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경영학 석사 학위논문

Strategic Default and Distress Risk

Puzzle: Evidence from Korea

전략적 부도와 부도위험 이상현상:

한국 시장을 중심으로

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이지원

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지도교수 이 종 섭

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이지원

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2019년 12월

위원장 조재호 (인)

부위원장 고봉찬 (인)

위원 이종섭 (인)

Abstract

Strategic Default and Distress Risk Puzzle: Evidence from Korea

Jiwon Lee

College of Business Administration

The Graduate School

Seoul National University

Exploiting unique identification opportunities in Korea, I empirically examine the effect of shareholder bargaining power over creditors on the distress anomaly (Campbell, Hilscher, and Szilagyi (2008)), the negative risk premium for distressed stocks. Korean data provide rich cross-sectional and time-series variation in the relative shareholder bargaining power over creditors. I find that the distress anomaly is primarily observed among firms in business groups, whose controlling shareholders have stronger bargaining power over creditors than those of non-business group firms. I further show using an exogenous bankruptcy law reform in 2006 that the asymmetry in the distress anomaly is significantly reduced post-reform when the cross-sectional difference in shareholder bargaining power is significantly reduced between the two groups due to Debtor-in-Possession (DIP) rule change. My results suggest that strategic default by shareholders is one of the major contributing

factors to shape the distress risk puzzle.

Keywords: Distress anomaly, Strategic default, Bankruptcy, Business groups

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I. Introduction

This paper explores the effect of the corporate governance structure on the distress risk puzzle by exploring a unique identification strategy. Theoretically, firms with high shareholder bargaining power have a negative relationship between the level of distress risk and the expected equity return due to strategic default (Garlappi et al. (2008)). Violations of the absolute priority rule in bankruptcy imply that default may not be costly to shareholders, who could default strategically in order to gain at the expense of creditors. Existing empirical studies using simple proxies for the relative shareholder bargaining power over creditors report mixed evidence on this issue, due in part to the innate endogeneity in those measured proxies for shareholder bargaining power. Given the complex corporate governance structure and institutional characteristic differences, it is difficult to sharply identify whether the distress anomaly exists and under what circumstances such anomalies got deepened. In this paper, I introduce a novel identification strategy to capture the effect of shareholder bargaining power over creditors and test if it could be one of the major contributing factors to the distress anomaly.

Korean economy provides a rich and unique opportunity to test this relation between strategic default option and distress risk puzzle. First, there is a significant cross-sectional difference in shareholder bargaining power. Business group firms endow a stronger bargaining position to their controlling shareholders over creditors,

whereas non-business group firms do not exhibit such strong bargaining opportunity to their shareholders against creditors. I find that the distress anomaly exists asymmetrically in business group firms that have high shareholder bargaining power.

Not only relying on this cross-sectional heterogeneity but also exploiting an exogenous bankruptcy law reform in Korea in 2006, I design a difference in difference test and show that the distress anomaly is affected by the changing shareholder bargaining power against creditors before and after the reform for two different group of firms – business group members and non-business group firms. When the cross-sectional difference in shareholder bargaining power over creditors is reduced between these two types of firms, I show that the difference in distress risk premium is significantly reduced, consistent with the effect of strategic default on the shareholder wealth extraction from creditors around corporate default. Overall, my study provides clean empirical evidence that the relative shareholder bargaining power against creditors is one of the major contributing factors to shape the distress risk puzzle.

I test the shareholder bargaining power hypothesis in a panel of 2,621 firms over the period from 1997 to 2018 which covers the Asian Financial Crisis and the Great Recession. A novel hand-collected bankruptcy disclosure data is used to construct the bankruptcy indicator.

I carry out my analysis in three steps. First, I estimate firms' distress probability using the conditional logit model of Campbell et al. (2008), including a

business group dummy variable. The superior ability to forecast distress probability of the logit model compared to other measures such as Merton's distance-to-default (1974), Altman's Z-score (1968), and Ohlson's O-score (1980) is proven in several prior studies (Shumway (2001), Chava and Jarow (2004)). I find that the business group dummy is negatively associated with distress probability significant at the 1% level, which indicates the positive role of internal capital market as Gopalan et al. (2007) argue in their test on Indian business groups. I also find that bankrupt firms in business groups actually have less severe ex-post returns implying the possibility of the strategic default option.

Second, I show that the distress anomaly only exists in business group firms with strong shareholder bargaining power in the cross-sectional test of distress-probability-sorted portfolios, consistent with shareholder bargaining power hypothesis. Business group firms' long-short portfolio that buys the safest and sells the riskiest portfolio generates positive 3-factor and 4-factor alphas, 1.59% and 1.62% per month, significant at the 1% level. The results are similar when I test mean excess return and CAPM alpha. However, a long-short portfolio of non-business group firms does not show the distress anomaly; its excess return and alphas are neither significant nor greater than those of business group firms.

Third, in a difference-in-difference test, I further confirm that the relative cross-sectional gap in equity returns is significantly reduced in the post-reform period when the bankruptcy law becomes favorable to shareholders. The average

difference in monthly mean excess returns between the two groups is reduced by 2.78%p at the 5% significance level. Similarly, the differences in monthly alphas are also significantly reduced by about 2%p. This reduced gap results from the significant reform effect in non-business group firms, with relative weak shareholder bargaining power, showing the distress anomaly after the reform. Their long-short portfolio yields significantly positive return and alphas post-reform. For example, its monthly 3-factor alpha significantly rises to 0.48% per month significant at the 5% level, compared to -0.43% pre-reform. My findings coincide with the results of Hackbarth et al. (2015), where they find that the bankruptcy law reform effect is greater in low-shareholder-bargaining-power firms in their test of CAPM beta of the US market. Although a long-short portfolio of business group firms still generates more economically and statistically significant 3-3factor and 4-factor alphas about 1.11% per month post-reform, the cross-sectional difference in alphas between two subsamples is no longer significant.

My results are robust in the cross-sectional test of two group-level proxy variables of shareholder bargaining power within business group firms. I predict that the larger group total assets and/or the more member firms the firm has, the greater the level of distress anomaly it shows. The empirical findings are consistent with the prediction; a long-short portfolio yields higher 3-factor and 4-factor alphas in larger firms, 1.33% and 1.38% per month, compared to 0.82% and 0.85% in smaller firms. I find similar results in subsamples divided by the number of member firms. Thus, there is a cross-sectional variation in the distress anomaly even within business group

firms according to the magnitude of shareholder bargaining power. Examining firm-level proxies, I also find the evidence supporting my hypothesis that shareholder bargaining power turns out to be significantly stronger in business group firms.

This paper contributes to the literature in three ways. The first contribution is to suggest findings to reconcile the conflicting evidence on the existence and the potential rationales behind the distress risk puzzle, recently expanded to global market (Chava and Purnanandam (2010), Friewald et al. (2014), Gao et al. (2018), Aretz et al. (2018), Eisdorfer et al. (2018)). My findings give support to the hypothesis that one of the main driving forces of the puzzle is the strategic default option available to strong shareholders against creditors by employing clean identification strategy and unique dataset.

Second, it contributes to the literature on the creditor rights by suggesting another empirical evidence of the importance of relative bargaining power between shareholders and creditors in firms' activities and outcomes. After Hart and Moore (1994, 1998) first suggest strategic default, its role in investment outcomes, equity risk, and credit spread is also highlighted in many existing papers (Davydenko and Strebulaev (2007), Favara et al. (2012), Hackbarth et al. (2015), Schoenherr (2018)). Moreover, I suggest a new identification strategy for shareholder bargaining power by using business group data and a quasi-natural experiment, which is developed from accounting proxy measures containing potential endogeneity issues.

Lastly, it also contributes to the business group studies. I figure out that the

effect of the strategic default option on equity returns in business groups are significantly distinguished from those of non-business groups. Furthermore, it is the first study to test the existence of distress anomaly in relation to the heterogeneity in corporate governance structures around the globe.

The rest of the paper proceeds as follows. Section II reviews previous studies on the distress anomaly and Section III develops testable hypotheses. Section IV provides an explanation of data and a brief explanation of the bankruptcy law reform in Korea, 2006. Section V provides empirical results on hypotheses. Section VI concludes.

