

WORKING PAPERS SES

**Investors' perception of
business group
membership during an
economic crisis:
Evidence from the
COVID-19 pandemic**

Romain DUCRET

**N.524
X.2021**

Investors' perception of business group membership during an economic crisis

Evidence from the COVID-19 pandemic^{*}

Romain Ducret[♦]

This version: September 7, 2021

Abstract

This paper examines how investors perceive business group membership in Korea during the COVID-19 pandemic. Stock price performance analysis reveals evidence of a time-varying and heterogeneous value of affiliation: investors discount business group affiliation during a market collapse, but are willing to pay a premium for affiliation during market recovery. Overall, this pattern is more pronounced for financially weak affiliates and large business groups. The results further show that business group membership alleviates investors' concerns regarding financial flexibility, highlighting the role of internal capital markets as a substitute for external finance.

Keywords: Business groups, financial crisis, COVID-19, internal capital market, Korea

JEL Classification: G01, G14, G38, L20

* I thank Pr. Dušan Isakov (University of Fribourg, CH), Pr. Berno Büchel (University of Fribourg, CH), Pr. Woochan Kim (Korea University, KR), Pr. Woojin Kim (Seoul National University, KR), Ngoc Bich Le (University of Fribourg, CH), Pr. Alexander Wagner (University of Zürich, CH) for their helpful comments and suggestions. I am responsible for all remaining errors. Declarations of interest: none.

♦ University of Fribourg, Boulevard de Pérolles 90, 1700 Fribourg, Switzerland, Email: romain.ducret@unifr.ch

Investors' perception of business group membership during an economic crisis

Evidence from the COVID-19 pandemic

1. Introduction

This paper exploits the COVID-19 pandemic to examine investors' perception of business group membership during a crisis period. Starting in early 2020, the COVID-19 pandemic spread quickly across Asia and the rest of the world. The shock from this unprecedented event in recent history serves as an interesting opportunity to empirically investigate the costs and benefits of business group affiliation. First, the COVID-19 crisis exhibits the desired features of a natural experiment (Ramelli and Wagner, 2020). This event was highly unexpected. In fact, environmental issues and climate were the focus of most concerns at the beginning of 2020 (WEF, 2020a). Additionally, as a health crisis, the COVID-19 crisis is exogenous to the financial and economic fields, in contrast to previous crises (Goldstein et al., 2021). Second, the effects of the COVID-19 crisis on the economy are likely to revive some benefits associated with business group affiliation. Indeed, the literature often describes the ability of business groups to pool and reallocate resources among affiliates as a factor in their success, especially when markets are underdeveloped or inefficient (Holmes Jr et al., 2018). During the COVID-19 pandemic, governments had to take extraordinary measures to mitigate the spread of the disease altering, the functioning of the product, labor, and financial markets. This situation led to a supply and demand shock and generated strong uncertainty among managers and investors (Altig et al., 2020).

Business groups are prevalent in many countries around the world (Dau et al., 2021) and South Korea (henceforth "Korea") presents interesting features for studying this type of business structure. Since the end of the Korean War, large business groups, commonly called chaebols, have dominated the Korean economy. In the 1980s, the power accumulated by chaebols led the government to monitor their activities (Eichengreen et al., 2015). To this end, the Korea Fair Trade Commission (KFTC) discloses a list of large business groups and their affiliates every year, simplifying the identification of business groups and their affiliated firms. Korea was one of the first countries hit by the COVID-19 pandemic outside China. Therefore, Korean firms and investors had little time to respond, ensuring the exogeneity of the economic shock compared with other countries that reported their first cases months later.

This paper provides new evidence about the perception of business group affiliation by market participants during an economic downturn. The cross-sectional analysis of stock price performance reveals a time-varying value of business group membership. During the first months of the pandemic, investors discounted affiliation. The growing uncertainty and financial market volatility tended to exacerbate the costs of affiliation due to the risk of minority shareholder expropriation, liquidation, and restructuring. In addition, the economy-wide shock annihilated some of the value enhancing mechanisms associated with business group membership in normal times. Empirical results indicate a stronger discount for affiliates with a higher risk of minority shareholder expropriation and for affiliation with groups exposed to the financial distress of their affiliates. Later, policy interventions reassured market participants and investors were willing to pay a premium for business group affiliates. Further, access to internal capital markets associated with business group affiliation alleviated concerns regarding financing during the crisis. Consequently, the positive association between financial flexibility proxies and stock returns observed for unaffiliated firms is not significant for firms belonging to a business group. Evidence of heterogeneity in affiliation value also highlights the financing role of internal capital markets. Affiliation pricing is more pronounced for affiliates with weaker balance sheets, whereas investors ignore affiliation with small business groups with fewer resources to share.

My paper extends several fields of finance literature. First, it contributes to the growing literature on the COVID-19 pandemic and its impact on firms and stock markets. As a quasi-natural experiment, this pandemic has generated a substantial number of research papers in finance. Several articles examine market responses to the pandemic within a country (e.g. Baker et al. (2020), Bretscher et al. (2020) and Carletti et al. (2020)) or at a global level (e. g. Ding et al. (2021)). A number of authors investigate financing issues during the COVID-19 pandemic. Among others, Acharya and Steffen (2020) and Halling et al. (2020) examine the access to debt or bond markets during the pandemic, whereas Fahlenbrach et al. (2020) and Ramelli and Wagner (2020) discuss the effect of financial flexibility. My results confirm prior findings regarding the value of financial flexibility during a crisis and highlight the role of internal capital markets as a subsidiary source of financing during economic crisis.

The results regarding the value of affiliation also complement the literature on business groups. Many scholars examine internal capital markets and business groups in the context of underdeveloped markets or crisis periods. However, the value of affiliation remains unclear. Some authors find a positive effect explained by access to scarce resources (Khanna and Yafeh, 2007), risk reduction (Lincoln et al., 1996), or mutual support (Gopalan et al., 2007). Others

point out the risks associated with governance (Baek et al., 2004) and expropriation of minority shareholders (Johnson et al., 2000b). The present study offers new insights into this literature by explicitly focusing on investors' perception through an analysis of stock price performance. This approach contrasts with the majority of prior studies that use operating or valuation measures of performance.¹ Stock price analysis allows a finer analysis of changes in investors' perception and market expectation throughout the different phases of the crisis.² Hence, I observe a switch in the affiliation value between the market collapse and market recovery periods. This finding explains the lack of consensus in prior works. Indeed, it suggests that the sample period and sample length used to estimate affiliation value affect the final result. Additionally, the evidence of between-affiliate and between-group heterogeneity highlights the potential effect of sample composition and business group definition.

As a third contribution, my paper extends the existing literature on Korean chaebols, which mostly focuses on the 1997 Asian financial crisis (e. g. Baek et al. (2004), Bae et al. (2012), Almeida et al. (2015), Gormley et al. (2015)). Several elements call for a reexamination of this topic in light of the substantial changes in the Korean institutional framework. First, the 1997 Asian financial crisis led to numerous reforms aimed at curbing the power of chaebols, improving corporate governance, and promoting free market economy. The lifting of restrictions on foreign ownership opened the Korean stock market to foreign investors (Eichengreen et al., 2015). Second, Korea has improved its competitive position and has become one of the most innovative and competitive countries in the world (WEF, 2019). Some Korean companies have also gained significant international recognition and visibility. Finally, the nature and context of the 1997 Asian financial crisis and COVID-19 crisis differ. In the 1990s, Korean economic growth was driven by investments fueled by foreign capital inflows. The economic slowdown and withdrawal of foreign capital precipitated the insolvency of Korean companies and the financial system (Eichengreen et al., 2015). The COVID-19 pandemic is a global health crisis that triggered a sudden revenue shock and high uncertainty regarding the economic outlook (Altig et al., 2020).

The remainder of this paper is organized as follows. Section 2 reviews the literature on business groups and internal capital markets. In Section 3, I discuss the role of financial flexibility and affiliation with a business group during an economic crisis. The testable

¹ Baek et al. (2004) and Bae et al. (2012) also propose analyses based on stock price performance of Korean firms around the 1997 Asian financial crisis. However, their focus is on corporate governance rather than business group affiliation per se.

² Ramelli and Wagner (2020) use a similar approach to investigate financial policies and international trade exposure drive value of US firms during the COVID-19 pandemic.

hypotheses are presented in the same section. Section 4 presents the empirical framework of this study (sample, variables, and timeline). Empirical results are presented and discussed in Section 5 and Section 6 concludes the paper.

2. Business groups and internal capital market

2.1 Business groups and Korean chaebols

Business group is a form of business organization common in many regions around the world including both developed and emerging markets (Dau et al., 2021). Khanna and Yafeh (2007) define business groups as groups of “*legally independent firms, operating in multiple (often unrelated) industries, which are bound together by persistent formal and informal ties*” (p. 331). Unlike conglomerates, business group’ affiliates are usually not fully owned but controlled by an individual or family through complex and often control-magnifying ownership structures (Kandel et al., 2019). The centralized control allows affiliates to act in a coordinated manner and pursue common strategy. In addition, it creates a group identity (Granovetter, 2010). The level of diversification differs between groups. Risk reduction and the lack or inefficiency of external markets are often cited as motives for diversification of business groups especially in less developed countries (Khanna and Yafeh, 2007).

Business groups have played a prominent role in Korea in historical, political, and economic terms.³ As partners of the government, they contributed to the economic development and industrialization of the country during the second half of the twentieth century. Access to preferential loans and foreign capital, tax benefits, and tariff exemptions allowed chaebols to expand and diversify their activities. This growth came hand in hand with the accumulation of significant economic and political power. Chaebols also benefited from government support in facing different crises. Despite their contribution to the economic development of Korea, chaebols were criticized for their role in the 1997 Asian financial crisis that led to an IMF rescue package. In the aftermath of the crisis, the government implemented several reforms targeting chaebols, with the aim to improve governance, financial resilience, and transparency of chaebols (Eichengreen et al., 2015). However, these reforms did not lead to the disappearance of business groups in Korea. Chaebols still play the role of the spearhead of the Korean economy (Kandel et al., 2019) and several chaebol affiliates become world players in industries such as electronics and automotive.

³ For details, interested readers are referred to chapter 5 in Eichengreen et al. (2015).

Despite the well-developed literature, the value of business group membership remains unclear. In their meta-analysis, Carney et al. (2011) show that the effect of affiliation is heterogeneous and depends on the institutional framework, group organization and firm characteristics. Among the costs associated with business group membership, corporate governance issues and the risk of minority shareholder expropriation are recurring topics (Holmes Jr et al., 2018). The complex ownership structure, intra-group transactions, and the presence of a controlling shareholder worsen these risks (Faccio et al., 2001). Indeed, controlling shareholders might privilege group-level interests at the expense of minority shareholders. For instance, Bae et al. (2002) show that some strategic decisions are value-enhancing at a group level but value-destroying for minority shareholders.

Nevertheless, business group membership offers some advantages. Khanna and Yafeh (2007) suggest that internalization of resources and transactions benefits affiliates through better access to scarce resources and lower transaction costs. As large and important economic actors, Edwards (1955) argues that business groups have a better access to authorities and stronger market power. Affiliation with a business group also provides advantages in terms of financing. Shin and Park (1999) find that business group affiliates are less financially constrained and have lower investment to cash flow sensitivity. Gopalan et al. (2007) show that affiliated firms benefit from lower borrowing costs, and Larrain et al. (2019) find that business group affiliates have better access to the debt market. These advantages are mainly associated with the ability of business groups to pool and allocate financial, human, technological or other resources between affiliates, creating internal resource markets (Holmes Jr et al., 2018). This paper focuses more specifically on internal capital markets.

2.2 Internal capital markets and business group membership

According to Stein (2003), internal capital markets create value through “more-money” and “smarter-money” effects. Business groups have several features that can explain their ability to raise a larger amount of external financing. First, Lewellen (1971) points out the lower risk induced by the diversification of cash flow sources among different affiliates and industries (co-insurance effect). Second, internal capital markets can be used as collateral to increase debt capacity at the group level. For instance, unused debt capacity (Larrain et al., 2019) or assets of one affiliate (Chang and Hong, 2000) can be used to provide access to external debt to another affiliate. Finally, given their size and economic power, business groups might benefit from “too big to fail” belief (Gormley et al., 2015) and from political ties (Minetti and Yun, 2015) to

access external finance. The “smarter-money” effect refers to the ability to transfer resources among affiliates, depending on financial needs and investment opportunities. Stein (1997) argues that low within group information asymmetry enables efficient monitoring and winner-picking activities. Combined with the "more-money" effect, internal capital markets ensure that the most promising projects receive financing and reduce the risk of canceling profitable investments due to the lack of financing (Almeida et al., 2015).

However, a number of authors observe evidence of propping and mutual insurance within business groups, in contrast to the common definition of efficient resource allocation. Bae et al. (2008) define propping as cross-subsidizations, aiming to support financially constrained affiliates. According to Friedman et al. (2003), the controlling shareholders might engage in propping to preserve private benefits. Lincoln et al. (1996) and Gopalan et al. (2007) suggest that propping and mutual insurance lower profit volatility and bankruptcy risk, to promote long-term group interests. Additionally, internal capital markets can play the role of a substitute and mitigate financial market failures during economic crises or shocks (Matvos and Seru, 2014). For instance, Buchuk et al. (2020) and Santioni et al. (2020) document the role played by internal capital markets during the global financial crisis in Chile and Italy. In both cases, access to internal capital markets helps affiliated firms in facing crises.

The literature provides evidence of the existence of internal capital markets within Korean chaebols. Several authors examine the functioning and ties between affiliates. For instance, Chang and Hong (2000) document a relationship between group-level resources and affiliate-level performance. Ferris et al. (2003) observe that chaebols allocate resources to smooth profits and support weak affiliates. Shin and Park (1999) find a relationship between the investment of one affiliate and the cash flow and investment opportunities of the other affiliates of the same group. Almeida et al. (2015) observe that capital reallocation within chaebols mitigate the effect of the crisis on affiliates’ value and investments during the 1997 Asian financial crisis. A number of scholars also document the spillover effect within chaebols at credit rate (Kwon et al. (2016) and Joe and Oh (2018)) and earnings announcements (Bae et al., 2008). Kwon et al. (2019) also find a positive association for stock price crash risk between affiliates of the same business group. Other articles examine the advantage of chaebol membership in terms of fundraising. Gormley et al. (2015) find that chaebol affiliates benefit from the “too big to fail” belief to raise a larger amount on the debt market than non-chaebol firms during the 1997 Asian financial crisis. Minetti and Yun (2015) find that during the pre-crisis period, political ties help chaebol affiliates to raise funds under better conditions than

unaffiliated firms. However, this advantage disappears after the 1997 Asian financial crisis, suggesting the effectiveness of some reforms.

3. Hypotheses development

In this section, I present and develop testable hypotheses regarding investors' perception of business group membership when firms face an economic shock. The section starts by discussing the benefits and costs of affiliation to predict the overall value of affiliation. Next, the market response to a sudden revenue drop is modeled given firm financial flexibility and access to internal capital markets. Finally, I address the between-affiliate and between-group heterogeneity of business group membership value.

3.1 Value of business group membership

The overall value of business group membership corresponds to the sum of the benefits and costs of affiliation. Affiliated firms have access to internal markets. The literature documents several benefits provided by internal markets such as access to scarce resources, lower transaction costs, and flexible resource allocation (Kim et al., 2004). In terms of financing, affiliated firms benefit from “more-money” and “smarter-money” effects associated with internal capital markets. Business group members might also benefit from mutual insurance in case of financial distress (Hoshi et al., 1991). Nevertheless, business group affiliation is also associated with some costs given the conflict of interest between controlling and non-controlling shareholders or the misallocation of resources (Khanna and Yafeh, 2007).

