# The Impact of Ownership Concentration and Agency Problems on Firm Value

## : Evidence from M&As in Korea

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**Abstract:** Ownership concentration is associated with two agency problems. Using M&A data from Korean firms, we examine the impact of ownership concentration on M&A activity and outcomes. According to the agency theory, ownership concentration can decrease principal-agent (PA) conflict but increase principal-principal (PP) conflict. We posit that owners with higher ownership concentration may make bad decisions in terms of firm value in the payment methods with M&As because of an unwillingness to relinquish control. Employing logistic regression and pooled ordinary least squares, we find that the positive effect of ownership concentration on the acquirer's cumulative abnormal returns becomes significantly negative when the acquirer chooses a cash payment method. Our results further suggest that the negative effect of ownership concentration weakens when the ownership level is less than 30% or higher than 60%. Our results are consistent for the nonparametric model and matching sample analysis signifying strong evidence that while ownership concentration generally lowers PA conflict, the owner who values control could manipulate investment decisions for his/her private benefits.

## 1. Introduction

We study the relationship between two different agency problems and ownership concentration. The literature suggests that while a high control of ownership decreases principal-agent (PA) conflict (agency problem I), it also causes principal-principal (PP) conflict (agency problem II) (Martin, 1996; Villalonga and Amit, 2006; Shim and Okmuro, 2011; Sumon et al., 2012; Sun et al., 2016; Purkayastha et al., 2019). We focus on the payment methods used for mergers and acquisitions (M&As) to examine the impact of ownership concentration and agency problem on firm value. Many studies have shown that the owners (family or controlling shareholders) fear losing control and strive to maintain or increase their control (Martin 1996; Shim and Okamuro, 2011). They prefer cash payments over stock payments when they are reluctant to lose control (Harris and Raviv, 1988; Stulz 1988; Martin, 1996; Faccio and Masulis, 2005; Sumon et al., 2012). In this study, we argue that the controlling shareholders can make value-decreasing investment decisions to maintain their reputation or desire for control, regardless of the other shareholders' value, or choose a financing method that is not appropriate for the firm's financial management.

An M&A can affect an owner's control, especially when stock payment is used. If the owner fears losing control regardless of corporate value, that decision will have a negative impact on firm value. We posit that this effect will be better reflected in cash payments for M&As because the more importance accorded to control by owners, the more they will prefer to pay in cash rather than in stock. Therefore, M&As are more than just an investment tool for owners who value control. In this

45 study, we study the impact of ownership concentration and agency problems on firm value through
46 the M&A payment methods.
47    Since owners with higher percentages of shares have an incentive to monitor managers, higher
48 ownership concentration can affect firm value positively, but it is also likely to cause PP conflict.
49 Further, when the investment decision increases the probability of losing control, the PP conflict
50 increases. Therefore, owners might make a value-decreasing choice. We argue that: (i) as ownership
51 concentration increases, companies are unlikely to participate in M&As as acquirers; (ii) higher
52 ownership concentration affects M&A performance positively, but this effect becomes negative when
53 cash payment is used. We use the common equity of the largest shareholder and his/her special
54 relationships such as family, as a proxy for ownership concentration.
55    Using a sample of 25,974 panel data and 1040 M&A deals for the 2000-2017 period in the Korean
56 market, this study documents evidence of the influence of ownership concentration on M&A
57 performance. Our main findings are as follows. First, the effect of ownership concentration on the
58 likelihood of acquisition is significantly negative, which is similar to the results of previous studies
59 (Shim and Okamuro, 2011; Sumon et al., 2012). This means that ownership in Korean firms is related
60 to agency problems because owners with a large share of ownership monitor the indiscriminate
61 M&As of their agents, reducing the overall likelihood of a merger. Second, the joint effect of
62 ownership concentration and cash payment on CARs is significantly negative, which shows that the
63 cash payments in M&As cause PP conflict for the largest shareholders to defend their control. Third,
64 we find that the effect of ownership concentration related to PP conflict weaken when the ownership
65 level is less than 30% or higher than 60%. This result implies that the owners with low/high
66 shareholding might cause less of PP conflict because they do not have much interest in maintaining
67 it. Finally, we find that the joint impact of ownership concentration and cash payment on long-term
68 performance is not significant while the ownership concentration affects the long-term performance
69 significantly positively. We argue that the negative effects of cash acquisitions are offset by the
70 positive effects of concentrated ownership in the long run.
71    Our study contributes to the research on agency problem and ownership concentration in two
72 ways. First, we have presented new evidence that the ownership concentration has different effects
73 on the firm's decision-making process simultaneously according to the two agency problems. We
74 find that the ownership concentration causes value-increasing investment decisions which decrease
75 PA conflict while it causes value-decreasing payment decisions which increase PP conflict. Second,
76 Martin (1996) states that owners with very low or very high shareholding have less fear of losing their
77 control, and we have empirically proven this through the choice of investment methods. In sum,
78 ownership concentration in M&As may be a good indicator of a firm's agency problem, which
79 determines successful M&A performance and sustainable growth.
80    The remainder of this paper is organized as follows. Section 2 reviews related studies and
81 presents our hypotheses. Section 3 describes our empirical methodology and sample data. Section 4
82 presents the results of the empirical analysis. Finally, Section 5 offers conclusions.

83 **2. Literature review and hypotheses**

84    One agency problem between managers and owners (principal-agency conflict) decreases
85 shareholder wealth, but another agency problem between the dominant shareholders and minority
86 shareholders (principal-principal conflict) can negatively impact shareholder value (Purkayastha et
87 al., 2019). Further, both agency problems have a significant effect on the capital structure (Jensen and
88 Meckling 1976; Nicodano and Regis 2019), financing decisions (Sun et al., 2016), and M&A activity
89 (Sumon et al., 2012).
90    As ownership concentration increases, the large shareholder has a powerful incentive to monitor
91 managers. This behavior affects firm value positively. However, with increased ownership
92 concentration, the largest shareholder is also likely to gain private benefits through control even if it
93 dilutes minority shareholders' wealth (Villalonaga and Amit, 2006; Purkayastha et al., 2019).
94    The studies comparing family and non-family firms (Morck et al., 1988; Purkayastha et al., 2019)
95 argue that PA conflict in family firms is less costly than in non-family firms because family firms have

96    a higher ownership concentration. However, there is also the negative effect of PP conflict. Hence,
97    the effect of ownership concentration on shareholder value is not clear. Villalonga and Amit (2006)
98    and Sumon et al. (2012) considered both agency problems simultaneously.
99        In relation to ownership concentration, the different effects of the two agency problems is
100   debatable. Do the two different problems effect M&As simultaneously? We expect that conflicts
101   between management and shareholders are less likely than conflicts between the largest shareholder
102   and minority shareholders. However, it is difficult to directly discern how the two effects of the
103   opposite directions caused by ownership concentration affect the firm's value in relation to the two
104   agency problems. Therefore, studying the two different effects using M&A payment methods helps
105   us understand the relationship between ownership concentration and the two agency problems.
106       M&As require a relatively larger capital investment than other investment opportunities and
107   also affect the control of the large shareholders, especially when stock payment are used, as it directly
108   changes the ownership structure. Therefore, in M&As, the largest shareholder has a greater incentive
109   to monitor managers or participate in the decision making. Shim and Okamuro (2011) show that
110   family-owned companies are likely to see a significant reduction in family ownership after the merger,
111   and that family firms are more reluctant to merge than non-family firms. They also argued that the
112   family gains more private benefits because of their control over the family firm.
113       Studies on the risk of losing control (Harris and Raviv, 1988; Stulz 1988; Martin, 1996; Faccio and
114   Masulis, 2005; Sumon et al., 2012) argue that the owner of family firms or the controlling shareholders
115   who value their control fear losing control when making financial decisions since stock-financed
116   M&As would directly affect owner control. Even if they used a different type of financing than stock,
117   M&As can still affect their future control. Since M&As require more capital, owners considering their
118   future financing are likely to be reluctant about current large capital expenditures. When they find a
119   good project or experience negative economic shocks and do not have sufficient cash or debt, the
120   owner uses stock financing. They would want to avoid this situation. This leads to our first empirical
121   prediction, which is similar to related studies (Shim and Okamuro, 2011; Sumon et al., 2012)[1].

