Estimating the Value of Absolute Power: Evidence from Judiciary Decision Events on Controlling Shareholders in Large Business Groups

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Abstract

This paper estimates the impact of judicial decisions, mainly the prosecution and court sentencing of controlling shareholders' corporate crime, embezzlement, and breach of fiduciary duty, on the market value of a firm. The indictment or imprisonment of controlling shareholders in Korean large business groups, *chaebols*, provides an experimental setting for analyzing the absence of the real boss.

Our main findings are as follows. First, judicial decisions relating to controlling shareholders generally do not have a significant group-wide effect on the value of a firm. Second, the portion of firms that receive a positive impact and a negative impact from having a controlling shareholder held in custody is almost equivalent (46% versus 54%, respectively). In situations where there is a court appeal, the portion of firms that receive a positive impact decreases to 38%, while the portion of firms that receive a negative impact increases to 62%. Third, the effect of court decisions on affiliated firms within the same business group is asymmetric. For instance, such decisions have a positive effect on affiliates where a controlling shareholder holds a large proportion of the shares; however, they have a negative impact on affiliates thought to be more likely to grow at faster rates in the future. For this reason, sentencing of the controlling shareholder itself induces value transference between the different affiliated firms in a given company group.

Keywords: Family Firm, Controlling Shareholder, Corporate Crime, Judicial System, Event Study
JEL classification: G30

Introduction

The controlling shareholder is one popular research topic in the field of finance, especially in governance. Many studies provide theoretical discussions on the benefit and cost of controlling shareholders (Shleifer and Vishny, 1986; Admati, Pfleiderer, and Zechner, 1994; Huddart, 1993; Noe, 1997; Maug, 1998). La Porta et al. (1999) provide empirical evidence that the existence of a controlling shareholder in firm ownership structure is a global phenomenon that includes developed countries. Anderson and Reeb (2003) argue that it is hard to conclude that family ownership of firms is less efficient than non-family owned firms.

The literature is divided into the presence of controlling shareholders with direct involvement in management (Faccio and Lang, 2002; Gadhoum, Lang, and Young, 2005, Villalonga and Amit, 2006b); deviations in controlling shareholders' cash flow and voting rights (Claessens, Djankov, and Lang, 2000 for East Asia; Joh, 2003 for Korea, Bennedsen, Morten, and Nielsen, 2005 for Western Europe, Villalonga and Amit, 2006b for the United States; Barontini and Caprio, 2006 for Continental Europe); and the impact of management succession on firm performance (Francisco Perez-Gonzalez, 2006; Villalonga and Amit, 2006b).

Korean conglomerates, chaebols, have provided meaningful conclusions in this field because the controlling shareholder (i.e., so-called owner) has an important position in addition to being a large shareholder. Owners are often directly involved in company management. Through complicated governance (e.g., pyramids), owners also exercise control over all affiliated firms within the group. In addition, most reigns are inherited.

We analyze the effects of judicial decisions regarding criminal acts, embezzlement, and breach of fiduciary duty on the market value of a firm. It can be easily anticipated that the prosecuting or sentencing of controlling shareholders has a negative effect on the value of a firm. The temporary absence of the owner due to the outcome of a court decision (e.g., directly by indictment or imprisonment, or indirectly by involvement in a criminal action or stepping down from the CEO position) can have a negative impact on management. Also, prosecuting or sentencing controlling shareholders can seriously damage a firm's reputation.

The imprisonment or taking into custody of a controlling shareholder provides an experimental setting for analyzing the absence of a company's boss. Police custody is the first stage of law enforcement, and can cause the first effects on market values. Imprisonment after a court's final decision is the final stage of law enforcement, and provides a situation where there is no more uncertainty about affecting the market's expectations.

The recent health issues of Lee Kun-Hee, Samsung's chairman and CEO, provided important motivation for our paper. During this period, Samsung's stock prices moved asymmetrically. Some affiliated firms increased and others decreased during the shareholder's health issues. There seems to be no reason why the hospitalization of a controlling shareholder would have a positive effect on the firm's fundamentals.

Therefore, this market change can be interpreted as investors expecting value transfer (i.e., tunneling) between Samsung's affiliated firms. In other words, the absence of the controlling shareholder might induce the transfer of affiliated firms' resources and values through various means. In the Samsung case, investors anticipated tunneling to the future holding company where Lee Kun-Hee and Lee Jae Young, son of Lee Kyn-Hee, hold large portions of shares.

Our paper is similar to Bennedsen, Pérez-González, and Wolfenzon (2011), which provided evidence for the effect of CEOs on firm performance resulting from the number of days a CEO was hospitalized. They concluded that CEOs meaningfully affected firm performance. In this paper, we focused on controlling shareholders who have real authority over all affiliated firms within the same business group. We analyzed the variation of value effects among all affiliated firms.

Moreover, we contributed to the literature as follows. Our paper is an event study about the value of controlling shareholders as part of the top management team. The literature related to our paper was divided into three categories. The first was the effect of controlling shareholders on the policy and performance of a firm (Baek, Kang and Park; 2004, Bertrand et al; 2008; Anderson, Duru, Reeb; 2009). We estimated the effect of a controlling shareholder's temporary absence on the market value of a family firm.

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The second category included event studies about the value of a firm when an unexpected turn-over or sudden death happened to the CEO (Furtado, 1987; Weisbach, 1988; Bonnier and Bruner, 1989; Furtado and Karan, 1990; Kang and Shivdasani, 1995; Dedman and Lin, 2002; Salas, 2010). We provided empirical evidence for what happened to all affiliated firms within the same business group when the controlling shareholder was absent.

Lastly, many studies showed that tunneling occurred by the controlling shareholder (Shin and Park, 1999; Bae, Kang and Kim, 2002; Campbell and Keys, 2003; Joh, 2003; Baek, Jang and Lee, 2006; Bae, Cheon, and Kang, 2008). Among the above studies, our paper is methodologically similar to Bae, Cheon and Kang (2008). They showed how affiliated firms' stock prices changed when one affiliated firm within the conglomerate announced an operating profit increase, a positive event. We suggest the possibility that the absence of the controlling shareholder could cause a similar phenomenon due to the expectation for corporate governance restructuring or a succession of control to the next generation.

Our main findings are as follows. First, judicial decisions related to controlling shareholders generally do not have a significant group-wide effect on firm value. Second, the portion of firms that received a positive impact (46%) and a negative impact (54%) from having a controlling shareholder held in custody was almost equivalent. In situations where there was a court appeal, the portion of firms that received a positive impact decreased to 38%, while the portion of firms that received a negative impact increased to 62%. Third, the effect of a court decision on affiliated firms within the same business group was asymmetric. For instance, this had a positive effect on the affiliate at which a controlling shareholder held large portions of shares. However, it had a negative impact on the affiliate most likely to grow fast in the future. That is, sentencing of the controlling shareholder itself induced value transference between affiliated firms.