II. Literature Review

The negative relationship between distress risk and equity returns are reported in many existing papers such as Dichev (1998), who first finds bankruptcy risk is not rewarded by higher returns in the US market, casting doubt on the role of distress risk in explaining size and value effects. Campbell et al. (2008) also show that financially distressed stocks have higher market betas and other risk factor loadings but anomalously lower returns in their try to explain this phenomenon by a limit in arbitrage opportunities. Their paper also contributes to the literature, suggesting a dynamic logit model to forecast distress probability which develops earlier studies such as Shumway (2001) and Chava and Jarrow (2004).

After Campbell et al. (2008) suggest the distress anomaly, various studies

try to explain this anomaly. One approach is a risk-based explanation. Chava and Purnanandam (2010) argue that the negative relationship between default risk and expected returns is a misrepresented outcome caused by the use of noisy ex-post realized returns as a proxy of expected returns since they find the positive relationship by using implied cost of capital. George and Hwang (2010) show that this negative relationship can be explained by firms' rational optimization in taking leverage as firms with high costs choose low leverage to avoid distress but are still exposed to a high level of systematic risk, which triggers the negative relationship between returns and leverage as well as returns and distress intensity. Friewald et al. (2014) and Anginer and Yildizhan (2018) also argue that the distress anomaly can be explained by the better measure of distress risk such as CDS and corporate bond credit spreads.

On the other hand, a line of research tries to explain the relationship between equity return and distress risk through the relative bargaining power between shareholders and creditors. For example, Garlappi et al. (2008) show in their theoretic model that the relationship between default probability and equity returns varies according to shareholder advantages in the debt renegotiation process, which even brings a humped or downward sloping relationship for firms with strong shareholder bargaining power due to strategic default. Garlappi and Yan (2011) also introduce financial leverage to explain humped shaped equity beta and expected returns in relation to shareholder recovery. Hackbarth et al. (2015) suggest that the 1978 bankruptcy law reform in the US that shifts bargaining power in financial

distress from creditors to shareholders reduces equity returns, risk factor loadings, and alphas.

Gao et al. (2018) suggest a behavioral interpretation of the distress anomaly instead of rational models. Employing two measures of investor overconfidence, individualism and market states, they find that the distress anomaly is stronger in countries with high individualistic cultures and in periods directly preceded by aggregate market gains. They also suggest the international evidence of the distress anomaly in their test across 38 countries. The negative relationship exists extensively in small stocks of developed countries while this relationship exists only in Korea and Chile among emerging countries.

Eisdorfer et al. (2018) and Aretz et al. (2018) also examine the distress anomaly in international markets but suggest mixed results. These mixed results may result from the difference in measures of the distress risk used. Eisdorfer et al. (2018) employ the distance-to-default from Merton's (1974) model, similar to Moody-KMV's Expected Default Frequency (EDF) used in Gao et al. (2018) and find that the negative relationship between distress risk and equity returns appears dominantly in developed markets. However, Aretz et al. (2018) find a positive relationship in 14 developed markets estimating the distress probability of firms using the conditional logit model of Campbell et al. (2008). They also find conflicting evidence in relation to bargaining power between shareholders and creditors by testing aggregate country-level indices such as Creditor Right Index (La Porta et al. (1998)), Creditor

Recovery Rate (Djankov et al. (2008)), and the Renegotiation Failure Index (Favara et al. (2012)).

III. Hypotheses

This section introduces hypotheses to test the effect of shareholder bargaining power on the relationship between distress risk and equity returns. If shareholders have high bargaining power, they can have advantages over creditors in the debt renegotiation process, triggering deviation from absolute priority rule in bankruptcy and strategic default. Since the bankruptcy event becomes less costly, it leads to a humped or even downward-sloping relationship between distress risk and equity returns, the pattern of the distress anomaly (Garlappi et al. (2008)). Since business groups have stronger shareholder bargaining power endogenously thanks to their unique ownership and governance structure, they are more likely to show the distress anomaly than non-business groups. On the other hand, non-business group firms are unlikely to show the distress anomaly since their shareholders have relatively lower bargaining power which reduces the private benefit of strategic default. Without the strategic default option, non-business group firms would have a positive risk premium. Therefore, hypothesis 1 is as follows.

Hypothesis 1-1. The business group firm is likely to have a negative relationship between distress risk and equity returns (distress risk puzzle) because it has strong shareholder bargaining power.

Hypothesis 1-2. The non-business group firm is likely to have a positive relationship between distress risk and equity returns because it has weak shareholder bargaining power.

Furthermore, I exploit the quasi-natural experiment in Korea, the bankruptcy law reform in 2006, to test the effect of an exogenous shock on shareholder bargaining power. In the post-reform period, shareholders of non-business groups can also enjoy extended strategic default options thanks to exogenously increased bargaining power. Thus, I expect that non-business groups begin to show the distress anomaly in the post-reform period. Since shareholders of business groups already leverage their strong bargaining power even in the pre-reform period, the reform effect would not be great. It would decrease the cross-sectional difference between equity alphas in the post-reform period because the relative difference in the bargaining power of shareholders is reduced. Thus, hypothesis 2 is established as follows.

Hypothesis 2-1. The relative difference in portfolio alphas between business groups and non-business groups will decrease in the post-reform period.

Hypothesis 2-2. The reform effect will be greater in non-business groups and they will also show the distress anomaly in the post-reform period.

IV. Data

IV.1 Data Construction

This section provides a brief description of the dataset and its summary statistics.

To forecast distress probability, I adopt a conditional logit model from Campbell et al. (2008) and construct a dataset. Their model is widely used to forecast distress probability in the literature (Hackbarth et al. (2015), Aretz et al. (2018)). The model forecasts a firm's distress probability by regressing the indicator of financial distress on accounting and equity market variables. First, to construct $\text{BANKRUPTCY}_{i,t}$, a financial distress indicator, I hand-collect bankruptcy disclosure data from KIND (Korea Investor's Network for Disclosure), a web-based corporate filing system of Korea Stock Exchange. It consists of companies listed on two markets of Korea Stock Exchange, KOSPI and KOSDAQ, including delisted companies during the sample period, from January 1997 to December 2018. $\text{BANKRUPTCY}_{i,t}$ takes a value of one in month t when a firm i discloses that it applies for the bankruptcy proceeding, both formal court receivership and out-of-court restructuring. I do not permit multiple defaults for one firm. In other words, if a firm declares a default, the indicator has a value of one and the firm is removed from the sample. Campbell et al. (2008) also test a failure dataset, a broader set including firms delisted for financial reasons or received a D rating. However, I do not expand the dataset since they are not related to the strategic default option.

I also collect business group data from the Korean Fair Trade Committee (KFTC). It annually designates the list of business groups by their total assets according to the Monopoly Regulation and Fair Trade Act since 2001. For the period before 2001, I collect the largest 30 business group data classified by its total assets from the KFTC, following the approach in Joh (2003). The rest of the firms are treated as non-business group firms.

Table 1 presents the number of active and bankrupt firms by year. Column 1 shows the annual average number of active firms. Column 2 represents the number of bankrupt firms each year. A firm is treated as being bankrupt when it files for bankruptcy and removed from the active firm sample. Column 3 shows the bankruptcy rate, the proportion of firms going bankrupt among active firms each year.

Table 1 shows a consistent trend in the bankruptcy rate during the sample period except for the late 1990s, the Asian Financial Crisis, when the rate records its highest level. This crisis led to systemic default across the entire economy since Korean firms relatively less concerned about leverage management and heavily depended on inter-company loans before the crisis. In 1998, the bankruptcy rate dramatically rises to more than 10%. From 1997 to 1999, 185 firms filed for bankruptcy, accounting for more than 40% of total bankrupt firms during the sample period. However, after the crisis, the bankruptcy rate tends to be stabilized around 1% although it slightly increases to 1.29% in 2010 right after the Great Recession.

Figure 1 shows the bankruptcy rate in business groups and non-business groups. Panel A presents the number of bankrupt firms and Panel B provides the bankruptcy rate in two subsamples. During the Asian Financial Crisis, non-business groups record a relatively higher bankruptcy rate which reaches its peak at 12.0% in 1998 whereas the peak level of business groups is 9.9% in 1997. In 2013, it increases to 4.0% in business groups but this is mainly because of serial defaults in two business groups. Overall, the bankruptcy rates of both subsamples remain quite steady after the crisis, although that of business groups seems slightly lower than that of non-business groups.

