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경제학석사학위논문

**The Effects of Holding Company  
Transition on Firm's Market Value and  
Performance: Empirical Analysis on the  
U.S. Holding Companies**

지주회사 전환의 기업 시장 가치와  
성과에 대한 효과 실증 분석: 미국 지주회사를  
중심으로

2017년 8월

서울대학교 대학원  
경제학부 경제학전공  
이 건 호

**The Effects of Holding Company Transition on Firm's  
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## **Abstract**

# **The Effects of Holding Company Transition on Firm's Market Value and Performance: Empirical Analysis on the U.S. Holding Companies**

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This paper empirically analyzes the impacts of holding company transition on the U.S. firms' market values measured by stock prices and performances. Three event study methods presented by Brown and Warner (1985) are used to evaluate the effects on daily abnormal stock returns with different estimation and test windows for the robustness of the results. The results show that stock prices increase after the firms' public announcements of adopting the holding company system. The event study analysis proposes that a firm's reputation among investors rises along with the holding company system, corresponding with the prediction that the positive impacts of the transition on corporate governance and managerial efficiencies leads to the improvement of investors' perception.

In contrast, conducting the panel data analysis with quarterly financial data, the paper finds that the holding company transition do not have any statistically significant effect on firm's performances and growth potential, measured by ROA, ROE, turnover ratio and revenue growth rate. The results on performances imply that the holding company transition does not create any specific values in a firm to improve its profitability and growth potential, but mainly works as a means of promoting firm

values during the period of stock price stagnation caused by diversification. In addition, considering that stock price represents the potential value of a firm, the fact that holding company transition of the U.S. companies has the effects only in short-run suggests that investors are involved in the short-termism, mostly focusing on the short-run performances and dividends, and that the U.S. stock market is inefficient in evaluating the market values of firms which convert to holding companies.

**Keywords:** Holding company, corporate governance, event study, abnormal return, panel data, stock price.

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## **1. Introduction**

In the United States, the holding company system has been regarded as the corporate governance system to efficiently manage a firm while expanding its market power through M&A. Majority of the U.S. public utilities and banking companies have this system in order to maintain their market shares over geographically wide industrial fields. Moreover, business corporations such as General Electric (GE), P&G, and General Motors (GM) drive the operating holding company systems, which conduct their own businesses while acting as umbrella companies of operating subsidiaries. Recently, IT firms such as Google and Activision converted its corporate governance into the holding company system.

There have been several literatures pointing out the drawbacks of a firm's diversification strategy through M&A. Wernerfelt and Montgomery (1988), Berger and Ofek (1995) and Lang and Stulz (1994) find the robust diversification discount in developed countries such as the U.S.; diversified firms are valued less in terms of stock price than competing firms without diversification strategy. Lee et al. (2008) states that diversification premium can turn into diversification discount unless managers develop growth strategies in response to institutional and environment circumstances because the preferential resources are diluted over time. Moreover, diversified firms have dispersed corporate governances as well as geographically wide markets. Thus, additional transaction costs can occur to stabilize the governance, leading to "eroding profit margin" for a long period of time (Siddharthan and Lall, 1982; Grant, 1987).

Considering these drawbacks of the diversification strategy, holding company transition is regarded as a solution to the investors' concern on firm's diversification. Holding company is a company that manages its subsidiaries totally based on shareholding. It supports its subsidiaries by managing risks and capitals along with its growth strategies. Thus, it gets easier for investors to analyze performances and growth potential of each subsidiary before making investment (Yoon, 2008). In addition, a holding company can conduct a "select-and-concentration" strategy for the growth of an



organization as a whole because it does not indemnify debtors for bankruptcy of a subsidiary, and the bankruptcy does not influence the other subsidiaries (Kennon, 2017). In 2015, Google founded a holding company, Alphabet Inc., and Google was positioned as a subsidiary of Alphabet Inc. Zenger (2015) states that Google converted to the holding company because Google's active diversification strategy has caused stagnated stock price derived from serious concerns of shareholders about the possible failure of subsidiaries. Google is known for its multiple-class shareholding structure, which endows the managers with huge power to conduct their firm growth strategies regardless of investor's relations. Despite the managers' prevalence on corporate governance, Google's transition to the holding company system implies that the holding company transition is a crucial tool for a diversified firm to stabilize firm value and to secure the next-generation growth engines.

This paper studies the effect of holding company transition on firm's performances based on event study and long-term financial panel data analysis. Stock market is efficient in a sense that strategic changes and portent of firm growth are instantly reflected in daily (or hourly) market value of a firm. Thus, it is crucial for a firm to consider investors' concern and assessment from outside while working on diversification. Therefore, this paper conducts an event study of a corporate event of holding company transition based on daily stock returns of the U.S. firms and market indices (NYSE and NASDAQ) to analyze the effect of the transition on firm's market value, and test the statistical significance of the effect. Three models suggested by Brown and Warner (1985), which are the mean-adjusted model, the market-adjusted model, and the OLS market model, are separately used and the results are compared to check robustness of the analysis. The event study mainly focuses on daily changes in firms' stock prices, and the changes demonstrate the effect on cognition of shareholders toward firms before and after the announcement of holding company transition. To see the effect on firm's performances in profitability and productivity, this paper uses the quarterly financial data of the U.S. firms and conducts the long-term panel data analysis inspired by the pre- and post- transition comparison of Ra and Koh (2009). In chapter

two, this paper discusses previous literatures on holding company, and on event study. In chapter three, the paper discusses the models and the hypotheses. Chapter four presents the data sources and compares the descriptive statistics of pre- and post-transition periods, and chapter five shows the results and conducts the discussion. Lastly, chapter six concludes the study.