Sample

Our corporate crime samples covered events violating Korea's Article 356 of Criminal Law regarding embezzlement and breach of fiduciary duty. We excluded samples regarding collateral frauds, and included banking and accounting fraud.

Within a conglomerate, tunneling can occur by transferring resources from one firm to another underperforming firm. Another method is transferring resources to other firms where it is easier to use the resources privately. A third way is transferring resources to commit finance accounting fraud, which is generally conducted to support troubled firms within the conglomerate.

Our study sample was composed of 18 business conglomerates, c*haebols*, which committed white-collar crime in Korea from 2000 to 2014. All of the conglomerates were prosecuted and received a verdict in district and high courts. Because the judicial authorities did not archive all the documents pertaining to the criminal cases, collecting the data was arduous work. We collected the data through three channels as follows.

NGO and press reporting

Our study was based on a series of reports presented by People's Solidarity for Participatory Democracy and Solidarity for Economic Reform, which is a civil action group in Korea. We additionally used news and press reports because the above series of reports did not contain a large enough sample, even though it contained detailed information about some crucial and conspicuous corporate crimes. The samples were extracted from news articles from 2000 to 2014 using the key words "embezzlement", "breach of fiduciary duty", "court decision", and "verdict".

This approach was efficient for searching through considerable information. However, it had the drawback that defendant numbers were not determined exactly because most of the corporate crimes had more than one defendant. Also, because news articles are not always precise, there was the possibility that errors were committed in the reporting process. Therefore, it was necessary to collect more objective and accurate data, such as the courts' written judgments.

The judiciary written judgment

The written judgment is the official and final court sentence. With this information, we concentrated mainly on determining the position of the suspect. We tried to clearly understand whether the suspect was a controlling shareholder or CEO, and whether the suspect was related to the individual firm or if he/she was in a position to exercise power over the whole conglomerate.

Methodology and Analysis

To calculate abnormal return for an event study, we adopted two popular models: the Fama and French (1993) three-factor model and the Carhart (1997) four-factor model.

<Table 1>

<Table 1> contains main variable definitions. The 3 Factor Business Group Cumulative Average Abnormal Return (3 Factor Model CAAR) was the sum of averaged abnormal return measured during the event window with the 3 Factor Model. An averaged abnormal return was the average of all individual firms' abnormal return within the same business group (*chaebol*).

The 4 Factor Business Group Cumulative Average Abnormal Return (4 Factor Model CAAR) was the sum of averaged abnormal return during the event window measured with the 4 Factor Model. An averaged abnormal return was the average of all individual firms' abnormal return within the same business group (*chaebol*).

The 3 Factor Individual Cumulative Abnormal Return (3 Factor Model CAR) was the sum of each individual firm's abnormal return during the event window measured with the 3 Factor Model. The 4 Factor Individual Cumulative Abnormal Return (4 Factor Model CAR) was the sum of each individual firm's abnormal return during the event window measured with the 4 Factor Model.

<Table 2>

Our sample included prosecutor and court decisions on corporate crimes. We included prosecutor decisions for 10 cases (i.e., 10 associated business groups), representing a total of 80 affiliated firms. Court decisions were for 18 cases (i.e., 18 associated conglomerates), representing 176 affiliated firms.

<Table 3> and <Figure 1-1, 2-1, 3-1, 4-1>

<Table 3> shows the abnormal return for prosecutor indictment cases. We set up a seven day event window. In Panel A, the 3 Factor Model CAAR was -1.33% and the 4 Factor Model CAAR was -0.84%; however, this was not statistically significant. The 3 Factor Model CAR was marginally significant at -2.11%, while the 4 Factor Model CAR was -1.67%. In general, there was no strong evidence that the prosecutor's decision had a positive or negative effect on firm value.

Panel B shows the abnormal return for a sub-sample of cases involving pre-trial detention. The 3 Factor Model CAAR was -3.31% and the 4 Factor Model CAAR was -3.25%; however, this was not statistically significant. The 3 Factor Model CAR was -4.51% and the 4 Factor Model CAR was -4.32%, which were both statistically significant. This occurred because the portion of affiliated firms with negative effects, regardless of the business group, was larger than 50%. (See in Panel C)

Panel C implies that the effect of prosecution on individual affiliated firms was asymmetric. Positive effects were observed for 23 firms (46%) and negative effects for 27 firms (54%).

<Figure 1-1> shows the business groups' AAR (Average Abnormal Return) and CAAR, and the affiliated firms' AR (Abnormal Return), CAR before and CAR after the prosecution decision for the Samsung Everland case on April 17, 2008 from the 3 Factor Model. For the group perspective, this appeared to have a positive effect; however, it was divided into a positive and a negative effect for each affiliated firm.

<Figure 2-1> shows the business groups' AAR and CAAR, and the affiliated firms' AR, CAR before and CAR after the prosecution decision for the CJ case on July 18, 2013 from the 3 Factor Model. This showed a negative result for the group perspective, while it had an asymmetric result for individual firms.

<Table 4> and <Figure 1-2, 2-2, 3-2, 4-2>

<Table 4> shows the abnormal return for court decision cases. In Panel A, the 3 Factor Model CAAR was -0.56% and the 4 Factor Model CAAR was 0.01%, which was not statistically significant. The 3 Factor Model CAR was -0.87% and the 4 Factor Model CAR was -0.92%, which was also not statistically significant.

Panel B and C show that the number of firms experiencing a positive effect on firm value even though a controlling shareholder was imprisoned was 47 (3 factor CAR) and 48 (4 factor CAR) out of 98 firms.

In Panel D, we show that 37% to 39.1% of affiliated firms had a positive CAR even though the controlling shareholder was imprisoned by the final court.

<Figure 1-2> shows the business groups' AAR and CAAR, and the affiliated firms' AR, CAR before and CAR after the decision for probation in the case of Samsung Everland on July 16, 2008 from the 3 Factor Model. This had a positive effect for the group perspective; however, it was divided into a positive and a negative effect for each affiliated firm.

<Figure 3-2> shows the business groups' AAR and CAAR, and the affiliated firms' AR, CAR before and CAR after the probation decision at the first trial of the Hansol case on May 27, 2005 from the 4 Factor Model. This showed a positive result for the group perspective, while it had an asymmetric result for individual firms. This result is similar to the SK case in <Figure 4-2>, the high court imprisonment sentence on February 27, 2014. This clearly showed a positive impact for the group, and an asymmetric impact for individual firms.

<Table 5>

In <Table 5>, we provide evidence that the difference in CAAR between pretrial detention and no pretrial detention is not statistically significant. In <Table 5-1>, the 3 factor CAAR and the 4 factor CAAR in pretrial detention cases were -3.32% and -3.25%, respectively. The 3 factor CAAR and the 4 factor CAAR in cases of no pretrial detention were 2.78% and 3.02%. There was no significant difference between the two cases.