122   **Hypothesis 1.** *Companies with a higher concentration of ownership tend to be reluctant to participate in*
123   *M&As.*

124       If the owners considering their controlling power are reluctant about M&As, we can argue that
125   the ownership of Korean firms is related to agency problems. Besides, the equity ratio of the largest
126   shareholder and related parties in the Korean stock market was at 38~40% on average per year
127   between 2001 and 2017. This means that the ownership structure of Korean companies is concentrated
128   among their largest shareholders. Therefore, the ownership concentration in Korean public firms is
129   suitable for studying the relationship between ownership concentration and the two types of agency
130   problems.
131       Since ownership concentration decreases the cost of agency conflict between managers and
132   owners, we suppose that the higher the ownership concentration in a firm, the more it is likely to
133   choose a value-increasing investment following Jensen and Meckling (1976). However, the higher
134   ownership concentration could also increase the negative impact of PP conflict and the largest owners'
135   decision can affect the financing of M&As.
136       We expect that the impact of ownership concentration and agency problems on firm value is
137   manifested through the M&A payment method. Following Harris and Raviv (1988), Stulz (1988),
138   Martin (1996), Faccio and Masulis (2005), and Sumon et al., (2012), we posit that when the largest
139   shareholders value their control, they are reluctant to use a stock transaction. Therefore, they may

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[1] Some recent evidence in Abudy, Benninga, and Shust (2016) argues that the controlling shareholders, which are usually non-diversified, are not likely to be engaged in value-decreasing transactions of their firm. However, Faccio and Masulis(2005), Sumon et al. (2012) argue that even if the largest shareholders do not make a value-decreasing investment decision, they can choose a payment method that is not good for corporate value so as not to lose their control.

140 choose a cash payment even if the cash payment is not suitable for firm's financial position. In
141 addition, Shim and Okamuro (2011) say that families gain more private benefits because of their
142 control over the family firms. This dilutes minority shareholders' wealth or the firm's value. We
143 suggest that high ownership concentration can have a negative impact on corporate value through
144 the choice of financing method and investment decisions. However, blocking PA conflict in
145 investment decisions can have a positive impact on corporate value.

146 However, Sumon et al. (2012) report that agency conflict is one of the main causes of M&A failure,
147 and ownership association does not necessarily improve post-M&A performance because of PP
148 conflict. Therefore, in order to see if PA conflict has a significant influence on M&A failure and if
149 ownership concentration improves post-M&A performance by inhibiting PA conflict, it is necessary
150 to control the PP conflict caused by ownership concentration. We claim to be able to make this
151 distinction by using M&A payment methods.

152 If this is the case, we believe that the largest shareholders who chose to pay with cash are more
153 likely to make this decision not for the sake of firm value or shareholders' wealth, but for their own
154 private benefit or to maintain their control. In this regard, the acquirers' CAR is affected by the
155 payment method chosen. Owners who value their control prefer cash payment (Harris and Raviv,
156 1988; Martin, 1996; Shim and Okamuro, 2011). If the largest shareholders or owners choose cash
157 financing in an M&A, we believe it is because they likely fear losing control. We propose our second,
158 and main, hypothesis:

159 **Hypothesis 2.** *Higher ownership concentration affects M&A performance positively, but this effect becomes*
160 *negative when cash payment is used.*

161 Martin (1996) states that owners with a very low or very high shareholding are less concerned
162 about losing control. His control hypothesis (Martin, 1996) is a good setting to check our hypotheses.
163 If $H_2$ is true because the largest owners do not want to lose control, the joint effect of ownership
164 concentration and cash payment will be stronger when they are at an ownership level somewhere in
165 the middle. Therefore, the owners with a very low or very high shareholding will cause less of PP
166 conflict because they either have enough control already or they do not have much interest in
167 maintaining it. This leads to our third empirical prediction.

168 **Hypothesis 3.** *The effect of PP-related ownership concentration on firm value varies depending on the level of*
169 *ownership.*

170

171 **3. Data and Variables**

172 *3.1. Data*

173 Our sample includes Korean public firms and domestic Korean M&A deals between 2001 and
174 2017. We combine both the databases to construct our sample dataset for firms and M&As. We use
175 TS2000 for the financial and accounting data and use Thomson Reuter's Securities Data Corporation
176 (SDC) Merger and Acquisition database for the M&A deal data. We exclude sample firms with no
177 reported financials along with firms in the financial and insurance industries (KSIC 64–66).
178 To be eligible for analysis, the M&A deals must meet the following conditions: the bidders
179 should be public; the deals should have been completed; the deal's announcement date should have
180 been between January 1, 2001 and December 30, 2017; the deals should have a reported transaction
181 value of more than 1 million dollars; the acquirers should own less than 10% of the target firm before
182 the deal and more than 40% after; the acquirers should have the required basic financial and
183 accounting data; and the bidder and the target should have different parent firms; excluding firms
184 with fewer than 130 price observations in the estimation period (-210, -9) for CAR. The final dataset
185 panel comprises 25,974 observations and the M&A dataset comprises 1040 observations. For the

186 M&A performance measures in the short and the long term, we use various CARs : CAR(-1,1), CAR(-
187 1,2),CAR(-5,730), and CAR (-1,1095).
188

189 *3.2. Control variables*

190   For the control variables, we need to consider the non-family or outside blockholders. Edmans
191 (2014) and D'Mello et al. (2011) argue that blockholders play a role in monitoring management
192 effectively; the more concentrated their share, the more motivated they are to monitor management
193 (Jensen and Meckling, 1976; Fama and Jensen, 1983). Therefore, we control the effect of monitoring
194 by blockholders. Many studies on foreign stake in the Korean market argue that the higher the foreign
195 ownership ratio, the lesser the agency problem of monitoring management (Lee et al., 2009; Park,
196 2011; Woo and Goo, 2019, etc.). Hence, we use foreign shareholding as another control variable.
197   We also use other control variables following the literature on CAR at the time of the M&A
198 announcement. We use a tender offer dummy variable to reflect related agency costs (Kim, 2018); the
199 public status of the firms, and the relative value between the transaction value of the M&A and the
200 acquirer's size (Aktas et al., 2018; Harford and Uysal, 2014; Kim, 2018). However, we cannot use the
201 number of bidders, indicating the bidding competition (Ahern, 2012; Kim, 2018), or takeover defenses
202 (Ahern, 2012) because the data are not observable. The number of bidders in M&A transactions is set
203 to 1 and no defense methods, such as poison pills or defensive recapitalizations are considered.
204   We add variables related to fixed assets and the scarcity of the firm's product to the firm's
205 financial and accounting variables, following Ahern (2014) and Kim (2018). To et al. (2018) analyze
206 the effect of financial analysts on corporate investment decisions, using control variables for size,
207 leverage, book-to-market ratio, and asset growth. In the Korean market, Lee et al. (2012) find that
208 return on assets (ROA) and sales growth rate have significantly positive effects on investment activity
209 and leverage has a significantly negative effect.

210 *3.3. Ownership structure*

211   We use the common equity share of the largest shareholder and that of his/her special relations,
212 such as family, as a proxy for ownership concentration. We delete the firms with no reported largest
213 shareholder. However, if the common equity of other shareholders, such as foreigners or
214 shareholders with at least 5% holding (blockholders or large shareholders), is missing, we change the
215 value to zero. We use the sum of the common equity of blockholders with at least 5% but not the
216 largest shareholder's family or affiliates and the common equity of others who are not minority
217 shareholders. In the Korean market, ownership concentration is 39.1% on average. Table 1 describes
218 the statistics of ownership concentration.