## **2. Literature Review**

Holding company is a company that manages its subsidiaries totally based on shareholding. Yoon (2008) proposes three positive effects of holding company system on firm's market value and growth in perspectives of the management, investor, and the government. First, for management teams of both holding company and subsidiaries, as holding company system is based on percentage ownership, firm owners and managers, most of whom are major shareholders, obtain benefits of increased voting rights. For example, they can defend against hostile takeover, and implement their growth strategies with less interference of investors. Second, investors can analyze firm's growth potential and strategies easily before making investment, for corporate governance under holding company plan becomes "transparent"; it has a vertical governance structure that subsidiaries can focus only on developing by their own because internal capital is totally controlled by a holding company.

A typical conglomerate utilizes cross-subsidization among subsidiaries for managing an internal capital market of a firm (Chang and Hong, 2000). Thus, there exists a risk of negative spillover of a subsidiary's bankruptcy. In contrast, the corporate governance with holding company does not need cross-subsidization of subsidiaries. A holding company does not take financial and legal responsibilities for its subsidiaries unless it co-signs the debt of subsidiaries; it does not indemnify debtors for bankruptcy of a subsidiary. In addition, the bankruptcy risk is not transferred to other subsidiaries under the vertical corporate governance. Simultaneously, a holding company supports its

subsidiaries by managing risks and capitals along with its growth strategies. Hence, a holding company can conduct a “select-and-concentration” strategy for the growth of an organization as a whole. In sum, managers of subsidiaries can not only maintain the benefits of resource management of conglomerate governance, but obtain independence in management as well.

Previous literatures studying holding company system focus mostly on the diversification of bank holding companies (BHCs) and its impacts on the firms (Wall, 1987; Boyd et al., 1993; Klein and Saidenberg, 1998).<sup>1</sup> Wall (1987) studies the effect of non-bank subsidiaries on the riskiness of bank holding companies, and finds that the non-bank diversification of bank holding companies is more of reducing risks than of increasing risks. Boyd et al. (1993) analyzes the effects of mergers between bank holding companies and non-bank firms on riskiness of bank holding companies. They find that risk effects on bank holding companies depend on which financial industries the companies have their business. Klein and Saidenberg (1998) tests the efficiency of diversification of subsidiaries in the holding company system by matching quarterly call reports of multi-bank bank holding companies (MBHCs) and non-diversified banks. They show that the internal capital market is less beneficial for larger MBHCs, and expect that the bank holding companies expand for the geographical diversification and easier access to the internal capital markets.

This paper uses the event study to analyze the effects of holding company transition. Event study figures out changes in firm’s performances such as stock price and profitability, before and after a firm’s specific event such as R&D and patent acquisition. The event study periods depend on property of an event, ranging from daily to annual basis. For example, event study dealing with M&A uses long-run financial

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<sup>1</sup> The U.S. Bank Holding Company Act (BHCA) regulates the bank holding companies in the U.S. to get permission from the Federal Reserve to expand their business in other industries or not to execute its business in other geographic regions. These laws have worked as a major obstacle for the applicable conglomerates to convert to bank holding companies.

panel data to analyze the effects on acquiring and acquired firms in terms of profitability and growth. Previous literatures using event study technique focus on the specific events of corporate M&A (Gugler et al., 2003; Ravenscraft and Scherer, 1989; Healy et al., 1992), of innovative activities of IT enterprises (Paik et al., 2011), and of foreign patent acquisition (Na et al., 2013). Gugler et al. (2003) and Healy et al. (1992) analyze the effects of M&A by comparing performances of merging firms and non-merging firms. Using annual financial data, they find the positive effects of M&A in profits within 5 years after M&A. In contrast, using M&A cases in 1960s and 70s, Ravenscraft and Scherer (1989) state that profitability of acquired firms rather decreases after M&A occurs.

While the literatures studying M&A effects deal with annual performances in the event study, several event study literatures analyzes the impacts of innovation in IT enterprises by focusing on pre- and post-effects on daily stock returns (Paik et al., 2011; Na et al., 2013; Subramani and Walden, 2001). The literatures estimate “abnormal returns” for a period around the specific event date, and test the statistical significance of the returns. Abnormal return (AR) is the difference between actual return and predicted return estimated by a firm’s benchmark performance in the period before the test window. This figure thereby indicates the day-to-day effect of the event on stock prices, and cumulative abnormal return (CAR) describes the overall effect within a test period around the event date. Paik et al. (2011) find that there are the significant positive effects on stock returns of IT firms within a week around the public announcement of innovative activities. Na et al. (2013) state that foreign patent acquisition does not have significant effect on firm’s market value, but it has a limited influence in the capital market. Subramani and Walden (2001) analyze the changes in stock returns of E-Commerce firms with  $\pm 5$ -day and  $\pm 10$ -day windows.<sup>2</sup> They find a consistent pattern in

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<sup>2</sup> Subramani and Walden (2001) suggest the comparison of the results from different test windows as the robustness check method of event study. In addition to the significance in t-statistics of the abnormal returns, if there exhibits a consistent pattern from the different windows, it is plausible to insist the statistical significance of the results.

both windows that investors anticipate the firm action to engage in E-Commerce.

In case of holding company transition, Ra and Koh (2009) observe the impacts of holding company transition on a firm's finances by comparing the financial factors such as the number of employees, debt ratio, turnover ratio (operating income/total assets), and leverage ratio. They use financial data of 54 subsidiaries of Korean holding companies for  $\pm 1$ -year around the transition year, and find that the financial performances of subsidiaries of holding companies improve after the holding company transition. However, the study lacks the robustness of the result, for it does not control any financial status in the comparison model, mainly focusing on the single variable comparison between pre- and post-transition. For the long-run performance analysis, the Asian Institute of Corporate Governance (2009) compares the financial performances of Korean holding companies for  $\pm 5$ -year period around the transition year. It finds that the total asset and net income increases after adopting the holding company system.