The current analysis is conducted in the context of a sudden and unexpected economic shock. Therefore, the benefits and costs of business group membership need to be reexamined in such circumstances. Resource based view theories argue that internal markets constitute a competitive advantage of business groups when external markets are underdeveloped or inefficient (Khanna and Yafeh, 2007). Economic shocks alter functioning and restrain access to external capital markets by increasing uncertainty, risk of bankruptcy, and information asymmetry. Therefore, access to internal capital markets is likely to be more valuable during such period. This prediction is supported by Santioni et al. (2020), who observe that firms rely more on internal capital markets when their bank faces a deteriorating balance sheet. In addition, they also find a higher survival rate for affiliated firms suggesting that mutual insurance might constitute another benefit of business group membership during an economic downturn. Hence, I propose the following hypothesis:

H1a: *Investors perceive business group membership as value-enhancing when an economic shock occurs.*

However, economic crises might also reduce some benefits and increase the costs associated with business group affiliation. An economy-wide shock annihilates the co-insurance effect based on the diversification of cash flow among different affiliates and industries (Khanna and Yafeh, 2005). Therefore, affiliates might lose the benefits of mutual support and insurance associated with business group membership in normal times. In addition, financial ties between affiliates may generate a systemic risk at the group level (Bae et al., 2008). Economic crises also tend to exacerbate corporate governance costs. Johnson et al. (2000a) and Lemmon and Lins (2003) document that during periods of economic crisis minority shareholder expropriation is more frequent. Bae et al. (2012) explain the increase in minority shareholder expropriation during crisis periods due to poor investment opportunities and economic prospects. Moreover, in the case of business groups, controlling shareholders are likely to prioritize their own or group-level interests at the expense of minority shareholders. Considering the loss of some benefits and the increase in the costs of affiliation during economic crises, I propose the following alternative hypothesis:

H1b: *Investors perceive business group membership as more costly when an economic shock occurs.*

Hypotheses 1a and 1b are not competing hypotheses and the overall value of business group membership will depend on the extent to which one hypothesis dominates the other. Therefore, the value of affiliation is likely to change over time, given the evolution of market conditions and prospects.

3.2 Economic crisis and internal capital markets

This section starts with a simple example to describe the transmission of an economic shock to stock prices. Then, I develop hypotheses related to the mediating role of financial flexibility. Finally, the hypotheses are complemented given the possibility for the firm to be affiliated with a business group.

3.2.1 Economic shock and equity value ⁴

To illustrate how an economic shock integrates into stock prices, assume an unlevered firm with an infinite lifespan earning in each period t a revenue R , incurring costs C , and investing amount I . Following Fama et al. (1972) (pp. 87-88), the equity value of this firm is given by Equation (1):

$$V_0 = \sum_{t=1}^{\infty} \frac{R_t - C_t - I_t}{(1+r)^t} = \sum_{t=1}^{\infty} \frac{X_t - I_t}{(1+r)^t} \quad (1)$$

where, the firm market value, V_0 , is the sum of future net cash flows discounted at the rate r . Net cash flow is the revenue, R , minus operating costs, C , and investments, I . Through simplification, net cash flow can be written as the difference in operating cash flow X (with $X_t \equiv R_t - C_t$), and the investments, I .

Now, assume an economic shock triggering a reduction in firm revenue during several periods. For constant costs, the firm's operating cash flow decreases leading to a loss in equity value. For a crisis of length T , the value of the firm facing a crisis, V'_0 , can be written as

$$V'_0 = \sum_{t=1}^T \frac{X'_t - I'_t}{(1+r)^t} + \sum_{t=T+1}^{\infty} \frac{X_t - I_t}{(1+r)^t} \quad (2)$$

where, X' and I' denote operating cash flows and investments during the crisis with $X' < X$, and $I' \leq I$. The total value of the firm is given by the sum of the present value of net cash flows during the crisis and the present value of post-crisis net cash flows. Under the assumption that post-crisis net cash flows are equal to cash flows in a state without crisis (Equation (1)), the value loss, ΔV_0 , due to the crisis is given by Equation (3):

$$\Delta V_0 = \sum_{t=1}^T \frac{\Delta X_t - \Delta I_t}{(1+r)^t} \quad (3)$$

Equation (3) shows that value loss increases with the length of the crisis, T , and the magnitude of the operating cash flow drop, ΔX_t , but is reduced by investment reduction, ΔI_t . The hypotheses developed later in this section assume an efficient market as defined by Fama (1970). Under this assumption, stock price changes reflect the market's expectations regarding

⁴ Interested readers can also read Fahlenbrach et al. (2020).

the magnitude of the cash flow shortfall and the length of the crisis. As the crisis unfolds, market participants correct their expectations to the latest information available leading to stock price adjustments. As crisis length is common to all firms, only the magnitude of changes in operating cash flow and investment drive the cross-sectional differences in stock price changes.

3.2.2 Value of financial flexibility

Denis (2011) defines financial flexibility as “*the ability of a firm to respond in a timely and value-maximizing manner to unexpected changes in the firm's cash flows or investment opportunity set*”. When a firm faces an economic shock, financial flexibility allows the firm to offset the revenue drop with alternative sources of financing. This analysis considers two sources of financing: cash reserves as internal financing and debt as outside financing.

The literature describes internal financing as a cheaper source of financing than external funds because of lower information asymmetry (Myers and Majluf, 1984). Gamba and Triantis (2008) observe that firms manage their cash balance to avoid the risk of financial distress given the current prospects. Hence, firms increase cash reserves for precautionary purposes if they anticipate a revenue shock, financial constraints or investment opportunities. When an unexpected cash flow shortfall occurs, cash reserves play the role of a buffer to avoid liquidation or fire sales (Almeida et al., 2004). Additionally, holding cash allows firms to maintain profitable investments when external financing is either unavailable or too costly (Denis and Sibilkov, 2010). These findings are confirmed by a survey of CFOs conducted by Campello et al. (2010). The survey also shows that firms with limited access to external financing use internal liquidity to fund investments and liquidated assets to generate cash during the global financial crisis. Finally, most authors point at a higher value of cash holding for financially constrained firms (e.g. Almeida et al. (2004) and Denis and Sibilkov (2010)). However, a high level of uncertainty, revenue decline, and limited access to external finance are likely to generalize the value of cash holding during crisis periods. For instance, Fahlenbrach et al. (2020) and Ramelli and Wagner (2020) document the positive value of cash holding during the COVID-19 pandemic in the US. Therefore, I expect the following:

H2: Cash holding is positively associated with stock returns when firms experience a sudden economic shock.

As external funds, debt is costlier than internal liquidity (Myers and Majluf, 1984). Debt also constitutes a source of fixed costs due to interest and repayment. Therefore, a higher debt level implies higher costs to fund and a larger value loss in the case of a revenue shock. In addition, a high level of debt exposes firms to debt payments and rollover risks (Fahlenbrach et al., 2020). These negative effects are especially relevant for short-term debt (Duchin et al., 2010). Debt also restrains the ability of the firm to raise additional external funds, thus reducing its financial flexibility. Accordingly, I propose the following hypothesis regarding the value of debt:

H3: Debt ratio is negatively associated with stock returns when firms experience a sudden economic shock.

Investments can be considered as another aspect of financial flexibility. A revenue drop alters the firm's ability to fund new projects especially if the firm has a limited internal liquidity and restricted access to external financing. Therefore, as the survey by Campello et al. (2010) indicates, many firms have to cut profitable investments to lower their costs during crisis periods. In the short run, cutting investments limits the drop in equity value as illustrated by Equation (3). However, it might reduce firm value in the long run by altering future revenue (the second part of the right-hand side of Equation (2)). Therefore, investment-intensive firms are likely to suffer more from revenue shocks. First, if investment cancelation is not possible in the short run, investment-intensive firms have to cover higher costs increasing the value loss. Second, reducing investments is likely to strongly alter the future value of investment-intensive firm. For these reasons, I propose the following hypothesis:

H4: Investment intensity is negatively associated with stock returns when firms face a sudden economic shock.

3.2.3 Value of financial flexibility and business group affiliation

Hypotheses 2 to 4 discuss the value of financial flexibility when economic shocks occur, assuming that the firm is independent and relies on internal liquidity and external finance. This subsection introduces the possibility of a business group affiliation. Unlike independent firms, firms affiliated with a business group have access to internal capital markets (see Section 2.2). When an economic shock occurs, access to internal capital markets might help affiliated firms

to fund the revenue drops and offset the restricted access to external finance. This assumption requires to revisit and complement previous hypotheses.

As access to internal capital markets relaxes financial constraints (Shin and Park, 1999), the value of cash holding might be lower for business group affiliates than for unaffiliated firms. Indeed, as a flexible source of financing, internal capital markets offset a lack of internal liquidity, when firm revenue drops. In addition, the co-insurance effect and mutual insurance substitute the precautionary and buffer effects of cash holding. Hypothesis 2 can be developed as follows:

H5: When an economic shock occurs, cash holding is a less relevant pricing factor for affiliated firms than for unaffiliated firms.

For similar reasons, business group membership is likely to mitigate the negative association between debt level and equity value when a revenue drop occurs. The mutual insurance effect alleviates the risk of bankruptcy associated with interest and debt repayments. In addition, through the “more-money” effect, internal capital markets ease access to debt financing and reduces its costs or acts as a substitute for external debt for affiliates unable to raise external financing. Accordingly, Hypothesis 3 can be revised as follows:

H6: When an economic shock occurs, debt ratio is a less relevant pricing factor for affiliated firms than for unaffiliated firms.

Due to lower information asymmetry, internal capital markets allow for a more efficient resource allocation than external markets (Stein, 1997). Almeida et al. (2015) observe that during crisis period, affiliates with high growth opportunities benefit from internal capital markets to fund investments. Hoshi et al. (1991) and Shin and Park (1999) empirically show that business group affiliation is associated with a lower investment to cash flow sensitivity. Therefore, the access to internal capital markets reduces the likelihood of investment cancelation in the case of cash flow drops. Accordingly, I suggest revising Hypothesis 4 as follows:

H7: When an economic shock occurs, investment intensity is a less relevant pricing factor for affiliated firms than for unaffiliated firms.

3.3 Heterogeneity of business group membership value

According to Hypotheses 1a and 1b, the value of business group membership depends on the extent to which an economic meltdown increases the benefits and costs of affiliation. However, an important limitation of these hypotheses is the assumption of a homogeneous affiliation value. The following hypotheses relax this assumption and examine between-affiliate and between-group heterogeneity.

3.3.1 *Between-affiliate heterogeneity of business group membership value*

Affiliates with weaker balance sheets are likely to benefit more from business group affiliation. Internal capital markets constitute a valuable source of funding for affiliates with low cash reserves or high debt, given their limited access to outside financing (Bae et al., 2008). In addition, Gormley et al. (2015) show that affiliation also eases access to the debt market. Finally, propping and mutual insurance may benefit weaker affiliates (Friedman et al., 2003). According to these arguments,

H8a: *The value of business group membership is positive for affiliates with weaker balance sheets.*

However, an economic crisis might reduce some benefits of affiliation, particularly for weak affiliates. As discussed earlier in this section, economy-wide shocks annihilate the co-insurance effect of internal markets. Friedman et al. (2003) also suggest that propping is likely to stop in the case of severe macroeconomic shocks. Financially weak affiliates also face higher agency costs due to the risk of bankruptcy and restructuring (Jensen and Meckling, 1976) as well as minority shareholder expropriation (Friedman et al., 2003). Finally, financial distress might lead business groups to liquidate the weakest affiliates to focus on core businesses (Kim et al., 2004). Therefore, the following hypothesis is proposed:

H8b: *The value of business group membership is negative for affiliates with weaker balance sheets.*

As an additional source of financing, internal capital markets help affiliates to fund investments above their internal capacity (Belenzon et al., 2013). When access to external funding tightens, investment-intensive affiliates can rely on internal capital markets to maintain

an optimal level of investment. For instance, Almeida et al. (2015) find that internal capital markets allow business group affiliates to maintain their investments during and after financial crisis. As discussed previously, investment-intensive firms face a double burden due to higher costs and the risk of altering future value by canceling investments. Hence,

H9: The value of business group membership is positive for firms with high investment intensity.

3.3.2 Between-group heterogeneity of business group membership value

The value of affiliation is likely to vary between groups depending on the benefits and risks associated with each group. The resource based view approach suggests a positive link between the benefits of affiliation and business group size (Carney et al., 2011). Byun et al. (2013) argue that the co-insurance effect and group size are positively associated. Group size also provides some intangible benefits such as higher market and political power (Khanna and Yafeh, 2007), the “too big to fail” belief (Gormley et al., 2015), and better visibility and reputation, easing business relations (Morck et al., 2005). As this analysis focuses on investors’ perception, these benefits are especially relevant. Therefore,

H10: The value of business group membership is higher for the largest business groups.

Group financial vulnerability might be a source of concern for investors. First, the lack of resources decreases the benefits of internal capital markets such as propping and co-insurance. Second, as observed by Gopalan et al. (2007) in India, the bankruptcy of an affiliate increases the bankruptcy risk of other affiliates. The collapse of Korean chaebols during the 1997 Asian financial crisis provides another example of this spillover effect (Eichengreen et al., 2015). Hence, I expect the following:

H11: The value of business group membership is negative for business groups exposed to affiliate financial distress.

The value of business group membership during economic downturns depends on the extent to which economic shocks influence the benefits and costs of affiliation. On the one hand, investors might perceive business group affiliation as beneficial when firm experiences

revenue shock and access to external financing is limited. Indeed, access to internal capital markets reduces the affiliates' reliance on cash reserves and outside financing. In addition, business groups might support their distressed affiliates through propping and mutual insurance. On the other hand, the uncertainty that characterizes crisis periods exacerbates the conflicts of interest between controlling and non-controlling shareholders. A strong economic shock might also reduce some of the benefits of affiliation. For these reasons, the value of affiliation is likely to differ between affiliates depending on their financial conditions and capital needs. Finally, the value of business group membership also depends on the group's financial strength and its ability to provide advantages to its affiliates.

4. Sample and variables

4.1 Sample selection

As discussed in the introduction, the Korean market provides an ideal field for analyzing business groups and internal capital markets. A single country analysis also ensures consistency in business group definition and homogeneity in the institutional framework (Byun et al., 2013). The sample consists of firms listed on the two main divisions (KOSPI and KOSDAQ) of the Korean stock market (KRX) as of January 2, 2020.⁵ Following common practice in the literature, financial and utility firms are excluded from the sample (ICB industry codes 30 and 65). To avoid bias due to the pandemic, firms with fiscal ends other than the end of December 2019 are dropped. After deleting firms with missing data, the final sample is composed of 1870 listed firms including 704 listed on the KOSPI and 1166 listed on the KOSDAQ division.

4.2 Dependent and independent variables

Accounting and financial data are retrieved from Refinitiv Datastream and Worldscope. The main dependent variable of the analysis is the cumulative excess return⁶ computed as the sum of daily excess returns defined as the natural logarithm of one plus the daily stock return minus the risk free rate. The total return index (RI) provided from Refinitiv Datastream is used to compute daily returns. The risk-free rate is the yield of one-year treasury bonds provided by

⁵ Established in 1956, the KOSPI is the main and historical market division of the Korean stock market. The largest Korean multinational enterprises are listed on this division. Founded in 1996, the KOSDAQ aims to provide an access to capital market for SMEs. The list of listed firms comes from the KRX website.

⁶ This methodology follows Fahlenbrach et al. (2020) and Ramelli and Wagner (2020) who use cumulative returns to investigate the market reaction during the COVID-19 pandemic.

the Bank of Korea. Cumulative excess returns are computed for different sub-periods (see Section 4.3) and are described in Section 5.1.