<Table 6>

<Table 6> provides evidence that the difference in CAAR between probation and imprisonment at the court sentencing was not statistically significant either. In <Table 6-1>, the 3 factor CAAR and the 4 factor CAAR in cases of probation at the second trial were -3.33% and -3.54%, respectively (Panel C). The 3 factor CAAR and the 4 factor CAAR in cases of imprisonment were -3.08% and -3.62%, respectively. There was no significant difference between the two cases.

<Table 7>

<Table 7> shows the daily AAR for each business group during the event window for indictment and sentencing.

<Table 8>

<Table 8> is the result of the regression analysis. We estimated the effects of prosecutor and court decision on each affiliated firm. The dependent variable was CAR. In <Table 8-1> and <Table 8-2>, the first regression showed that pretrial detention did not have any significant effect on firm value. The third regression suggested that imprisonment had positive or no effect on firm value.

In <Table 8-1> and <Table 8-2>, the first regression showed that there was a negative

effect on firms when a controlling shareholder held large portions of shares during the pre-trial stage. The second and third regressions showed that there was a positive effect on firms when a controlling shareholder held large portions of shares, and negative effect on growing firms (i.e., higher MTB firm) during trial. The third regression showed that the coefficient of firm size and variation of stock return were positive, but MTB was negative. This implied that large-sized affiliated firms and affiliated firms with uncertain circumstances received positive effects, while growing firms received negative effects.

Conclusion

We analyze judicial decision effects on firm values when a conglomerate's controlling shareholder committed crimes. We provide the following evidences. First, judicial decisions relating to controlling shareholders generally do not have a significant group-wide effect on the value of a firm. Second, the portion of firms that receive a positive impact and a negative impact from having a controlling shareholder held in custody is almost equivalent (46% versus 54%, respectively). In situations where there is a court appeal, the portion of firms that receive a positive impact decreases to 38%, while the portion of firms that receive a negative impact increases to 62%. Third, the effect of court decisions on affiliated firms within the same business group is asymmetric. For instance, such decisions have a positive effect on affiliates where a controlling shareholder holds a large proportion of the shares; however, they have a negative impact on affiliates thought to be more likely to grow at faster rates in the future.

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<Table 1> Description: Variables

Variable	Description
3 Factor Business Group Cumulative Average Abnormal Return (3 Factor Model CAAR)	Sum of business group averaged abnormal return during the event window measured by 3 Factor Model
4 Factor Business Group Cumulative Average Abnormal Return (4 Factor Model CAAR)	Sum of business group averaged abnormal return during the event window measured by 4 Factor Model
3 Factor Individual Cumulative Abnormal Return (3 Factor Model CAR)	Sum of each individual firm's abnormal return during the event window measured by 3 Factor Model
4 Factor Individual Cumulative Abnormal Return (4 Factor Model CAR)	Sum of each individual firm's abnormal return during the event window measured by 4 Factor Model
Pretrial detention	1 if the controlling shareholder (defendant) is indicted in custody; otherwise, 0
Imprisonment	1 if the controlling shareholder (defendant) goes to the prison; otherwise, 0 in the case of probation
Instance	1 if the decision is made at the second trial or later; otherwise, 0 in the case of the first trial

<Table 2> Summary statistics

Variable: court decisions	Observations
Number of prosecutor decisions (Number of business groups, *chaebols*)	10
Number of individual firm related corporate crimes	89
Number of court decisions (Number of business groups, *chaebols*)	18
Number of individual firm related corporate crimes	176
Variable: financial characteristics	Mean (Observations)
Total assets (Million Won)	6,279,986
Financial leverage	3.05 (164)
ROA (Return on Assets)	2.12% (176)
ROE (Return on Equity)	4.54% (175)
MTB (Market-to-Book Ratio)	1.72 (176)
Stock price volatility (Average of 52 weeks)	2.64% (176)
Variable: corporate governance	Mean (Observations)
Portion of controlling shareholder (defendant) ownership	2.51% (176)
Portion of family ownership	2.44% (176)
Portion of subsidiaries ownership	27.54% (176)
Size of board of directors	7.68 (176)
Portion of outside director	52.29% (176)

<center><Table 3> CAAR(-7, +7) and CAR(-7, +7): Prosecutor Indictment event</center>

Panel A: All events

Model	Business group		Individual firm	
	3 Factor Model CAAR	4 Factor Model CAAR	3 Factor Model CAR	4 Factor Model CAR
Observations	10	10	89	89
Mean	-0.0133	-0.0084	-0.0211*	-0.0167
Standard deviation	0.0716	0.0713	0.1366	0.1369
Min	-0.2031	-0.2028	-0.7671	-0.7667
Max	0.0739	0.0753	0.1902	0.1910

Panel B: Pre-trial detention

Model	Business group		Individual firm	
	3 Factor Model CAAR	4 Factor Model CAAR	3 Factor Model CAR	4 Factor Model CAR
Observations	5	5	50	50
Mean	-0.0332	-0.0325	-0.0451**	-0.0432**
Standard deviation	0.0956	0.0955	0.1671	0.1680
Min	-0.2031	-0.2028	-0.7671	-0.7667
Max	0.0239	0.0235	0.1757	0.1910

Panel C: CAR by Pre-trial detention

	Observations	CAR>0	CAR<0
3 Factor	50	23 (46%)	27 (54%)
4 Factor	50	23 (46%)	27 (54%)

<Table 4> CAAR(-7, +7) and CAR(-7, +7): Court decision event

Panel A: All events

Model	Business group		Individual firm	
	3 Factor Model	4 Factor Model	3 Factor Model	4 Factor Model
	CAAR	CAAR	CAR	CAR
Observations	18	18	176	176
Mean	-0.0056	0.0001	-0.0087	-0.0092
Standard deviation	0.0744	0.0853	0.1148	0.1423
Min	-0.1662	-0.1899	-0.4488	-0.4493
Max	0.1478	0.1543	0.4005	0.4829

Panel B: CAR by sentencing outcome and instance (3 Factor Model)

	Observations	CAR>0	CAR<0
Imprisonment	98	47	51
Probation	78	30	48
First trial	90	46	44
Second trial	86	31	55

Panel C: CAR by sentencing outcome and instance (4 Factor Model)

	Observations	CAR>0	CAR<0
Imprisonment	98	48	50
Probation	78	29	49
First trial	90	45	45
Second trial	86	32	54

Panel D: CAR by Second Trial and Imprisonment (3 and 4 Factor Model)

	Observations	CAR>0	CAR<0
3 Factor	46	18 (39.1%)	28 (61.9%)
4 Factor	46	17 (37%)	29 (63%)

<Table 5-1> CAAR(-7, +7) of Business group: Prosecutor Indictment event

***, **, * represent statistical significance at 1%, 5%, 10% level.

Panel A: Total sample

	Total	No Pretrial detention	Pretrial detention	Difference
Observations	9	4	5	
3 Factor Model	-0.0061	0.0277	-0.0332	0.0609
4 Factor Model	-0.0046	0.0302	-0.0325	0.0627