### **3. Models and Hypotheses**

#### **3.1. Hypothesis of the Effects on the Stock Prices**

The first hypothesis focuses on the impacts of holding company transition on investors' perception reflected by firm's market value. Zenger (2015) states that holding company system can solve the investors' unease by restructuring corporate governance into vertical and transparent. Therefore, if a firm plans to restructure its corporate governance into holding company system, and investors notice the plan, it is expected that the stock price reflecting investors' perceptions on the firm's value increase.

***Hypothesis 1: The abnormal stock returns have positive value along with the public announcement of a firm's holding company transition.***

To test the hypothesis 1, I conduct the event study of daily stock prices with periods of 200, 250, and 365 days. Because the stock price return is calculated on daily

basis, it is plausible that longer analysis period would lead to inconsistent estimate and bias. However, it is meaningful to conduct the same procedure for all periods to ensure robustness of the analysis results. Each time interval consists of two windows: estimation and test. Estimation window evaluates benchmark performances of a firm's stock prices before the event takes place. Test window is a time interval around the event date on which the abnormal returns from the benchmark performance are estimated and the statistical significance of each abnormal return is tested.<sup>3</sup> This paper does not only control the analysis interval, but also describes the consistency of analysis result with changes in the test window from [-5, +5] to [-10, +10].

The event study models of daily stock return used in this paper are based on Brown and Warner (1985): Mean-Adjusted Model, Market-Adjusted Model, and OLS Market Model.<sup>4</sup> Brown and Warner (1985) points out that non-normality of daily stock returns does not have an obvious impact on event study, so I assume the normality of the estimation results in order to test the significance of abnormal returns. Moreover, Scholes and Williams (1977) and Barber and Lyon (1997) suggest the possible bias and inconsistency problems in the measures if firms' stock returns and market index are from different trading intervals. However, because this paper does not suffer from the problems, for sample firms have the exact event dates of the announcement and the market indices in respective trading intervals are provided as well.

### **3.1.1. Mean-Adjusted Model**

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<sup>3</sup> For example, taking the event date as day 0, conducting a  $\pm 5$ -day event analysis with a 250-day interval, the estimation window is from day -244 to day -6, and the test window is day -5 to day +5.

<sup>4</sup> Brown and Warner (1985) states that the market-adjusted model and the OLS market model outperform the mean-adjusted model, but this paper uses three models to compare the results and ensure the consistency of patterns in abnormal returns.

Mean-Adjusted Model estimates the abnormal returns by subtracting the mean firm stock return during the estimation period from each actual return in the test window:

$$abr_{it} = return_{it} - \overline{return}_i$$

where  $abr_{it}$  = Abnormal Return of firm  $i$  on day  $t$

$return_{it}$  = firm  $i$ 's daily stock return on day  $t$

$$\overline{return}_i = \frac{1}{t_e} \sum_{estimation\ window} return_{it}$$

where  $t_e$  = length the estimation window

Length of the estimation window differs by the test window and the event study period. For example,  $\pm 5$ -day event analysis with a 250-day interval has 239 of the length.

### 3.1.2. Market-Adjusted Model

In Market-Adjusted Model, abnormal returns are calculated by subtracting market index return from firm stock return for each day in the test period.

$$abr_{it} = return_{it} - mreturn_t$$

where  $t \in test\ window$

### 3.1.3. OLS Market Model

In OLS Market Model, a firm's abnormal return is difference between actual return and projected return estimated by OLS regression on market index within the estimation window. Assuming that performances of firms are independent of each other, Brown and Warner (1985) states that OLS Market Model leads to the most preferable result among three models, for it controls for the overall market effects.

$$abr_{it} = return_{it} - \widehat{return}_{it}$$

subject to,

$$\widehat{return}_{it} = \hat{\alpha}_i + \hat{\beta}_i mreturn_t \text{ for } t \in \textit{estimation window}$$

where  $abr_t$  = Abnormal Return of firm i on day t

$return_{it}$  = firm i's daily stock return on day t

$mreturn_t$  = Daily stock market return on day t (NASDAQ, NYSE)

On each day in the test window, abnormal returns of each sample firm are taken into average to estimate the average abnormal return of firm samples (AAR):

$$AAR_t = \frac{1}{21} \sum_{i=1}^{21} abr_{it}$$

$t \in \textit{test window}$

To test the significance of AARs in the test window, t-statistics are calculated:

$$t_{AAR_t} = \frac{AAR_t}{SE(BAAR_t)}$$

where  $BAAR_t$  = Benchmark Average Abnormal Return on day t =  $BAAR_t$

$$= \frac{1}{21} \sum_{i=1}^{21} abr_{it} \text{ for } t \in \textit{estimation window}$$

$$SE(BAAR_t) = \sqrt{\frac{(BAAR_t - \overline{BAAR_t})^2}{t_e - 1}}$$

$$\text{where } \overline{BAAR_t} = \frac{1}{t_e} \sum_{\textit{estimation window}} BAAR_t$$

While AAR indicates the daily effect of holding company transition on firm's stock return in the test window, cumulative abnormal return (CABR) demonstrates an overall effect of specific time intervals within the test window:



$$cabr_{t_1, t_2} = \sum_{t=t_1}^{t=t_2} abr_t$$

$$t_2 = t_1 + 1$$

$$t_1 \in [-5, 4]$$

Cumulative abnormal returns of each firm are taken into average to estimate the cumulative average abnormal return of firm samples (CAAR):

$$CAAR_t = \frac{1}{21} \sum_{i=1}^{21} cabr_{it} \quad t \in \text{test window}$$