The independent variables include proxies for financial flexibility and investment. Cash holding is used as a measure for the internal source of financing. The analysis uses three different measures of debt to assets ratios: short-term, long-term, and total debt. Net short-term debt computed as short-term debt in excess of cash combines internal and external financing. Investment intensity is measured as the ratio of capital expenditure to lagged assets. In further analysis, Tobin's q is used as a proxy for investment opportunities. Following Fahlenbrach et al. (2020), I use five variables to control for cross-sectional variation in stock returns. These variables are profitability, size, value, market beta, and momentum. Profitability is measured using return on assets (ROA). Firm size is the natural logarithm of the year-end market capitalization. The book-to-market ratio is a proxy for firm value. These variables are measured at the end of 2019. Market beta is the regression slope of daily stock excess returns on a constant and daily excess market returns for 2019.⁷ Momentum is the sum of the daily log excess stock returns of year 2019. All variables are winsorized at the 1 percent level in each tail. The industry indicator is based on the ICB supersectors definition. Appendix A defines the independent variables in more detail.

Summary statistics of the independent variables are presented in Panel A of Table 1. The average (median) firm has a cash to assets ratio of 10.33 percent (7.61 percent). In terms of debt structure, we observe a higher proportion of long-term debt than short-term debt, with ratios of 14.54 percent (11.39 percent) and 7.60 percent (4.04 percent), respectively. Firms have, on average, positive net short-term leverage meaning that their short-term debt exceeds their cash reserves. In 2019, the average (median) capital expenditure to lagged assets is 4.88 percent (2.51 percent).

[Insert Table 1 here]

Every year, the KFTC discloses a list of the largest business groups and their affiliates. This specificity of the Korean framework is an interesting and convenient feature for researchers. Following common practice in the literature, the chaebol affiliation indicator is based on this classification. Unlike some authors, this analysis does not restrict the definition of chaebol to the 30 largest business groups, and instead includes all business groups with a

⁷ KOSPI Composite and KOSDAQ Composite are used as benchmark markets depending on which market stocks are listed.

value of total assets above the threshold of 5 trillion KRW. The final sample comprises 52 groups and 237 listed affiliates.⁸ Ownership variables for chaebol affiliates are based on KFTC data. Following a common practice in the literature (e. g. Baek et al. (2004) and Bae et al. (2012)), the disparity between control and cash flow rights of controlling shareholders (and their families) is used as a proxy for governance and expropriation risks. For a given firm, the controlling shareholder' cash flow rights are the sum of direct and indirect equity ownership, which is computed as the product of ownership stakes obtained along the control chain. Control rights are the sum of direct equity ownership and the sum of equity ownership of other affiliates in the given affiliate.⁹ Like Bae et al. (2012), I trace indirect equity stakes up to the second pyramid layer.¹⁰ Then, chaebol affiliates are classified into two groups depending on whether their ratio of control to cash flow rights is higher or lower than the median.¹¹

Panels B and C of Table 1 contain summary statistics of firm characteristics sorted based on their affiliation status. On average, chaebol affiliates are larger, more profitable, and less risky than their unaffiliated counterparts. They exhibit higher book-to-market ratio and negative returns for the year 2019. In terms of financial position, unaffiliated firms hold more cash and use less debt than chaebol affiliates. However, the debt structure between the two groups differs. Affiliated firms use more long-term debt, and unaffiliated firms rely more on short-term debt.

4.3 Economic shock and timeline of COVID-19 pandemic in Korea¹²

As an exogenous and unexpected shock, the COVID-19 crisis provides a perfect setting to empirically test the hypotheses developed in Section 3. Firms are unlikely to have had time to adjust their financial positions, given the rapid spread of the virus around the world. In addition, the shock alleviates concerns regarding the endogeneity of business group formation. The COVID-19 pandemic is also interesting because of its non-financial origin, in contrast to previous economic crises (Albuquerque et al., 2020). Finally, this crisis differs from previous ones due to the rapid and massive policy interventions, allowing a strong rebound of stock markets (WEF, 2020b). The sample period covers the first months of the pandemic from

⁸ Among the 64 business groups identified by the KFTC, some business groups do not have listed affiliates.

⁹ I consider both listed and unlisted affiliates in the computation of indirect control and cash flow rights.

¹⁰ Almeida et al. (2011) observe that pyramids in Korean chaebols are rarely longer than two or three firms.

¹¹ An affiliate located above the second layer (23 listed affiliates over 237) is considered as an affiliate with high control to cash flow right disparity.

¹² Center for Strategic and International Studies (CSIS) and World Health Organization (WHO) provide comprehensive timelines of COVID-19 in South Korea and worldwide at the following URL: <https://www.csis.org/analysis/timeline-south-koreas-response-covid-19> and <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline>.

January 2 to May 13, 2020. To investigate the market reaction during the different phases of the crisis, I adapt the methodology used by Ramelli and Wagner (2020) to the Korean case and split the sample period into three sub-periods: the Uncertainty, the Panic, and the Recovery periods.

On December 31, 2019, Chinese authorities reported cases of an unknown pneumonia in Wuhan to the World Health Organization (WHO) local office. The following day, the local authorities closed the food market identified as the source of contamination (WHO, 2020b). The Uncertainty period starts on January 2, corresponding to the first trading day after the closing of the Huanan Seafood Wholesale Market. Increasing uncertainty characterized the first months of the pandemic with the rise of new infections and the spread of the disease outside China. Ramelli and Wagner (2020) note that the COVID-19 pandemic started catching the attention of managers and analysts from mid-January. Korea introduced a screening for passengers from Wuhan on January 3. The detection of the first imported case on January 20 triggered the heightening of the 4-level National Infectious Disease Risk Alert System from level 1 to level 2. Seven days later, the alert level was raised to level 3. From the end of January, Korea organized charter planes to bring citizens back, and traveling restrictions were introduced in early February. Meanwhile, large-scale mask distributions were organized in vulnerable workplaces and testing facilities were opened (MOFA, 2020).

On February 20, Korea reported the first COVID-19 death (WHO, 2020a) marking the beginning of the Panic period. During the following days, the health situation deteriorated in Korea. The infectious disease alert was raised to its highest level (MOFA, 2020). The potential role of a religious circle in the spread of the virus drew international attention on the country (Cha, 2020). By the end of February, distancing measures were introduced (MOFA, 2020). During this period, Korean and international stock markets faced severe turbulence with a price drop and increasing volatility (WEF, 2020b). The Panic period corresponds to an economy-wide shock as defined in the hypotheses. Most industries faced difficulties. Local lockdowns and border restrictions disrupted supply chains and production. In addition, the spread of the disease and the increase in cases around the world generated high uncertainty.

The announcement of a USD 60 billion swap arrangement between the Bank of Korea and the US Federal Reserve (BOK, 2020a) marked the beginning of the Recovery period on March 20, 2020 (the first trading day after the announcement). This intervention reassured market participants and dispelled the risk of a credit crunch. The Recovery period ends on May 13 when the Bank of Korea announced additional support for SMEs (BOK, 2020b).

5. Empirical results

This section starts by presenting an overview of the Korean stock market reaction to the COVID-19 pandemic. Next, the hypotheses developed in Section 3 are empirically tested and discussed.

5.1 Korean market and COVID-19 pandemic

The COVID-19 pandemic triggered an unprecedented collapse of stock markets around the world. Between January 2 and March 19, 2020, the main Korean index (KOSPI) lost 33.68 percent and dropped to its lowest level since the global financial crisis.¹³ However, rapid policy responses around the world allowed a rebound of the stock markets (WEF, 2020b). However, the V-shaped recovery of financial markets is in contrast with the difficulties experienced by the real economy (Goldstein et al., 2021).

[Insert Table 2 here]

Panel A of Table 2 contains summary statistics of cumulative excess returns for all sample firms over the three sub-periods (Columns (1) to (3)) and the whole sample length (Column (4)). In the Uncertainty period, the Korean stock market entered a downtrend with a slightly negative average cumulative excess return. The actual market collapse occurred during the Panic period. Between February 20 and March 19, 2020, the average cumulative excess return was -55.74 percent. Even firms in the top quartile exhibited a negative cumulative return (-41.22 percent), illustrating the severity of the shock. During the Recovery period, the market rebounded, and firms earned, on average, a positive cumulative return of 48.65 percent. However, despite the strong upturn, the mean and median cumulative returns were negative (-7.33 and -10.76 percent, respectively) over the full sample length.

Panel A of Table 2 presents an overall view of the Korean stock market reaction during the first months of the COVID-19 outbreak. Prior empirical studies show that all firms were not affected by the COVID-19 pandemic to the same extent. Market reaction depended on different factors, such as the sector of activities and resilience to different health measures (Pagano et al., 2020), financial flexibility (Fahlenbrach et al., 2020), or exposure to foreign markets (Ramelli and Wagner, 2020). To illustrate the heterogeneity of market reactions, Figure 1 plots

¹³ The KOSPI ended the year 2019 at 2197.97 points and plunged to 1457.64 points. During the same period, the KOSDAQ dropped from 669.83 to 428.35 points.

mean the cumulative excess returns by industry over the different phases of the COVID-19 pandemic.

[Insert Figure 1 here]

In January, stock and currency markets showed the first signs of concern regarding the potential impact of the health situation. Treasury yield declined and the Korean won depreciated. Later, some economic indicators such as industrial production, retail sales, and construction, started to decline (KDI, 2020). During the Uncertainty period (blue bars), travel and leisure firms performed the worst, with a negative cumulative excess return of 9.47 percent. Travel restrictions and health measures aimed at mitigating the spread of the virus immediately and heavily affected this industry. In annual comparison, the number of visitor arrivals declined by 43 percent in February.¹⁴ Hit by a slowdown in new orders and investments (KDI, 2020), construction and real estate firms also performed poorly and earned negative returns of 6.37 and 4.49 percent, respectively. Other sectors such as, automobile, technology and telecommunications, and non-durable household goods retailers still generated positive cumulative returns.

During the Panic period (yellow bars), the effects of the pandemic on the real economy became more salient with a drop in domestic demand and decline in employment. The COVID-19 pandemic also altered prospects regarding the global economy affecting export-oriented firms (KDI, 2020). Unsurprisingly, all industrial sectors experienced a severe stock price drop during the Panic period. The media performed the worst, with a cumulative excess return of -68.17 percent. No systematic link between performance during the Uncertainty and the Panic periods was observed. For instance, non-durable household goods retailers earned a positive cumulative return during the Uncertainty period (+5.20 percent), but experienced one of the most severe price drops during the Panic period (-59.68 percent).

Central bank intervention and the declining number of domestic COVID-19 cases reassured market participants and allowed the stock market to rebound in mid-March (KDI, 2020). All sectors generated positive cumulative returns on average during the Recovery period (green bars). However, the rebound was not strong enough to offset the price drop in the previous months. Only healthcare firms exhibited, on average, a positive cumulative return of 9.82 percent over the entire sample length (red bars).

¹⁴ See <https://kto.visitkorea.or.kr/eng/tourismStatics/keyFacts/KoreaMonthlyStatistics.kto>.

Panels B and C of Table 2 report the cumulative returns for non-chaebol and chaebol firms. Unlike unaffiliated firms, chaebol affiliates earned on average negative returns during the Uncertainty period but experienced a lower price drop during the following period. Finally, a stronger rebound during the Recovery period allowed unaffiliated firms to outperform chaebol affiliates over the full sample length. Baek et al. (2004) find similar results for the 1997 Asian financial crisis. On average, chaebol firms outperformed unaffiliated firms during the market collapse following the announcement of the IMF rescue package, but unaffiliated firms experienced a stronger rebound after the announcement of the sovereign debt rollover by international creditors. Table 2 also reveals that a larger fraction of unaffiliated firms disappeared from the sample due to trading suspension, delisting or bankruptcy. This observation illustrates the higher survival rate of affiliated firms during crisis (Santioni et al., 2020). The disappearance of the weakest unaffiliated firms from the sample might also explain part of the outperformance of unaffiliated firms during the Recovery period. The results reported in Table 2 do not account for the cross-sectional differences in stock returns explained by firm characteristics. Therefore, it is not possible to draw any conclusions regarding the value of business group membership. This question is empirically tested and discussed in the remainder of this section.

5.2 Value of business group membership during crisis

The identification strategy to estimate the affiliation value is based on the cross-sectional regression of stock returns on an affiliation indicator. To capture the value of affiliation net of the effects of other firm characteristics, the regression model includes a series of control variables that explain cross-sectional variation in stock returns. The baseline model is given by Equation (4):

$$y_i = \alpha + \delta Chaebol_i + \gamma X_i + Industry_i + Market_i + \varepsilon_i \quad (4)$$

where, y_i is the stock price performance of firm i . $Chaebol_i$ is an indicator for business group affiliation taking value 1 if firm i is affiliated with a chaebol and 0 otherwise. X_i is a vector of firm characteristics including value, size, market beta, profitability, and momentum computed at the end of 2019. $Industry_i$ and $Market_i$ are indicators for industry and market division (see Section 4.2 and Appendix A for more details).

Figure 2 illustrates the evolution of investors' perception evolves as the crisis unfolds. Equation (4) is estimated on a daily basis with daily stock returns as the dependent variable. The values of the coefficient on the affiliation indicator are then cumulated over the sample period to provide the daily cumulative value of business group membership.

[Insert Figure 2 here]

During the first months of the crisis, investors discount affiliation suggesting that business group affiliation is perceived as value-destroying during this period of high uncertainty and market downturn. The reverse can be observed during the Recovery period. When policy interventions stabilize markets and dispel risk of systemic crisis, business group affiliation is perceived as value-enhancing.

Table 3 presents the estimates of the business group membership value during the different phases of the crisis. Following Equation (4), the cumulative excess return for each sub-period is regressed on the affiliation indicator and control variables. The coefficients on the chaebol membership indicator are statistically significant for all phases. Consistent with Figure 2, business group membership is associated with lower cumulative stock returns net of other firm characteristics effects of 1.74 and 2.61 percent during the Uncertainty and the Panic periods, respectively. The value of affiliation turns positive and business group membership is associated with a 5.00 percent higher return during the Recovery period. Over the entire sample period, the coefficient on business group affiliation is not significant. This result suggests that the negative and positive effects offset each other.

[Insert Table 3 here]

The evidence of a time-varying value of affiliation emerges from Figure 2 and Table 3. During the first phases of the COVID-19 pandemic, the costs of affiliation (Hypothesis 1b) exceed its benefits (Hypothesis 1a). Consequently, investors penalize business group membership. The increasing uncertainty and risk of financial distress expose investors to expropriation by controlling shareholders. Additionally, the severity of the crisis raises the fear of systemic risk as observed during the 1997 Asian financial crisis when several chaebols collapsed. This event changed the perception of chaebols among Korean society and investors (Kim et al., 2004). Business group affiliates also lose some benefits associated with affiliation with a business group in normal times. The economy-wide shock annihilates the co-insurance

effect associated with the diversification of business groups. Therefore, business groups might not support their affiliates through propping or mutual insurance. Finally, the negative value of affiliation during the Uncertainty and Panic periods suggests that investors do not believe in the “too big to fail” or the possible government bailout of chaebols (Minetti and Yun, 2015).

The Recovery period starts with the intervention of the central bank aiming to stabilize financial market and financially support households and businesses (MOFA, 2020). This quick policy response dispels concerns that a deterioration of the situation threaten chaebols existence. Therefore, the benefits of affiliation surpass the costs, reflecting in the positive value of business group membership. Several authors document the beneficial effect of business group membership during the post-crisis period. For instance, Kim and Lee (2003), and Almeida et al. (2015), document that chaebol affiliates perform better and recover faster from the 1997 Asian financial crisis than unaffiliated firms. Additionally, Almeida et al (2015) find that access to internal capital markets allows chaebol affiliates to maintain investments.