<Table 5-2> CAR(-7, +7) of Individual firm: Prosecutor Indictment event

***, **, * represent statistical significance at 1%, 5%, 10% level.

Panel A: Total sample

	Total	No Pretrial detention	Pretrial detention	Difference
Observations	80	30	50	
3 Factor Model	-0.0204	0.0208	-0.0451	0.0659**
4 Factor Model	-0.0184	0.0231	-0.0432	0.0663**

<Table 6-1> CAAR(-7, +7) of Business group: Court decision event

Panel A: Total sample

	Total	Probation	Imprisonment	Difference
Observations	18	9	9	
3 Factor Model	-0.0056	-0.0128	0.0015	0.0144
4 Factor Model	0.0001	-0.0174	0.0178	0.0352

Panel B: Total sample

	Total	First trial	Second trial	Difference
Observations	18	10	8	
3 Factor Model	-0.0056	0.0154	-0.0320	0.0475
4 Factor Model	0.0001	0.0289	-0.0358	0.0648

Panel C: Second trial sub-sample

	Total	Probation	Imprisonment	Difference
Observations	8	4	4	
3 Factor Model	-0.0320	-0.0333	-0.0308	0.0024
4 Factor Model	-0.0358	-0.0354	-0.0362	0.0008

<Table 6-2> CAR(-7, +7) of Individual firm: Court decision event

Panel A: Total sample

	Total	Probation	Imprisonment	Difference
Observations	176	78	98	
3 Factor Model	-0.0087	-0.0207	0.0008	0.0216
4 Factor Model	-0.0092	-0.0425 **	0.0172	0.0597 ***

Panel B: Total sample

	Total	First trial	Second trial	Difference
Observations	176	90	86	
3 Factor Model	-0.0087	0.0144	-0.0329 ***	0.0473 ***
4 Factor Model	-0.0092	0.0202	-0.0400 **	0.0602 ***

Panel C: Second trial sub-sample

	Total	Probation	Imprisonment	Difference
Observations	86	40	46	
3 Factor Model	-0.0329	-0.0571 **	-0.0118	0.0452 *
4 Factor Model	-0.0400	-0.0681 **	-0.0156	0.0525 *

<Table 7-1> Market reaction of business group level based on indictment date (3 Factor Model)

	AAR (-7)	-6	-5	-4	-3	-2	-1	indictment date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
SK (2003.03)	-1.15	1.37 ***	-2.63 ***	-4.44 ***	-1.30 *	-3.12 ***	-2.34 **	-6.61 ***	-4.36 *	-5.82 **	-0.62	-3.13 **	6.67 ***	0.83	6.34 ***	-20.31 ***	-13.61 **	-0.09 ***
Dongkuk Steel (2004.07)	1.12	0.22	2.33	0.51	1.79 *	0.56	-0.95	-1.05	0.45	1.22	-1.15	-1.32 *	-2.68 **	0.13	3.75 **	4.94	5.57	0.41
Dongbu (2004.05)	0.10	0.98	-1.62	-1.21	-0.83	0.16	-0.02	0.91	-2.85 *	0.58	1.76	0.93	-1.16	0.24	-1.02	-3.06	-2.45	-1.64
DOOSAN (2005.11)	-1.34	1.54	-1.60 **	-1.06 *	-1.22	1.64	2.02 *	0.54	-1.11	4.60	3.80	-0.95	-1.63 **	0.57	1.59	7.39	-0.02	6.87 *
Hansol (2004.09)	1.25	1.82	0.02	-0.49	0.45	0.82	0.21	0.22	-2.28	1.16	-0.35	-0.52	-0.28	-0.32	-0.61	1.10	4.08 *	-3.20 *
KIA (2006.05)	0.19	0.18	-1.52 *	-0.02	-0.33	-0.06	0.12	-1.09	-0.61	-0.29	3.69 *	-0.59	-0.65	0.30	-0.90	-1.58	-1.45	0.95
Samsung (2008.04)	0.49	0.49	0.54	-0.30	0.51	-0.17	0.12	0.90 **	1.47 *	-0.55	-1.36	-0.31	0.42	0.18	-0.62	1.81	1.67	-0.77
Hanwha (2011.01)	0.28	0.05	-0.29	0.82	0.69	-0.51	0.41	0.75	-1.35	-1.35	-1.35	-1.35	-0.11	0.28	-0.07	-3.09	1.46	-5.30
SK (2012.01)	0.60	-1.49 **	-0.45	-0.45	-1.31 *	1.20	1.48	0.94	-0.61	0.95 *	0.49	-0.28	0.94	-0.31	0.59 **	2.29	-0.42	1.77
CJ (2013.07)	0.19	-0.72	1.48 *	-0.04	-0.97 *	-0.09	1.31 *	0.71	-0.99 **	-0.53	-0.86	-0.41	-0.30	0.33	-1.88 **	-2.76 **	1.16	-4.63 **
Average of Business group	0.17	0.44	-0.37	-0.67	-0.25	0.04	0.23	-0.38	-1.22 **	0.00	0.41	-0.79 **	0.12	0.22 *	0.72	-1.33	-0.40	-0.55
Average of Individual	0.18	0.26	-0.45 *	-0.86 ***	-0.44 *	-0.08	0.26	-0.44	-1.12 **	-0.43	0.14	-0.79 **	0.78 **	0.19	0.68 *	-2.11	-1.13	-0.55

<Table 7-1> Market reaction of business group level based on sentencing date (3 Factor Model)

	AAR (-7)	-6	-5	-4	-3	-2	-1	sentencing date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
SK (2003.06)	-2.10 *	-0.43	-1.45	2.77 **	0.36	-0.01	2.63 *	4.87 ***	0.4	1.26	0.23	-0.11	-3.75 **	-1.63	-1.19	1.85	1.76	-4.78
Dongkuk Steel (2004.12)	-3.22	-0.37	0.91	-1.25	-3.38	0.90	-1.8	1.42	-0.96	-2.00	2.17	1.86	-3.51 **	-0.28	-0.80	-10.31 **	-8.21 **	-3.52
Dongbu (2005.02)	0.34	-1.66 **	3.04 *	-1.43 *	3.95 *	2.33 **	-0.82	1.53	1.53	0.00	-1.24	-0.39	-0.49	2.52	5.58 **	14.79 *	5.74 *	7.51
Hansol (2005.05)	0.01	0.99	0.76	-0.96	-0.47	-0.86	-0.3	1.72	1.32	-0.57	0.30	0.81	1.47	-1.49	1.67	4.40 *	-0.83	3.51
SK (2005.06)	0.71	1.39	-0.19	0.40	-0.98	2.24 *	-0.46	-0.80	-0.91 *	-1.22 *	2.09 *	0.70	-0.06	0.55	-1.03	2.41	3.1	0.11
Dongbu (2005.09)	-0.82	1.85	0.18	-0.28	-3.47 **	3.30	0.21	3.13	-0.5	-2.87 *	0.86	-1.46	-0.76	-0.92	3.24 ***	1.71	0.98	-2.4
DOOSAN (2006.02)	-0.76	-1.35 *	-1.64 *	-2.68	-4.06 **	1.59	1.96	-1.58	-0.62	1.77 *	-0.18	0.47	-1.86 ***	0.21	0.74	-7.99 **	-6.95 **	0.54
DOOSAN (2006.07)	0.23	-1.49	0.41	0.34	-1.49	0.73	0.79	-0.84	0.35	1.66	-0.08	-0.21	-1.71	0.38	0.14	-0.81	-0.49	0.52
Hyundai Motor Group (2007.02)	0.02	0.48	0.10	-0.43	0.02	1.03 **	0.48	0.18	0.06	1.41 **	0.86	0.05	0.53	1.40	1.41 *	7.61 **	1.69	5.74 **
Samsung (2008.07)	-1.57 *	-3.89 ***	-2.1 **	2.01 *	2.19 ***	-0.31	-2.81 ***	0.93 *	1.12 **	-0.14	3.88 ***	-0.35	1.16	1.82 ***	-1.07 *	0.86	-6.49 ***	6.42 ***