For t-statistic of CAAR, standard error is calculated with the cross-sectional standard deviation of cumulative abnormal returns in the test window. The standard deviation is the cross-sectional deviation of cumulative average abnormal returns:

$$t_{CAAR_t} = \frac{CAAR_t}{\frac{STDEV(cabr_{it})}{\sqrt{21}}}$$

### 3.2. Hypothesis of the Effects on the Firm's Performances and Growth

The second hypothesis focuses on the impact of holding company transition on firm's performances and growth. Increased ownership of the management team through the holding company system endows managers with stable managerial power to conduct their growth strategies such as diversification. In addition, the vertical governance enables the firm to conduct the "select-and-concentration" capital management among subsidiaries. Compared with the statistics of financial data in the pre-transition period, the post-transition statistics exhibits improvement in most financial factors, suggesting the possibility that holding company transition positively affects the firm's performance.

***Hypothesis 2: The difference in profitability of a firm between pre- and post-transition is positive.***

The effects of holding company transition on long-term performance of firms are estimated by panel data regression analysis. This paper uses models inspired by the pre- and post- transition comparison of Ra and Koh (2009), and sets each time interval of a quarter to closely observe the impact of holding company transition:

$$y_{it} = \alpha_{it} + \beta_1 HC_{it} + X'_{it}\gamma + \delta * \text{Time Dummy} + \varepsilon_{it} ,$$

$$t = \{-4, -3, \dots, +19, +20\} ,$$

t = 0 is the quarter when a firm converts to holding company

$$HC_{it} = 1 \text{ if } t \geq 0; = 0 \text{ otherwise}$$

$$X_{it} = \{\text{cashflow}, \text{capex}, \text{ta}, \text{costrev}, \text{manage}, \\ \text{capinv}, \text{firmage}, \text{debratio}, \text{mreturn}\}$$

Compared to the pre-transition period in a maximum of four quarters, firms' performance is analyzed by Least Square Dummy Variable regression (LSDV), fixed-effect (FE) and random-effect (RE) regression to test the significance of the differences of the means between pre- and post-transition periods. Dependent variables are return on asset (ROA), return on equity (ROE), turnover ratio (operating income/total asset; *oita*), and revenue growth rate (*revgrowth*). First three variables indicate profitability, and revenue growth is the productivity index. Explanatory variable is holding company dummy variable (*HC*), which equals to one on the post-transition quarters, and to zero otherwise. Covariates are based on Kim and Lee (2009): cash flow (net income + depreciation; *cashflow*), CAPEX ratio (fixed capital expenditure/operating revenue; *capex*), firm size (total asset; *ta*), firm's age (converted year – founded year; *firmage*), operating expense ratio (operating cost/operating revenue; *costrev*), general expense ratio (sales & administrative expense/operating revenue; *manage*), capital investment ratio ((fixed capital expenditure + depreciation) / fixed capital in previous quarter; *capinv*), and debt ratio (total debt/total asset; *debratio*). Quarterly market index return (*mreturn*) is added as a control variable to consider linkage of effects on daily stock

return and long-term performance. Differences of firm's performances are estimated in periods of [-1, +1], [-2, +2], [-4, +4], [-4, +8], [-4, +12], [-4, +16], and [-4, +20].

## 4. Data

21 Samples of the U.S. firms announcing holding company transition on explicit dates have been collected from various media such as the Internet, SEC 10-K reports, and the news. The daily stock returns of firms and market indices are collected from Yahoo! Finance (<https://finance.yahoo.com/>) for 365 days around the event dates each. Quarterly financial data of the same firm samples for 24 quarters around the event quarter are from the YCharts financial data research database (<https://ycharts.com/>), and are constructed in the longitudinal dataset.

[Table 1] Descriptive Statistics in the Pre-Transition Period ( $time \leq 0$ )

Variable	N	mean	median	s.d.
Return on Asset (ROA)	83	0.006	0.003	0.053
Return on Equity (ROE)	83	0.004	0.168	0.168
Total Asset (in billion \$)	83	253.2	14.5	523.5
Operating Revenue (in billion \$)	84	3.2	0.22	5.06
Operating Income (in billion \$)	84	-0.05	0.03	4.02
Net Income (in billion \$)	84	0.108	0.02	2.32
Cash Flow (=net income + depreciation; in billion \$)	79	0.175	0.04	2.39
Revenue Growth Rate	84	0.323	0.033	2.19
Turnover Ratio (=operating income / total asset)	83	0.008	0.004	0.042
Firm Age (=converted year - founded year)	84	72.95	73	60.86
Operating Expense Ratio (=operating cost / operating revenue)	84	0.308	0.368	0.912
General Expense Ratio (=sales&administrative expense / operating revenue)	84	0.321	0.367	0.851
Capital Expenditure (CAPEX) Ratio (=fixed capital expenditure / operating revenue)	79	-0.057	-0.039	0.117
Debt Ratio(=total debt / total asset)	83	0.92	0.911	0.43
Quarterly Market Stock Return	84	0.022	0.032	0.081

Descriptive statistics of financial data in the one-year pre-transition period illustrates that there is huge deviations around variable means, indicating that the sample firms, which converted to holding companies, have various financial conditions.