[Insert Table 4 here]

To test whether an increase in governance risks explains the affiliation discount observed during the market collapse, chaebol affiliates are classified into two groups depending on whether the control to cash flow rights disparity is above or below the median. Affiliates with high disparity are expected to be more exposed to expropriation and governance risks. The results presented in Table 4 support the hypothesis that affiliation discount is associated with governance risk. During the Panic period, only affiliates with a high level of control to cash flow rights disparity exhibit a discount. However, both groups of affiliates benefit from a premium during the Recovery period, suggesting that governance issues are less of a concern during this period. These results are also consistent with findings of Bae et al. (2012) who document an increase in the risk of expropriation during market collapse and a decrease in this risk when the market recovers around the 1997 Asian financial crisis.¹⁵

Overall, the empirical analysis reveals how investors’ perception of business group membership evolves as the crisis unfolds. This finding shows that the value of affiliation can switch from a discount to a premium in a short period of time. This variability might explain the lack of consensus in prior studies, as the results are highly sensitive to the sample period used to estimate affiliation value.

¹⁵ Bae et al. (2012) define the crisis period as the 15 months following the announcement of the Baht devaluation in July 1997 and the recovery period as the following 15 months.

5.3 Pricing of financial flexibility and investment

This section presents empirical tests of the hypotheses relative to the value of financial flexibility and the role of internal capital markets. The estimation of financial flexibility value follows the methodology used to estimate affiliation value (see also Fahlenbrach et al. (2020)). Cumulative excess returns are regressed on proxies for financial flexibility and firm characteristics to account for the cross-sectional variation in returns. The baseline model to assess the value of financial flexibility is presented in Equation (5):

$$CR_i = \alpha + \beta FinancialProxies_i + \gamma X_i + Industry_i + Market_i + \varepsilon_i \quad (5)$$

where, CR_i is the cumulative excess return of firm i for a given period. $FinancialProxy_i$ is a vector of financial variables computed as of the end of year 2019. X_i , $Industry_i$ and $Market_i$ are the same vector of firm characteristics and indicators for industry and market, respectively, as used in Equation (4). Two specifications of Equation (5) are tested. The first specification uses net short-term and long-term debt as the financial proxies. The second specification considers cash and short-term debt separately, in addition to long-term debt. Both approaches are complementary. Gamba and Triantis (2008) point out that different combinations of cash reserves and debt leverage might result in a similar net debt position, but have different implications in terms of firm value, taxation, and financial flexibility. In the context of a sudden economic and revenue shock, both measures are informative. Net short-term debt reflects the capacity of the firm to face financial obligations in the short run without revenue. Taken separately, cash holding represents the capacity of the firm to fund a revenue drop without raising outside financing, whereas short-term debt represents the financial obligations that it needs to meet in the short run. Table 5 reports the estimates for both specifications.

[Insert Table 5 here]

Panel A of Table 5 presents the results for all sample firms. As expected, financial flexibility explains returns during periods of high uncertainty and market turmoil. A one-standard deviation of net short-term debt is associated with a lower cumulative return (net of the effects of other firm characteristics) of 0.73 and 1.87 percent during the Uncertainty and

Panic periods, respectively. When cash and short-term debt are considered separately, results show that investors penalize debt holding during the Uncertainty period and value cash holding during the Panic period. This result illustrates the relevance and different nature of these two balance sheet components depending on the crisis phase. During the first months of the pandemic, financial market turmoil raises concerns regarding access to external finance, leading to a discount on short-term debt. However, when the risk materializes through an actual revenue drop, investors are willing to pay a premium for the buffer effect of cash holding. During the Recovery period, the market rebounds and policy interventions dissipate concerns regarding financing. None of the coefficients on the financial proxies are significant. The results also show that investors do not significantly price long-term debt, supporting the interpretation that financial distress is the first concern during a revenue shock.

Overall, Hypotheses 2 and 3 are supported by the empirical results. During the full sample period, a one standard deviation of cash holding is associated with a 1.94 percent higher cumulative excess return net of firm characteristics and, a one standard deviation of short-term debt is associated with a 1.72 percent lower cumulative return. The positive (negative) value of cash holding (debt) during the crisis period is consistent with the existing literature regarding the COVID-19 pandemic (e.g. Fahlenbrach et al. (2020) and Ramelli and Wagner (2020)) and the Korean market during the 1997 Asian financial crisis (Baek et al., 2004).

To test whether investors price financial flexibility proxies differently depending on business group membership and access to internal capital markets, Equation (5) is estimated separately for non-chaebol and chaebol firms. The results are reported in Panels B and C, respectively, of Table 5. Consistent with general predictions, investors value financial flexibility for unaffiliated firms. During the full sample period, a one standard deviation of cash holding is associated with a 2.02 percent higher cumulative return and a one standard deviation of short-term debt is associated with a 2.14 percent lower cumulative return. However, the results of Panel C indicate that investors do not price financial flexibility proxies for firms affiliated with a business group supporting Hypotheses 5 and 6. Except for cash holding during the Uncertainty period, none of the coefficients on financial flexibility proxies are significant.

[Insert Table 6 here]

Table 6 presents estimates of Equation (5) including investment intensity proxy. Investment intensity is proxied by the ratio of capital expenditure scaled by the lagged assets. Columns (1) to (4) report results for all sample firms. Investment intensity is negatively

associated with stock returns during the Panic period. During this period, a one standard deviation of investment is associated with a 1.36 percent lower cumulative return. Consistent with the prediction of Hypothesis 4, investment expenses exacerbate the loss in equity value when the revenue drops. Investors might also anticipate a deterioration of future prospects if firms are unable to maintain their optimal investment level. The next columns report results for non-chaebol (columns (5) to (8)) and chaebol (columns (9) to (12)) firms. The negative association is significant only in the case of unaffiliated firms supporting Hypothesis 7. Overall, the results presented in Table 5 and Table 6 suggest that business group membership and access to internal capital markets alleviate investors' concerns about financing during crisis period.

5.4 Heterogeneity of value of business group membership

5.4.1 Value of business group membership and affiliates characteristics

This section starts by examining the between-affiliate heterogeneity of the value of business group membership. So far, the costs and benefits of affiliation are assumed to be homogeneous across affiliates. However, financial flexibility and the need for funds are likely to influence the value of affiliation as discussed in Section 3. To capture between-affiliate heterogeneity, affiliates are first sorted based on their financial ratios.

[Insert Table 7 here]

Panel A of Table 7 presents the results for classification based on net short-term debt. In columns (1) to (4), affiliates are sorted by the sign of net short-term debt. During the Uncertainty and Panic periods, investors discount business group membership for affiliates with positive net debt. These affiliates are unable to meet short-term financial obligations without revenue and/or additional financing. In normal times, they can rely on group support or external finance to face a sudden drop in revenue. However, the economy-wide dimension of the COVID-19 crisis reduces the ability of groups to provide support and access to external finance. In addition, financial vulnerability exacerbates the risk of liquidation or expropriation by controlling shareholders (Friedman et al., 2003). Once the market rebounds and the financial outlook brightens, the risk of liquidation is dispelled and affiliates might benefit from advantages such as propping and mutual insurance. Consequently, the coefficient on affiliation turns positive during the Recovery period. Overall, investors do not price business group membership for affiliates with negative net debt. These affiliates are less exposed to financial

distress because they are able to fund short-term financial obligations with their own cash reserves. In columns (5) to (8), affiliates are sorted into three groups based on the value of net short-term debt. Affiliates in the highest and lowest quartiles form two distinct groups (“high” and “low”). The reference group (“middle”) is composed of affiliates in the two middle quartiles. The results are consistent with the sorting based on the sign. However, this finer classification allows to observe that investors first discount the weakest affiliates (with a high net debt ratio) and then affiliates with a middle ratio when the economic situation deteriorates. During the Recovery period, business group membership is associated with significantly higher returns for affiliates with high and middle levels of net short-term debt. The results based on quartile classification also confirm the non-significance of the affiliation value for the strongest affiliates.

In Panel B, affiliates are sorted by cash holding (columns (1) to (4)) and total debt (columns (5) to (8)) quartiles following the same procedure as described above. Overall, the results are similar and consistent with the net short-term debt classification. Business group membership does not explain the strongest affiliates’ returns. Cash-rich firms do not rely on internal capital markets to fund revenue drops and firms with moderate or low debt are usually able to face their financial obligations. Additionally, these affiliates keep debt capacity to raise additional financing. During the first two phases of the crisis, as the situation worsens, investors discount affiliates with low cash reserves and/or high debt levels. During the Uncertainty period, only affiliates with the lowest cash reserves are discounted. However, when the market collapses and the crisis hits the real economy, the discount also affects affiliates with middle cash reserves. Given the risk of financial distress due to debt, investors discount affiliates with a high debt ratio during the first two periods. Consistent with earlier observations, once financial markets recover, affiliates with weaker balance sheets might benefit from their affiliation and the coefficient on affiliation turns positive during the Recovery period.

[Insert Table 8 here]

The results for sorting based on investment intensity (reported in Table 8) do not allow any conclusion regarding the association between investment intensity and the value of business group membership. During the Uncertainty period, investors discount affiliation for affiliates with middle investment intensity only. During the Recovery, positive coefficients on affiliation indicator are observed for affiliates with high and low investment intensity. These results do not support Hypothesis 9. A plausible explanation is that investors anticipate an efficient

allocation of resources as consistent with the “smarter-money” effect and prior literature (e. g. Shin and Park (1999) and Almeida et al. (2015)). In other words, they expect that only affiliates with good prospects benefit from propping to maintain their investments. To examine this hypothesis, affiliates are sorted by investment intensity and investment opportunities proxied by Tobin’s q .¹⁶ Overall, the results presented in Appendix B support this hypothesis. During the Uncertainty period, the discount observed for middle investment-intensive affiliates is not valid for those with high investment opportunities and the premium observed during the Recovery period is not significant for affiliates with poor investment opportunities.

5.4.2 Value of business group membership and business group characteristics

The results show that financial strength and the need for capital explain the between-affiliate heterogeneity of affiliation value. Therefore, it is also likely that the value of affiliation depends on the ability of business groups to provide resources and support to their affiliates. As discussed in Section 3, resource availability is associated with the group size. To capture between-group heterogeneity, the affiliation indicator is redefined based on the KFTC classification ranking.¹⁷

[Insert Table 9 here]

Columns (1) to (4) of Table 9 present the results for a classification distinguishing the 30 largest chaebols (top 30) from smaller ones (Other chaebols). The coefficients on indicators for affiliation with a top 30 chaebol are significant during the Panic and Recovery periods. Investors discount business group affiliation when the market collapses but pay a premium during the market rebound. This result is consistent with the findings in Table 3. However, only the indicator for top 30 chaebols affiliation is significant, suggesting that only affiliation with a large business group matters for investors. The visibility and publicity of the top 30 chaebols are likely to explain this result. Indeed, before using the value of total assets as a threshold for its classification, the KFTC only considered the 30 largest business groups (Almeida et al., 2011). Moreover, some authors still consider only the 30 largest business groups as chaebols.¹⁸ Therefore, investors may ignore smaller business groups.¹⁹ Another explanation is the size,

¹⁶ To avoid multicollinearity with Tobin’s q , regressions do not include book-to-market ratio as control variables.

¹⁷ KFTC classification is based on the value of total assets of all group affiliates (listed and unlisted).

¹⁸ See Bae et al. (2002) and Bae et al. (2011)

¹⁹ In addition, business groups close to the threshold of total assets are more likely to enter or exit the KFTC classification.

diversification, and economic power that characterize the largest chaebols (Bae et al., 2002). Therefore, investors might disregard an affiliation with a business group with few affiliated firms and less resources to share.

Columns (5) to (8) present an alternative specification classifying chaebols into three groups: the 10 largest chaebols (top 10), the chaebols ranked between the 11th and 30th positions (top 11-30), and smaller chaebols (Other chaebols). The results differ slightly from the results for the top 30 classification. During the Uncertainty period, the coefficient on affiliation with a middle-sized chaebol is negative and significant, whereas the coefficient on affiliation with a top 10 chaebol is not. During this period, investors might perceive the largest chaebols to be strong enough to face the increasing uncertainty and potential losses. However, middle-sized chaebols might appear as riskier given their lower resources and diversification. However, when the crisis worsens and the market collapses during the Panic period, the threat of expropriation and liquidation touch affiliates of the largest chaebols as well. In addition, given the severity and scale of the crisis, neither the size nor diversification of the largest chaebols ensure group strength and viability. During the Recovery period, investors value affiliation with both the top 10 and middle-sized chaebols. The evidence that investors only price affiliation with the largest chaebols confirms Hypothesis 10.

When a sudden and economy-wide shock occurs, investors may be concerned with the financial vulnerability of business groups. The proportion of listed affiliates with positive net short-term debt is used as a proxy for group financial vulnerability. Chaebols are ranked in quartiles according to the proportion of the listed weak affiliates. Chaebols in the highest and lowest quartiles are classified as “high risk” and “low risk”, respectively, whereas chaebols belonging the middle quartiles are classified as “middle risk”.

[Insert Table 10 here]

In Table 10, we observe that during the Uncertainty period, affiliation with a low-risk chaebol is associated with a premium, whereas affiliates of riskier chaebols suffer from a discount. During the Panic period, only affiliation with the riskiest chaebols is associated with a significant discount. Consistent with Hypothesis 11, these results suggest that the severe economic shock and uncertainty raise fears of chaebol collapse among investors. The no bail-out policy adopted by the Korean government in the aftermath of the 1997 Asian financial crisis may have exacerbated this fear (Minetti and Yun, 2015). As observed at a firm-level, the market

rebound and policy interventions dispel these concerns. Hence, affiliates of all chaebols benefit from a premium during the Recovery period.

6. Conclusion

My paper exploits the exogeneity of the economic shock triggered by the COVID-19 pandemic to provide novel evidence about investors' perception of business group membership. A stock price analysis indicates a switch from an affiliation discount to an affiliation premium as the crisis unfolded.

During the first months of the pandemic, global turmoil raised investors' skepticism regarding business groups. The high level of uncertainty and the severity of the economic shock revived the fear of chaebols collapse and exacerbated governance risks, leading investors to discount affiliation. This pattern is more pronounced for both chaebols exposed to their affiliates distress and affiliates with a high risk of minority shareholder expropriation. Nevertheless, policy intervention and market stabilization dispelled these risks and reassure investors. Hence, business group affiliation becomes a value-enhancing factor once the market rebounded.

My analysis also highlights the role of internal capital markets during a financial crisis. Hence, I observe that financial flexibility is a significant stock price driver only for unaffiliated firms. This finding suggests that access to internal capital markets associated with business group affiliation alleviates investors' concerns regarding financing. The evidence of between-affiliates and between-groups heterogeneity of affiliation value also emphasizes the important role of internal capital markets as a source of financing. Indeed, affiliation appears to be a more relevant pricing factor for affiliates with weak balance sheets. Additionally, investors tend to price affiliation only for large business groups with more resources to share.

Overall, this paper highlights how current economic uncertainty affects the anticipations of market participants regarding the benefits and costs of business group affiliation. Future research might compare these expectations with the real effect of business group membership in terms of operating performance during the pandemic.