In addition, I also collect accounting and equity market data to construct explanatory variables in the best model of Campbell et al. (2008). Quarterly accounting data is collected from TS-2000. Monthly and daily stock market data is taken from Dataguide. Explanatory variables consist of average net income margin (NIMTAAVG), total liabilities to market value of total assets (TLMTA), average relative excess stock return (EXRETAVG), annualized volatility of stock return (SIGMA), relative size of market capitalization (RSIZE), cash, cash equivalent and short-term investments to market value of total assets (CASHMTA), market to book ratio (MB), and log price (PRICE). They are constructed mainly following the specification of Campbell et al. (2008). For example, 10% of the book value of equity is added to the market value of total assets, since many distress companies suffer from the negative book value of equity. All variables are winsorized at 1st and 99th percentiles across all firm-month observations. Detailed explanation of explanatory

variables is provided in Appendix A.

Table 2 summarized sample properties. It provides mean, median and standard deviation of each variable for all sample firms (columns 1 to 3), survived firms (4 to 6), and bankrupt firms (7 to 9). Firm-month observations of 334,025 which have non-missing values of all variables are only included. Bankrupt firms are the firms that apply for bankruptcy each month and survived firms are the rest of firms. Columns 10 and 11 report the difference between the mean value of each variable of survived firms and bankrupt firms and its t-statistics.

Panel A of Table 2 displays descriptive statistics of full sample firms. On average, bankrupt firms show relatively negative characteristics in most of the variables, such as lower profitability and higher leverage. These differences are significant at the 1% level. However, there are no statistically significant differences between bankrupt and survived firms in PRICE and MB. According to Panel B and C, business group firms and non-business group firms show similar patterns to that of the full sample. All differences in variables except PRICE and MB are significant at the 1% level as well.

To illustrate the difference in bankruptcy between business group firms and non-business group firms, I compare the characteristics of bankrupt firms of those two groups in Panel D of Table 2. Overall, bankrupt firms in business groups have significantly less severe financial difficulties. For example, they generate a relatively higher profit margin and equity return than those in non-business groups. It implies

that business group firms apply for bankruptcy in less severe financial difficulties.

However, bankrupt business group firms have significantly higher leverage and lower cash. These differences are significant at the 1% level. It can be interpreted in two ways. First, they can stay longer even if they have liquidity problems. Maybe this is because they can get support from their group, which indicates the evidence of internal capital market, as Gopalan et al. (2007) find that it functions by providing intragroup loans to avoid default. On the other hand, it is also possible to interpret that they default because of the liquidity problem, not because of severely worsened financial performance. If the firm's default is endogenously decided within the business group, it is possible that cash of a planned-to-default firm is moved to other member firms while their liabilities are moved to the default firm. It might act as a bad company in the group, just like the bad banks that emerged in the financial crisis.

IV.2 Bankruptcy Law Reform in Korea

This section describes a major change in the bankruptcy law in Korea and its effect on shareholder bargaining power.

In 2006, a new bankruptcy law, the Unified Bankruptcy Act (UBA), was enforced in Korea motivated by the advice of the International Monetary Fund (IMF) that recommended that Korea should amend its bankruptcy law to follow the US system when it provided a bailout in the Asian Financial Crisis. This event was a major change in the legislative history of the bankruptcy law in Korea, which

incorporated two separate corporate bankruptcy laws. Before the UBA, two separate bankruptcy proceedings were available to Korean firms. Composition was very restrictively available for small firms with a simple debt structure (Park (2005), Schoenherr (2018)). On the other hand, the corporate reorganization was possible for all firms, of which standard practice is that the court-appointed trustee engages in a sales process upon bankruptcy filing (Ko (2007), Schoenherr (2018)).

By adopting the Debtor-in-Possession (DIP) system, the enforcement of UBA increases overall shareholder bargaining power. It is introduced to encourage the management of the distressed firm to apply for bankruptcy and restructure the firm in a timely manner. Thus, shareholders can still exercise their power to the firm through their agent, the incumbent management who can stay even after the bankruptcy. Management stay system is considered as one of the important mechanisms to deter the creditor protection (La Porta et al. (1998)). A lot of controlling shareholders prevailing in Korean firms serve as CEO themselves and magnify this effect on shareholder bargaining power. Although some firms can choose the management-stay option even before the UBA, the option is restrictively allowed to small firms with low total debts under the Composition Act. Therefore, the management stay system is generally regarded not available in Korea before the UBA (La Porta et al. (1998)).

For example, the Woongjin group, which used to be ranked in 38th among business groups, tried to leverage the UBA to exercise the power of the controlling

shareholder to the maximum. In 2012, when its holding company went bankrupt, Seok-Keum Yoon, the controlling shareholder and founder of the group, tried to secure his control right by staying in the CEO position after designating himself as a co-CEO at the date when the firm filed for bankruptcy. Under the UBA, the incumbent CEO can secure his position unless he is accused of a significant breach of duty. Since Yoon was accused, the creditors raised objections against him to the court. However, although the court dismissed him, it permitted Kwangsoo Shin, the other co-CEO and right-hand man of Yoon, to stay in the firm instead. As a result, it caused the exceptionally favorable debt reorganization plan for the controlling shareholder, which guaranteed his ownership and control right of the firm. As seen from this anecdote, the management stay system enables controlling shareholders to pursue their private benefits even after bankruptcy by achieving greater deviations from absolute priority rule.

Admittedly, there might be a debate on whether this event can be used for the difference-in-difference test. It is possible to say that shareholders can anticipate the favorable change in their bargaining power before the UBA becomes effective. Nevertheless, it would not be easy to expect the exact magnitude and the direction of the effect of the introduction of the UBA ex-ante. This is due to the fact that the UBA brought a drastic structural change into bankruptcy code. There are nine important changes brought by the UBA. Among them, two changes are considered in favor of shareholders, whereas four changes against them. Thus, it is not exaggerating to say that it is difficult to exactly expect the impact of the UBA on

shareholder bargaining power. After the UBA became effective, it is generally regarded as a favorable event for shareholders (Kim et al. (2016)).

V. Results

V.1 Distress Probability and Ex-Post Returns

This section suggests a distress probability forecasting model, considering the corporate governance structure. It also reports the test comparing the severity of bankruptcy outcomes.

To measure distress risk for individual firms, I adopt the conditional logit model of Campbell at el. (2008). Business group dummy variable (GROUP) is included in explanatory variables to investigate the effect of heterogeneous corporate governance structures on the probability of bankruptcy since there is a significant difference between default firms in business groups and non-business groups as seen in Table 2.

I assume that the marginal probability of bankruptcy follows a logistic distribution.

$$P_{t-12}(BANKRUPTCY_{i,t} = 1) = \frac{1}{1 + \exp(-\alpha - \beta x_{i,t-12})},$$

where BANKRUPTCY_{i,t} is a bankruptcy indicator of a firm i in month t and x_{i,t-12} is

a vector of explanatory variables consisting of accounting, stock market, and business group dummy variables at the end of month t-12. A 12-month-ahead model is selected to estimate distress risk across firms conservatively as suggested by Campbell et al. (2008).

Table 3 reports the result of the conditional logit regression. All explanatory variables are significant and most of the coefficients have the same signs as expected in Table 2. The firm is more likely to go bankrupt in 12 months if it has characteristics such as lower profitability, higher leverage and so on. One notable point is that MB is positively associated with BANKRUPTCY. This positive relationship might be not because bankrupt firms are growth stocks, but because they have a significantly low book value of equity eroded by low profitability.

On the other hand, GROUP is negatively associated with the probability of bankruptcy at the 1% significance level. Thus, business group firms are less likely to go default, other things equal. It indicates that internal capital market functions well in Korean business groups.

Meanwhile, it is expected that business group firms have not only low distress probability, but also less severe results in bankruptcy state. It decreases the cost of bankruptcy while the strategic default option becomes more attractive to shareholders and leads to a higher likelihood of the negative relationship between distress risk and equity return.

Table 4 reports ex-post equity returns of bankrupt firms in business groups

and non-business groups. Ex-post returns are buy-and-hold excess returns of 1 month, 3 months, 6 months, and 1 year after a firm declares bankruptcy in a month t . Columns 1 to 3 (4 to 6) show the number of observations, mean excess returns and t-statistics of bankrupt firms in business groups (non-business groups). Columns 8 and 9 report the mean difference test and t-statistics.

In Table 4, business group firms show significantly higher ex-post returns up to 6 months after declaring bankruptcy than non-business group firms. The difference in ex-post returns between two subsamples is 12.34%p one month after filing for bankruptcy. The gap widens to around 20%p until six months later. One year later, the difference is not significant any more although bankrupt firms in business groups still show higher excess returns on average.