[Table 2] Descriptive Statistics in the Post-Transition Period (time $\geq$ 0)

Variable	N	mean	median	s.d.
Return on Asset (ROA)	401	0.004	0.002	0.02
Return on Equity (ROE)	401	0.062	0.018	0.884
Total Asset (in billion \$)	401	261.6	25.04	483.4
Operating Revenue (in billion \$)	401	3.86	0.31	5.92
Operating Income (in billion \$)	401	0.66	0.06	1.69
Net Income (in billion \$)	401	0.5	0.04	1.14
Cash Flow (=net income + depreciation; in billion \$)	380	0.59	0.06	1.29
Revenue Growth Rate	401	0.122	0.022	0.843
Turnover Ratio (=operating income / total asset)	401	0.006	0.003	0.015
Firm Age (=converted year - founded year)	441	72.95	73	60.56
Operating Expense Ratio (=operating cost / operating revenue)	401	0.341	0.352	0.517
General Expense Ratio (=sales&administrative expense / operating revenue)	401	0.413	0.381	0.404
Capital Expenditure (CAPEX) Ratio (=fixed capital expenditure / operating revenue)	379	-0.042	-0.034	0.069
Debt Ratio(=total debt / total asset)	401	0.83	0.894	0.196
Quarterly Market Stock Return	401	0.014	0.026	0.094

The summary statistics of financial data in the five-year post-transition period exhibit that the financial factors mostly improves. Especially operating income has a huge jump from -0.05 billion dollars to 0.66 billion dollars, and the liability condition also improves from 0.92 to 0.83. Considering the comparison of values between pre- and post-transition periods, it is expected that holding company transition contribute to the improvement of financial performances of the firms.

## 5. Results and Discussion

### 5.1. Effects on Daily Stock Returns with $\pm 5$ -day test period

The effect of holding company transition on daily stock returns is studied by event analysis method with various lengths of estimation and test windows for its robustness. First, Table 3 describes the estimation result of 250-day event analysis with  $\pm 5$  days of test window, which is used in Brown and Warner (1985). The accounts with number 1, 2, and 3 denote the results of the mean-adjusted model, the market-adjusted model, and the OLS market model, respectively.

[Table 3] AARs and CAARs of 250-day event analysis with a test window of  $\pm 5$  days

Estimation:-244 ~ -6 (239 days)												
Test: -5 ~ 5 (11 days) = 250 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-5	0.004	0.692	0.002	0.094	0.003	0.512	0.000	0.010	0.007	1.297	0.004	0.197
-4	<b>-0.016</b>	<b>-2.516</b>	-0.012	-0.657	<b>-0.014</b>	<b>-2.629</b>	-0.013	-0.586	<b>-0.014</b>	<b>-2.501</b>	-0.008	-0.353
-3	-0.004	-0.704	-0.015	-0.818	0.000	-0.065	-0.011	-0.528	0.000	0.089	-0.005	-0.245
-2	-0.011	-1.731	-0.028	-1.500	-0.004	-0.677	-0.017	-0.800	-0.004	-0.694	-0.011	-0.516
-1	0.001	0.220	-0.026	-1.374	0.001	0.095	-0.016	-0.720	-0.004	-0.724	-0.014	-0.627
0	<b>0.049</b>	<b>7.984</b>	-0.029	-1.516	<b>0.046</b>	<b>8.422</b>	-0.022	-1.018	<b>0.048</b>	<b>8.795</b>	-0.019	-0.837
1	0.001	0.104	0.022	1.180	0.005	0.895	0.033	1.530	0.007	1.209	<b>0.039</b>	<b>1.736</b>
2	0.009	1.509	<b>0.035</b>	<b>1.849</b>	0.009	1.579	<b>0.045</b>	<b>2.086</b>	0.008	1.395	<b>0.050</b>	<b>2.242</b>
3	0.004	0.666	<b>0.037</b>	<b>1.943</b>	0.008	1.480	<b>0.051</b>	<b>2.333</b>	0.007	1.333	<b>0.054</b>	<b>2.433</b>
4	-0.001	-0.192	<b>0.036</b>	<b>1.917</b>	0.001	0.244	<b>0.053</b>	<b>2.425</b>	0.003	0.525	<b>0.058</b>	<b>2.589</b>
5	-0.005	-0.785	<b>0.032</b>	<b>1.709</b>	-0.001	-0.260	<b>0.052</b>	<b>2.408</b>	0.004	0.648	<b>0.062</b>	<b>2.795</b>

The day effect is statistically significant on day -4 and day 0 and this is consistent through three models. In the OLS Market Model, when holding company transition is announced (day 0), the average abnormal return jumps up from the -0.4% to 4.8%, indicating that a firm's announcement of converting to holding company leads to an increase in firm value measured by stock price. Throughout the three models, cumulative average abnormal returns in the test period are increasing and statistically significant only after the announcement takes place.

[Table 4] AARs and CAARs of 200-day event analysis with a test window of  $\pm 5$  days

Estimation:-194 ~ -6 (189 days)												
Test: -5 ~ 5 (11 days) = 200 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-5	0.002	0.315	0.002	0.103	0.000	0.038	0.000	0.010	0.005	0.832	0.005	0.207
-4	<b>-0.014</b>	<b>-2.231</b>	-0.012	-0.626	<b>-0.013</b>	<b>-2.345</b>	-0.013	-0.586	<b>-0.012</b>	<b>-2.157</b>	-0.007	-0.331
-3	-0.003	-0.453	-0.015	-0.774	0.001	0.228	-0.011	-0.528	0.002	0.437	-0.005	-0.222
-2	<b>-0.013</b>	<b>-2.023</b>	-0.028	-1.434	-0.006	-1.070	-0.017	-0.800	-0.006	-0.994	-0.011	-0.470
-1	0.003	0.409	-0.025	-1.301	0.002	0.317	-0.016	-0.720	-0.002	-0.444	-0.013	-0.580
0	-0.002	-0.395	-0.027	-1.430	-0.006	-1.173	-0.022	-1.018	-0.005	-0.807	-0.018	-0.782
1	<b>0.051</b>	<b>8.149</b>	0.024	1.231	<b>0.055</b>	<b>10.029</b>	0.033	1.530	<b>0.057</b>	<b>10.199</b>	<b>0.040</b>	<b>1.762</b>
2	0.013	2.045	<b>0.036</b>	<b>1.899</b>	0.012	2.187	<b>0.045</b>	<b>2.086</b>	<b>0.012</b>	<b>2.050</b>	<b>0.051</b>	<b>2.273</b>
3	0.002	0.314	<b>0.038</b>	<b>2.002</b>	0.005	0.974	<b>0.051</b>	<b>2.333</b>	0.004	0.744	<b>0.055</b>	<b>2.459</b>
4	0.000	-0.045	<b>0.038</b>	<b>1.987</b>	0.002	0.361	<b>0.053</b>	<b>2.425</b>	0.004	0.691	<b>0.059</b>	<b>2.631</b>
5	-0.004	-0.595	<b>0.034</b>	<b>1.792</b>	0.000	-0.065	<b>0.052</b>	<b>2.408</b>	0.005	0.872	<b>0.064</b>	<b>2.849</b>