	AAR (-7)	-6	-5	-4	-3	-2	-1	sentencing date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
Samsung (2008.10)	1.54 *	-0.34	-1.13 **	-1.80 *	0.13	-6.10 ***	1.20	-6.70 ***	2.98 **	3.77 ***	-0.92 *	-9.34 ***	-0.52	1.52	-0.91	-16.63 ***	-6.51 **	-3.42
Hanwha (2012.08)	0.07	0.05	1.05	1.62	1.39	-0.56 **	-0.05	-0.35	1.68	0.74	-0.19	0.84	1.58	-0.34	0.22	7.74 *	3.57 *	4.52
SK (2013.01)	-0.19	-0.89 ***	-0.64 **	0.25	-0.78	0.01	-0.01	-0.64	-0.68	0.21	-1.35 **	0.72	-0.78 **	0.55	-0.15	-4.39 ***	-2.26 ***	-1.5
Hanwha (2013.04)	-0.41	-2.28 ***	-1.20 *	-0.02	1.85 *	-0.59	-0.49	-1.89 *	-1.98 *	-1.89	-0.76	0.59	0.01	-0.86	0.63	-9.29 **	-3.14 **	-4.25 *
SK (2013.09)	0.06	0.22	0.02	0.64	-0.33	0.33	0.16	-0.08	-1.25 **	0.07	0.57	0.19	-0.13	-0.2	-0.13	0.13	1.09	-0.88
Hanwha (2014.02)	0.96	-0.83	-1.91 *	-0.11	0.91	0.49	-1.11 *	-1.17 ***	0.59	1.06 *	-0.72	-0.2	-1.23 **	0.37	-1.93 ***	-4.84 ***	-1.61	-2.07 *
CJ (2014.02)	-2.03 ***	0.23	0.16	-0.27	1.75 **	0.11	-0.33	0.6	0.23	0.08	0.56	-1.63 ***	0.37	-0.67	1.77 ***	0.93	-0.38	0.72
SK (2014.02)	-0.29	0.36	-1.2 **	0.44	0.03	0.7 *	0.3	0.11	0.29	-0.17	0.74	0.05	-0.06	0.44	-0.09	1.64	0.33	1.19
Average of Business group	-0.42	-0.44	-0.27	-0.04	-0.13	0.3	-0.03	0.02	0.20	0.18	0.38	-0.41	-0.54	0.19	0.45	-0.57	-1.03	0.44
Average of Individual	-0.30	-0.45 **	-0.52 **	0.19	0.07	-0.05	0.00	-0.20	0.27	0.34	0.48 **	-0.77 ***	-0.38 *	0.31	0.13	-0.87	-1.06 *	0.38

***, **, * represent statistical significance in 1%, 5%, 10% significant level.

<Table 7-2> Market reaction of business group level based on indictment date (4 factor Model)

	AAR (-7)	-6	-5	-4	-3	-2	-1	sentencing date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
SK (2003.03)	-1.05	1.41***	-2.51***	-4.51***	-1.21*	-3.04***	-2.15*	-6.61***	-4.52*	-5.85**	-0.33	-2.73**	6.32***	0.66	5.85***	-20.28**	-24.20***	-0.60
Dongkuk Steel (2004.07)	1.11	0.19	2.35	0.51	1.77**	0.57	-0.95	-1.05	0.47	1.18	-1.11	-1.33**	-2.70**	0.11	3.77**	4.88	4.98	0.38
Dongbu (2004.05)	0.33	0.81	-1.29	-1.14	-0.80	0.52	-0.13	0.67	-2.93*	0.88	1.88	1.09	-1.26	0.28	-1.14	-2.24	-3.96	-1.21
DOOSAN (2005.11)	-1.34	1.51	-1.54*	-1.05*	-1.21	1.64	2.01*	0.48	-1.08	4.65	3.81	-0.93	-1.68**	0.59	1.64	7.53	-0.56	7.01*
Hansol (2004.09)	0.65	1.75	0.82	-0.48	-0.52	0.33	0.36	0.00	-2.24	1.22	-0.14	-1.37	-0.62	0.22	0.47	0.45	0.67*	-2.46*
KIA (2006.05)	0.24	0.26	-1.34*	0.46	-0.30	-0.17	0.48	-0.57	-0.06	0.13	3.63*	-0.56	-1.03*	0.26	-1.09	0.33	-1.01	1.28
Samsung (2008.04)	0.49	0.49	0.57	-0.25	0.54	-0.18	0.12	0.92**	1.44*	-0.56	-1.36	-0.36	0.43	0.22	-0.61	1.90	4.13	-0.80**
Hanwha (2011.01)	0.26	0.00	-0.36	0.78	0.59	-0.66	0.44	0.72	-1.30	-1.30	-1.30	-1.30	-0.06	0.38	-0.02	-3.12	0.47	-4.89
SK (2012.01)	0.59	-1.49**	-0.46	-0.46	-1.30*	1.22	1.47	0.93	-0.61	0.97	0.50	-0.26	0.97	-0.30	0.59**	2.35	-0.12	1.86
CJ (2013.07)	0.57	-0.69	1.30	-0.03	-0.03	0.00	0.79	0.71	-0.59	-0.17	-0.77	0.27	-0.33	0.60	-1.83**	-0.20	2.03	-2.82*
Average of Business group	0.19	0.42	-0.25	-0.62	-0.25	0.02	0.24	-0.38	-1.14*	0.11	0.48	-0.75*	0.00	0.30***	0.76	-0.84	-1.76	-0.23
Average of Individual	0.20	0.25	-0.34	-0.82***	-0.41*	-0.09	0.26	-0.44	-1.06**	-0.33	0.22	-0.73**	0.67*	0.25	0.70**	-1.67	-0.95	-0.28

<Table 7-2> Market reaction of business group level based on indictment date (4 factor Model, continued)

