplinary role, reducing agency costs [19; 20].

Hypothesis 2: Companies with foreign investors are expected to adjust towards the target capital structure faster.

Following the intuition about foreign ownership reducing market inefficiencies, it is also expected that foreign ownership has an indirect effect on leverage through the speed of adjustment towards the target. According to [27], firms with a higher degree of foreign investment adjust rapidly towards their optimal level of capital structure.

Hypothesis 3: Foreign ownership results in higher leverage during crisis periods compared to non-period periods.

Foreign investors may provide a more extensive set of credit sources [4], which can be used in periods of credit crunches and liquidity constraints [23]. As a result, it may imply that companies with foreign investors can attract more debt during crises than companies without foreign investors. Thus, the effect of foreign ownership as a disciplining role and provision of more credit sources work in different directions and leverage during crises is expected to be higher than in regular times.

Methodology and data

The paper uses the framework of the dynamic trade-off theory to explain the capital structure dynamics. The total debt to total assets ratio is used to measure capital structure [28]. Foreign ownership is calculated as the percentage of shares outstanding owned by foreign investors. The analysis starts with the identification of channels via which foreign ownership can impact capital structure. The first channel refers to the direct effect of foreign ownership on the target leverage ratio. The second channel is the indirect effect of foreign ownership via its impact on the adjustment speed. These channels are later incorporated into the basic specifications of the dynamic trade-off theory.

Basic specification. The optimal leverage $L_{i,t}^*$ for firm i at time t is modelled as a function of firm characteristics in the previous period $X_{i,t-1}$:

$$L_{i,t}^* = \beta X_{i,t-1} \quad (1)$$

where $X_{i,t}$ is a vector of commonly used firm characteristics, including profitability, growth opportunities, non-debt tax shield, size, tangibility, business risk, and chaebol affiliation. The description of the variables can be found in Table 1.

Under perfect conditions, the observed leverage should be equal to optimal leverage $L_{i,t}^*$ that can be written as:

$$L_{i,t} = L_{i,t}^*$$

Then the leverage adjustment can be written as follows:

$$\Delta L_{i,t} \equiv L_{i,t} - L_{i,t-1} = L_{i,t}^* - L_{i,t-1}$$

Because the process of adjustment from one state to another can be costly for a company, it adjusts gradually with the speed of adjustment $\lambda_{i,t}$:

$$L_{i,t} - L_{i,t-1} = \lambda_{i,t}(L_{i,t}^* - L_{i,t-1}) \quad (2)$$

$$L_{i,t} = (1 - \lambda_{i,t})L_{i,t-1} + \lambda_{i,t}L_{i,t}^* \quad (3)$$

Plugging the equation for the target leverage, equation (1), and introducing random shock $\varepsilon_{i,t}$ in the model, the resulting model specification could be formulated as follows:

$$L_{i,t} = (1 - \lambda_{i,t})L_{i,t-1} + \lambda_{i,t}\beta X_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

Foreign ownership and capital structure. To account for the direct effect of foreign ownership $F_{i,t}$ on capital structure, we added $F_{i,t}$ to the model explicitly as a determinant of the target leverage. To mitigate the reverse causality problem, the lagged value $F_{i,t-1}$ is introduced. To account for possible asymmetry in the foreign ownership effect between under and over-leveraged companies, an interactive dummy variable $M_{i,t}$, is introduced, which takes the value of 1 if a company is under-leveraged and 0 otherwise:

$$L_{i,t} = \gamma_1 F_{i,t-1} + \gamma_2 M_{i,t-1}F_{i,t-1} + (1 - \lambda_{i,t})L_{i,t-1} +$$
$$+ \lambda_{i,t}\beta X_{i,t-1} + \varepsilon_{i,t} \quad (5)$$