Table 4 describes the estimation result of 200-day event analysis. The statistically significant average abnormal returns on day -4 and day +1 describe a before-and-after effect of holding company transition. In other words, abnormal returns are negative until the event date, and jumps up by approximately 5%.

[Table 5] AARs and CAARs of 365-day event analysis with a test window of  $\pm 5$  days

Estimation:- 359 ~ -6 (354 days)												
Test: -5 ~ 5 (11 days) = 365 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-5	0.002	0.269	0.002	0.088	0.000	0.037	0.000	0.010	0.004	0.699	0.004	0.176
-4	<b>-0.014</b>	<b>-2.354</b>	-0.013	-0.681	<b>-0.013</b>	<b>-2.333</b>	-0.013	-0.586	<b>-0.012</b>	<b>-2.188</b>	-0.008	-0.375
-3	-0.003	-0.523	-0.016	-0.851	0.001	0.227	-0.011	-0.528	0.002	0.398	-0.006	-0.275
-2	<b>-0.013</b>	<b>-2.140</b>	-0.029	-1.550	-0.006	-1.065	-0.017	-0.800	-0.006	-1.097	-0.012	-0.552
-1	0.002	0.366	-0.027	-1.430	0.002	0.316	-0.016	-0.720	-0.002	-0.383	-0.014	-0.648
0	-0.003	-0.462	-0.029	-1.581	-0.006	-1.168	-0.022	-1.018	-0.005	-0.814	-0.019	-0.853
1	<b>0.051</b>	<b>8.338</b>	0.021	1.140	<b>0.055</b>	<b>9.980</b>	0.033	1.530	<b>0.057</b>	<b>10.143</b>	<b>0.038</b>	<b>1.704</b>
2	<b>0.012</b>	<b>2.051</b>	<b>0.034</b>	<b>1.810</b>	<b>0.012</b>	<b>2.177</b>	<b>0.045</b>	<b>2.086</b>	<b>0.012</b>	<b>2.079</b>	<b>0.050</b>	<b>2.228</b>
3	0.002	0.268	<b>0.035</b>	<b>1.897</b>	0.005	0.969	<b>0.051</b>	<b>2.333</b>	0.004	0.705	<b>0.053</b>	<b>2.405</b>
4	-0.001	-0.102	<b>0.035</b>	<b>1.864</b>	0.002	0.359	<b>0.053</b>	<b>2.425</b>	0.004	0.675	<b>0.057</b>	<b>2.575</b>
5	-0.004	-0.669	<b>0.031</b>	<b>1.646</b>	0.000	-0.065	<b>0.052</b>	<b>2.408</b>	0.004	0.733	<b>0.061</b>	<b>2.760</b>

Lastly, Table 5 depicts the estimation result of 365-day event analysis. For all three models, the pattern of average abnormal returns shows the same before-and-after day effect as 200-day analysis. Besides, cumulative average abnormal returns describe the consistent after-effect of holding company transition.<sup>5</sup>

In sum, in the short test window of  $\pm 5$  days, it is suggested with robustness that there exist a significant before-and-after daily effect of public announcement of holding

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<sup>5</sup> Considering the volatile nature of daily stock return under an efficient stock market, the day effect after the public announcement of holding company transition is substantial. In addition, cumulative average abnormal returns steadily increases from day +1 to day +5 in market-adjusted model and OLS market model while they decrease in mean-adjusted model. The mean-adjusted model utilizes the mean stock returns of firm samples in the estimation period. The estimates are more vulnerable to within- and outside- firm shocks than the market-adjusted model which uses the market index as a benchmark, and the OLS market model whose benchmark performance is fitted value of firm's stock return calculated by market index as an explanatory variable. The observation corresponds with Brown and Warner (1985) mentioning that the market-adjusted and OLS market models outperform the mean-adjusted model.

company transition on day 0 and day 1 with huge increase in average stock return of approximately 5%, and positive overall effect only after the announcement. Increasing cumulative average abnormal returns imply that public announcement of holding company transition has a clear positive effect on firm's market value. However, it is essential to note that cumulative average abnormal returns are statistically significant only after the event date. Assuming an efficient stock market, the lagging effect of holding company transition suggests that investors carefully assess the potential effects of the change in corporate governance. First, the transaction costs emerge in a period of stabilizing governance after holding company transition, and the cost may lead to eroding profit margin (Siddharthan and Lall, 1982; Grant, 1987). Second, the transition cannot be fulfilled in the short-run so that they provide time long enough for investors to change their minds to invest in competing firms which do not have holding company governance structure or has already converted to holding company.