219                                    **Table 1.** Statistics of ownership.

| | | Owner_1_share | | Owner_share | | Comparative_share | | Foreigner_share | |
|---|---|---|---|---|---|---|---|---|---|
| YR | N | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| 2000 | 879 | 23.31 | 37.30 | 7.11 | 4.38 | 20.10 | 36.29 | 0.00 | 0.13 |
| 2001 | 1036 | 24.34 | 21.75 | 38.20 | 37.40 | 6.80 | 0.00 | 4.62 | 0.14 |
| 2002 | 1192 | 25.14 | 22.98 | 39.20 | 38.62 | 6.49 | 0.00 | 4.62 | 0.14 |
| 2003 | 1316 | 25.44 | 22.92 | 39.82 | 39.59 | 6.35 | 0.00 | 5.92 | 0.28 |
| 2004 | 1346 | 26.24 | 23.77 | 39.88 | 39.15 | 7.25 | 0.00 | 6.95 | 0.19 |
| 2005 | 1376 | 25.26 | 22.86 | 37.84 | 36.88 | 6.01 | 0.00 | 7.80 | 1.08 |
| 2006 | 1452 | 24.91 | 22.58 | 37.41 | 36.24 | 6.32 | 0.00 | 7.77 | 1.00 |
| 2007 | 1505 | 24.89 | 22.14 | 37.06 | 36.31 | 6.35 | 0.00 | 7.61 | 1.23 |
| 2008 | 1554 | 25.59 | 22.75 | 38.06 | 37.58 | 6.83 | 0.00 | 6.07 | 1.01 |
| 2009 | 1513 | 25.84 | 23.27 | 38.64 | 38.07 | 6.44 | 0.22 | 5.41 | 0.54 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2010 | 1510 | 26.79 | 24.05 | 39.81 | 39.26 | 6.60 | 1.08 | 5.89 | 0.72 |
| 2011 | 1526 | 27.18 | 24.22 | 40.37 | 39.97 | 6.40 | 0.94 | 5.89 | 0.90 |
| 2012 | 1561 | 27.40 | 24.71 | 40.31 | 39.48 | 6.65 | 1.00 | 5.99 | 1.08 |
| 2013 | 1561 | 27.81 | 25.00 | 40.31 | 39.60 | 6.67 | 0.75 | 6.43 | 1.44 |
| 2014 | 1589 | 27.85 | 24.99 | 40.12 | 39.43 | 6.81 | 0.94 | 6.80 | 1.87 |
| 2015 | 1617 | 27.65 | 24.87 | 39.46 | 38.93 | 6.75 | 0.77 | 6.69 | 2.12 |
| 2016 | 1684 | 27.64 | 24.62 | 38.91 | 38.44 | 6.44 | 0.67 | 7.03 | 2.54 |
| 2017 | 1757 | 27.97 | 25.00 | 39.13 | 38.60 | 6.10 | 0.50 | 7.28 | 2.53 |
| Average | 1476 | 26.35 | 23.67 | 39.09 | 38.44 | 6.55 | 0.40 | 6.40 | 1.11 |

"Owner_1_share" denotes the largest shareholder's common equity. "Owner_share" denotes the sum of the common equity shares of the largest shareholder and that of his/her special relations. "Comparative_share" denotes the sum of the blockholders and others, such as employee stock ownership associations.

Table 1 illustrates that Owner_share is 24~28% on average and Owner_share is 38~40% on average per year for 2000–2017. Further, each variable has little difference between the mean and the median in a given year. The ownership concentration in Korean firms has remained unchanged in the 2000s. When we compare the early 2000s to the present, we find that despite a nearly 70% increase in the number of public firms, there is a steady concentration of around 40% in ownership level. We also find that blockholders or large shareholders on average have 6.5% share while foreigners have 6.4%.

*3.4. Summary statistics*

Table 2 presents the summary statistics for M&A transactions. We see that the transactions are paid in cash rather than stocks in the Korean domestic M&As because of the high ownership concentration in the Korean firms. Moreover, if the transaction was paid only in cash, it would be completed faster than stock financing. In our M&A sample, the bidders acquire an average 75% stake in the targets. Therefore, our sample represents a substantial transfer of control.

**Table 2.** Statistics of M&A transactions.

| | Mean | | | | |
|---|---|---|---|---|---|
| | N | Time | Value | Prior % | After % |
| Full | 1040 | 46.13 | 65.34 | 5.25 | 82.63 |
| Ownership > 40% | 352 | 49.09 | 72.78 | 4.79 | 84.09 |
| Ownership < 40% | 688 | 44.62 | 61.54 | 5.47 | 81.89 |
| Cash100 | 400 | 35.55 | 37.58 | 3.23 | 77.61 |
| Stock100 | 188 | 87.57 | 127.80 | 5.36 | 98.27 |

Time is calculated as completed day minus announcement day. The value of transaction (Value) is measured in million dollars. Prior % and After % denote the acquirer's share in the target firm before and after the M&A.

Table 3 shows the summary statistics for the financial and accounting variables of sample firms. "PCM" and "ROA" have differing signs between the mean and the median. We winsorize the variables from the top 1% (3%) and the bottom 1% (3%) each year. The results are similar when we test our hypothesis using the raw and winsorized data. These variables are defined in Appendix A. We also see that acquirers have lower financial characteristics related to profitability (ROA, PCM) than public firms.

**Table 3.** Statistics of sample firms.

| | Public firm | Acquirer |
|---|---|---|

|  | Raw data | | 1% | 3% | Raw | | 1% | 3% |
|---|---|---|---|---|---|---|---|---|
|  | Mean | Median | Mean | Mean | Median | Mean | Mean | Mean |
| Size | 25.0032 | 24.8008 | 25.0032 | 25.0032 | 25.2973 | 24.9531 | 25.2973 | 25.2973 |
| Leverage | 0.4403 | 0.4229 | 0.4405 | 0.4411 | 0.4454 | 0.4237 | 0.4454 | 0.4462 |
| B/M_ratio | 1.0162 | 0.9901 | 1.0167 | 1.0188 | 0.8432 | 0.7933 | 0.8442 | 0.8495 |
| PCM | -0.0323 | 0.0394 | -0.0046 | 0.0095 | -0.1555 | 0.0214 | -0.1244 | -0.0914 |
| Fixed_ratio | 0.5283 | 0.5266 | 0.5287 | 0.5300 | 0.5463 | 0.5511 | 0.5463 | 0.5487 |
| Sales_grow | 1.1559 | 1.0465 | 1.1570 | 1.1607 | 1.1102 | 1.0335 | 1.1102 | 1.1190 |
| ROA | -0.0396 | 0.0245 | -0.0241 | -0.0123 | -0.1809 | 0.0069 | 0.1108 | -0.1074 |

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## 4. Empirical Results

*4.1. Results for Hypothesis 1*

We argue that firms with a higher ownership concentration tend to be reluctant to participate in M&As (H1). Using logistic regression, we test our empirical prediction that ownership concentration (Owner_share) has a negative effect on the likelihood to become an acquirer. In table 4, all models support H1 at the 1% significance level. Thus, we can argue that ownership in Korean firms is associated with agency problems, like previous studies (Shim and Okamuro, 2011; Sumon et al., 2012). The control variables show a similar effect in the literature on M&A probability: size and leverage (Shim and Okamuro, 2011; Harford and Uysal, 2014); ROA and foreigner_share (Shim and Okamuro, 2011).