Foreign ownership and speed of adjustment. According to Faulkender et al. [29], a change in leverage can occur without any actual adjustment of leverage towards the target due to changes in net income and retained earnings. The adjustment caused by profit is a "passive" adjustment, while the one caused by accessing capital markets (actual debt or equity is attracted) is an "active" adjustment. The paper focuses on active leverage adjustments. Then, an active deviation $dL_{i,t}$ involves the subtraction of a passive mechanical component $L_{i,t}^p$ from the target level $L_{i,t+1}^*$:

$$dL_{i,t} \equiv L_{i,t+1}^* - L_{i,t}^p \quad (6)$$

where

$$L_{i,t+1}^* = \beta X_{i,t}$$

$$L_{i,t}^p \equiv \frac{D_{i,t}}{A_{i,t} + NI_{i,t+1}}$$

The fitted value of target leverage from (4) is used as a proxy of $L_{i,t+1}^*$, $D_{i,t}$ denotes a book value of outstanding debt in period t, $A_{i,t}$ indicates a book value of total assets in period t, and $NI_{i,t+1}$ denotes net income in period $t+1$.

Then, equation (2) can be revised to model an active adjustment of leverage towards the target leverage:

$$\Delta L_{i,t}^a \equiv L_{i,t} - L_{i,t-1}^p = \lambda_{i,t}(L_{i,t}^* - L_{i,t-1}^p) + \varepsilon_{i,t} \quad (7)$$

Using equation (6), equation (7) can be rewritten:

$$\Delta L_{i,t}^a \equiv L_{i,t} - L_{i,t-1}^p = \lambda_{i,t}dL_{i,t-1} + \varepsilon_{i,t} \quad (8)$$

Then the active speed of adjustment can be derived from the ratio of active leverage adjustment to active leverage deviation:

$$\lambda_{i,t} = \frac{\Delta L_{i,t}^a}{dL_{i,t-1}} + \varepsilon_{i,t} \quad (9)$$

The speed of adjustment is modelled explicitly to account for the influence of foreign ownership:

$$\lambda_{i,t} = \lambda_0 + \lambda_1 F_{i,t-1} + \lambda_2 M_{i,t-1} F_{i,t-1} + \lambda_3 Z_{i,t-1} \quad (10)$$

where $Z_{i,t}$ is the vector of control variables including size, dividends [30], corporate governance [7], firm and annual fixed effects.

Foreign ownership and capital structure during crises. We introduced an interactive crisis dummy D_t to account for the change in the significance of foreign ownership during crisis periods, where D_t is the vector of crises dummies for the periods of Asian, global and COVID-19 crises, respectively [5; 1]:

$$L_{i,t} = \gamma_1 F_{i,t-1} + \gamma_2 M_{i,t-1} F_{i,t-1} + \gamma_3 D_{i,t} F_{i,t-1} +$$
$$+ \left(1 - \lambda_{i,t}\right) L_{i,t-1} + \lambda_{i,t} \beta X_{i,t-1} + \varepsilon_{i,t} \quad (11)$$

Foreign ownership and speed of adjustment during crises. To account for the change in the significance of foreign ownership during crisis periods, an interactive crisis dummy $D_{i,t}$ is introduced in the equation (10):

$$\lambda_{i,t} = \lambda_0 + \lambda_1 F_{i,t-1} + \lambda_2 M_{i,t-1} F_{i,t-1} +$$
$$+ \lambda_3 D_{i,t} F_{i,t-1} + \lambda_3 Z_{i,t-1} \quad (12)$$

Table 1. Description of variables

Variables	Measurement
Profitability	The ratio of net income to total assets
Growth opportunity	Market-to-Book ratio
Non-debt tax shield	The ratio of depreciation expenses to total assets
Size	Natural logarithm of total revenues
Asset tangibility	The ratio of tangible assets to total assets
Chaebol affiliation	1997-2001: 1 if categorised as chaebol by KFTC; 0 otherwise 2002-2008: 1 if total assets exceed two trillion KRW; 0 otherwise 2009-2016: 1 if total assets exceed five trillion KRW; 0 otherwise 2017-2020: 1 if total assets exceed ten trillion KRW; 0 otherwise
Dividends	The ratio of dividends to total revenue
Corporate governance	The ratio of non-floating shares to the total number of shares outstanding

Sources: Prepared by the authors.