Therefore, the bankruptcy event is considered less costly in business groups, which is likely to build a negative relationship between distress risk and equity return. However, it cannot still exclude the possibility that business groups' higher ex-post returns are caused by relatively higher profitability and other financial performance better at the time of bankruptcy. Thus, the more careful scrutiny to analyze ex-post returns of the two groups is needed.

V.2 Portfolio Analysis

This section analyzes returns of distress-risk-sorted portfolios including long-short portfolios.

To measure the distress risk premium, I sort stocks into tercile value-weighted portfolios every January by distress risk, using the fitted value from the model in section V.1. Monthly portfolio returns are calculated using monthly-updated weights. If a stock is delisted in the middle of the year, then portfolio weight is adjusted under the assumption that the proceeds from the stock are reinvested. In order to minimize trading costs, penny stocks of which prices are lower than KRW1,000, corresponding to US\$1 criteria, are excluded.

Table 5 reports mean excess return as well as CAPM, 3-factor (Fama and French (1993)), and 4-factor (Carhart (1997)) alphas of distress-risk-sorted portfolios. A long-short portfolio is a zero-cost portfolio buying the safest (portfolio 1) while selling the riskiest portfolio (portfolio 3). It also reports the value-weighted mean and standard deviation of distress probability for each portfolio. Portfolio factor loadings are provided in Appendix B.

In Panel A, full sample portfolios show the negative relationship between distress risk and equity risk premium. Portfolio 1 has a positive monthly CAPM alpha of 0.58%, significant at the 5% level. After controlling other risks, 3-factor and 4-factor alphas become greater, generating about 1.0% monthly excess return significant at the 1% level. On the other hand, portfolio 3 generates negative 3-factor (-0.35%) and 4-factor (-0.37%) alphas significant at the 1% level. The long-short portfolio has significantly positive 3-factor (1.40%) and 4-factor (1.42%) alphas at the 1% level. Portfolio alphas decrease monotonically according to distress risk.

In order to analyze the effect of shareholder bargaining power, I suggest the results of two subsamples, business groups and non-business groups, in Panel B and C. If the firm belongs to the business group in one year but it is no longer in the business group in the following year, then it is reclassified as a non-business group firm that year and vice versa.

According to Panel B, business group portfolios also show the pattern of distress anomaly. Mean excess return and alphas decrease monotonically from portfolio 1 to portfolio 3. Portfolio 1 has positive CAPM (0.78%), 3-factor (1.12%), and 4-factor (1.11%) monthly alphas significant at the 1% level as well as a mean excess return (1.08%) at the 10% level. Alphas of portfolio 3 are negative although they are not statistically significant. All returns of a long-short portfolio are significant and positive. A monthly mean excess return is 0.79% and a CAPM alpha is 0.82%, significant at the 10% level. After controlling size, value and momentum risks, the economic and statistical significance of alphas become greater; 3-factor and 4-factor alphas of 1.59% and 1.62% significant at the 1% level.

On the other hand, non-business group portfolios do not show the pattern of the distress anomaly in Panel C. None of the portfolio alphas and mean excess returns are significant. Moreover, a mean excess return and a CAPM alpha of the long-short portfolio are negative, which are opposed to the distress anomaly. Thus, non-business group portfolios have a positive relationship between distress risk and expected returns and are well priced in the market.

Therefore, only business groups report the distress anomaly, the negative relationship between distress risk and equity return, which supports the shareholder bargaining power hypothesis (hypothesis 1). It is likely that shareholders of business group firms feel less threatened by bankruptcy and thus pay less distress risk premium since they can exercise higher bargaining power against creditors through their governance structures, which enables them to deviate from absolute priority rule and utilize strategic default option. This result supports previous studies on shareholder bargaining power and the negative distress risk premium (Garlappi et al. (2008), Hackbarth et al. (2015)). Presumably, the distress anomaly in full sample portfolios is likely to be driven by business group firms.

V.3 Channel Test

In this section, I conduct two tests to further examine whether the distress anomaly in business groups is driven by relatively higher shareholder bargaining power. First, I examine whether business group firms actually have higher shareholder bargaining power by comparing proxy variables of bargaining power between business group firms and non-business group firms.

I construct three proxy variables of shareholder bargaining power. First, a higher proportion of short-term debt in total debt (STDEBT) is related to lower shareholder bargaining power. Since short-term lenders rarely forgive the debts, a higher proportion of short-term debt gives less room for shareholders to exercise

their bargaining power in debt renegotiation (Gertner and Scharfstein (1991), Berglof and von Thadden (1994), Davydenko and Strebulaev (2007)). Similarly, a higher proportion of bank debt in total debt (BANKDEBT) is related to lower shareholder bargaining power against banks. Public bond ownership with atomistic bondholders tends to make renegotiation easier and enable firms to deviate more from absolute priority rule (Gertner and Scharfstein (1991), Rajan (1992), Davydenko and Strebulaev (2007), Hackbarth et al. (2015)). Quarterly debt data from TS-2000 is used to construct these variables. Also, the higher ownership the largest shareholder has (OWNERSHIP), the stronger the bargaining power he has. Hackbarth et al. (2015) suggest that a higher level of insider ownership further aligns the incentives of management and shareholders. I measure OWNERSHIP as the annual ownership of the largest shareholder and its related parties in percentage term from TS-2000 instead of insider ownership since it is very common in Korea that a firm has controlling shareholders and they designate management on behalf of them.

Table 6 shows the result that compares proxy variables of shareholder bargaining power between business group firms and non-business group firms, which shows expected signs. Panel A reports the mean value of proxy variables of two kinds of firms and the mean difference test in the full sample. In Panel A, business group firms have a significantly lower STDEBT (48.88%) and BANKDEBT (61.12%) than non-business group firms on average. The differences are -10.85%^p for STDEBT and -12.48%^p for BANKDEBT, both significant at the 1% level. Moreover, the largest shareholders of business group firms have

significantly higher OWNERSHIP (41.53%) and the difference in average OWNERSHIP is 2.82%p, significant at the 1% level. Panel B provides the result of the same test but only for bankrupt firms. The results are similar to those of full sample firms except that the difference in BANKDEBT is no longer statistically significant.

Therefore, on average, business group firms have stronger bargaining power than non-business group firms according to proxy variables. This trend still appears in the bankruptcy sample but becomes weaker. It indicates that this difference might derive the asymmetric distress anomaly although the more sophisticated test is needed to conclude.

For the second test, I further examine whether the degree of the distress anomaly varies by different shareholder bargaining power within business groups. If the distress anomaly is stronger in firms with higher shareholder bargaining power within business groups, then it would give support to the shareholder bargaining power hypothesis. Thus, I construct proxy variables for group-level shareholder bargaining power. Group-level proxies are selected because the bargaining power of business group firms can be determined in relation to other member firms, not at individual firm-level. For instance, even if a firm as the standalone company meets conditions for weak shareholder bargaining power, the business group that it belongs to can have strong bargaining power as a whole, like the case that the group has multiple debt transactions with a bank through its affiliates, which becomes an

important customer to the bank. Then the ultimate shareholder of the firm, mostly the owner of the group, can exercise his strong bargaining power to the bank to deviate from absolute priority rule.

I use two proxy variables to measure the aggregate level of shareholder bargaining power of the group. First, if the group has a larger asset size, it is likely to have higher bargaining power. Garlappi et al. (2008) state that due to information asymmetry, small firms tend to have a concentrated group of debtholders which have an advantage in monitoring the firm. Hackbarth et al. (2015) also utilize this measure because deviations from absolute priority rule are more common for large firms (Weiss 1990, Franks and Torous 1994). I use the total assets of each group announced by the KFTC as a measure of group asset size. Second, if it has more member firms, the group is likely to have higher bargaining power. This is because if the group has a lot of member firms, then it tends to have multiple relationships with banks and more options to suggest to them at near default state. I measure the number of member firms as the total number of public and private firms in the group, announced annually by the KFTC.

Table 7 presents the mean excess return and alphas of long-short shareholder-bargaining-power-sorted portfolios. Stocks are independently double-sorted by the median value of distress risk and each proxy variable, group total assets and the number of member firms. Then long-short portfolios are constructed to buy the safest and sell the riskiest portfolio in each bargaining power level. Columns 1

and 2 (4 and 5) report returns of long-short portfolios in group total assets (the number of group firms), LARGE-ASSET and SMALL-ASSET (LARGE-NUM and SMALL-NUM). Column 3 (6) reports returns of LARGE-ASSET (LARGE-NUM) minus those of SMALL-ASSET (SMALL-NUM). It also reports the mean value and the standard deviation of distress probability in each long-short portfolio.