References

- Acharya, V. V., and Steffen, S., 2020, The risk of being a fallen angel and the corporate dash for cash in the midst of COVID, *The Review of Corporate Finance Studies*, 9(3), 430-471.
- Albuquerque, R., Koskinen, Y., Yang, S., and Zhang, C., 2020, Resiliency of environmental and social stocks: an analysis of the exogenous COVID-19 market crash, *The Review of Corporate Finance Studies*, 9(3), 593-621.
- Almeida, H., Campello, M., and Weisbach, M. S., 2004, The cash flow sensitivity of cash, *The journal of finance*, 59(4), 1777-1804.
- Almeida, H., Kim, C. S., and Kim, H. B., 2015, Internal capital markets in business groups: Evidence from the Asian financial crisis, *The journal of finance*, 70(6), 2539-2586.
- Almeida, H., Park, S. Y., Subrahmanyam, M. G., and Wolfenzon, D., 2011, The structure and formation of business groups: Evidence from Korean chaebols, *Journal of Financial Economics*, 99(2), 447-475.
- Altig, D., Baker, S., Barrero, J. M., Bloom, N., Bunn, P., Chen, S., Davis, S. J., Leather, J., Meyer, B., and Mihaylov, E., 2020, Economic uncertainty before and during the COVID-19 pandemic, *Journal of Public Economics*, 191, 104274.
- Bae, G. S., Cheon, Y. S., and Kang, J.-K., 2008, Intragroup propping: Evidence from the stock-price effects of earnings announcements by Korean business groups, *The Review of Financial Studies*, 21(5), 2015-2060.
- Bae, K.-H., Baek, J.-S., Kang, J.-K., and Liu, W.-L., 2012, Do controlling shareholders' expropriation incentives imply a link between corporate governance and firm value? Theory and evidence, *Journal of Financial Economics*, 105(2), 412-435.
- Bae, K. H., Kang, J. K., and Kim, J. M., 2002, Tunneling or value added? Evidence from mergers by Korean business groups, *The journal of finance*, 57(6), 2695-2740.
- Bae, S. C., Kwon, T. H., and Lee, J. W., 2011, Does corporate diversification by business groups create value? Evidence from Korean chaebols, *Pacific-Basin Finance Journal*, 19(5), 535-553.
- Baek, J.-S., Kang, J.-K., and Park, K. S., 2004, Corporate governance and firm value: Evidence from the Korean financial crisis, *Journal of Financial Economics*, 71(2), 265-313.
- Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., and Viratyosin, T., 2020, The unprecedented stock market reaction to COVID-19, *The Review of Asset Pricing Studies*, 10(4), 742-758.
- Belenzon, S., Berkovitz, T., and Rios, L. A., 2013, Capital markets and firm organization: How financial development shapes European corporate groups, *Management Science*, 59(6), 1326-1343.
- Bank of Korea (BOK), 2020a, Bank of Korea Announces Swap Arrangement with U.S. Federal Reserve, Retrieved from: http://www.bok.or.kr/ucms/cmmn/file/fileDown.do?menuNo=400069&atchFileId=FILE_000000000016593&fileSn=1
- Bank of Korea (BOK), 2020b, BOK to Provide Additional Financial Support of 5 Trillion Won to SMEs Affected by COVID-19 (total of 10 trillion won including first-round support), Retrieved from: https://www.bok.or.kr/ucms/cmmn/file/fileDown.do?menuNo=400069&atchFileId=FILE_000000000017508&fileSn=2
- Bretscher, L., Hsu, A., Simasek, P., and Tamoni, A., 2020, COVID-19 and the cross-section of equity returns: Impact and transmission, *The Review of Asset Pricing Studies*, 10(4), 705-741.

- Buchuk, D., Larrain, B., Prem, M., and Urzúa Infante, F., 2020, How do internal capital markets work? Evidence from the great recession, *Review of Finance*, 24(4), 847-889.
- Byun, H.-Y., Choi, S., Hwang, L.-S., and Kim, R. G., 2013, Business group affiliation, ownership structure, and the cost of debt, *Journal of Corporate Finance*, 23, 311-331.
- Campello, M., Graham, J. R., and Harvey, C. R., 2010, The real effects of financial constraints: Evidence from a financial crisis, *Journal of Financial Economics*, 97(3), 470-487.
- Carletti, E., Oliviero, T., Pagano, M., Pelizzon, L., and Subrahmanyam, M. G., 2020, The COVID-19 shock and equity shortfall: Firm-level evidence from Italy, *The Review of Corporate Finance Studies*, 9(3), 534-568.
- Carney, M., Gedajlovic, E. R., Heugens, P. P., Van Essen, M., and Van Oosterhout, J., 2011, Business group affiliation, performance, context, and strategy: A meta-analysis, *Academy of Management Journal*, 54(3), 437-460.
- Cha, H. S. a. S., 2020, 'Like a zombie apocalypse': Residents on edge as coronavirus cases surge in South Korea, *Reuters*, 20.02.2020, Retrieved from <https://www.reuters.com/article/us-china-health-southkorea-cases-idUSKBN20E04F>
- Chang, S. J., and Hong, J., 2000, Economic performance of group-affiliated companies in Korea: Intragroup resource sharing and internal business transactions, *Academy of Management journal*, 43(3), 429-448.
- Dau, L. A., Morck, R., and Yeung, B. Y., 2021, Business groups and the study of international business: A Coasean synthesis and extension, *Journal of International Business Studies*, 52(2), 161-211.
- Denis, D. J., 2011, Financial flexibility and corporate liquidity, *Journal of Corporate Finance*, 17(3), 667-674.
- Denis, D. J., and Sibilkov, V., 2010, Financial constraints, investment, and the value of cash holdings, *The Review of Financial Studies*, 23(1), 247-269.
- Ding, W., Levine, R., Lin, C., and Xie, W., 2021, Corporate immunity to the COVID-19 pandemic, *Journal of Financial Economics*, 141(2), 802-830.
- Duchin, R., Ozbas, O., and Sensoy, B. A., 2010, Costly external finance, corporate investment, and the subprime mortgage credit crisis, *Journal of Financial Economics*, 97(3), 418-435.
- Edwards, C. D., 1955. Conglomerate bigness as a source of power. In *Business concentration and price policy* pp. 331-359: Princeton University Press.
- Eichengreen, B., Lim, W., Park, Y. C., and Perkins, D. H., 2015, *The Korean Economy From a Miraculous Past to a Sustainable Future* (1 ed. Vol. 375): Harvard University Asia Center.
- Faccio, M., Lang, L. H., and Young, L., 2001, Dividends and expropriation, *American economic review*, 91(1), 54-78.
- Fahlenbrach, R., Rageth, K., and Stulz, R. M., 2020, How Valuable Is Financial Flexibility when Revenue Stops? Evidence from the COVID-19 Crisis, *The Review of Financial Studies*. doi:10.1093/rfs/hhaa134
- Fama, E. F., 1970, Efficient Capital Markets: A Review of Theory and Empirical Work, *The journal of finance*, 25(2), 383-417. doi:10.2307/2325486
- Fama, E. F., Miller, M. H., and Miller, M., 1972, *The theory of finance*: Holt Rinehart & Winston.
- Friedman, E., Johnson, S., and Mitton, T., 2003, Propping and tunneling, *Journal of Comparative Economics*, 31(4), 732-750.
- Gamba, A., and Triantis, A., 2008, The value of financial flexibility, *The journal of finance*, 63(5), 2263-2296.

- Goldstein, I., Kojien, R. S. J., and Mueller, H. M., 2021, COVID-19 and Its Impact on Financial Markets and the Real Economy, *The Review of Financial Studies*, hhab085. doi:10.1093/rfs/hhab085
- Gopalan, R., Nanda, V., and Seru, A., 2007, Affiliated firms and financial support: Evidence from Indian business groups, *Journal of Financial Economics*, 86(3), 759-795.
- Gormley, T. A., Johnson, S., and Rhee, C., 2015, Ending “too big to fail”: government promises versus investor perceptions, *Review of Finance*, 19(2), 491-518.
- Granovetter, M., 2010, 19 Business Groups and Social Organization, *The Handbook of Economic Sociology*, 429.
- Halling, M., Yu, J., and Zechner, J., 2020, How Did COVID-19 Affect Firms’ Access to Public Capital Markets?, *The Review of Corporate Finance Studies*, 9(3), 501-533.
- Holmes Jr, R. M., Hoskisson, R. E., Kim, H., Wan, W. P., and Holcomb, T. R., 2018, International strategy and business groups: A review and future research agenda, *Journal of World Business*, 53(2), 134-150.
- Hoshi, T., Kashyap, A., and Scharfstein, D., 1991, Corporate structure, liquidity, and investment: Evidence from Japanese industrial groups, *The Quarterly journal of economics*, 106(1), 33-60.
- Jensen, M. C., and Meckling, W. H., 1976, Theory of the firm: Managerial behavior, agency costs and ownership structure, *Journal of Financial Economics*, 3(4), 305-360.
- Joe, D. Y., and Oh, F. D., 2018, Spillover effects within business groups: the case of Korean chaebols, *Management Science*, 64(3), 1396-1412.
- Johnson, S., Boone, P., Breach, A., and Friedman, E., 2000a, Corporate governance in the Asian financial crisis, *Journal of Financial Economics*, 58(1-2), 141-186.
- Johnson, S., La Porta, R., Lopez-de-Silanes, F., and Shleifer, A., 2000b, Tunneling, *American Economic Review*, 90(2), 22-27.
- Kandel, E., Kosenko, K., Morck, R., and Yafeh, Y., 2019, The great pyramids of America: A revised history of US business groups, corporate ownership, and regulation, 1926–1950, *Strategic Management Journal*, 40(5), 781-808.
- Korea Development Institute (KDI), 2020, *Economic Bulletin*, Retrieved from: https://www.kdi.re.kr/kdi_eng/publications/economic_bulletin.jsp
- Khanna, T., and Yafeh, Y., 2005, Business groups and risk sharing around the world, *The Journal of Business*, 78(1), 301-340.
- Khanna, T., and Yafeh, Y., 2007, Business groups in emerging markets: Paragons or parasites?, *Journal of Economic literature*, 45(2), 331-372.
- Kim, B., and Lee, I., 2003, Agency problems and performance of Korean companies during the Asian financial crisis: Chaebol vs. non-chaebol firms, *Pacific-Basin Finance Journal*, 11(3), 327-348.
- Kim, H., Hoskisson, R. E., Tihanyi, L., and Hong, J., 2004, The evolution and restructuring of diversified business groups in emerging markets: The lessons from chaebols in Korea, *Asia Pacific Journal of Management*, 21(1-2), 25-48.
- Kwon, S., Jung, T., Sunwoo, H.-Y., and Yim, S.-G., 2019, Does stock price crash of firms in the same business group cause stock price crash in other member firm? Evidence from Korea, *Emerging Markets Finance and Trade*, 55(7), 1566-1592.
- Kwon, Y., Han, S. H., and Lee, B.-S., 2016, Financial constraints and negative spillovers in business groups: Evidence from Korea, *Pacific-Basin Finance Journal*, 39, 84-100.
- Larrain, B., Sertsios, G., and Urzúa I, F., 2019, The effects of losing a business group affiliation, *The Review of Financial Studies*, 32(8), 3036-3074.
- Lemmon, M. L., and Lins, K. V., 2003, Ownership structure, corporate governance, and firm value: Evidence from the East Asian financial crisis, *The journal of finance*, 58(4), 1445-1468.

- Lewellen, W. G., 1971, A pure financial rationale for the conglomerate merger, *The journal of finance*, 26(2), 521-537.
- Lincoln, J. R., Gerlach, M. L., and Ahmadjian, C. L., 1996, Keiretsu networks and corporate performance in Japan, *American sociological review*, 67-88.
- Matvos, G., and Seru, A., 2014, Resource allocation within firms and financial market dislocation: Evidence from diversified conglomerates, *The Review of Financial Studies*, 27(4), 1143-1189.
- Minetti, R., and Yun, S.-G., 2015, Institutions, bailout policies, and bank loan contracting: Evidence from Korean chaebols, *Review of Finance*, 19(6), 2223-2275.
- Ministry of Foreign Affairs (MOFA), 2020, *All about Korea's response to COVID-19*, Retrieved from: https://www.mois.go.kr/cmm/fms/FileDown.do?atchFileId=FILE_00096799-EI8D-P&fileSn=0
- Morck, R., Wolfenzon, D., and Yeung, B., 2005, Corporate governance, economic entrenchment, and growth, *Journal of economic literature*, 43(3), 655-720.
- Myers, S. C., and Majluf, N. S., 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics*, 13(2), 187-221.
- Pagano, M., Wagner, C., and Zechner, J., 2020, Disaster resilience and asset prices, *arXiv preprint arXiv:2005.08929*.
- Ramelli, S., and Wagner, A. F., 2020, Feverish stock price reactions to COVID-19, *The Review of Corporate Finance Studies*, 9(3), 622-655.
- Santioni, R., Schiantarelli, F., and Strahan, P. E., 2020, Internal Capital Markets in Times of Crisis: The Benefit of Group Affiliation, *Review of Finance*, 24(4), 773-811.
- Shin, H.-H., and Park, Y. S., 1999, Financing constraints and internal capital markets: Evidence from Korean chaebols, *Journal of corporate finance*, 5(2), 169-191.
- Stein, J. C., 1997, Internal capital markets and the competition for corporate resources, *The journal of finance*, 52(1), 111-133.
- Stein, J. C., 2003. Agency, information and corporate investment. In *Handbook of the Economics of Finance* Vol. 1, pp. 111-165: Elsevier.
- World Economic Forum (WEF), 2019, *Global Competitiveness Report 2019*, Retrieved from: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
- World Economic Forum (WEF), 2020a, *Global Risk Report 2020*, Retrieved from: <https://www.weforum.org/reports/the-global-risks-report-2020>
- World Economic Forum (WEF), 2020b, *Impact of COVID-19 on the Global Financial System*, Retrieved from: http://www3.weforum.org/docs/WEF_Impact_of_COVID_19_on_the_Global_Financial_System_2020.pdf#page=1&zoom=auto,-274,848
- World Health Organization (WHO), 2020a, Coronavirus disease 2019 (COVID-19) Situation Report – 31, Retrieved from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200220-sitrep-31-covid-19.pdf?sfvrsn=dfd11d24_2
- World Health Organization (WHO), 2020b, Pneumonia of unknown cause – China, Disease outbreak news, Retrieved from: <https://www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en/>

Tables

Table 1 Summary statistics

	Obs.	Mean	Min	p25	Median	p75	Max	SD
Panel A: All sample firms								
Cash (%)	1870	10.331	0.001	3.525	7.606	13.819	51.721	9.859
Net ST debt (%)	1870	4.208	-47.754	-7.195	3.005	15.935	51.221	18.338
ST debt (%)	1870	14.537	0.000	2.699	11.386	22.588	57.441	13.418
LT debt (%)	1870	7.603	0.000	0.556	4.040	11.391	41.880	9.149
CAPEX/Assets (%)	1870	4.881	0.014	0.847	2.508	6.251	35.109	6.447
Tobin's q	1870	1.393	0.429	0.841	1.072	1.548	6.672	1.011
ROA (%)	1870	1.509	-39.625	-0.791	2.602	6.159	19.719	9.157
Log(MV)	1870	18.827	14.005	17.955	18.552	19.422	26.661	1.282
Book-to-Market	1870	1.101	0.068	0.477	0.861	1.500	4.063	0.833
Beta	1870	0.915	0.000	0.645	0.919	1.187	1.979	0.405
Momentum (%)	1870	0.164	-114.406	-19.987	-0.814	18.842	108.329	36.847
Panel B: Non-chaebol firms								
Cash (%)	1633	10.726	0.001	3.763	8.016	14.383	51.721	10.107
Net ST debt (%)	1633	4.251	-47.754	-7.569	3.011	16.863	51.221	18.837
ST debt (%)	1633	14.974	0.000	2.573	12.056	23.640	57.441	13.717
LT debt (%)	1633	6.755	0.000	0.469	3.462	9.924	41.880	8.346
CAPEX/Assets (%)	1633	5.008	0.014	0.829	2.526	6.394	35.109	6.620
Tobin's q	1633	1.427	0.429	0.850	1.111	1.598	6.672	1.036
ROA (%)	1633	1.147	-39.625	-1.522	2.279	6.106	19.719	9.574
Log(MV)	1633	18.580	14.005	17.890	18.409	19.116	23.135	1.004
Book-to-Market	1633	1.062	0.068	0.461	0.816	1.434	4.063	0.820
Beta	1633	0.920	0.000	0.646	0.924	1.196	1.979	0.413
Momentum (%)	1633	0.618	-114.406	-20.111	-0.357	20.004	108.329	37.921
Panel C: Chaebol firms								
Cash (%)	237	7.609	0.001	2.751	5.770	9.880	51.721	7.409
Net ST debt (%)	237	3.909	-47.754	-3.607	2.854	12.467	51.221	14.463
ST debt (%)	237	11.523	0.000	3.524	8.911	17.284	57.441	10.696
LT debt (%)	237	13.445	0.000	1.874	11.391	21.627	41.880	11.914
CAPEX/Assets (%)	237	4.007	0.014	0.965	2.448	4.964	32.600	5.023
Tobin's q	237	1.160	0.429	0.799	0.931	1.256	6.672	0.777
ROA (%)	237	4.007	-20.977	2.164	3.668	6.313	19.719	4.793
Log(MV)	237	20.526	16.975	19.252	20.288	21.626	26.661	1.654
Book-to-Market	237	1.369	0.095	0.626	1.262	1.880	4.063	0.875
Beta	237	0.885	0.000	0.635	0.891	1.149	1.841	0.347
Momentum (%)	237	-2.970	-114.406	-19.798	-3.352	10.939	94.998	28.233
Cash flow right (%)	237	20.562	0	4.359	14.744	32.176	84.980	18.954
Voting rights (%)	237	40.127	0	29.850	40.740	55.050	84.980	19.768

The table presents summary statistics of independent variables. Variables are computed at the end of 2019. Appendix A defines variables in detail. Data are retrieved from Refinitiv Datastream and Worldscope. All variables are winsorized at the 1 percent level in each tail. Financial and utility firms are excluded from the sample.