	AAR (-7)	-6	-5	-4	-3	-2	-1	sentencing date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
SK (2003.06)	-0.16	-0.06	-1.29	4.54 ***	0.24	0.94	2.18	8.24 ***	0.72	3.64 **	0.01	3.81 *	-2.08	-3.92 **	-1.39 *	15.43 **	6.4 *	0.79
Dongkuk Steel (2004.12)	-1.48	0.83	-0.1	-1.99	-3.99 *	1.7	-0.83	0.48	-1.35	0.03	3.91	0.92	-2.18 **	-0.48 *	-1.1	-5.62	-5.85 **	-0.25
Dongbu (2005.02)	0.77	-1.32 *	2.37	-2.4 **	4.87 **	0.48	-0.38	2.50 *	0.41	3.4	-1.31	-0.86	-0.85	1.09	3.67	12.43	4.38	5.55
Hansol (2005.05)	0.26	-0.85	0.52	-1.77 **	-0.38	-0.24	-0.55	3.07 **	-0.8	0.05	0.44	0.48	-0.92	-0.11	2.93 *	2.11	-3.01 *	2.06
SK (2005.06)	1.23	0.17	-1.26	0.24	-1.12	1.4	1.43	-1.7 **	-1.05 *	-1.92 **	2.58 **	0.55	0.01	1.00	-0.97	0.6	2.09	0.2
Dongbu (2005.09)	-0.89	1.37	-0.01	-0.43	-2.03 *	1.84	0.53	2.18	-0.45	-1.5	0.91	-2.45	0.61	-0.75	3.31 ***	2.25	0.38	-0.32
DOOSAN (2006.02)	-1.61	-0.48	-0.43	-2.04	-1.00	1.56	0.90	-1.42	-1.29	0.74	-0.90	0.03	1.65 *	-0.45	1.59	-3.13	-3.08	1.37
DOOSAN (2006.07)	0.12	-0.99	0.26	-1.71 **	-0.22	0.01	3.32 **	-1.14	0.57	1.72	-0.26	0.82	-1.35	0.67	0.18	1.98	0.78	2.34
Hyundai Motor Group (2007.02)	0.93	-0.23	-0.21	0.28	0.97	0.1	2.93 ***	-0.3	-0.71	2.08 ***	-0.09	0.02	0.9	0.24	2.44 **	9.37 ***	4.78 *	4.89 *
Samsung (2008.07)	-1.48 *	-5.07 ***	-3.3 ***	1.66	0.33	0.11	-5.09 ***	0.32	-0.01	-0.77 *	5.98 ***	0.22	-0.4	2.31 ***	-2.17 ***	-7.37 ***	-12.85 ***	5.15 ***

<Table 7-2> Market reaction of business group level based on indictment date (4 factor Model, continued)

	AAR (-7)	-6	-5	-4	-3	-2	-1	sentencing date 0	1	2	3	4	5	6	7	CAAR (-7,7)	CAAR (-7,-1)	CAAR (1,7)
Samsung (2008.10)	0.98	-1.02 *	-1.81 ***	-5.14 ***	-0.10	-9.90 ***	2.14 **	-4.75 ***	-1.43	10.1 ***	-2.11 ***	-9.27 ***	2.93 ***	1.59	-1.21 *	-18.99 ***	-14.86 ***	0.62
Hanwha (2012.08)	-0.61	0.25	1.87 *	3.59 *	0.97	0.42	0.89 ***	-0.26	1.88	0.54	-0.48	0.23	0.62	-0.18	0.24	9.98 *	7.39 **	2.85
SK (2013.01)	-0.47	-0.98 **	-0.65 **	-0.57 *	-0.37	0.13	0.52	-1.08 **	-0.52	-0.74 *	-0.82 **	1.08 *	-0.69 **	0.52	-0.45 *	-5.09 ***	-2.39 ***	-1.62
Hanwha (2013.04)	-0.79	-2.23 ***	-1.06	-0.49 *	1.84 **	-0.05	-0.57	-2.82 **	-2.4 **	-1.67	-1.25	1.69	-0.91	-0.11	0.18	-10.66 **	-3.37 **	-4.48 *
SK (2013.09)	-0.03	-0.04	-0.13	0.38	0.04	0.43	0.04	-0.46 *	-0.70 *	-0.81 *	-0.28	-0.7	0.23	0.08	-0.41	-2.36	0.69	-2.59
Hanwha (2014.02)	0.64	-0.53	-2.49 *	0.31	-0.44	0.29	-1.05 *	-0.79 **	0.78	1.49 **	-0.39	-0.47	-0.81	0.97	-2.73 ***	-5.23 ***	-3.29 **	-1.16
CJ (2014.02)	-1.7 ***	0.63	0.18	0.39	1.13	0.38	-0.73	-0.06	1.03	0.56 *	-0.07	-1.03 **	0.19	-1.46 **	1.41 **	0.84	0.27	0.63
SK (2014.02)	-0.03	0.43	-0.96 **	1.03 **	0.22	0.76 **	0.22	-0.16	0.24	-0.35	0.35	0.71 *	0.28	1.49 **	-0.51	3.74	1.67	2.23
Average of Business group	-0.24	-0.56	-0.47	-0.23	0.05	0.02	0.33	0.10	-0.28	0.92	0.35	-0.24	-0.15	0.14	0.28	0.02	-1.1	1.01
Average of Individual	-0.15	-0.73 ***	-0.77 ***	-0.08	0.1	-0.41	0.22	-0.04	-0.31	1.04 ***	0.43 *	-0.47	0.01	0.33	-0.1	-0.92	-1.81 **	0.93

***, **, * represent statistical significance in 1%, 5%, 10% significant level.

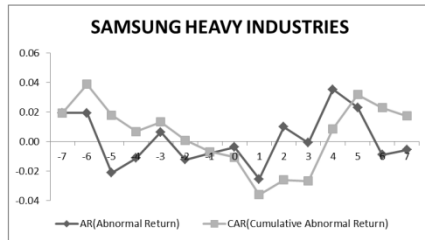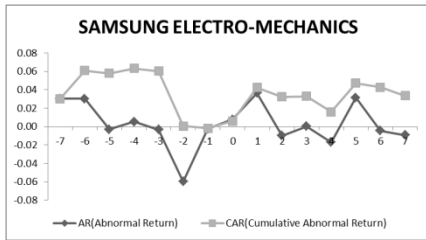## <Table 8-1> CAR(-7, +7) Regression results (3 Factor Model)