We applied the Generalised Method of Moments (GMM) that results in unbiased and consistent estimates [31; 25] for the analysis of the direct effect, equations (5) and (11). We estimated the indirect effect (10, 12) using Pooled, Fixed Effect or Random Effect models.

Sample construction. The research is based on a sample of companies listed on the Korean Stock Exchange in the 1997-2020 financial years. Financial data was downloaded from the Bloomberg database. Additionally, data on total assets denominated in Korean won was downloaded to be consistent with the KFTC criteria when identifying chaebols. Chaebol dummies introduced in the model will be different for different periods to avoid identification bias.

Financial companies are excluded from the sample according to the specific balance sheet and income statement data [5]. We excluded the firm-year observations with missing information on significant variables and with fewer than two years of data. The final data set includes 809 firms with 11 275 firm-year observations. We keep the data unbalanced to avoid survivorship bias.

Discussion of results

This part opens with a presentation of the results of foreign ownership and capital structure analysis without accounting for crisis periods explicitly to test (Hypothesis 1) and (Hypothesis 2). Then, a crisis variable will be introduced to the models to present the results of Hypothesis 3 testing.

Based on the Lagrange Multiplier Test – Honda test results[5] for equations (10) and (12), the data panel structure should be considered, with Wooldridge's test[6] results in the Random Effect model being the most statistically appropriate for the estimation. All estimation methods are implemented to control for the individual and time-specific effects and use robust standard errors.

Foreign ownership and capital structure

Table 2 shows the results of the GMM estimation of the equation (5). The dependent variable is leverage.

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[5] Equation (10) Langrange Multiplier Test - Honda: p-value = 2.384e-13

Equation (12) Langrange Multiplier Test - Honda: p-value = 6.945e-13.

[6] Equation (10) Wooldridge's test: p-value = 0.307.

Equation (12) Wooldridge's test: p-value = 0.3061

Table 2. Leverage estimation output (GMM)

Variable	Estimate
Foreign ownership	-0.0166*** (0.0046)
Foreign ownership x Median dummy	-0.1232*** (0.0076)
Leverage (-1)	0.6969*** (0.0348)
Profitability	0.0280* (0.0141)
Growth opportunities	-0.0681 (0.0463)
Non-debt tax shield	-0.0257 (0.1695)
Size	-1.6761 (1.2415)
Tangibility	0.1243. (0.0749)
Median leverage	0.1318* (0.0553)
Chaebol dummies	Yes
	p-value
Sargan test	0.084003
Autocorrelation test (1)	< 2.22e-16
Autocorrelation test (2)	0.36605

Note: significance codes are 0 (***), 0.001 (**), 0.01 (*), 0.05 (.).

First, the negative and highly significant foreign ownership coefficient indicates downward pressure on the target leverage level, which results in lower observed leverage levels. Moreover, an interactive dummy of median leverage introduced in the model shows that when observed leverage is above the median level (Median dummy = 1), foreign ownership results in a more significant target leverage decrease than in an under-leveraged company.

Secondly, the effects of profitability, growth opportunities, non-debt tax shield, and tangibility are consistent with the trade-off theory expected signs. Year- and sector-specific median leverage ratio has positive significant coefficients, which is consistent with the fact that the leverage of individual companies converges with the median leverage of the whole industry in a specific period.

Overall, these estimation results support (Hypothesis 1) about foreign ownership facilitating lower levels of leverage. The channel of influence is likely to be the monitoring role of foreign investors, as the disciplining role of debt can be substituted.

Foreign ownership and speed of adjustment. Table 3 contains information on estimation output using the Random Effect model. The dependent variable is the speed of active adjustment.