**Table 4.** Logistic regressions.

| D_M&A | Raw data | | | | Full and Winsorized | |
|---|---|---|---|---|---|---|
|  | Full | YR<2008 | YR=2008-09 | YR>2009 | at 1% | at 3% |
|  | (1) | (2) | (3) | (4) | (5) | (6) |
| Constant | -3.277*** | -2.96** | -3.927** | -4.938*** | -5.3*** | -6.123*** |
| Owner_share | -0.016*** | -0.022*** | -0.014*** | -0.01*** | -0.012*** | -0.009*** |
| Foreigner_share | -0.001 | -0.004 | -0.001 | -0.004 | -0.002 | -0.001 |
| Comparative_share | -0.004 | -0.01 | -0.009 | 0.004 | -0.002 | -0.001 |
| Size | 0.049 | 0.082 | 0.065 | 0.092** | 0.118*** | 0.147*** |
| Leverage | -0.608*** | -0.723*** | -0.638** | -0.335* | -0.501*** | -0.499*** |
| B/M_ratio | -0.744*** | -1.554*** | -0.176 | -0.533*** | -0.595*** | -0.565*** |
| PCM | -0.019 | -0.003 | -0.006 | -0.063* | -0.44*** | -0.843*** |
| Fixed_ratio | 0.72*** | 0.426 | 1.085** | 0.706** | 0.479** | 0.403** |
| Sales_grow | -0.038 | -0.019 | -0.045 | -0.159 | -0.016 | -0.008 |
| ROA | -0.269** | -0.23*** | -0.282** | -0.438*** | -0.673*** | -1.137*** |
| N | 25974 | 10102 | 3067 | 12805 | 25974 | 25974 |
| N_acquirer | 964 | 349 | 178 | 437 | 964 | 964 |
| pseudo_R² | 0.032 | 0.085 | 0.023 | 0.019 | 0.04 | 0.045 |

"D_M&A" is considered 1 if the firms participated in M&As as acquirers in (t+1) year. All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

*4.2. Results for Hypothesis 2*

264     We suggest that impact of ownership concentration and agency problems on firm value
265 manifests through the M&A payment method. We provide evidence to support our view. We use the
266 market(CARm) and adjusted market models(CARad) to calculate abnormal returns. Many studies
267 have used the market model (Ahern, 2012; Harford and Uysal, 2014; Kim, 2018; Aktas et al., 2018) in
268 the U.S. market. However, the market-adjusted model is more appropriate for M&As because firms
269 can participate in other M&As during the estimation period (Bouwman, Fuller, and Nain, 2009). In
270 the Korean market, Han and Shin (2018) used the market model but Kim and Jung (2017) used the
271 adjusted market model. Hence, we use both models to calculate abnormal returns. Regardless of the
272 model used, our results are similar. Table 5 shows the results of the t-test for the cumulative abnormal
273 average returns (CAARs). All CAARs are significant and positive. Han and Shin (2018) show that
274 CAAR is significantly positive in both sub-samples divided at 43%.

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**Table 5.** Descriptive statistics on CAARs.

|  | N | CAR1m | CAR2m | CAR3m | CAR1ad | CAR2ad | CAR3ad |
|---|---|---|---|---|---|---|---|
| Full | 1040 | 0.06*** | 0.056*** | 0.051*** | 0.049*** | 0.046*** | 0.043*** |
| Owner>40 | 352 | 0.058*** | 0.056*** | 0.051*** | 0.051*** | 0.048*** | 0.044*** |
| Owner<40 | 688 | 0.061*** | 0.056*** | 0.05*** | 0.049*** | 0.045*** | 0.042*** |
| Cash100 | 400 | 0.039*** | 0.036*** | 0.031*** | 0.022*** | 0.021*** | 0.017*** |
| Stock100 | 188 | 0.141*** | 0.13*** | 0.117*** | 0.13*** | 0.121*** | 0.111*** |

276     ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

277     Table 6 represents CAARs by sub-sample and rank of ownership concentration. "Full M&A"
278 shows that the CAARs are significant and positive for all ranks. Furthermore, the distribution of the
279 sample by rank is concentrated in the lower ranks. These results are the same for the only stock-
280 financing sample (M&A only stock) but not for the only cash payment sample. Rows 10 and 11 of
281 Table 6 show that CAAR is significant and positive only below rank 4. This suggests that, when the
282 deal is paid for in only cash, a higher ownership concentration has more negative reactions when
283 compared to the lower section.

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**Table 6.** CAARs by sub-samples.

|  | Mean of ownership | Full M&A | | | M&A only stock | | | M&A only cash | | |
|---|---|---|---|---|---|---|---|---|---|---|
|  |  | N | CAR1m | CAR2m | N | CAR1m | CAR2m | N | CAR1m | CAR2m |
| Rank 1 | 10.8 | 207 | 0.074*** | 0.066*** | 32 | 0.155*** | 0.149*** | 86 | 0.076*** | 0.061*** |
| Rank 2 | 19.8 | 133 | 0.056*** | 0.049*** | 24 | 0.146*** | 0.128*** | 46 | 0.037* | 0.035 |
| Rank 3 | 25.9 | 125 | 0.08*** | 0.08*** | 31 | 0.178*** | 0.16*** | 49 | 0.058*** | 0.057** |
| Rank 4 | 31.3 | 89 | 0.036** | 0.034** | 10 | 0.139 | 0.114 | 42 | 0.025 | 0.021 |
| Rank 5 | 36 | 110 | 0.041*** | 0.034** | 13 | 0.143*** | 0.126*** | 47 | 0.031 | 0.022 |
| Rank 6 | 40.8 | 95 | 0.05*** | 0.05*** | 23 | 0.124*** | 0.116*** | 35 | 0.021 | 0.022 |
| Rank 7 | 45.9 | 94 | 0.039*** | 0.046*** | 18 | 0.109*** | 0.108*** | 24 | -0.004 | 0.024 |
| Rank 8 | 51.1 | 63 | 0.076*** | 0.07*** | 10 | 0.231** | 0.233** | 21 | 0.029 | 0.027 |
| Rank 9 | 58.2 | 72 | 0.048** | 0.04** | 16 | 0.099*** | 0.098** | 25 | -0.006 | -0.007 |
| Rank 10 | 70.6 | 62 | 0.083*** | 0.076*** | 11 | 0.133** | 0.115** | 25 | 0.014* | 0.029*** |

285     ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

286     Table 7 represents the results of our main hypothesis. We argue that a higher ownership
287 concentration affects M&A performance positively but that this effect becomes negative when cash

288  payment is used. Therefore, we expect ownership concentration (Owner_share) to have a positive
289  effect on CARs, but the joint effect of ownership concentration and cash payment (D_cash*Owner) to
290  have a negative value. The results in Table 7 support our hypothesis. In all pooled-ordinary least
291  squares models, the t-statistics from heteroskedasticity robust standard error are reported in
292  parentheses and contain industry and year dummies.

293  Owner_share is significant and positive and the joint effect is significant and negative when all
294  the variables are included, while Owner_share is not significant without the joint variables. These
295  results mean that high ownership concentration reduces PA conflict but increases PP conflict at the
296  same time. In models (1), (2), (3), (5), (6), and (7) of Table 7, the effect of ownership concentration on
297  CAR is positive but not significant. However, in model (4) and (8), Owner_share has a positive and
298  significant effect on CAR. Therefore, the interaction variable between ownership concentration and
299  cash payment (D_cash*Owner) controls the part where controlling shareholders causes PP conflict.
300  This shows that ownership association plays a positive role in corporate value by mitigating PA
301  conflict.
302  We infer that the owners who value control strive to maintain it, and this is detrimental to firm
303  value because it is in the interest of the owner, not the company. Their behavior leads them to select
304  cash payment (Martin, 1996; Shim and Okamuro, 2011), and this choice of transaction method is
305  determined regardless of the value or financial position of the firm. Therefore, the joint effect is
306  negative and significant.
307

308  **Table 7.** The joint effect of ownership concentration and cash payment on short-term performance.