In Table 7, a long-short portfolio with large group total assets (LARGE-ASSET) outperforms than that with small group total assets (SMALL-ASSET). LARGE-ASSET reports higher 3-factor and 4-factor alphas of 1.33% and 1.38% than those of SMALL-ASSET, 0.82% and 0.85% per month. The statistical significance is stronger in LARGE-ASSET, but the difference between the two portfolios is not significant. This insignificance might be due to a relatively small number of observations in the business group subsample. Long-short portfolios double-sorted by distress risk and the number of member firms show similar patterns.

Overall, long-short portfolios with strong shareholder bargaining power outperform within business groups, even though the difference is not statistically significant. It indicates that shareholder bargaining power is one of the contributing factors to distress anomaly in business groups.

V.4 Difference-in-Difference Test

This section provides the result of a difference-in-difference (DID) test using the bankruptcy law reform event, the introduction of the UBA, in 2006 as an exogenous

shock. This event adopting the DIP system is considered favorable to shareholders.

For the DID analysis, I divided the sample period into two periods. The pre-reform period is from 1998 to 2005 before the UBA was enforced. The post-reform period is from 2006 to 2018. For both pre- and post-reform periods, I divide firms into business groups and non-business groups, sorting firms in those groups separately into tercile portfolios by distress risk.

In this test, the difference in alphas between two subsamples is expected to be reduced in the post-reform period because the reform effect would be stronger in non-business groups with previously low shareholder bargaining power. Hackbarth et al. (2015) argue in their paper analyzing the 1978 Bankruptcy Reform Act in the US changed favorably to shareholders that the reform effect on a CAPM beta is stronger for firms with lower shareholder bargaining power. Thus, if it is also true for alphas, the magnitude of the change in alphas triggered by the law reform should be greater in non-business groups. Since the business group firms' shareholders already enjoy their higher bargaining power to exploit creditors before the law reform, the marginal reform effect might not be drastic. Therefore, it will reduce the gap in alphas between business groups and non-business groups in the post-reform period.

Figure 2 provides cumulative returns of long-short portfolios before and after the reform. Panel A and B provide cumulative market-adjusted returns of long-short portfolios of business group firms and non-business group firms. Panel C and

D provides cumulative 4-factor-adjusted returns, i.e., returns adjusted for the market, size, value, and momentum, of long-short portfolios of business group firms and non-business group firms. From Panel A and C, business group firms' long-short portfolio returns do not tend to be affected by the law reform event (the grey area). However, as seen in Panel B and D, those of non-business groups greatly increases after the reform. It implies that non-business group firms are disproportionately affected by the bankruptcy law reform.

Table 8 reports long-short portfolios' mean-excess returns and alphas in the pre- and post-reform period. Columns 1, 2, and 3 report mean excess returns, CAPM alphas, 3-factor alphas, and 4-factor alphas of long-short portfolio of full sample firms, business group firms, and non-business group firms in the pre-reform period as well as the mean and standard deviation of the fitted value of distress probability for each portfolio. Column 4 reports the difference between long-short portfolios of business groups and non-business groups in the pre-reform period. Columns 4 to 8 suggest the same results for the post-reform period.

Column 9 of Table 8 shows the DID effect. It is measured as the coefficient of the interaction term between each factor and POST dummy, which has a value of 1 for the post-reform period. The DID effect in alphas is measured as the coefficient of POST.

In the pre-reform period, long-short alphas are significantly positive in only full sample and business group subsample, showing the distress anomaly. The long-

short portfolio of full sample firms has significant positive monthly 3-factor and 4-factor alphas of 1.98% and 2.06% at the 1% level. Similarly, that of business group firms has significant positive monthly 3-factor and 4-factor alphas of 2.20% and 2.23% at the 1% level. In contrast, excess return and alphas of the long-short portfolio of non-business groups are negative and mostly not significant. The differences in alphas of business groups minus those of non-business groups are also all significantly positive at the 5% level in the pre-reform period, which might result from a significant difference in the shareholder bargaining power in this period.

However, in the post-reform period, non-business groups also have significantly positive long-short alphas. A long-short portfolio of non-business group firms has a weakly significant but positive monthly excess return (0.39%) and CAPM alpha (0.40%). It also has positive monthly 3-factor (0.48%) and 4-factor (0.45%) alphas significant at the 5% and 10% level. Nevertheless, the economic and statistical significance of long-short alphas is greater in business groups, which show about 1.11% of monthly 3-factor and 4-factor alphas significant at the 5% level. Although the magnitude is weaker, non-business groups also show distress anomaly after the reform, thanks to an increase in shareholder bargaining power guaranteed by the favorable reform. Furthermore, due to this change the difference between two subsamples is no longer significant, indicates that the reform effect is greater in previously low-bargaining-power firms. This suggests the evidence supporting hypothesis 2-2.

In Column 9, the direction of coefficients and t-statistics supports hypothesis 2-1 that the relative cross-sectional difference in alphas is reduced after the reform. The coefficients of Column 9, which mean the cross-sectional difference in the post-reform period minus that in the pre-reform period, have negative signs and are statistically significant at the 5% to 10% level. For example, the gap in CAPM alphas is reduced by -2.69%^p significant at the 5% level in the post-reform. This might be because the overall increase in shareholder bargaining power affects firms disproportionately and it brings a more favorable outcome to shareholders of non-business groups with low bargaining power.

VI. Conclusion

I examine the effect of a firm's corporate governance mechanism on the relationship between distress risk and equity returns. I find evidence that supports shareholder bargaining power hypothesis that firms with high shareholder bargaining power have a negative relationship between distress risk and equity returns, utilizing Korean business group data. In a difference-in-difference test, non-business group firms that have previously low bargaining power even show this negative relationship in the post-reform period when the bankruptcy law increases overall shareholder bargaining power by adopting the DIP system. This shock triggers to reduce the cross-sectional difference in distress risk premium between business group firms and non-business group firms after the reform.

This paper contributes to the literature in three ways. First, it adds empirical evidence to international distress anomaly. I find that the distress anomaly exists in Korea, corresponding to the findings in Gao et al. (2018), and suggest empirical evidence to the shareholder bargaining power hypothesis. Second, it also contributes to the literature on law and finance. I show that the change in the creditor right by an exogenous shock significantly affects shareholders' strategic decisions and distress anomaly. Lastly, it is the first paper to shed light on the effect of firms' internal governance structure on the distress anomaly. I find that the business group structure shapes strong shareholder bargaining power which triggers the distress anomaly. It is known that many firms outside the US have diverse governance mechanisms such as controlling shareholders, business groups, and pyramid holding structures. (La Porta et al. (1998), Classens et al. (2000), Faccio and Lang (2002)). Thus, it would be meaningful to extend this study to the international level since the heterogeneity in corporate governance across the world would play the important role in understanding the difference in firms' decision making such as strategic default.

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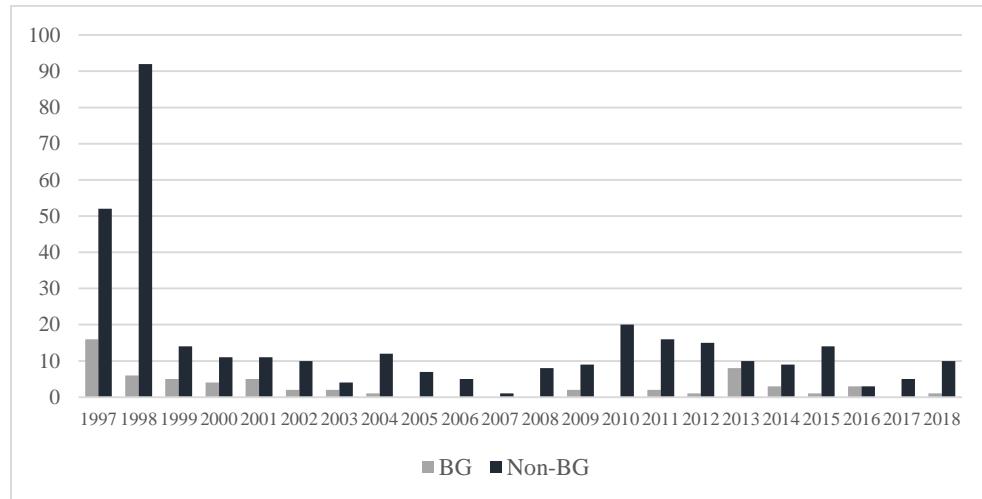
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Figure 1. Number of bankrupt firms in business groups and non-business groups

This table shows the number of bankrupt firms and the bankruptcy rate in business group firms as well as in non-business group firms.