Table 3. Speed of active adjustment estimation output (Random Effect)

Variable	Estimate
Constant	-1.6921*** (0.0122)
Foreign ownership	0.0016** (0.0006)
Foreign ownership x Median dummy	0.0180*** (0.0006)
Size	0.1066*** (00137)
Dividends	-0.0000 (0.0000)
Corporate governance	0.0027*** (0.0006)
	p-value
Chisq	< 2.22e-16

Note: Significance codes are 0 (***), 0.001 (**), 0.01 (*), 0.05 (.). *Source: authors' calculations*

The foreign ownership variable is positive and significant, meaning that the speed of active adjustment increases with foreign ownership. As the interactive median dummy and foreign ownership coefficient is positive and significant, it can be concluded that foreign ownership increases the speed of active adjustment more in over-leveraged companies. The result is intuitive; firms with relatively high leverage ratios tend to be financially distressed and are likely to substitute debt whenever possible. In this case, debt can be replaced by foreign ownership if it is issued to reduce agency costs of equity.

The results also offer evidence that larger companies and those with more non-floating shares tend to have a higher speed of active adjustment, which can be interpreted as companies having lower transaction costs.

Overall, the results from Table 3 support (Hypothesis 2): the faster speed of active adjustment in case of higher foreign ownership. The expected channel of influence is the reduced transaction costs due to monitoring in which foreign investors are engaged.

Results from Table 2 and Table 3 reflect the general pattern of the impact of foreign ownership on capital structure and find a direct influence on the target leverage and indirect effect via the speed of active adjustment.

Foreign ownership and capital structure during crises. Table 4 shows the results of the GMM estimation of the equation (11) and provides general information about foreign ownership during crises and, additionally, distinguishes different crises for a deeper analysis. The second column contains estimates using a model that does not account for various crises. The third column includes estimates that incorporate multiple crises periods. The dependent variable is leverage.

The effect of the crises can be broken down into the effects of Asian, Global and COVID-19 crises separately. Interestingly, foreign ownership resulted in even lower leverage levels during all crises, with only the COVID-19 impact being significant. The channel through which this change can be explained is likely the difficulty and high cost of debt attraction, so less debt can be used for its disciplining role when foreign ownership increases.

The analysis of crisis specifications does not support (Hypothesis 3) since, in all crisis periods, foreign ownership resulted in even lower leverage ratios, which contradicts the tested hypothesis. It is still possible that foreign investors expand the credit sources, which increases leverage, but the impact of monitoring probably outweighs it and the overall leverage decreases.

Table 4. Leverage estimation output during crises

Variable	Estimates	
Foreign ownership	-0.0168*** (0.0046)	-0.0160*** (0.0046)
Foreign ownership x Crisis dummy	-0.0031 (0.1505)	
Foreign ownership x Asian		-0.0349 (0.0292)
Foreign ownership x Global		-0.0331 (0.1242)
Foreign ownership x COVID-19		-0.0697* (0.0283)
Foreign ownership x Median dummy	-0.1234*** (0.0076)	-0.1282*** (0.0078)
Leverage (-1)	0.6967*** (0.0348)	0.6916*** (0.0348)
Profitability	0.0284* (0.0141)	0.0276* (0.0138)
Growth opportunities	-0.0675 (0.0459)	-0.0707 (0.0500)
Non-debt tax shield	-0.0219 (0.1680)	-0.0189 (0.1633)
Size	-1.6603 (1.2401)	-1.6234 (1.2304)
Tangibility	0.1233. (0.0744)	0.1182 (0.0741)
Median leverage	0.1319* (0.0552)	0.1362* (0.0560)
Chaebol dummies	Yes	Yes
	p-value	**p-value**
Sargan test	0.081829	0.075399
Autocorrelation test (1)	< 2.22e-16	< 2.22e-16
Autocorrelation test (2)	0.36847	0.35938

Note: significance codes are 0 (***), 0.001 (**), 0.01 (*), 0.05 (.).
Source: authors' calculations.

Foreign ownership and speed of adjustment during crises. Table 5 contains information on estimation output for the effect of foreign ownership on the speed of active adjustment during crises using the Random Effect model. The dependent variable is the speed of active adjustment.