|  | CAR1m | | | | CAR1ad | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Constant | 0.238* | 0.220 | 0.165 | 0.145 | 0.294** | 0.26** | 0.213* | 0.196* |
| Owner_share | 0.000 | 0.000 | 0.000 | 0.001** | 0.001 | 0.001 | 0.000 | 0.001** |
| D_cash100 |  |  | 0.003 | 0.058** |  |  | -0.01 | 0.033 |
| D_stock100 |  |  | 0.102*** | 0.102*** |  |  | 0.088*** | 0.088*** |
| D_cash*Owner |  |  |  | -0.002*** |  |  |  | -0.001** |
| Foreigner_share |  | -0.000 | 0 | 0.000 |  | -0.000 | 0.000 | 0.000 |
| Comparative_share |  | -0.001 | -0.001 | -0.001 |  | -0.000 | 0.000 | 0.000 |
| D_public_target | 0.001 | 0.000 | -0.014 | -0.017 | 0.002 | 0.001 | -0.011 | -0.014 |
| D_affiliate | -0.000 | 0.000 | 0.004 | 0.004 | 0.001 | 0.001 | 0.004 | 0.004 |
| D_tender offer | -0.089* | -0.088* | -0.088* | -0.092* | -0.109*** | -0.109*** | -0.108*** | -0.111*** |
| Relative_value | 0.01 | 0.01 | 0.006 | 0.006 | 0.008 | 0.008 | 0.004 | 0.004 |
| Size | -0.012*** | -0.011** | -0.009** | -0.009** | -0.015*** | -0.013*** | -0.011*** | -0.011*** |
| Leverage | -0.004 | -0.004 | 0.000 | 0.001 | 0.006 | 0.007 | 0.01 | 0.011 |
| B/M_ratio | 0.017 | 0.018 | 0.022 | 0.020 | 0.017 | 0.018 | 0.022* | 0.021* |
| PCM | -0.014* | -0.014* | -0.010 | -0.011 | -0.007 | -0.007 | -0.004 | -0.005 |
| Fixed_ratio | -0.025 | -0.026 | -0.023 | -0.023 | -0.021 | -0.022 | -0.02 | -0.02 |
| Sales_grow | 0.005* | 0.005* | 0.006* | 0.006** | 0.009*** | 0.009*** | 0.009*** | 0.01*** |
| ROA | -0.015 | -0.015 | -0.022 | -0.020 | -0.010 | -0.009 | -0.016 | -0.015 |
| adj. R² | 0.051 | 0.051 | 0.096 | 0.103 | 0.067 | 0.067 | 0.117 | 0.122 |

309  All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and
310  10% levels, respectively.

However, the choice of transaction method may not have a significant impact on the long-term performance of M&As. The impact of a payment or financing method would be limited unless it was overworked.

In Table 8, we examine the long-term effect of ownership concentration and payment method. Additionally, we use adjusted market models (CARad) to calculate abnormal return. This is because companies are likely to participate in other M&As during that period in analyzing long-term performance. In all models of Table 8, the ownership concentration (Owner_share) has a positive and significant impact on the long-term performance of post-M&A. However, cash payment (D_cash100) and the joint effect of ownership concentration and cash payment do not have a significant effect. Therefore, we argue that the choice of transaction method may not have a significant impact on the long-term performance of M&As.

**Table 8.** The joint effect of ownership concentration and cash payment on long-term performance

| | Raw | | Winsorized at 1% | | | Winsorized at 3% | | |
|---|---|---|---|---|---|---|---|---|
| | CAR730ad | CAR1090ad | CAR1ad | CAR730ad | CAR1090ad | CAR1ad | CAR730ad | CAR1090ad |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Constant | -1.912* | -1.734 | 0.174 | -1.197 | -1.102 | 0.189 | -0.280 | -0.134 |
| Owner_share | 0.011*** | 0.011*** | 0.001** | 0.010*** | 0.01** | 0.001** | 0.007** | 0.007* |
| D_cash100 | -0.224 | -0.185 | 0.031 | -0.164 | -0.137 | 0.033 | -0.161 | -0.142 |
| D_stock100 | 0.005 | -0.021 | 0.088*** | 0.006 | -0.028 | 0.087*** | 0.027 | -0.011 |
| D_cash*Owner | 0.000 | -0.001 | -0.001** | -0.001 | -0.002 | -0.001** | -0.001 | -0.002 |
| Foreigner_share | -0.001 | -0.001 | -0.000 | -0.001 | -0.001 | -0.000 | -0.001 | -0.001 |
| Comparative_share | 0.005 | 0.005 | -0.000 | 0.004 | 0.003 | -0.000 | 0.002 | 0.002 |
| D_public_target | 0.273* | 0.281* | -0.013 | 0.262* | 0.27* | -0.013 | 0.244* | 0.251 |
| D_affiliate | 0.108 | 0.098 | 0.005 | 0.106 | 0.097 | 0.005 | 0.108 | 0.098 |
| D_tender offer | 0.253 | 0.179 | -0.110*** | 0.256 | 0.186 | -0.11*** | 0.251 | 0.191 |
| Relative_value | -0.057* | -0.06** | 0.004 | -0.051* | -0.054* | 0.004 | -0.046 | -0.049* |
| Size | 0.034 | 0.037 | -0.010*** | 0.007 | 0.012 | -0.011*** | -0.028 | -0.024 |
| Leverage | -0.379** | -0.478** | 0.014 | -0.273 | -0.351* | 0.019 | -0.166 | -0.236 |
| B/M_ratio | 0.307** | 0.295** | 0.022* | 0.243* | 0.232 | 0.019 | 0.202 | 0.184 |
| PCM | 0.171** | 0.241*** | -0.013 | 0.281* | 0.312** | -0.013 | 0.384* | 0.406* |
| Fixed_ratio | -0.086 | -0.174 | -0.022 | 0.033 | -0.072 | -0.021 | 0.163 | 0.073 |
| Sales_grow | -0.021 | -0.03 | 0.010*** | -0.033 | -0.038 | 0.01*** | -0.043 | -0.048 |
| ROA | 0.132 | 0.091 | -0.020 | 0.395** | 0.353** | -0.020 | 1.033*** | 0.994*** |
| adj. $R^2$ | 0.265 | 0.271 | 0.123 | 0.275 | 0.278 | 0.121 | 0.296 | 0.298 |
| N | 903 | 836 | 1040 | 903 | 836 | 1040 | 903 | 836 |

All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

*4.3. Results for Hypothesis 3*

Martin (1996) states that owners with very low or very high shareholding are less concerned about losing control because they either already have enough control already or they do not have any interest in it. Therefore, we infer that the effect of PP-related ownership concentration on firm value

will vary depending on the level of ownership. We test this hypothesis (H3) and present the results in Table 9.

In the Korean market, ownership concentration has remained unchanged in the 2000s with the average at 39%. We argue that if the owner's share is less than 30% or higher than 60%, the owner values control less than the average Korean owners. In this case, they would cause less PP conflict. Model (1) and (5) of Table 9 support this: the joint effect of ownership concentration and cash payment is not significantly negative. However, the joint effect in Model (2) is significant and negative. Further, the results of Models (3) and (4) in Table 9 are similar to Martin's (1996) control hypothesis. What is interesting is that the effect of ownership concentration in Models (6) and (7) is significant and negative. This is similar to the results of the interaction terms in Table 8. The negative effect of ownership concentration is greater in Model (7) than in Model (6). Therefore, our third hypothesis is supported.

**Table 9.** Results depending on the level of ownership.

| | Full sample | | | | | Only cash | |
|---|---|---|---|---|---|---|---|
| | <=30 | >30 | not 1, 10 | Rank 1 | Rank 10 | Full | 1 std |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Constant | 0.215 | -0.005 | 0.037 | -0.093 | 1.602*** | 0.035 | 0.008 |
| Owner_share | 0.001 | 0.002** | 0.001 | 0.003 | -0.001 | -0.001* | -0.003** |
| D_cash100 | 0.054 | 0.107** | 0.064* | 0.102 | -0.534* | | |
| D_stock100 | 0.122 | 0.077*** | 0.088*** | 0.124*** | 0.142*** | | |
| D_cash*Owner | -0.002 | -0.003** | -0.002* | -0.005 | 0.009** | | |
| Foreigner_share | 0.001 | 0 | 0 | 0.001 | 0.02*** | 0 | -0.001 |
| Comparative_share | -0.002*** | 0.001 | 0 | -0.002 | 0.001 | 0 | -0.001 |
| D_public_target | -0.019 | -0.037* | -0.024 | -0.129** | -0.081 | -0.05*** | -0.045* |
| D_affiliate | 0.019 | -0.013 | 0.006 | -0.015 | -0.019 | -0.021 | -0.011 |
| Relative_value | 0.002 | 0.035*** | 0.029*** | 0 | 0.183** | 0.039** | 0.045** |
| Size | -0.012 | -0.005 | -0.004 | 0.002 | -0.056** | 0 | 0.004 |
| Leverage | -0.018 | 0.03 | -0.011 | -0.009 | 0.351*** | -0.003 | 0.133*** |
| B/M_ratio | 0.03 | 0.027 | 0.019 | 0.033 | -0.064 | 0.042* | 0.06** |
| PCM | -0.007 | -0.028 | -0.008 | -0.017 | 0.18 | -0.03 | 0.006 |
| Fixed_ratio | -0.013 | -0.016 | 0.001 | 0.044 | 0.006 | -0.018 | -0.043 |
| Sales_grow | 0.015 | 0.005 | 0.006* | 0.01 | 0.165** | 0.011*** | 0.006*** |
| ROA | -0.03 | 0.003 | -0.026 | -0.011 | 0.527*** | -0.036 | 0.041 |
| N | 484 | 556 | 773 | 207 | 60 | 400 | 237 |
| adj. $R^2$ | 0.057 | 0.134 | 0.139 | 0.114 | 0.701 | 0.107 | 0.062 |