***, **, * represent statistical significance in 1%, 5%, 10% significant level. The numbers in (   ) are t-value.

	(1) Total pre-trial sample	(2) Total sentencing sample	(3) Second trial sub-sample
Pre-trial detention	-0.0538 (-1.01)		
Instance		-0.0462*** (-2.69)	
Imprisonment		0.0156 (0.88)	0.0619** (2.36)
Total assets	-1.50e-12 (-0.58)	8.82e-10 (1.53)	1.03e-09* (1.92)
Leverage	0.00006 (0.00)	0.0011 (0.29)	-0.0052 (-1.25)
MTB (Market-to-Book ratio)	-0.0137 (-0.90)	-0.0241*** (-3.35)	-0.0347*** (-3.66)
Stock revenue volatility	-1.4875 (-0.55)	1.5305 (1.47)	3.2047* (1.88)
ROA (Return On Asset)	0.0051 (1.07)	0.0006 (0.45)	0.0009 (0.48)
Portion of controlling shareholder (defendant) ownership	-0.0070** (-2.25)	0.0032** (2.13)	0.0039 (1.64)
Portion of family ownership	0.0073 (1.29)	0.0001 (0.07)	0.0011 (0.37)
Portion of subsidiaries ownership	-0.00005 (-0.04)	-0.0002 (-0.54)	-0.0002 (-0.30)
Size of board of directors	0.0018 (0.15)	-0.0050 (-1.32)	-0.0015 (-0.23)
Portion of outside director	0.1764 (1.61)	-0.0493 (-0.63)	-0.0873 (-0.65)
Constant	0.1291 (0.63)	0.0618 (1.09)	-0.0254 (-0.24)
Fixed Effect	Yes	Yes	Yes
R-squared	0.5049	0.2399	0.3405
Observations	55	164	81

<Table 8-2> CAR(-7, +7) Regression results (4 Factor Model)

***, **, * represent statistical significance in 1%, 5%, 10% significant level. The numbers in (   ) are t-value.

	(1) Total pre-trial sample	(2) Total sentencing sample	(3) Second trial sub-sample
Pre-trial detention	-0.0544 (-1.03)		
Instance		-0.0436** (-2.20)	
Imprisonment		0.0671*** (2.84)	0.0615 (1.60)
Total assets	-1.73e-12 (-0.67)	3.15e-10 (0.40)	4.49e-10 (0.71)
Leverage	-0.0008 (-0.05)	0.0034 (0.70)	-0.0081* (-1.69)
MTB (Market-to-Book ratio)	-0.0151 (-1.00)	-0.0346*** (-4.89)	-0.0373*** (-3.59)
Stock revenue volatility	-0.6503 (-0.24)	3.7421** (2.62)	4.2598* (1.77)
ROA (Return On Asset)	0.0059 (1.23)	0.0005 (0.782)	-0.0023 (-0.88)
Portion of controlling shareholder (defendant) ownership	-0.0071** (-2.31)	0.0045** (2.55)	0.0041 (1.46)
Portion of family ownership	0.0069 (1.24)	-0.0011 (-0.51)	0.0011 (0.32)
Portion of subsidiaries ownership	-0.00008 (-0.07)	-0.0002 (-0.33)	-0.0006 (-0.78)
Size of board of directors	0.0005 (0.04)	0.0017 (0.36)	-0.0014 (-0.18)
Portion of outside director	0.1777 (1.64)	-0.1583 (-1.58)	0.0295 (0.20)
Constant	0.0671 (0.33)	-0.0104 (-0.16)	-0.0842 (-0.71)
Industry Fixed Effect	Yes	Yes	Yes
R-squared	0.5042	0.3069	0.3372
Observations	55	164	81

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<Figure 1-1> AAR & CAAR from 3 Factor Model: Samsung (Indictment, 2008/04/17)
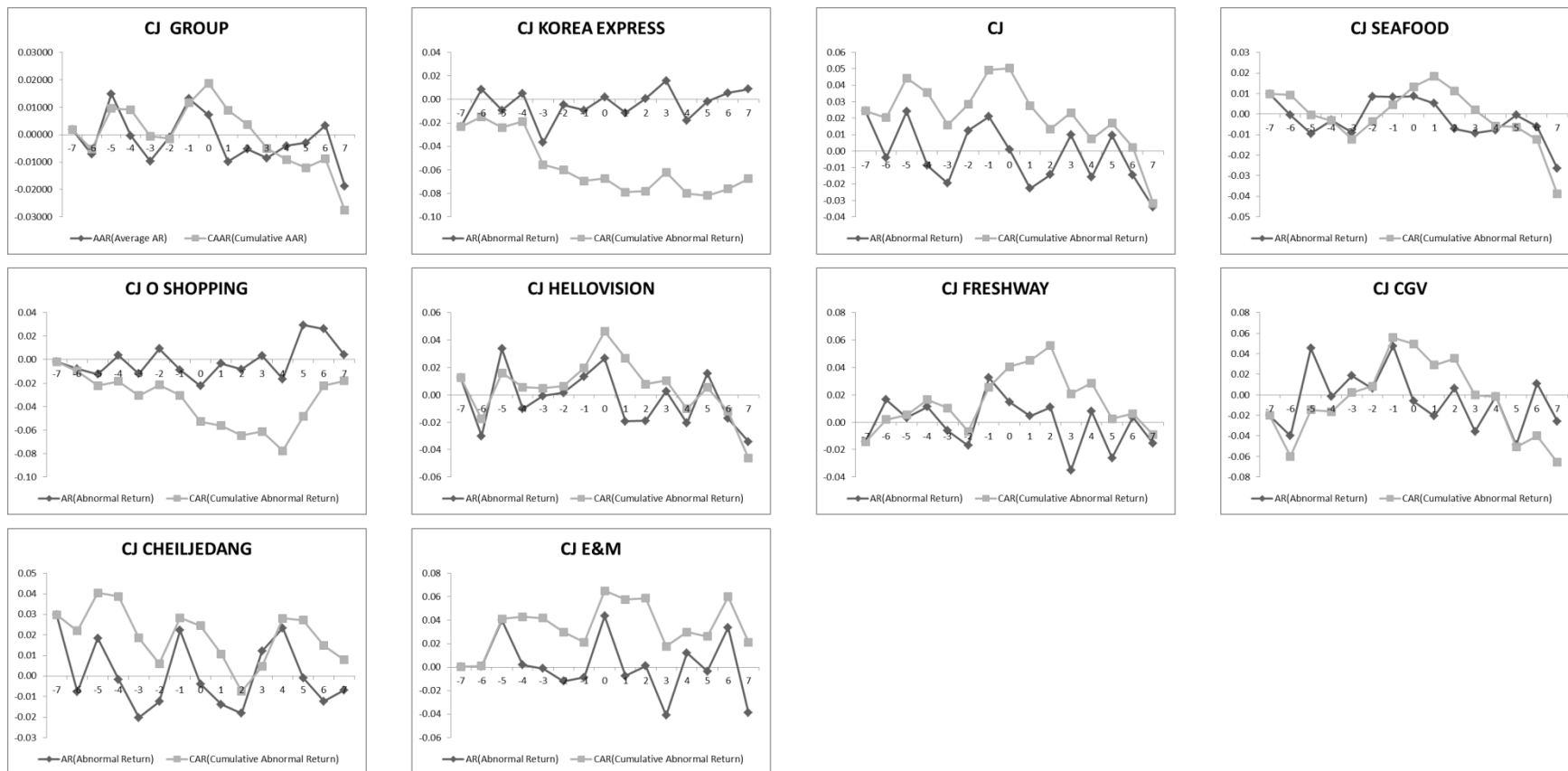
The first graph shows the business group AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return), and the others show the affiliated firms AR (Abnormal Return) and CAR (Cumulative Abnormal Return). Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