## **5.2. Effects on Daily Stock Returns with $\pm 10$ -day test period**

Statistical significance of the day effect varies along with the length of event study period because in a long time interval, it is more likely for the unobserved factors during both the estimation and the test periods to affect abnormal returns and thereby weaken the validity of event analysis (Paik et al., 2011). However, it is essential to analyze the results from the longer test window for the event of holding company transition in order to check the robustness of the effect of an event which takes relatively high transaction costs to be valid, assuming that efficient stock market ensures investors to notice the background of the event.

[Table 6] AARs and CAARs of 250-day event analysis with a test window of  $\pm 10$  days

Estimation:-239 ~ -11 (229 days)												
Test: -10 ~ 10 (21 days) = 250 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-10	-0.008	-1.361	-0.008	-0.292	-0.001	-0.126	-0.001	-0.020	-0.002	-0.412	-0.002	-0.061
-9	0.006	0.964	-0.002	-0.085	0.002	0.393	0.001	0.042	0.004	0.646	0.001	0.035
-8	<b>0.011</b>	<b>1.790</b>	0.008	0.299	0.004	0.755	0.006	0.160	0.005	0.937	0.006	0.174
-7	-0.002	-0.322	0.006	0.230	0.003	0.474	0.008	0.235	0.004	0.662	0.010	0.272
-6	-0.003	-0.449	0.004	0.133	-0.005	-0.926	0.003	0.089	-0.005	-0.918	0.005	0.136
-5	0.002	0.294	0.006	0.196	0.000	0.038	0.003	0.095	0.005	0.828	0.010	0.258
-4	<b>-0.014</b>	<b>-2.355</b>	-0.009	-0.309	<b>-0.013</b>	<b>-2.389</b>	-0.010	-0.280	<b>-0.012</b>	<b>-2.240</b>	-0.003	-0.074
-3	-0.003	-0.505	-0.012	-0.418	0.001	0.232	-0.008	-0.243	0.002	0.452	0.000	-0.007
-2	<b>-0.013</b>	<b>-2.138</b>	-0.025	-0.877	-0.006	-1.091	-0.014	-0.414	-0.007	-1.195	-0.007	-0.184
-1	0.002	0.392	-0.022	-0.793	0.002	0.323	-0.013	-0.364	-0.002	-0.420	-0.009	-0.246
0	-0.003	-0.444	-0.025	-0.888	-0.006	-1.196	-0.019	-0.551	-0.005	-0.842	-0.014	-0.371
1	<b>0.051</b>	<b>8.444</b>	0.026	0.925	<b>0.055</b>	<b>10.221</b>	0.036	1.053	<b>0.057</b>	<b>10.471</b>	0.043	1.181
2	<b>0.013</b>	<b>2.094</b>	0.039	1.374	<b>0.012</b>	<b>2.229</b>	0.048	1.403	<b>0.011</b>	<b>2.061</b>	0.055	1.487
3	0.002	0.293	0.040	1.437	0.005	0.993	0.054	1.559	0.004	0.729	0.059	1.595
4	0.000	-0.081	0.040	1.420	0.002	0.368	0.056	1.617	0.003	0.596	<b>0.062</b>	<b>1.683</b>
5	-0.004	-0.653	0.036	1.280	0.000	-0.067	0.055	1.606	0.005	0.873	<b>0.067</b>	<b>1.813</b>
6	0.004	0.738	0.040	1.438	0.004	0.664	<b>0.059</b>	<b>1.711</b>	0.004	0.685	<b>0.070</b>	<b>1.914</b>
7	<b>0.021</b>	<b>3.436</b>	<b>0.061</b>	<b>2.176</b>	<b>0.018</b>	<b>3.258</b>	<b>0.077</b>	<b>2.222</b>	<b>0.016</b>	<b>3.010</b>	<b>0.087</b>	<b>2.361</b>
8	-0.003	-0.574	<b>0.058</b>	<b>2.053</b>	-0.002	-0.402	<b>0.074</b>	<b>2.159</b>	-0.003	-0.477	<b>0.084</b>	<b>2.290</b>
9	-0.002	-0.402	<b>0.055</b>	<b>1.967</b>	0.002	0.427	<b>0.077</b>	<b>2.226</b>	0.001	0.273	<b>0.086</b>	<b>2.330</b>
10	0.004	0.620	<b>0.059</b>	<b>2.100</b>	<b>0.011</b>	<b>2.059</b>	<b>0.088</b>	<b>2.549</b>	<b>0.012</b>	<b>2.126</b>	<b>0.097</b>	<b>2.646</b>

Table 6 illustrates 250-day event analysis with the test window of  $\pm 10$  days. Compared with the same-length event analysis with  $\pm 5$  days test period,  $\pm 10$ -day test window shortens estimation period by 10 days from 239 days to 229 days - less information is used for benchmark performance to estimate abnormal returns in wider test interval. However, the observation depicts the more straightforward results than the  $\pm 5$ -day test window. The average abnormal returns propose that the positive day effects last after the public announcement, and this pattern exhibits a direct opposite to the negative figures in throughout the before-announcement period. In addition, the cumulative average abnormal returns in three models steadily increase from 6% to 9%. As in the cases in  $\pm 5$ -day test window, the figures are statistically significant only in the post-event period.

All the observations in three models have the same pattern that exhibits negative returns before the event date, whereas positive and high returns after the event



date in spite of diverse time intervals of estimation and test windows. In addition, the cumulative average abnormal returns that are significant only after the event date imply that investors are aware of the timely effect of holding company transition on firm's growth. Thus, we can conjecture that dealing with the event of holding company transition, investors' assessment on firm's market value changes only after the firms actually finalize their transition plans along with the public announcements.