Model (7) shows the result of companies whose ownership concentration level is within 1 standard deviation of the mean. All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

*4.4. Robustness*

Our main results in Table 8 show that the joint effect of ownership concentration and cash payment on CARs are significant and negative. In Table 9, we also show that the effect varies depending on the level of ownership. Hence, we can argue that the result of Table 8 is the PP conflict caused by ownership concentration. Although we have consistently shown results using various sub-samples, the possibility remains that firms with some ownership concentration interval (or cash payment firms) have different characteristics and investment opportunities from firms with other ownership concentration interval (or stock transaction firms), and this can cause these different results. Therefore, we use one standard deviation interval from the mean (or ownership > 30% or only

355 cash) sample (treatment group) and match it with the lower ownership concentration interval sample
356 (control group) above it. We use the lower interval (or only stock) as the control group because the
357 lowest ownership concentration interval has continuously shown insignificant results.
358     In the matching procedure, we use size, leverage, book-to-market ratio, PCM, fixed asset ratio,
359 sales growth, and ROA as matching variables because they have high explanatory power for whether
360 a firm belongs to the A interval or the near-BBB interval. We use the Mahalanobis distances between
361 firms in the same industry as the matching method. While matching, we narrow down the closeness
362 of the matched samples using the pooled estimate of common standard deviations to show the
363 consistency of the results. We use SAS program's "caliper = r" option, which signifies r times the
364 pooled estimate of the common standard deviation. We use the matched samples based on 0.1 for
365 "caliper = r." Following Austin (2011), about 99% of the bias associated with the measured
366 confounders can be reduced using "CALIPER = 0.2." Therefore, we add the 0.2 times the pooled
367 estimate of the common standard deviation.
368     In Table 10, we can see that the control variables have differences between sub-samples, which
369 are divided by ownership concentration level at 30%. However, these differences between the
370 treatment group (ownership concentration>30%) and the control group (ownership concentration
371 <=30%) is narrowed in the matched sample. Therefore, we can conclude that the matched samples we
372 constructed have similar firm characteristics between the two groups.

373

**Table 10.** Statistics of matched samples.

| | raw sample | | | matched sample | | | raw sample | | matched sample | |
|---|---|---|---|---|---|---|---|---|---|---|
| | <= 30 (1) | >30 (2) | (2)-(1) | <= 30 (3) | >30 (4) | (4)-(3) | stock | cash | stock | cash |
| SIZE | 24.883 | 25.691 | 0.808*** | 25.256 | 25.285 | 0.029 | 24.730 | 25.158 | 24.661 | 24.826 |
| leverage | 0.470 | 0.422 | -0.049*** | 0.410 | 0.393 | -0.017 | 0.422 | 0.451 | 0.412 | 0.416 |
| bm_RATIO | 0.747 | 0.923 | 0.176*** | 0.844 | 0.849 | 0.005 | 0.834 | 0.839 | 0.862 | 0.848 |
| PCM | -0.329 | -0.004 | 0.324*** | -0.047 | -0.026 | 0.021* | -0.258 | -0.158 | -0.168 | -0.112 |
| Fixed_ratio | 0.530 | 0.557 | 0.027** | 0.531 | 0.539 | 0.007 | 0.510 | 0.532 | 0.510 | 0.500 |
| salesgrow | 1.060 | 1.158 | 0.098 | 1.154 | 1.094 | -0.060 | 1.103 | 1.132 | 1.126 | 1.057 |
| ROA | -0.367 | -0.018 | 0.349*** | -0.050 | -0.034 | 0.015 | -0.159 | -0.240 | -0.171 | -0.133 |
| N | 484 | 556 | | 202 | 202 | | 188 | 400 | 116 | 116 |

374     This table represents the mean value of financial and accounting variables of matched samples. We
375     employ t-tests between sub-samples, which are divided by ownership concentration level at 30%. In
376     column 10 and 11, we divided by only cash payment or only stock payment. Symbols ***, **, and *
377     denote statistical significance at the 1%, 5%, and 10% levels, respectively.

378     The results of Models (1), (4) and (7) in Table 11 show that the joint effect of ownership
379 concentration and cash payment is negative and significant at the 5% level. Additionally, in the
380 matched sample, we construct the sub-sample that contains only firms in which ownership
381 concentration is lower than 30%. The results are represented by Models (2) and (5) in Table 11. These
382 results are similar to Model (1) in Table 9. In addition, we match the only cash payment sample and
383 the only stock payment sample using the same method. The results of Model (7) show that the joint
384 effect is negative and significant. The results of Model (8) in Table 11 suggest that when the firms use
385 only cash payment, the ownership concentration has a negative relationship with CARs. Thus, we
386 argue that our results are robust in the matched sample.

387

**Table 11.** Results of matched samples.

| CAR1m | Matched sample at 30% r=0.2 | | | Matched sample at 30% r=0.1 | | | Cash vs Stock r=0.1 | |
|---|---|---|---|---|---|---|---|---|
| | Full | <= 30 | > 30 | Full | <= 30 | > 30 | Full | Only cash |

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Constant | 0.06 | 0.037 | -0.18 | -0.092 | -0.593 | -0.449 | 0.577** | 0.086 |
| Owner_share | 0.001 | -0.002 | 0.004* | 0.002** | -0.001 | 0.006** | 0.001 | -0.002*** |
| D_cash100 | 0.113*** | 0.069 | 0.223* | 0.126*** | 0.067 | 0.343** | -0.031 |  |
| D_stock100 | 0.113*** | 0.124*** | 0.1*** | 0.092*** | 0.127*** | 0.087** |  |  |
| D_cash*Owner | -0.003** | -0.002 | -0.005* | -0.003*** | -0.001 | -0.008** | -0.002** |  |
| Foreigner_share | 0 | 0 | -0.001 | 0 | -0.001 | 0 | -0.001 | -0.001 |
| Comparative_share | -0.001* | -0.003*** | 0.001 | -0.001 | -0.002* | 0.001 | 0 | 0 |
| D_public_target | -0.059*** | -0.06** | -0.101** | -0.062** | -0.065* | -0.11** | -0.014 | -0.126*** |
| D_affiliate | -0.022 | -0.012 | -0.037 | -0.014 | -0.001 | -0.034 | 0.014 | -0.013 |
| D_tender offer | -0.067 |  | -0.03 | 0.105** |  | 0.301*** | -0.15 | -0.037 |
| Relative_value | 0.004 | 0 | 0.025*** | 0.003 | 0 | 0.051*** | 0.004 | 0.107*** |
| Size | -0.007 | -0.004 | -0.004 | -0.008 | 0.01 | -0.003 | -0.021** | -0.013 |
| Leverage | 0.063 | 0.102* | 0.05 | 0.093** | 0.121* | 0.135* | 0.037 | -0.079 |
| B/M_ratio | 0.053** | 0.107*** | 0.021 | 0.073** | 0.16*** | 0.023 | 0.042 | 0.04 |
| PCM | 0.024 | -0.08 | 0.028 | -0.005 | -0.097 | -0.011 | -0.013 | -0.067 |
| Fixed_ratio | -0.054 | 0 | -0.048 | -0.046 | 0.002 | -0.079 | -0.065 | -0.066 |
| Sales_grow | -0.005 | 0.002 | -0.006 | 0.005 | 0.042 | -0.011 | 0.009 | 0.027* |
| ROA | -0.008 | 0.077 | 0.027 | -0.01 | 0.083 | 0.024 | 0.013 | 0.109** |
| N | 496 | 248 | 248 | 404 | 202 | 202 | 268 | 134 |
| adj. $R^2$ | 0.141 | 0.135 | 0.153 | 0.112 | 0.097 | 0.132 | 0.116 | 0.146 |