Panel A. Number of bankrupt firms by year



Panel B. Bankruptcy rate by year

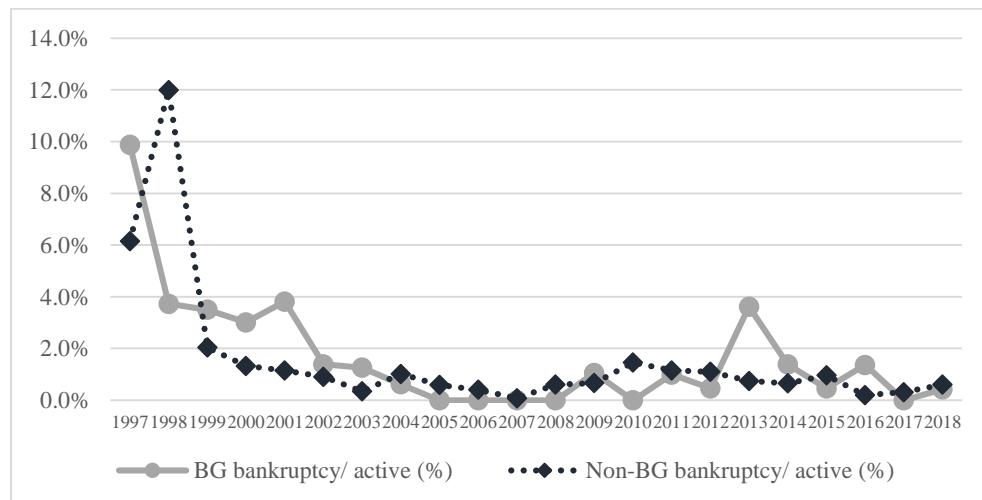


Figure 2. Cumulative long-short portfolio returns

This figure shows cumulative returns of long-short portfolios of business group and non-business group. Panel A and B provide cumulative market-adjusted returns of long-short portfolios of business group firms and non-business group firms. Panel C and D provide cumulative 4-factor-adjusted returns (i.e. returns adjusted for the market, size, value, and momentum) of long-short portfolios of business group firms and non-business group firms.



Table 1. Number of bankrupt firms by year

This table shows the number of active and bankrupt firms by year. The annual number of active firms is calculated by averaging the monthly number of active firms each year. Firms are treated bankrupt in a month when the firm files bankruptcy. The sample period is from January 1997 to December 2018. Sample firms are listed on the Korean Stock Exchange (KOSPI) and KOSDAQ, including delisted firms.

Year	Active firm	Bankrupt firms	Bankrupt / Active (%)
1997	1,008	68	6.75%
1998	928	98	10.56%
1999	830	19	2.29%
2000	960	15	1.56%
2001	1,088	16	1.47%
2002	1,248	12	0.96%
2003	1,316	6	0.46%
2004	1,342	13	0.97%
2005	1,356	7	0.52%
2006	1,415	5	0.35%
2007	1,478	1	0.07%
2008	1,539	8	0.52%
2009	1,547	11	0.71%
2010	1,556	20	1.29%
2011	1,585	18	1.14%
2012	1,583	16	1.01%
2013	1,563	18	1.15%
2014	1,592	12	0.75%
2015	1,676	15	0.89%
2016	1,762	6	0.34%
2017	1,834	5	0.27%
2018	1,886	11	0.58%
Total	31,092	400	1.29%

Table 2. Summary statistics

This table reports summary statistics of explanatory variables of bankruptcy probability forecasting model. NIMTAAVG is a rolling average of net income over the market value of total assets. TLMTA is total liabilities over market value of total assets. EXRETAvg is a rolling average of log of gross stock return over KOSPI index return. PRICE is a log of price and RSIZE is a log of stock market capitalization over that of KOSPI index. MB is market to book ratio and SIGMA is annualized rolling 3-month standard deviation of daily stock return. CASHMTA is a sum of cash, cash equivalent and short-term investment over market value of total assets. A detailed variable description is provided in Appendix A. Panel A, B, C, and D shows descriptive statistics of the full sample, business group firms, non-business group firms, and bankrupt firms. Bankrupt firms are the firms that apply for bankruptcy each month and survived firms are the firms that do not. The total number of firm-month observations is 334,025. The number of business groups and non-business groups observations are 43,484 and 290,541. All variables are winsorized at 1%. *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

Panel A. Full sample

	All firms			Survived			bankrupt			Mean difference	t-value
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD		
Obs	334,025			333,704			321				
NIMTAAVG	0.000	0.014	0.074	0.000	0.014	0.073	-0.056	-0.021	0.093	0.056***	10.827
TLMTA	0.411	0.388	0.249	0.410	0.387	0.249	0.856	0.907	0.134	-0.446***	-59.547
EXRETAvg	-0.008	-0.008	0.055	-0.007	-0.008	0.055	-0.083	-0.084	0.077	0.075***	17.408
PRICE	8.612	8.436	1.561	8.611	8.436	1.561	8.737	8.320	2.272	-0.126	-0.993
RSIZE	-9.174	-9.429	1.421	-9.174	-9.429	1.421	-9.662	-9.760	1.362	0.488***	6.411
MB	1.373	1.032	1.135	1.373	1.032	1.133	1.345	0.466	2.016	0.028	0.248
SIGMA	0.558	0.501	0.271	0.558	0.501	0.271	0.976	0.999	0.309	-0.418***	-24.281
CASHMTA	0.136	0.086	0.144	0.136	0.086	0.144	0.081	0.050	0.101	0.055***	9.766

Panel B. Business groups

	All firms	Survived	bankrupt	t-value

	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean difference
Obs	43,484			43,424			60			
NIMTAAVG	0.012	0.016	0.043	0.012	0.016	0.043	-0.029	-0.013	0.047	0.042*** 6.922
TLTMA	0.498	0.493	0.263	0.497	0.492	0.262	0.901	0.923	0.072	-0.404*** -43.015
EXRETAVG	-0.003	-0.005	0.045	-0.003	-0.005	0.045	-0.057	-0.058	0.069	0.054*** 6.071
PRICE	9.807	9.872	1.610	9.807	9.872	1.610	9.770	9.717	1.816	0.038 0.161
RSIZE	-7.264	-7.254	1.643	-7.263	-7.251	1.643	-8.261	-8.451	1.315	0.999*** 5.877
MB	1.251	0.990	1.002	1.251	0.990	1.000	1.169	0.397	1.834	0.082 0.348
SIGMA	0.468	0.411	0.224	0.468	0.411	0.224	0.930	0.921	0.266	-0.462*** -13.464
CASHMTA	0.095	0.059	0.107	0.095	0.059	0.107	0.049	0.043	0.039	0.046*** 9.059

Panel C. Non-business groups

	All firms			Survived			bankrupt			Mean difference	t-value
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD		
Obs	290,541			290,280			261				
NIMTAAVG	-0.002	0.013	0.077	-0.002	0.013	0.077	-0.062	-0.023	0.099	0.06***	9.807
TLTMA	0.398	0.373	0.244	0.397	0.373	0.244	0.846	0.896	0.143	-0.449***	-50.755
EXRETAVG	-0.008	-0.009	0.056	-0.008	-0.009	0.056	-0.088	-0.093	0.078	0.080***	16.628
PRICE	8.433	8.294	1.473	8.433	8.294	1.472	8.500	8.003	2.303	-0.068	-0.474
RSIZE	-9.460	-9.598	1.136	-9.460	-9.598	1.136	-9.983	-10.045	1.156	0.524***	7.319
MB	1.391	1.039	1.152	1.391	1.039	1.151	1.386	0.480	2.057	0.006	0.044
SIGMA	0.572	0.517	0.275	0.571	0.517	0.275	0.987	1.024	0.317	-0.415***	-21.161
CASHMTA	0.142	0.091	0.148	0.142	0.091	0.148	0.088	0.054	0.109	0.054***	7.981

Panel D. Bankrupt firms

	All firms			Survived			bankrupt			Mean difference	t-value
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD		
Obs	321			60			261				