Table 2 Cumulative excess returns

	Obs.	Mean	Min	p25	Median	p75	Max	SD
Panel A: Cumulative excess returns (in %) of all sample firms								
Uncertainty	1,870	-0.40	-38.61	-9.33	-1.96	6.55	50.05	14.88
Panic	1,865	-55.74	-109.25	-73.06	-57.65	-41.22	16.41	24.37
Recovery	1,841	48.65	-1.63	34.82	48.46	62.03	110.73	21.78
Full	1,841	-7.33	-126.69	-23.21	-10.76	4.76	94.49	27.17
Panel B: Cumulative excess returns (in %) of non-chaebol firms								
Uncertainty	1,633	0.34	-38.61	-8.42	-1.16	7.08	50.05	15.18
Panic	1,630	-56.12	-109.25	-73.64	-58.33	-41.21	16.41	25.05
Recovery	1,606	49.29	-1.63	35.34	49.12	63.33	110.73	22.04
Full	1,606	-6.31	-126.69	-22.19	-9.45	5.39	94.49	27.41
Panel C: Cumulative excess returns (in %) of chaebol firms								
Uncertainty	237	-5.53	-27.06	-13.47	-7.59	0.50	34.62	11.39
Panic	235	-53.12	-98.21	-66.41	-53.34	-41.55	-2.55	18.87
Recovery	235	44.33	-1.63	31.60	43.02	55.63	110.73	19.40
Full	235	-14.31	-57.92	-32.18	-16.32	-3.30	80.19	24.38

The table presents summary statistics of cumulative excess returns for different sub-periods and the full period. Panel A presents returns of all sample firms. Panel B presents returns of non-chaebol firms and panel C presents returns of chaebol firms. Chaebol affiliation is based on the KFTC classification. Cumulative excess return is computed as the sum of daily excess returns defined as the natural logarithm of one plus the daily stock return minus the risk free rate. Daily return is computed based on the total return index (RI) retrieved from Refinitiv Datastream and the risk free rate is the yield of one-year treasury bonds provided by the Bank of Korea. The Uncertainty period starts on January 2 and ends on February 19, 2020, the Panic period starts on February 20 and ends on March 19, 2020, the Recovery period starts on March 20 and ends on May 13, 2020. Full period starts on January 2 and ends on May 13, 2020. Cumulative excess returns are winsorized at the 1 percent level in each tail. Financial and utility firms are excluded from the sample.

Table 3 Affiliation value

	(1) Uncertainty <i>Jan 2 – Feb 19</i>	(2) Panic <i>Feb 20 – Mar 19</i>	(3) Recovery <i>Mar 20 – May 13</i>	(4) Full period <i>Jan 2 – May 13</i>
Constant	0.267*** (0.065)	-0.853*** (0.101)	1.093*** (0.094)	0.480*** (0.113)
Chaebol	-0.017* (0.010)	-0.026* (0.016)	0.050*** (0.016)	0.003 (0.020)
Book-to-Market	-0.010** (0.005)	-0.002 (0.008)	-0.023*** (0.007)	-0.033*** (0.009)
Beta	0.024*** (0.009)	-0.189*** (0.016)	0.175*** (0.014)	0.015 (0.018)
Log(MV)	-0.014*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)
Momentum	0.022* (0.013)	-0.041** (0.019)	0.012 (0.017)	-0.018 (0.024)
ROA	0.328*** (0.048)	-0.059 (0.083)	0.268*** (0.073)	0.560*** (0.104)
Supersector indicators	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES
Observations	1870	1865	1841	1841
Adj. R-sq.	0.097	0.163	0.171	0.104

*The table presents results from cross-sectional regressions of cumulative excess returns on an indicator for chaebol affiliation and firm characteristics. The chaebol indicator takes value 1 for firms affiliated with a large business group as defined by the KFTC in 2019. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p-value * < 10% ** < 5% *** < 1%*

Table 4 Affiliation value and governance risks

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>
Constant	0.267*** (0.065)	-0.855*** (0.100)	1.094*** (0.094)	0.479*** (0.113)
Aff. with low disparity	-0.020 (0.013)	-0.003 (0.021)	0.041* (0.021)	0.015 (0.026)
Aff. with high disparity	-0.015 (0.012)	-0.046** (0.018)	0.058*** (0.019)	-0.007 (0.023)
Book-to-Market	-0.010** (0.005)	-0.003 (0.008)	-0.023*** (0.007)	-0.034*** (0.009)
Beta	0.024*** (0.009)	-0.189*** (0.016)	0.175*** (0.014)	0.015 (0.018)
Log(MV)	-0.014*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)
Momentum	0.022* (0.013)	-0.041** (0.019)	0.012 (0.017)	-0.018 (0.024)
ROA	0.328*** (0.048)	-0.061 (0.083)	0.268*** (0.073)	0.559*** (0.104)
Supersector indicators	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES
Observations	1870	1865	1841	1841
Adj. R-sq.	0.097	0.164	0.170	0.103

*The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. Affiliates are classified in “high” (“low”) disparity group, if their voting and cash flow rights disparity is in the higher (lower) than the median. Affiliates located below the second pyramid layer are considered as high risk affiliates. Chaebol affiliation is based on the 2019 KFTC classification. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p-value * < 10% ** < 5% *** < 1%*

Table 5 Pricing of financial flexibility proxies

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>	(5) Uncertainty <i>Jan 2-Feb 19</i>	(6) Panic <i>Feb 20-Mar 19</i>	(7) Recovery <i>Mar 20-May 13</i>	(8) Full period <i>Jan 2-May 13</i>
Panel A: All firms								
Constant	0.324*** (0.060)	-0.747*** (0.090)	0.969*** (0.083)	0.532*** (0.104)	0.342*** (0.061)	-0.772*** (0.094)	0.950*** (0.087)	0.512*** (0.108)
Net ST Debt	-0.040** (0.020)	-0.102*** (0.034)	-0.001 (0.031)	-0.154*** (0.039)				
Cash					0.002 (0.039)	0.151** (0.061)	0.040 (0.055)	0.197*** (0.074)
ST Debt					-0.063** (0.028)	-0.068 (0.048)	0.025 (0.044)	-0.128** (0.055)
LT Debt	0.014 (0.040)	0.042 (0.063)	-0.025 (0.055)	0.041 (0.073)	0.012 (0.040)	0.044 (0.063)	-0.023 (0.055)	0.043 (0.073)
Book-to-Market	-0.012** (0.005)	-0.005 (0.007)	-0.021*** (0.007)	-0.035*** (0.009)	-0.013*** (0.005)	-0.004 (0.008)	-0.020*** (0.007)	-0.034*** (0.009)
Beta	0.024*** (0.009)	-0.190*** (0.016)	0.174*** (0.014)	0.014 (0.018)	0.025*** (0.009)	-0.191*** (0.016)	0.174*** (0.014)	0.013 (0.018)
Log(MV)	-0.017*** (0.003)	0.017*** (0.005)	-0.032*** (0.004)	-0.032*** (0.006)	-0.018*** (0.003)	0.018*** (0.005)	-0.032*** (0.004)	-0.031*** (0.006)
Momentum	0.022* (0.012)	-0.042** (0.019)	0.009 (0.017)	-0.021 (0.024)	0.022* (0.012)	-0.042** (0.019)	0.009 (0.017)	-0.021 (0.024)
ROA	0.315*** (0.049)	-0.094 (0.084)	0.255*** (0.074)	0.497*** (0.103)	0.309*** (0.049)	-0.086 (0.084)	0.261*** (0.074)	0.503*** (0.103)
Supersector indicators	YES	YES	YES	YES	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1870	1865	1841	1841	1870	1865	1841	1841
Adj. R-sq.	0.098	0.167	0.166	0.112	0.098	0.167	0.166	0.112

Table 5 (ctd)

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>	(5) Uncertainty <i>Jan 2-Feb 19</i>	(6) Panic <i>Feb 20-Mar 19</i>	(7) Recovery <i>Mar 20-May 13</i>	(8) Full period <i>Jan 2-May 13</i>
Panel B: Non-chaebol firms								
Constant	0.453*** (0.082)	-0.828*** (0.130)	0.993*** (0.118)	0.580*** (0.146)	0.480*** (0.083)	-0.859*** (0.134)	0.976*** (0.121)	0.567*** (0.150)
Net ST Debt	-0.039* (0.021)	-0.111*** (0.036)	-0.011 (0.032)	-0.172*** (0.040)				
Cash					-0.016 (0.041)	0.167** (0.065)	0.044 (0.058)	0.200** (0.079)
ST Debt					-0.072** (0.030)	-0.071 (0.051)	0.010 (0.045)	-0.156*** (0.057)
LT Debt	0.048 (0.047)	0.106 (0.072)	-0.100 (0.064)	0.071 (0.087)	0.045 (0.047)	0.109 (0.072)	-0.098 (0.063)	0.073 (0.086)
Book-to-Market	-0.009* (0.005)	0.001 (0.008)	-0.026*** (0.008)	-0.031*** (0.010)	-0.010* (0.005)	0.002 (0.008)	-0.025*** (0.008)	-0.031*** (0.010)
Beta	0.031*** (0.010)	-0.190*** (0.017)	0.182*** (0.015)	0.029 (0.019)	0.032*** (0.010)	-0.191*** (0.017)	0.181*** (0.015)	0.028 (0.019)
Log(MV)	-0.025*** (0.004)	0.021*** (0.007)	-0.034*** (0.006)	-0.036*** (0.008)	-0.026*** (0.004)	0.022*** (0.007)	-0.034*** (0.006)	-0.035*** (0.008)
Momentum	0.025* (0.013)	-0.045** (0.020)	0.017 (0.018)	-0.014 (0.025)	0.025* (0.013)	-0.045** (0.020)	0.016 (0.018)	-0.014 (0.025)
ROA	0.352*** (0.051)	-0.135 (0.086)	0.267*** (0.075)	0.506*** (0.107)	0.344*** (0.051)	-0.125 (0.087)	0.272*** (0.075)	0.509*** (0.106)
Supersector indicators	YES	YES	YES	YES	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1633	1630	1606	1606	1633	1630	1606	1606
Adj. R-sq.	0.098	0.172	0.168	0.095	0.099	0.172	0.168	0.095

Table 5 (ctd)

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>	(5) Uncertainty <i>Jan 2-Feb 19</i>	(6) Panic <i>Feb 20-Mar 19</i>	(7) Recovery <i>Mar 20-May 13</i>	(8) Full period <i>Jan 2-May 13</i>
Panel C: Chaebol firms								
Constant	-0.120 (0.101)	-0.999*** (0.159)	1.691*** (0.176)	0.577*** (0.205)	-0.154 (0.100)	-0.998*** (0.166)	1.664*** (0.171)	0.521** (0.203)
Net ST Debt	-0.055 (0.053)	0.008 (0.096)	0.110 (0.121)	0.060 (0.127)				
Cash					0.188** (0.094)	-0.012 (0.145)	-0.003 (0.202)	0.167 (0.211)
ST Debt					0.016 (0.066)	0.006 (0.129)	0.178 (0.153)	0.192 (0.162)
LT Debt	-0.073 (0.079)	-0.084 (0.129)	0.121 (0.109)	-0.028 (0.164)	-0.072 (0.079)	-0.084 (0.129)	0.119 (0.108)	-0.030 (0.164)
Book-to-Market	-0.035*** (0.011)	-0.001 (0.017)	-0.028* (0.015)	-0.064*** (0.021)	-0.034*** (0.011)	-0.001 (0.017)	-0.027* (0.015)	-0.062*** (0.021)
Beta	-0.039* (0.022)	-0.161*** (0.037)	0.048 (0.039)	-0.158*** (0.052)	-0.041* (0.022)	-0.161*** (0.037)	0.047 (0.039)	-0.161*** (0.052)
Log(MV)	0.011** (0.005)	0.028*** (0.008)	-0.057*** (0.009)	-0.018 (0.011)	0.011** (0.005)	0.028*** (0.008)	-0.056*** (0.009)	-0.017 (0.011)
Momentum	0.020 (0.028)	0.012 (0.045)	-0.106** (0.045)	-0.078 (0.062)	0.025 (0.029)	0.012 (0.045)	-0.102** (0.045)	-0.071 (0.062)
ROA	-0.347* (0.182)	0.645*** (0.214)	-0.233 (0.357)	0.028 (0.337)	-0.354* (0.187)	0.645*** (0.215)	-0.235 (0.354)	0.022 (0.331)
Supersector indicators	YES	YES	YES	YES	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES	YES	YES	YES	YES
Observations	237	235	235	235	237	235	235	235
Adj. R-sq.	0.179	0.173	0.301	0.278	0.183	0.169	0.301	0.280

The table presents results from cross-sectional regressions of cumulative excess returns on financial proxies and firm characteristics. In columns (1) to (4), financial proxies are net short-term debt and long-term debt. In columns (5) to (8), financial proxies are cash, short-term debt, and long-term debt. Financial proxies and firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. In panel A, the sample consists of all sample firms. In panel B, the sample consists of firms not affiliated with a chaebol as defined by the KFTC. In panel C, the sample consists of firms affiliated with a chaebol as defined by the KFTC. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p -value * < 10% ** < 5% *** < 1%