388 All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and
389 10% levels, respectively.

390 Shim and Okamuro (2011) suggest that families who have high ownership concentration are
391 likely to make decisions on the merger. Following this argument, we expect that high ownership
392 concentration negatively affects the M&A decision. If our results support this view, we argue that
393 our empirical setting for ownership concentration is suitable and consistent with the related literature.
394 Also, we check the robustness using the same matching procedure as Table 11.
395 In Table 12, the result of Model (1) represents that the estimate of ownership concentration is
396 negative and significant when the ratio is less than 60%. However, the result of Model (2) shows the
397 opposite. The results of the matched sample are similar to Models (1) and (2) in Table 12. Therefore,
398 we posit that the owners with the highest ownership level are likely to decide on the M&A. They do
399 not feel much risk of losing control because they already have enough control. It is really interesting
400 that these results are consistently shown in Tables 9, 11, and 12.

401 **Table 12.** Logistic regressions using matched samples.

|  | Raw sample | | Matched sample at 60%, r=0.1 | | | Matched sample at 60%, r=0.2 | | |
|---|---|---|---|---|---|---|---|---|
|  | <= 60 | > 60 | Full | <= 60 | > 60 | Full | <= 60 | > 60 |
| Constant | -2.804*** | -11.262*** | -8.263*** | -6.919*** | -11.696*** | -6.552*** | -3.97* | -11.996*** |
| Large_share | -0.016*** | 0.025* | -0.012** | -0.016** | 0.028** | -0.013*** | -0.012 | 0.029** |
| Foreigner_share | 0.001 | -0.016 | -0.013 | -0.007 | -0.016 | -0.007 | 0.003 | -0.015 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Comparative_share | -0.004 | 0.014 | 0 | -0.002 | 0.017 | -0.001 | -0.006 | 0.019 |
| Size | 0.028 | 0.29*** | 0.251*** | 0.185* | 0.3*** | 0.191*** | 0.074 | 0.307*** |
| Leverage | -0.636*** | -0.406 | -0.814** | -1.263** | -0.393 | -0.848** | -1.39*** | -0.285 |
| B/M_ratio | -0.754*** | -0.43 | -0.139 | 0.055 | -0.425 | -0.355* | -0.352 | -0.364 |
| PCM | -0.019 | 0.084 | -0.591 | -1.135* | 0.048 | -0.43 | -0.823 | -0.025 |
| Fixed_ratio | 0.866*** | -1.078 | -0.305 | 0.413 | -1.122 | -0.215 | 0.604 | -1.265* |
| Sales_grow | -0.03 | -0.366 | -0.292 | -0.229 | -0.39 | -0.223 | -0.133 | -0.384 |
| ROA | -0.266** | -0.325 | -0.758 | -0.422 | -0.81 | -1.019 | -0.839 | -0.715 |
| N | 22567 | 3407 | 6626 | 3313 | 3313 | 6692 | 3346 | 3346 |
| N_acq | 893 | 71 | 170 | 100 | 70 | 179 | 110 | 49 |
| pseudo_R² | 0.03 | 0.037 | 0.023 | 0.022 | 0.039 | 0.026 | 0.02 | 0.039 |

All models control for the year effect. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

In Tables 9 and 11, we show that the relationship between ownership concentration and cash payment is non-linear. To illustrate, plots are presented using generalized additive models (GAM) and locally estimated scatter plot smoothing (LOESS).

Figure 1 shows two plots produced with GAM using cubic smoothing spline. From the left plots in Figure 1, it is seen that the smoothing component decreases near a 15% ownership concentration level and increases after the 40% level. The component continues to show negative values until it is near 58%. The right plot in Figure 1 shows that the additive component almost decreases, but the component decreases steeply between the 20% and 50% levels only. In the left plot of Figure 1, the smoothing component is a negative value from near 25% to near 58%. We argue that the negative effect of ownership concentration-related (PP) conflict appears in only the middle interval. This result is similar to Martin (1994)'s control hypothesis. In addition, Figure 2 shows a similar result to Figure 1.



(a)                                                    (b)
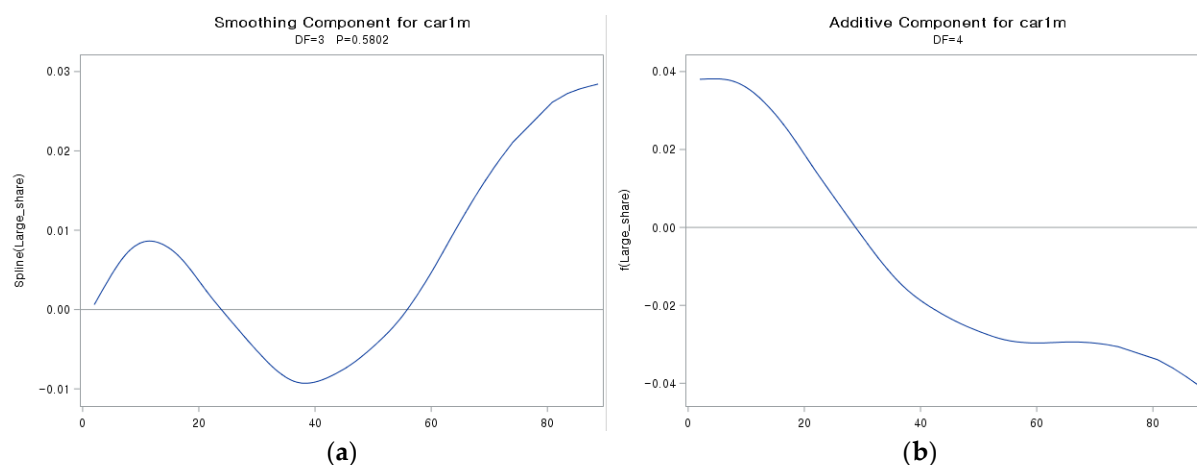
**Figure 1.** Cubic spline (Y = CAR(-1,1)m, X = Owner_relation_share) only cash100.

This figure shows the cubic smoothing plots of the 400 samples for the relationship between CAR1m and ownership concentration. The smoothing parameter is 0.999 and the degree of freedom is 3. The smoothing parameter has values of 0 and 1, and the smoother curve is drawn closer to 1. (**a**) Smoothing component plot; (**b**) Additive component plot, which combines the linear trend and nonparametric prediction for each spline.

424      (a)         (b)
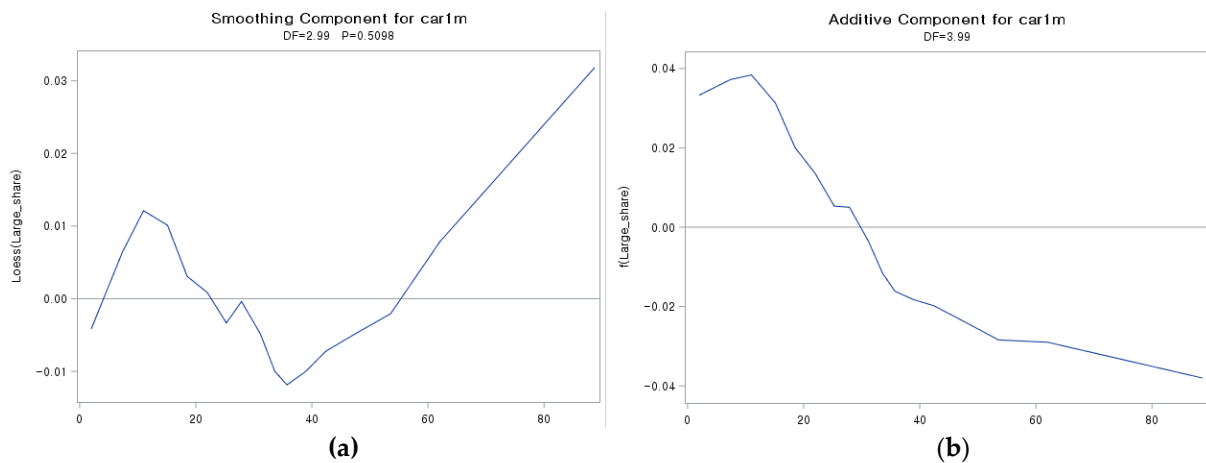
425      **Figure 2.** LOESS for ownership concentration on bidder's CAR only cash100.