NIMTAAVG	-0.056	-0.021	0.093	-0.029	-0.013	0.047	-0.062	-0.023	0.099	0.033***	3.851
TLTMA	0.856	0.907	0.134	0.901	0.923	0.072	0.846	0.896	0.143	0.055***	4.275
EXRETAVG	-0.083	-0.084	0.077	-0.057	-0.058	0.069	-0.088	-0.093	0.078	0.031***	3.101
PRICE	8.737	8.320	2.272	9.770	9.717	1.816	8.500	8.003	2.303	1.269***	4.627
RSIZE	-9.662	-9.760	1.362	-8.261	-8.451	1.315	-9.983	-10.045	1.156	1.722***	9.349
MB	1.345	0.466	2.016	1.169	0.397	1.834	1.386	0.480	2.057	-0.217	-0.807
SIGMA	0.976	0.999	0.309	0.930	0.921	0.266	0.987	1.024	0.317	-0.057***	-1.439
CASHMTA	0.081	0.050	0.101	0.049	0.043	0.039	0.088	0.054	0.109	-0.039***	-4.597

Table 3. Bankruptcy probability forecasting regression

This table shows the result of the conditional logit regression of the bankruptcy probability forecasting model, suggested in Campbell et al. (2008). The dependent variable is a binary variable that takes a value of 1 when a firm files bankruptcy in month t and 0 otherwise. Explanatory variables consist of 12-month lagged variables used in Campbell et al. (2008) model as well as the business group dummy variable (GROUP). GROUP is a dummy variable that takes a value of 1 when a firm belongs to a business group in month t. Parentheses are t-statistics and *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

Dependent variable	Bankruptcy 12 months
NIMTAAVG	-2.056** (-2.520)
TLMTA	5.410*** (16.854)
EXRETAVG	-2.988*** (-2.832)
SIGMA	0.864*** (3.677)
RSIZE	0.225*** (4.198)
CASHMTA	-1.674** (-2.211)
MB	0.128*** (3.019)
PRICE	0.324*** (9.558)
GROUP	-0.800*** (-3.922)
Constant	-11.51*** (-17.179)
Observations	326,404

Table 4. Ex-post bankruptcy returns between business group firms and non-business group firms

This table compares ex-post returns between bankrupt firms in business groups and non-business groups. Ex-post returns are buy-and-hold returns of 1 month, 3 months, 6 months, and 1 year after a firm files bankruptcy in a month t . Returns are excess returns adjusted by market return. *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

	Business groups			Non-business groups			Mean difference test	
	Obs	mean (%)	t-value	Obs	mean (%)	t-value	Difference (%p)	t-value
Ex-post return (1m)	62	-27.46***	-5.71	248	-39.79***	-17.99	12.34**	2.33
Ex-post return (3m)	62	-22.77***	-2.43	261	-47.38***	-12.30	24.61***	2.43
Ex-post return (6m)	62	-24.96***	-2.80	270	-47.01***	-11.39	22.06**	2.24
Ex-post return (12m)	61	-57.27***	-7.52	275	-70.23***	-8.20	12.96	1.13

Table 5. Returns of bankruptcy-probability-sorted portfolios

This table reports mean excess returns, alphas and average distress probability of value-weighted portfolios sorted by bankruptcy probability from the forecasting model in Table 3, rebalancing every January. Penny stocks whose price is less than KRW1,000 are excluded. A long-short portfolio is a zero-cost portfolio buying the safest (portfolio 1) and selling the riskiest portfolio (portfolio 3). Mean excess returns and alphas are estimated by regressing risk-free-rate-adjusted returns on constant, a market factor, Fama and French (1993) 3 factors, and Carhart 4 factors (1997). Panel A, B, and C reports the regression results of the full sample, business group firms, and non-business group firms. Parentheses are t-statistics and *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

Panel A. Full sample	1	2	3	LS (1-3)
Portfolio alphas				
Mean excess returns	0.853 (1.638)	0.366 (0.742)	0.388 (0.740)	0.465 (1.223)
CAPM alpha	0.584** (2.130)	0.100 (0.509)	0.068 (0.291)	0.515 (1.341)
3-factor alpha	1.050*** (4.235)	0.060 (0.308)	-0.351*** (-1.662)	1.402*** (4.311)
4-factor alpha	1.051*** (4.225)	0.074 (0.383)	-0.374*** (-1.782)	1.425*** (4.390)
Distress probability				
Mean	0.019	0.077	0.251	-0.232
SD	0.025	0.113	0.272	0.249
Panel B. Business groups	1	2	3	LS (1-3)
Portfolio alphas				
Mean excess returns	1.079* (1.944)	0.517 (0.959)	0.291 (0.456)	0.788* (1.662)
CAPM alpha	0.778*** (2.564)	0.233 (0.832)	-0.041 (-0.119)	0.819* (1.714)
3-factor alpha	1.115*** (4.031)	-0.452* (-1.966)	-0.471 (-1.448)	1.586*** (3.513)
4-factor alpha	1.112*** (4.009)	-0.489** (-2.177)	-0.512 (-1.592)	1.624*** (3.610)
Distress probability				
Mean	0.030	0.109	0.323	-0.293
SD	0.048	0.125	0.310	0.271

Panel C. Non-business groups	1	2	3	LS (1-3)
Portfolio alphas				
Mean excess returns	0.245 (0.465)	-0.090 (-0.180)	0.551 (1.032)	-0.306 (-0.927)
CAPM alpha	-0.050 (-0.180)	-0.340 (-1.261)	0.209 (0.738)	-0.259 (-0.776)
3-factor alpha	0.220 (0.982)	-0.304 (-1.100)	-0.104 (-0.374)	0.324 (1.128)
4-factor alpha	0.247 (1.113)	-0.285 (-1.033)	-0.112 (-0.401)	0.358 (1.261)
Distress probability				
Mean	0.016	0.072	0.235	-0.219
SD	0.017	0.114	0.275	0.261

Table 6. Shareholder bargaining power of business group firms and non-business group firms

This table reports sample mean of the proxy variables of shareholder bargaining power in the full sample and subsamples of business groups and non-business groups. STDEBT (%) is the ratio of short-term debt to total debt, BANKDEBT (%) is the ratio of bank debt to total debt, and OWNERSHIP (%) is the largest shareholder's ownership in percentage term. Panel A reports the results of the full sample which consists of 329,352 firm-month observations. Panel B reports the results of bankrupt firms of 307 observations. Observations that have non-missing data for all variables are included only. *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

Panel A. Full sample

	All firms	Business groups	Non-business groups	Mean difference	t-value
Obs	329,352	43,403	285,949		
STDEBT (%)	58.29	48.88	59.72	-10.85***	-63.98
BANKDEBT (%)	71.95	61.12	73.60	-12.48***	-69.43
OWNERSHIP (%)	39.09	41.53	38.72	2.82***	31.27

Panel B. Bankruptcy

	All firms	Business groups	Non-business groups	Mean difference	t-value
Obs	307	59	248		
STDEBT (%)	67.03	62.43	68.13	-5.70*	1.84
BANKDEBT (%)	78.33	77.76	78.47	-0.71	0.29
OWNERSHIP (%)	27.49	33.29	26.11	7.18***	-2.63

Table 7. Bargaining-power-proxy-sorted business group portfolios

This table shows long-short portfolio excess returns, alphas and average distress probability in business group firms. Stocks are sorted independently by the median value of distress probability and shareholder bargaining power proxy variables. Proxy variables represent group-level shareholder bargaining power, using group total assets and the number of member firms in the group. Group-level variables are given to each member firm. Parentheses are t-statistics and *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

LS portfolio	Group total assets			Number of firms in the group		
	LARGE-ASSET	SMALL-ASSET	LARGE-ASSET – SMML-ASSET	LARGE-NUM	SMALL- NUM	LARGE- NUM – SMALL- NUM
Mean excess returns	0.555 (1.422)	0.662 (1.616)	-0.107 (-0.219)	0.532 (1.312)	0.532 (1.413)	0.000 (0.000)
CAPM alpha	0.615 (1.573)	0.675 (1.642)	-0.061 (-0.123)	0.597 (1.469)	0.566 (1.515)	0.030 (0.061)
3-factor alpha	1.330*** (3.726)	0.824* (1.954)	0.506 (1.035)	1.326*** (3.557)	0.814** (2.135)	0.512 (1.021)
4-factor alpha	1.377*** (3.914)	0.851** (2.022)	0.526 (1.074)	1.369*** (3.707)	0.866** (2.306)	0.503 (0.999)
Distress probability						
Mean	-0.214	-0.164	-0.050	-0.202	-0.197	-0.004
SD	0.231	0.123	0.156	0.237	0.179	0.184

Table 8. Long-short portfolio returns in pre- and post-reform period

This table shows long-short portfolio excess returns, alphas, and average distress probability before and after the bankruptcy law reform event in 2006. The pre-reform period (column 1 to 4) is from 1997 to 2005, the period before the bankruptcy law reform event in Korea. The post-reform period (column 5 to 8) is from 2006 to 2018 after the bankruptcy law reform event in Korea. Column 9 (Post-Pre) represents the change in the cross-sectional difference of business groups and non-business groups between the pre- and post-reform periods. Parentheses are t-statistics and *, **, and *** denote statistical significance at 10%, 5%, and 1% level, respectively.