Table 6 Pricing of investment intensity

	Full-sample				Non-chaebol				Chaebol			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Uncertainty	Panic	Recovery	Full period	Uncertainty	Panic	Recovery	Full period	Uncertainty	Panic	Recovery	Full period
	Jan 2- Feb 19	Feb 20- Mar 19	Mar 20- May 13	Jan 2- May 13	Jan 2- Feb 19	Feb 20- Mar 19	Mar 20- May 13	Jan 2- May 13	Jan 2- Feb 19	Feb 20- Mar 19	Mar 20- May 13	Jan 2- May 13
Constant	0.310*** (0.058)	-0.801*** (0.089)	0.972*** (0.081)	0.469*** (0.100)	0.436*** (0.081)	-0.914*** (0.130)	0.995*** (0.118)	0.485*** (0.145)	-0.124 (0.101)	-0.994*** (0.162)	1.706*** (0.175)	0.592*** (0.201)
CAPEX/Assets	0.067 (0.063)	-0.211** (0.082)	-0.029 (0.082)	-0.067 (0.100)	0.069 (0.067)	-0.238*** (0.087)	-0.027 (0.087)	-0.086 (0.106)	0.013 (0.203)	0.019 (0.250)	0.101 (0.249)	0.137 (0.344)
Book-to-Market	-0.011** (0.005)	-0.005 (0.008)	-0.021*** (0.007)	-0.034*** (0.009)	-0.008 (0.005)	0.001 (0.008)	-0.025*** (0.008)	-0.028*** (0.010)	-0.035*** (0.011)	0.000 (0.018)	-0.026* (0.016)	-0.061*** (0.022)
Beta	0.024*** (0.009)	-0.187*** (0.016)	0.175*** (0.014)	0.016 (0.018)	0.031*** (0.010)	-0.185*** (0.017)	0.182*** (0.015)	0.032* (0.019)	-0.044** (0.022)	-0.163*** (0.037)	0.056 (0.038)	-0.157*** (0.050)
Log(MV)	-0.017*** (0.003)	0.021*** (0.005)	-0.033*** (0.004)	-0.028*** (0.005)	-0.024*** (0.004)	0.027*** (0.007)	-0.034*** (0.006)	-0.031*** (0.008)	0.011** (0.005)	0.027*** (0.008)	-0.058*** (0.008)	-0.020* (0.011)
Momentum	0.023* (0.013)	-0.038** (0.019)	0.010 (0.017)	-0.017 (0.024)	0.025* (0.013)	-0.040** (0.020)	0.018 (0.018)	-0.009 (0.025)	0.021 (0.028)	0.014 (0.045)	-0.103** (0.046)	-0.074 (0.062)
ROA	0.328*** (0.048)	-0.044 (0.083)	0.259*** (0.073)	0.563*** (0.104)	0.362*** (0.050)	-0.088 (0.085)	0.280*** (0.075)	0.575*** (0.108)	-0.294* (0.168)	0.677*** (0.203)	-0.337 (0.344)	0.004 (0.319)
Supersector ind.	YES											
KOSPI indicator	YES											
Observations	1870	1865	1841	1841	1633	1630	1606	1606	237	235	235	235
Adj. R-sq.	0.097	0.165	0.167	0.104	0.097	0.169	0.167	0.085	0.172	0.175	0.293	0.281

The table presents results from cross-sectional regressions of cumulative excess returns on investment intensity and firm characteristics. Investment intensity and firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. In columns (1) to (4), the sample consists of all sample firms. In columns (5) to (8), the sample consists of firms not affiliated with a chaebol as defined by the KFTC. In columns (9) to (12), the sample consists of firms affiliated with a chaebol as defined by the KFTC. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p -value * < 10% ** < 5% *** < 1%

Table 7 Between-affiliate heterogeneity of affiliation value (financial flexibility)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Uncertainty	Panic	Recovery	Full period	Uncertainty	Panic	Recovery	Full period
	<i>Jan 2-Feb 19</i>	<i>Feb 20-Mar 19</i>	<i>Mar 20-May 13</i>	<i>Jan 2-May 13</i>	<i>Jan 2-Feb 19</i>	<i>Feb 20-Mar 19</i>	<i>Mar 20-May 13</i>	<i>Jan 2-May 13</i>
Panel A: net short-term debt sorting								
	Positive net short-term debt				Net Debt			
Constant	0.267*** (0.065)	-0.853*** (0.100)	1.093*** (0.094)	0.480*** (0.113)	0.276*** (0.065)	-0.855*** (0.102)	1.086*** (0.095)	0.481*** (0.114)
Aff. with net ST Debt<0	-0.000 (0.014)	0.002 (0.022)	0.028 (0.022)	0.026 (0.025)				
Aff. with net ST Debt>0	-0.029** (0.012)	-0.045** (0.018)	0.065*** (0.019)	-0.012 (0.024)				
Aff. with high ratio					-0.047*** (0.014)	-0.034 (0.027)	0.081*** (0.027)	-0.004 (0.034)
Aff. with middle ratio					-0.011 (0.014)	-0.034* (0.020)	0.049** (0.020)	0.001 (0.024)
Aff. with low ratio					0.003 (0.016)	-0.004 (0.026)	0.019 (0.027)	0.015 (0.030)
Book-to-Market	-0.010** (0.005)	-0.001 (0.008)	-0.024*** (0.007)	-0.033*** (0.009)	-0.010** (0.005)	-0.002 (0.008)	-0.024*** (0.007)	-0.033*** (0.009)
Beta	0.025*** (0.009)	-0.188*** (0.016)	0.174*** (0.014)	0.016 (0.018)	0.025*** (0.009)	-0.189*** (0.016)	0.174*** (0.014)	0.015 (0.018)
Log(MV)	-0.014*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)	-0.015*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)
Momentum	0.023* (0.013)	-0.040** (0.019)	0.011 (0.017)	-0.017 (0.024)	0.023* (0.013)	-0.041** (0.019)	0.011 (0.017)	-0.018 (0.024)
ROA	0.324*** (0.048)	-0.064 (0.083)	0.272*** (0.073)	0.555*** (0.104)	0.327*** (0.048)	-0.061 (0.083)	0.269*** (0.073)	0.559*** (0.104)
Supersector indicators	YES	YES	YES	YES	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1870	1865	1841	1841	1870	1865	1841	1841
Adj. R-sq.	0.098	0.164	0.171	0.104	0.098	0.163	0.171	0.103

Table 7 (ctd)

	(1) Uncertainty Jan 2-Feb 19	(2) Panic Feb 20-Mar 19	(3) Recovery Mar 20-May 13	(4) Full period Jan 2-May 13	(5) Uncertainty Jan 2-Feb 19	(6) Panic Feb 20-Mar 19	(7) Recovery Mar 20-May 13	(8) Full period Jan 2-May 13
Panel B: Cash and debt sorting								
	Cash holding				Total debt			
Constant	0.272*** (0.066)	-0.864*** (0.101)	1.093*** (0.094)	0.475*** (0.113)	0.269*** (0.065)	-0.860*** (0.102)	1.102*** (0.095)	0.486*** (0.114)
Aff. with high ratio	0.014 (0.015)	0.002 (0.026)	0.024 (0.028)	0.037 (0.031)	-0.032** (0.016)	-0.051* (0.027)	0.072*** (0.025)	-0.015 (0.032)
Aff. with middle ratio	-0.020 (0.013)	-0.050*** (0.019)	0.058*** (0.017)	-0.015 (0.024)	-0.010 (0.013)	-0.029 (0.020)	0.058*** (0.022)	0.016 (0.027)
Aff. with low ratio	-0.044*** (0.016)	-0.009 (0.027)	0.060* (0.031)	0.004 (0.035)	-0.017 (0.016)	0.002 (0.024)	0.017 (0.024)	-0.002 (0.026)
Book-to-Market	-0.010** (0.005)	-0.001 (0.008)	-0.024*** (0.007)	-0.032*** (0.009)	-0.010** (0.005)	-0.002 (0.008)	-0.023*** (0.007)	-0.033*** (0.009)
Beta	0.024*** (0.009)	-0.189*** (0.016)	0.175*** (0.014)	0.016 (0.018)	0.024*** (0.009)	-0.189*** (0.016)	0.174*** (0.014)	0.015 (0.018)
Log(MV)	-0.014*** (0.003)	0.024*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)	-0.014*** (0.003)	0.023*** (0.005)	-0.040*** (0.005)	-0.029*** (0.006)
Momentum	0.023* (0.013)	-0.040** (0.019)	0.011 (0.017)	-0.017 (0.024)	0.022* (0.013)	-0.041** (0.019)	0.011 (0.017)	-0.018 (0.024)
ROA	0.326*** (0.048)	-0.062 (0.083)	0.269*** (0.073)	0.557*** (0.104)	0.327*** (0.048)	-0.063 (0.083)	0.273*** (0.073)	0.560*** (0.104)
Supersector indicators	YES	YES	YES	YES	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1870	1865	1841	1841	1870	1865	1841	1841
Adj. R-sq.	0.099	0.164	0.170	0.103	0.097	0.163	0.171	0.103

The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. To capture between-affiliate heterogeneity, affiliates are classified based on financial ratio. Panel A presents results for affiliates sorting based on net short-term debt computed as the difference between cash and short-term debt scaled by total assets. Columns (1) to (4) present results for sorting based on the sign of net short-term debt. Columns (5) to (8) present results for quartile sorting. Panel B presents results for quartile sorting. In columns (1) to (4), affiliates are sorted based on cash holding. In columns (5) to (8), affiliates are sorted based on total debt ratio. Affiliates are classified in “high” (“low”) ratio group, if their ratio is in the top (bottom) quartile, and “middle” if they are in the two middle quartiles. Chaebol affiliation is based on the 2019 KFTC classification. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p -value * < 10% ** < 5% *** < 1%

Table 8 Between-affiliate heterogeneity of affiliation value (investment intensity)

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>
Constant	0.255*** (0.066)	-0.844*** (0.102)	1.088*** (0.095)	0.474*** (0.115)
Aff. with high ratio	-0.003 (0.018)	-0.017 (0.027)	0.070*** (0.024)	0.045 (0.031)
Aff. with middle ratio	-0.039*** (0.013)	-0.021 (0.019)	0.031 (0.020)	-0.031 (0.025)
Aff. with low ratio	0.007 (0.015)	-0.041 (0.027)	0.066** (0.028)	0.028 (0.033)
Book-to-Market	-0.010** (0.005)	-0.002 (0.008)	-0.022*** (0.007)	-0.032*** (0.009)
Beta	0.025*** (0.009)	-0.190*** (0.016)	0.176*** (0.014)	0.016 (0.018)
Log(MV)	-0.013*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.029*** (0.006)
Momentum	0.022* (0.013)	-0.041** (0.019)	0.012 (0.017)	-0.017 (0.024)
ROA	0.327*** (0.048)	-0.059 (0.083)	0.268*** (0.073)	0.560*** (0.104)
Supersector indicators	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES
Observations	1870	1865	1841	1841
Adj. R-sq.	0.099	0.163	0.171	0.105

*The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. To capture between-affiliate heterogeneity, affiliates are classified based on investment intensity ratio. Affiliates are classified in “high” (“low”) ratio group, if their ratio is in the top (bottom) quartile, and “middle” if they are in the two middle quartiles. Chaebol affiliation is based on the 2019 KFTC classification. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p-value * < 10% ** < 5% *** < 1%*

Table 9 Group size and affiliation value

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Uncertainty	Panic	Recovery	Full period	Uncertainty	Panic	Recovery	Full period
	Jan 2-Feb 19	Feb 20-Mar 19	Mar 20-May 13	Jan 2-May 13	Jan 2-Feb 19	Feb 20-Mar 19	Mar 20-May 13	Jan 2-May 13
	Top30				Top10			
Constant	0.267*** (0.066)	-0.871*** (0.101)	1.097*** (0.094)	0.467*** (0.114)	0.286*** (0.066)	-0.871*** (0.104)	1.083*** (0.097)	0.472*** (0.117)
Top 30 chaebols	-0.016 (0.011)	-0.049*** (0.018)	0.055*** (0.017)	-0.014 (0.022)				
Top 10 chaebols					0.001 (0.016)	-0.049** (0.023)	0.043* (0.023)	-0.010 (0.026)
Top 11-30 chaebols					-0.030** (0.014)	-0.049** (0.022)	0.065*** (0.021)	-0.018 (0.028)
Other chaebols	-0.020 (0.016)	0.024 (0.022)	0.039 (0.027)	0.041 (0.031)	-0.018 (0.016)	0.024 (0.022)	0.038 (0.027)	0.041 (0.031)
Book-to-Market	-0.010** (0.005)	-0.003 (0.008)	-0.023*** (0.007)	-0.034*** (0.009)	-0.010** (0.005)	-0.003 (0.008)	-0.023*** (0.007)	-0.034*** (0.009)
Beta	0.024*** (0.009)	-0.190*** (0.016)	0.175*** (0.014)	0.015 (0.018)	0.024*** (0.009)	-0.190*** (0.016)	0.175*** (0.014)	0.015 (0.018)
Log(MV)	-0.014*** (0.003)	0.024*** (0.005)	-0.040*** (0.005)	-0.028*** (0.006)	-0.015*** (0.004)	0.024*** (0.006)	-0.039*** (0.005)	-0.028*** (0.006)
Momentum	0.022* (0.013)	-0.042** (0.019)	0.012 (0.017)	-0.018 (0.024)	0.023* (0.013)	-0.042** (0.019)	0.012 (0.017)	-0.018 (0.024)
ROA	0.328*** (0.048)	-0.061 (0.083)	0.268*** (0.073)	0.558*** (0.104)	0.330*** (0.048)	-0.061 (0.083)	0.266*** (0.073)	0.559*** (0.104)
Supersector indicators	YES							
KOSPI indicator	YES							
Observations	1870	1865	1841	1841	1870	1865	1841	1841
Adj. R-sq.	0.097	0.165	0.170	0.104	0.097	0.165	0.170	0.104

The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. To capture between-group heterogeneity, business groups are classified based on their rank in the KFTC classification (based on value of total assets). In columns (1) to (4), large business groups listed by the KFTC are split between the 30 largest (top 30 chaebols) and the smaller chaebols (other chaebols). In columns (5) to (8), large business groups listed by the KFTC are sorted into three categories: the 10 largest (top 10 chaebols), the business groups ranked between the 11th and 30th rank (top 11-30 chaebols) and the smaller chaebols (other chaebols). Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p -value * < 10% ** < 5% *** < 1%