Table 5. Speed of active adjustment estimation output (Random Effect)

Variable	Estimates	
Constant	-1.6922*** (0.0122)	-1.7095*** (0.0123)
Foreign ownership	0.0016** (0.0006)	0.0016** (0.0006)
Foreign ownership x Crisis dummy	0.00007 (0.0009)	
Foreign ownership x Asian		0.0042** (0.0015)
Foreign ownership x Global		0.0043* (0.0020)
Foreign ownership x COVID-19		-0.0065*** (0.0016)
Foreign ownership x Median dummy	0.0180*** (0.0006)	0.0186*** (0.0006)

Variable	Estimates	
Size	0.1065*** (00137)	0.1080*** (00137)
Dividends	-0.0000 (0.0000)	-0.0000 (0.0000)
Corporate governance	0.0027*** (0.0006)	0.0028*** (0.0006)
	p-value	**p-value**
Chisq	< 2.22e-16	< 2.22e-16

Note: significance codes are 0 (***), 0.001 (**), 0.01 (*), 0.05 (.).
Source: authors' calculations.

It is apparent that foreign ownership is positive and significant both during crisis and non-crisis periods and close to the values in Table 3. Overall, the change in foreign ownership influence during crises is positive and insignificant. However, from the analysis of the specific crises, it can be inferred that a single percentage point increase resulted in a more significant increase of the speed of active adjustment by 0.42 and 0.43 percentage points, on average, ceteris paribus, during Asian and Global financial crises, respectively. While the result of the COVID-19 crisis is precisely the opposite and more significant: during the crisis, a percentage point increase in foreign ownership reduces the speed of active adjustment by 0.65 percentage points, on average, ceteris paribus, and even makes the influence on the speed negative. The channels of changes may be inherent in the nature of the crises. The first two are financial crises, while the latter is a pandemic. During the financial crises, the ability to borrow is limited, which is likely to result in debt substitution, and the contribution of foreign investors becomes relatively higher. On the other hand, credit supply was not limited during the COVID-19 crisis. Moreover, additional loan supporting programs have been introduced, which has made borrowing cheap and has reduced the significance of foreign investors in the speed of active adjustment since adjustment can be easily financed by debt.

Overall, the findings support the intuition that foreign ownership is a substitute for debt in its disciplining role.

Conclusion

This study provides insights into the foreign ownership effect on the firms' capital structure in crisis and non-crisis periods, which remains unexplored.

In the paper, we show that foreign ownership has a significant negative impact on company target leverage and, through that, on the observed leverage with a more significant effect for the over-leveraged firms. When analysing the Asian financial crisis, the global financial crisis, and the COVID-19 crises, it becomes apparent that all three resulted in even lower leverage. Still, only the latter implied a significant change in the impact of foreign investors on company leverage.

An analysis of active adjustment led us to conclude that foreign ownership facilitates a higher speed of adjustment towards the target leverage level. The cost of borrowing during crises can explain the directions: substitution of debt when credit supply is limited or expensive (Asian and Global crises), and substitution of foreign ownership when borrowing is cheaper (COVID-19 crisis). An analysis of the crises demonstrates that foreign ownership increased the speed of active adjustment during the Asian and global financial crises, while COVID-19 reduced its influence.

Overall, the paper concludes that foreign ownership influences a company's capital structure directly by changing the target leverage and indirectly via the speed of adjustment. The findings are consistent with those of empirical papers that presume concluding lower leverage ratios for companies with higher foreign ownership and of theoretical papers focusing on the monitoring role of foreign investors.

The results of the research paper are helpful both in academic and practical spheres. Academics can use the paper to benchmark foreign ownership and its relationship with capital structure in crisis and non-crisis periods. In practice, results can be used by company managers when facing crises or other macroeconomic shocks. The findings may also guide policymakers in credit crunches and liquidity crises to facilitate investment from abroad when credit supply is limited.

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