SAMSUNG ELECTRO-MECHANICS

SAMSUNG HEAVY INDUSTRIES

SAMSUNG TECHWIN

S-1

SAMSUNG SECURITIES

SAMSUNG ENGINEERING

SAMSUNG CARD

CHEIL WORLDWIDE

CREDU
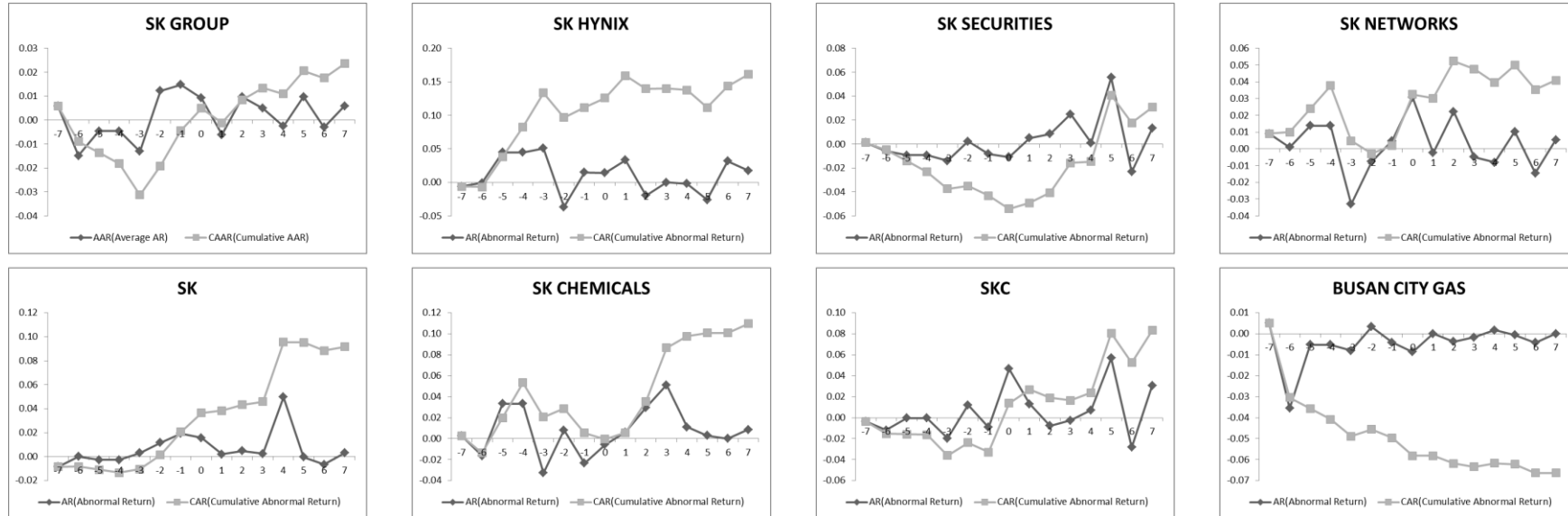
AR(Abnormal Return)　CAR(Cumulative Abnormal Return)

<Figure 1-2> AAR & CAAR from 3 Factor Model: Samsung first trial (Probation, 2008/07/16)

The first graph shows the business group AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return), and the others show the affiliated firms AR (Abnormal Return) and CAR (Cumulative Abnormal Return). Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

SAMSUNG ELECTRO-MECHANICS

SAMSUNG HEAVY INDUSTRIES

SAMSUNG TECHWIN

S-1

SAMSUNG SECURITIES

SAMSUNG ENGINEERING

SAMSUNG CARD

CHEIL WORLDWIDE

CREDU

<Figure 2-1> AAR & CAAR from 3 Factor Model: CJ (Indictment, 2013/07/18)

This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

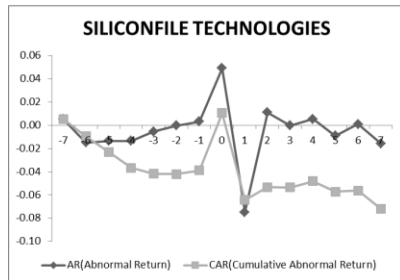<Figure 2-2> AAR & CAAR from 3 Factor Model: CJ First trial (Imprisonment, 2014/02/14)

This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

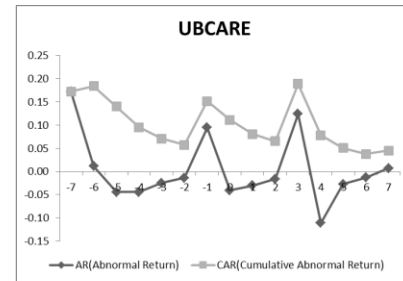<Figure 3-1> AAR & CAAR from 4 Factor Model: Hansol (Indictment, 2004/09/04)

This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

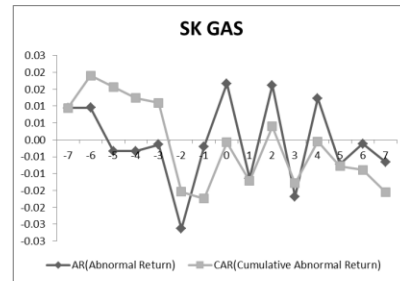<Figure 3-2> AAR & CAAR from 4 Factor Model: Hansol First trial (Probation, 2005/05/27)
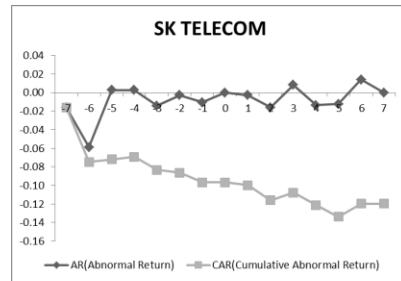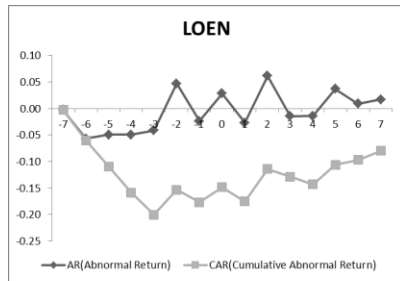
This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

<Figure 4-1> AAR & CAAR from 4 Factor Model: SK (Indictment, 2012/01/05)

This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

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<Figure 4-2> AAR & CAAR from 4 Factor Model: SK Second trial (Imprisonment, 2014/02/27)

This figure shows the group average AAR (Average Abnormal Return) and CAAR (Cumulative Average Abnormal Return). The first graph shows the business group AAR and CAAR, and the others show the affiliated firms AR and CAR. Black lines represent AAR (AR), and gray lines represent CAAR (CAR).

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