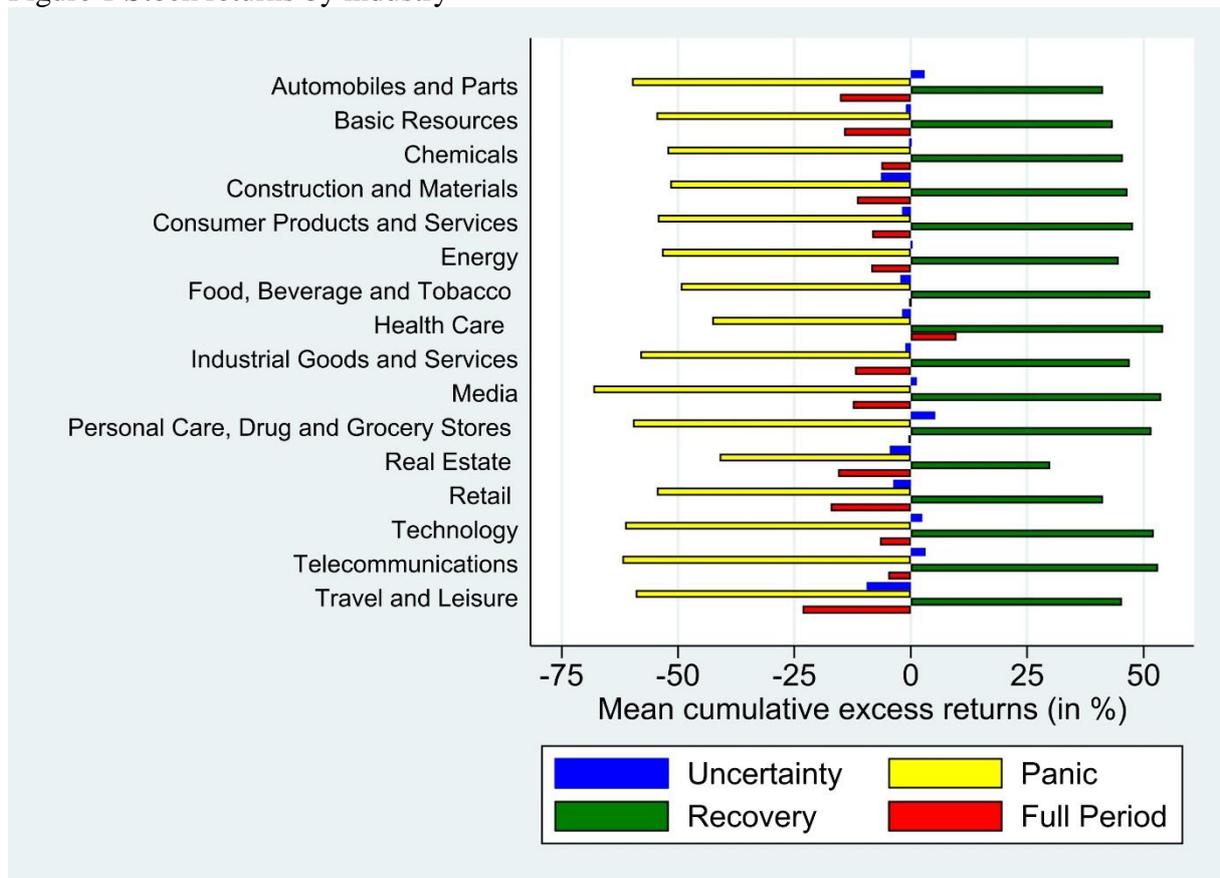
Table 10: Group risk and affiliation value

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>
Constant	0.277*** (0.064)	-0.845*** (0.101)	1.094*** (0.094)	0.498*** (0.111)
Low risk chaebols	0.028* (0.017)	0.001 (0.023)	0.064** (0.029)	0.088*** (0.032)
Middle risk chaebols	-0.028** (0.012)	-0.025 (0.020)	0.036** (0.017)	-0.022 (0.022)
High risk chaebols	-0.053*** (0.017)	-0.077*** (0.020)	0.082** (0.033)	-0.044 (0.042)
Book-to-Market	-0.010** (0.005)	-0.002 (0.008)	-0.023*** (0.007)	-0.032*** (0.009)
Beta	0.026*** (0.009)	-0.188*** (0.016)	0.176*** (0.014)	0.018 (0.018)
Log(MV)	-0.015*** (0.003)	0.023*** (0.005)	-0.039*** (0.005)	-0.030*** (0.006)
Momentum	0.023* (0.013)	-0.040** (0.019)	0.012 (0.017)	-0.016 (0.024)
ROA	0.324*** (0.048)	-0.062 (0.083)	0.268*** (0.073)	0.554*** (0.104)
Supersector indicators	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES
Observations	1870	1865	1841	1841
Adj. R-sq.	0.101	0.164	0.171	0.107

*The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. To capture between-group heterogeneity, business groups are classified based on the proportion of listed affiliates with positive net short-term debt. Chaebols are classified in “high risk” (“low risk”), if the proportion of affiliates with positive net short-term debt is in the top (bottom) quartile, and “middle risk” if they are in the two middle quartiles. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p-value * < 10% ** < 5% *** < 1%*

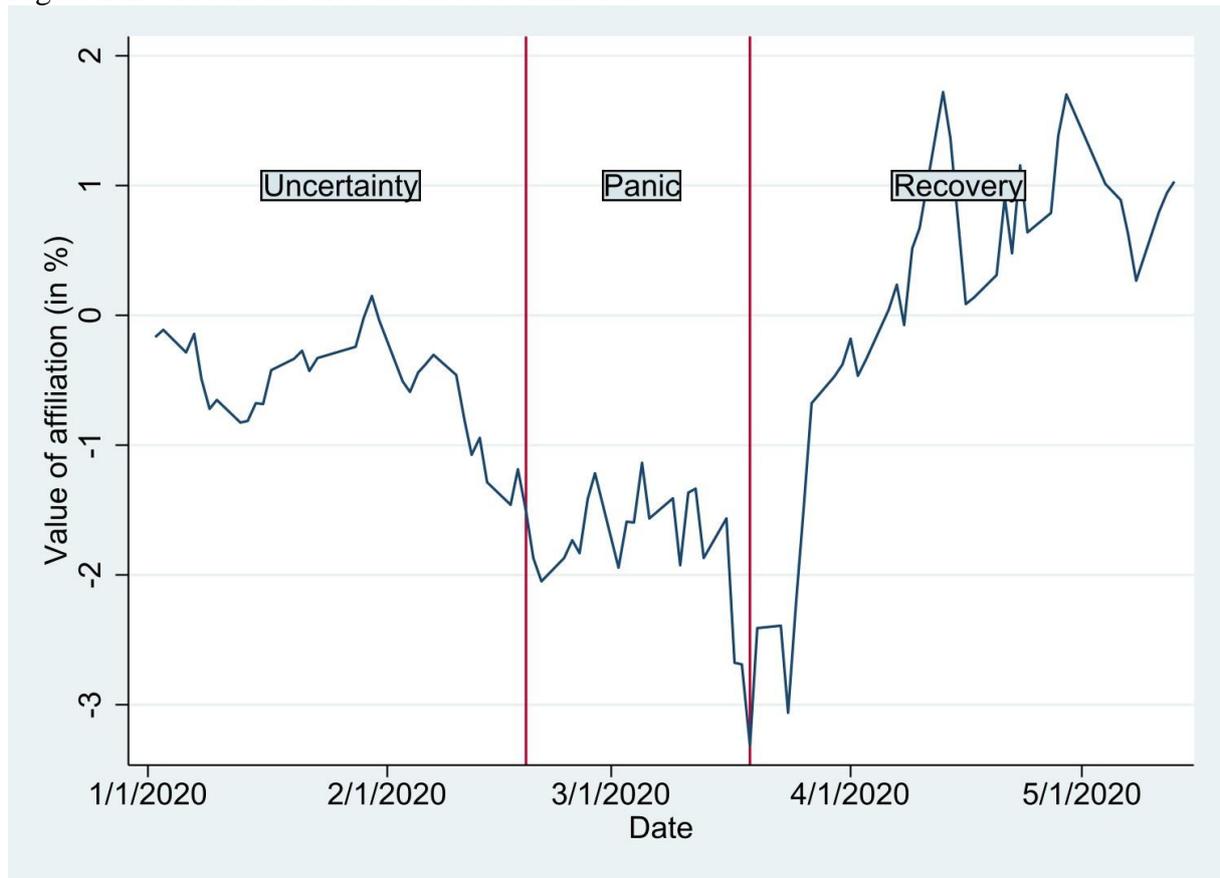
Figures

Figure 1 Stock returns by industry



The figure plots average cumulative stock excess returns for each supersector based on ICB classification and each sub-period: the Uncertainty period (blue bars, January 2 - February 19, 2020), the Panic period (yellow bars, February 20 - March 19, 2020), the Recovery period (green bars, March 20 - May 13, 2020), and full period (red bars, January 2 - May 13, 2020). Cumulative excess return is computed as the sum of daily excess returns defined as the natural logarithm of one plus daily stock return minus risk free rate. Daily return is computed based on total return index (RI) retrieved from Refinitiv Datastream and risk free rate is the yield of one-year treasury bonds provided by the Bank of Korea. Financial and utility firms are excluded from the sample.

Figure 2 Evolution of value of chaebol affiliation



The figure presents the evolution of the coefficient on business group affiliation indicator. Regression (4) is estimated on daily basis with daily excess returns as dependent variable. Independent variables are affiliation indicator, size, value, beta, momentum, and profitability. The chaebol indicator takes value 1 for firms affiliated with a business group as defined by the KFTC in 2019. Regressions include ICB supersector and market indicators. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Date are indicated as month/day/year.

Appendices

Appendix A Variable definition

Variable name	Definition
Cash holding	The ratio of cash (WC02003) to total assets (WC02999).
Short-term debt	The ratio of short-term debt and current portion of long-term debt (WC03051) to total assets (WC02999).
Long-term debt	The ratio of long-term debt (WC03251) to total of assets (WC02999).
Total debt	The ratio of total debt (WC03255) to total assets (WC02999).
Net short-term debt	The ratio of short-term debt (WC03051) minus cash (WC02003) divided by total of assets (WC02999)
Investment intensity	The ratio of capital expenditure (WC04601) to lagged assets (WC02999).
Tobin's q	The ratio of total assets (WC02999) minus book value of common equity (WC03501) plus year end market capitalization (WC08001) divided by total assets. (WC02999).
ROA	The ratio of operating income (WC01250) to total assets (WC02999).
Firm size	The natural logarithm of year end market capitalization (WC08001).
Book-to-market	The ratio of book value of common equity (WC03501) to year end market capitalization (WC08001).
Market beta	The regression slope of daily stock excess returns on a constant and daily excess market returns for year 2019.
Momentum	The sum of daily log excess stock returns of year 2019.
Chaebol affiliation	Dummy variable taking value 1 for firms affiliated with a business group in the KFTC list, 0 otherwise.
Cash flow rights	Sum of direct ownership and indirect ownership, which is computed as the product of ownership stakes obtained along the control chain.
Voting rights	Sum of the direct ownership and the sum of ownership of other affiliates in a given affiliate.
Industry indicators	Set of dummy variables for ICB supersectors.
KOSPI indicator	Dummy variable taking value 1 for firms listed on the KOSPI market, 0 otherwise.

This appendix contains the definitions of all independent variables. Data are retrieved from Refinitiv Datastream and Worldscope. Chaebol affiliation is based on the KFTC classification.

Appendix B Between-affiliate heterogeneity of affiliation value (investment intensity and opportunities)

	(1) Uncertainty <i>Jan 2-Feb 19</i>	(2) Panic <i>Feb 20-Mar 19</i>	(3) Recovery <i>Mar 20-May 13</i>	(4) Full period <i>Jan 2-May 13</i>
Constant	0.234*** (0.062)	-0.841*** (0.096)	0.982*** (0.089)	0.359*** (0.109)
Chaebol*Hi-invest*Hi-Q	0.023 (0.036)	0.112*** (0.041)	-0.018 (0.046)	0.111* (0.064)
Chaebol*Hi-invest*Mid-Q	0.004 (0.021)	-0.082*** (0.031)	0.095*** (0.025)	0.013 (0.036)
Chaebol*Hi-invest*Low-Q	-0.085*** (0.026)	0.050 (0.076)	0.102 (0.079)	0.059 (0.051)
Chaebol*Mid-invest*Hi-Q	0.007 (0.026)	0.057* (0.034)	0.011 (0.048)	0.078 (0.054)
Chaebol*Mid-invest*Mid-Q	-0.040** (0.018)	-0.047* (0.026)	0.021 (0.023)	-0.070** (0.032)
Chaebol*Mid-invest*Low-Q	-0.083*** (0.016)	-0.049** (0.024)	0.032 (0.025)	-0.100*** (0.030)
Chaebol*Low-invest*Hi-Q	0.101*** (0.034)	-0.068 (0.059)	0.126** (0.062)	0.158* (0.086)
Chaebol*Low-invest*Mid-Q	-0.029* (0.016)	-0.047 (0.036)	0.067* (0.037)	-0.016 (0.038)
Chaebol*Low-invest*Low-Q	-0.026 (0.024)	0.001 (0.041)	-0.026 (0.035)	-0.051 (0.032)
Beta	0.027*** (0.009)	-0.189*** (0.015)	0.182*** (0.014)	0.024 (0.017)
Log(MV)	-0.013*** (0.003)	0.022*** (0.005)	-0.035*** (0.005)	-0.025*** (0.006)
Momentum	0.024* (0.012)	-0.041** (0.019)	0.019 (0.017)	-0.009 (0.024)
ROA	0.319*** (0.048)	-0.072 (0.084)	0.250*** (0.073)	0.525*** (0.105)
Supersector indicators	YES	YES	YES	YES
KOSPI indicator	YES	YES	YES	YES
Observations	1870	1865	1841	1841
Adj. R-sq.	0.103	0.167	0.167	0.104

*The table presents results from cross-sectional regressions of cumulative excess returns on affiliation indicators and firm characteristics. To capture between-affiliate heterogeneity, affiliates are sorted independently based on investment intensity ratio and Tobin's q. Affiliates are classified in "high" ("low") ratio group, if their ratio is in the top (bottom) quartile, and "middle" if they are in the two middle quartiles. Chaebol affiliation is based on the 2019 KFTC classification. Firm characteristics are computed at the end of 2019. Appendix A defines variables in detail. All regressions include market and industry indicators. Data are retrieved from Refinitiv Datastream, Worldscope, and KFTC. Financial and utility firms are excluded from the sample. Robust standard errors are in parentheses. p-value * < 10% ** < 5% *** < 1%*

Authors

Romain DUCRET

Chaire de Finance et Gouvernance d'Entreprise, Department of Management, University of Fribourg Bd de Pérolles 90, 1700 Fribourg, Switzerland.

Email: romain.ducret@unifr.ch

Web: <http://www.unifr.ch/cgf>

Abstract

This paper examines how investors perceive business group membership in Korea during the COVID-19 pandemic. Stock price performance analysis reveals evidence of a time-varying and heterogeneous value of affiliation: investors discount business group affiliation during a market collapse, but are willing to pay a premium for affiliation during market recovery. Overall, this pattern is more pronounced for financially weak affiliates and large business groups. The results further show that business group membership alleviates investors' concerns regarding financial flexibility, highlighting the role of internal capital markets as a substitute for external finance.

Citation proposal

Romain Ducret 2021. «Investors' perception of business group membership during an economic crisis : Evidence from the COVID-19 pandemic». Working Papers SES 524, Faculty of Management, Economics and Social Sciences, University of Fribourg (Switzerland)

Jel Classification

G01, G14, G38, L20

Keywords

Business groups, financial crisis, COVID-19, internal capital market, Korea

Working Papers SES collection

Last published

517 Deschênes S., Dumas C., Lambert S.: Household Resources and Individual Strategies; 2020

518 Dumas C., Jàativa X.: Better roads, better off? Evidence on improving roads in Tanzania; 2020

519 Huber M., Imhof D., Ishii R.: Transnational machine learning with screens for flagging bid-rigging cartels; 2020

520 Eugster N., Ducret R., Isakov D., Weisskopf J-P.: Chasing dividends during the COVID-19 pandemic; 2020

521 Loginova D., Portmann M. and Huber M. Assessing the effects of seasonal tariff-rate quotas on vegetable prices in Switzerland; 2020

522 Herz H, Zihlmann C.: Adverse Effects of Monitoring: Evidence from a field experiment; 2021

523 GROSSMANN V.: Das House Kapital; 2021

Catalogue and download links

<https://www.unifr.ch/ses/fr/recherche/working-papers.html>

http://doc.rero.ch/collection/WORKING_PAPERS_SES

Publisher

Université de Fribourg, Suisse,
Faculté des sciences économiques et sociales et du management
Universität Freiburg, Schweiz, Wirtschafts- und sozialwissenschaftliche
Fakultät University of Fribourg, Switzerland, Faculty of Management,
Economics and Social Sciences

Bd de Pérolles 90, CH-1700 Fribourg
Tél.: +41 (0) 26 300 82 00
decanat-ses@unifr.ch www.unifr.ch/ses