426      This figure shows the relationship between investment and rating using LOESS for the 400 samples.
427      The smoothing parameter is 0.386 and the degree of freedom is 3.99. The smoothing parameter
428      represents the degree to which the data are used to fit each local polynomial. (**a**) The LOESS smoother
429      plot; (**b**) The additive component plot, which combine the linear trend and the nonparametric
430      prediction for each LOESS effect.

431

432      The plots of Figure 3 show a slightly different shape than before. When we add the parametric
433 function for the independent variable, the negative interval of the smoothing component is slightly
434 skewed to the right over the negative interval in Figure 1. However, all graphs indicate a negative
435 relationship between ownership concentration and CARs at the 30% to 50% intervals. In the Korean
436 public market, the average ownership concentration is 39%. We posit that the owners with near 40%
437 shareholding have strong drivers to maintain control and this behavior affects their investment
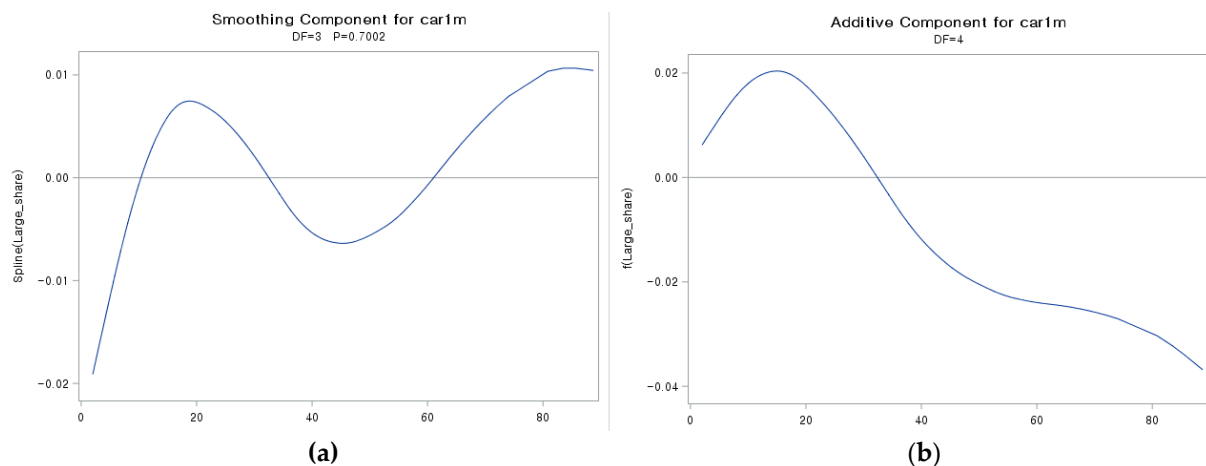438 decision. In addition, their decisions have a negative impact on firms' value.

439



440      (a)         (b)

441      **Figure 3.** Semi-parametric Spline (Y = CAR(-1,1)m, X = Owner_relation_share) only cash100.

442      This figure shows the semi-parametric plots of 400 samples for the relationship between CAR1m and
443      ownership concentration. We use the owner share and control variables (size, leverage, B/M ratio, PCM,
444      fixed ratio, sales_growth, and ROA) as explanatory variables (=X) for CAR1m (=Y). We add the
445      nonparametric smooth function for only owner share and fit the graph. The smoothing parameter is
446      0.386 and the degree of freedom is 3.99. (**a**) The smoothing component plot; (**b**) The additive component
447      plot which combines the linear trend and the nonparametric prediction for each spline.

448

## 5. Conclusions

This study examines the effects of ownership concentration on M&A performance. The literatures on ownership concentration or family firms suggest that ownership concentration is related the two agency problems and firms' financial decisions. Studies on PP conflict argue that controlling shareholders or family ownerships damage other or minority shareholders' wealth in pursuit of their private benefits, while studies on PA conflict show that the higher ownership concentration decreases PA conflict. These two different views make it difficult to predict the impact of ownership concentration on the decisions to M&A and post-M&A performance.

In this study, we find that the ownership concentration reduces the likelihood of acquiring other firms. We also find that ownership concentration affects firm value negatively when cash payment is used, while high ownership concentration affects M&A performance positively. We argue that the largest shareholders who chose to pay cash are likely to have made the decision not for the firm's value or shareholders' wealth, but for their private benefit or to maintain control. Furthermore, we suggest that the joint effect of ownership concentration and cash payment will be stronger when the control of owners is more important. We find that the owner with a 30-60% shareholding will cause PP conflict for the cash payment of M&As. Finally, this study also finds that the long-term M&A performance is affected by ownership concentration positively. Therefore, our empirical analysis shows that the higher the ownership concentration in the controlling shareholders, the more positive the CAR of an M&A transaction. This is related to PA conflicts among agent problem issues. M&A is a relatively large capital investment, so controlling shareholders have a motive to monitor M&A decisions more strictly. We also analyze the long-term performance for 1 year, 2 years, and 3 years after the merger announcement, indicating that this positive effect is stronger in the long-term. On the other hand, the negative effects of the choice of cash payment method during the M&As do not last long. In sum, our results conclude that the positive effect of lowering the PA conflict has a long-term impact on corporate value, but the negative effects of the cash payment method to preserve the owners' control for the equities do not persist in the long run.

This study extends the literature on agency problems and firm value by documenting the mechanism by which ownership concentration affects the value of a firm. The study has shown new evidence that the ownership concentration causes value-increasing investment decisions which decrease PA conflict while it causes value-decreasing payment decisions which increase PP conflict. Additionally, this study has empirically proven that the choice of investment methods is related to the desire to sustain the control strength through the level of ownerships. Summing up, our findings show that the ownership concentration in M&As may be a good indicator of a firm's agency problem, which determines successful M&A performance and sustainable growth.

However, this study has limitation in that it only addressed the aspects of the bidder perspective and did not consider the target perspective. Nevertheless, the results provide some insights for agency problem literature by pointing out ownership concentration's negative effect on M&A performance. For future research, we suggest that the negative relationship between the ownership concentration and M&A value through payment methods should be examined from the target perspective.

496 **Appendix A:** Variable description

| Variables | Description |
|---|---|
| D_M&A | Take 1 if a firm is an acquirer and 0 otherwise |
| CARad, CARm | The short-term or long-term cumulative abnormal returns surrounding M&A announcement date. And this return is estimated using the adjust market model : CARad(or market model: CARm). |
| Owner_share | The common equity shares of the largest shareholders and his/her special relations such as family |
| D_cash100 | Take 1 if the method of payment in M&As is only cash and 0 otherwise |
| D_stock100 | Take 1 if the method of payment in M&As is only stock and 0 otherwise |
| Foreigner_share | Foreigners' common equity shares |
| Comparative_share | Other blockholders' common equity shares than largest shareholder and his special relations |
| Size | The natural log of market capitalization |
| Leverage | Total debt / total asset |
| B/M ratio | Total asset / (book value of equity + market value of equity) |
| PCM | (Sales – costs of sales – expenses of general and administrative) / sales |
| Fixed ratio | Fixed asset / total asset |
| ROA | Net income / total asset |
| D_public_target | Take 1 if a target is public firm and 0 otherwise |
| D_affiliate | Take 1 if a target is an affiliate of bidder and 0 otherwise |
| D_tender offer | Take 1 if the deal is defined as a tender offer from SDC, and 0 otherwise |
| Relative_value | Transaction value of M&A / bidder's total asset |

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