Period	Pre-reform				Post-reform				Post - Pre
	LS portfolios	Full	BG	Non-BG	BG - Non-BG	Full	BG	Non-BG	BG - Non-BG
Portfolio alpha									
Mean excess returns	0.948	1.424	-1.316*	2.740**	0.133	0.351	0.387*	-0.036	-2.775**
	(1.299)	(1.592)	(-1.789)	(2.539)	(0.332)	(0.687)	(1.748)	(-0.069)	(-2.552)
CAPM alpha	1.054	1.429	-1.250	2.679**	0.255	0.537	0.403*	0.134	-2.687**
	(1.392)	(1.521)	(-1.633)	(2.366)	(0.672)	(1.136)	(1.815)	(0.278)	(-2.436)
3-factor alpha	1.975***	2.204***	-0.429	2.634**	0.792*	1.115**	0.484**	0.631	-2.003*
	(3.660)	(2.625)	(-0.693)	(2.351)	(1.962)	(2.203)	(2.130)	(1.246)	(-1.808)
4-factor alpha	2.062***	2.326***	-0.338	2.664**	0.751*	1.112**	0.452*	0.6590	-2.005*
	(3.921)	(2.823)	(-0.557)	(2.364)	(1.846)	(2.174)	(1.979)	(1.290)	(-1.797)
Distress probability									
Mean	-0.407	-0.498	-0.411	-0.087	-0.111	-0.152	-0.088	-0.064	0.023
SD	0.003	0.325	0.322	0.220	0.037	0.051	0.036	0.058	

Appendix A. Explanatory variables

Items	Description
NIMTA _{i,t}	$Net\ Income_{i,t} / (Firm\ Market\ Equity_{i,t} + Total\ Liabilities_{i,t})$
NIMTAAVG _{t-1,t-12}	$((1 - \phi^3) / (1 - \phi^{12})) * (NIMTA_{t-1,t-3} + \dots + \phi^9 NIMTA_{t-10,t-12}), \ where \ \phi = 2^{-1/3}$
TLMTA _{i,t}	$Total\ Liabilities_{i,t} / (Firm\ Market\ Equity_{i,t} + Total\ Liabilities_{i,t})$
EXRET _{i,t}	$\log(1 + R_{i,t}) - \log(1 + R_{KOSPI,t})$
EXRETAVG _{t-1,t-12}	$((1 - \phi) / (1 - \phi^{12})) * (EXRET_{t-1} + \dots + \phi^{11} EXRET_{t-12})$
PRICE _{i,t}	$\log(Price_{i,t})$
RSIZE _{i,t}	$\log(Firm\ Market\ Equity_{i,t} / KOSPI\ Market\ Value_i)$
MB _{i,t}	$Firm\ Market\ Equity_{i,t} / Book\ Value_{i,t}$
SIGMA _{i,t}	$((252 * (1/N - 1) * \sum_{k \in \{t-1, t-2, t-3\}} r_{i,t}^2)^{1/2}$
CASHMTA _{i,t}	$Cash\ and\ Short\ Term\ Investment_{i,t} / (Firm\ Market\ Equity_{i,t} + Total\ Liabilities_{i,t})$
GROUP _{i,t}	<i>Dummy variable which takes 1 if firm i belongs to the business group at t</i>

Appendix B. Factor loadings of distress-probability-sorted portfolios

Panel A. Full sample

	1	2	3	LS (1-3)
3-factor Regression Coefficient				
RM-RF	0.839*** (29.358)	0.866*** (38.675)	0.912*** (37.488)	-0.074* (-1.965)
SMB	-0.159*** (-3.818)	-0.162*** (-4.969)	-0.141*** (-3.990)	-0.017 (-0.320)
HML	-0.423*** (-8.553)	-0.016 (-0.401)	0.296*** (7.017)	-0.718*** (-11.086)
4-factor Regression Coefficient				
RM-RF	0.839*** (28.314)	0.876*** (37.899)	0.897*** (35.922)	-0.058 (-1.495)
SMB	-0.158*** (-3.741)	-0.153*** (-4.622)	-0.156*** (-4.379)	-0.002 (-0.040)
HML	-0.423*** (-8.511)	-0.011 (-0.288)	0.289*** (6.897)	-0.711*** (-10.980)
MOM	0.003 (0.055)	0.060 (1.631)	-0.094** (-2.373)	0.097 (1.575)

Panel B. Business groups

	1	2	3	LS (1-3)
3-factor Regression Coefficient				
RM-RF	0.877*** (27.518)	0.910*** (34.356)	1.045*** (27.889)	-0.168*** (-3.231)
SMB	-0.310*** (-6.669)	-0.053 (-1.370)	-0.242*** (-4.427)	-0.068 (-0.897)
HML	-0.363*** (-6.583)	0.536*** (11.696)	0.275*** (4.240)	-0.638*** (-7.087)
4-factor Regression Coefficient				
RM-RF	0.875*** (26.469)	0.884*** (33.033)	1.017*** (26.571)	-0.142*** (-2.657)
SMB	-0.312*** (-6.595)	-0.077** (-2.022)	-0.268*** (-4.905)	-0.043 (-0.563)
HML	-0.364*** (-6.571)	0.524*** (11.692)	0.262*** (4.090)	-0.626*** (-6.974)
MOM	-0.012 (-0.234)	-0.156*** (-3.655)	-0.170*** (-2.788)	0.158* (1.848)

Panel C. Non-business groups

	1	2	3	LS (1-3)
3-factor Regression Coefficient				
RM-RF	0.890*** (34.533)	0.829*** (26.022)	0.891*** (27.779)	0.000 (-0.012)
SMB	0.446*** (-0.446)	0.0910* (-0.0910)	0.109** (0.109)	0.337*** (0.337)

HML	(11.882) -0.085* (-1.901)	(1.967) -0.001 (-0.027)	(2.333) 0.284*** (5.126)	(6.998) -0.369*** (-6.450)
4-factor Regression Coefficient				
RM-RF	0.908*** (34.435)	0.842*** (25.591)	0.886*** (26.641)	0.0230 (0.676)
SMB	0.464*** (12.302)	0.104** (2.207)	0.104** (2.189)	0.360*** (7.437)
HML	-0.077* (-1.733)	0.004 (0.079)	0.282*** (5.065)	-0.359*** (-6.324)
MOM	0.112*** (2.652)	0.080 (1.518)	-0.032 (-0.601)	0.143*** (2.657)

국문 초록

본 논문은 한국 시장에 존재하는 고유한 식별 기회를 활용하여 채권자에 대한 주주의 협상력의 차이가 부도위험 이상현상에 끼치는 영향을 실증적으로 분석하였다. 부도위험 이상현상은 부도 확률이 높은 회사일수록 리스크가 높음에도 불구하고 낮은 주식 수익률을 시현하는 현상을 가리킨다 (Campbell, Hilscher, and Szilagyi (2008)). 한국 시장에는 회사간의 채권자에 대한 주주 협상력의 횡단면적 및 시계열적 차이가 크게 존재함에 따라 이러한 상관관계의 유의미성을 확인할 수 있는 기회를 제공한다. 본 논문에서는 부도위험 이상현상이 최대주주의 협상력이 상대적으로 높은 기업집단 회사들에서만 주로 관측되는 것을 발견하였다. 또한, 기존 경영자 관리인 제도 (Debtor-in-Possession) 도입을 통하여 기업집단 회사 및 비기업집단 회사 간 주주 협상력의 횡단면적 차이를 감소시킨 외생적 변화로 작용한 2006년 통합도산법 개정 사건을 통하여, 이러한 부도위험 이상현상의 비대칭성이 개정 이후 유의미하게 감소함을 확인하였다. 이는 주주들에 의한 전략적 부도 가능성성이 부도위험 이상현상의 주요 원인 중 하나로 작용한다는 것을 시사한다.