Table 7 shows 200-day event analysis with the test window of  $\pm 10$  days. Even though the estimation window for the benchmark performance of a firm's market value gets shorter by 50 days than the 250-day analysis, the patterns of average abnormal returns and cumulative abnormal returns are consistent. Table 8 shows 365-day event analysis with the test window of  $\pm 10$  days. Even though the longer event study period is likely to cause the emergence of unobserved factors affecting significance of the analysis results, the observations in tables 6, 7, and 8 strongly suggest the robustness of event analysis results by exhibiting the consistent pattern of abnormal returns with the estimation in the shorter period. Therefore, we can conclude that the daily sample stock returns used in this study does not suffer from the potential biases causing the inconsistent results among diverse study settings.

[Table 7] AARs and CAARs of 200-day event analysis with a test window of  $\pm 10$  days

Estimation:-189 ~ -11 (179 days)												
Test: -10 ~ 10 (21 days) = 200 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-10	-0.008	-1.274	-0.008	-0.262	-0.001	-0.125	-0.001	-0.020	-0.002	-0.375	-0.002	-0.054
-9	0.006	1.007	-0.002	-0.055	0.002	0.388	0.001	0.042	0.004	0.725	0.002	0.050
-8	<b>0.011</b>	<b>1.818</b>	0.010	0.319	0.004	0.747	0.006	0.160	0.006	1.000	0.008	0.194
-7	-0.002	-0.254	0.008	0.267	0.003	0.469	0.008	0.235	0.004	0.712	0.011	0.296
-6	-0.002	-0.379	0.006	0.189	-0.005	-0.916	0.003	0.089	-0.004	-0.782	0.007	0.184
-5	0.002	0.350	0.008	0.261	0.000	0.038	0.003	0.095	0.005	0.940	0.012	0.318
-4	<b>-0.014</b>	<b>-2.250</b>	-0.006	-0.202	<b>-0.013</b>	<b>-2.363</b>	-0.010	-0.280	<b>-0.012</b>	<b>-2.142</b>	0.000	0.011
-3	-0.003	-0.434	-0.009	-0.291	0.001	0.230	-0.008	-0.243	0.003	0.524	0.003	0.086
-2	<b>-0.013</b>	<b>-2.037</b>	-0.021	-0.710	-0.006	-1.079	-0.014	-0.414	-0.006	-1.078	-0.003	-0.068
-1	0.003	0.447	-0.018	-0.618	0.002	0.320	-0.013	-0.364	-0.002	-0.395	-0.005	-0.125
0	-0.002	-0.375	-0.021	-0.695	-0.006	-1.182	-0.019	-0.551	-0.004	-0.767	-0.009	-0.235
1	<b>0.051</b>	<b>8.350</b>	0.031	1.022	<b>0.055</b>	<b>10.107</b>	0.036	1.053	<b>0.057</b>	<b>10.324</b>	0.048	1.245
2	<b>0.013</b>	<b>2.117</b>	0.044	1.457	<b>0.012</b>	<b>2.204</b>	0.048	1.403	<b>0.012</b>	<b>2.107</b>	0.060	1.547
3	0.002	0.350	0.046	1.529	0.005	0.982	0.054	1.559	0.004	0.705	<b>0.064</b>	<b>1.648</b>
4	0.000	-0.018	0.046	1.525	0.002	0.363	0.056	1.617	0.004	0.696	<b>0.068</b>	<b>1.748</b>
5	-0.004	-0.579	0.042	1.406	0.000	-0.066	0.055	1.606	0.005	0.986	<b>0.073</b>	<b>1.889</b>
6	0.005	0.786	0.047	1.568	0.004	0.657	<b>0.059</b>	<b>1.711</b>	0.004	0.780	<b>0.078</b>	<b>2.001</b>
7	<b>0.021</b>	<b>3.435</b>	<b>0.068</b>	<b>2.274</b>	<b>0.018</b>	<b>3.221</b>	<b>0.077</b>	<b>2.222</b>	<b>0.017</b>	<b>3.012</b>	<b>0.094</b>	<b>2.432</b>
8	-0.003	-0.501	<b>0.065</b>	<b>2.171</b>	-0.002	-0.397	<b>0.074</b>	<b>2.159</b>	-0.003	-0.469	<b>0.092</b>	<b>2.365</b>
9	-0.002	-0.333	<b>0.063</b>	<b>2.103</b>	0.002	0.422	<b>0.077</b>	<b>2.226</b>	0.002	0.275	<b>0.093</b>	<b>2.405</b>
10	0.004	0.670	<b>0.067</b>	<b>2.240</b>	<b>0.011</b>	<b>2.036</b>	<b>0.088</b>	<b>2.549</b>	<b>0.012</b>	<b>2.191</b>	<b>0.106</b>	<b>2.719</b>

[Table 8] AARs and CAARs of 365-day event analysis with a test window of  $\pm 10$  days

Estimation:-354 ~ -11 (344 days)												
Test: -10 ~ 10 (21 days) = 365 days												
daten	aar1	t1	caar1	t1	aar2	t2	caar2	t2	aar3	t3	caar3	t3
-10	-0.008	-1.363	-0.008	-0.302	-0.001	-0.122	-0.001	-0.020	-0.002	-0.321	-0.002	-0.050
-9	0.006	0.933	-0.003	-0.095	0.002	0.380	0.001	0.042	0.003	0.577	0.001	0.040
-8	<b>0.011</b>	<b>1.749</b>	0.008	0.292	0.004	0.732	0.006	0.160	0.005	0.916	0.007	0.183
-7	-0.002	-0.337	0.006	0.218	0.003	0.459	0.008	0.235	0.004	0.671	0.010	0.288
-6	-0.003	-0.463	0.003	0.115	-0.005	-0.897	0.003	0.089	-0.005	-0.896	0.005	0.148
-5	0.002	0.271	0.005	0.175	0.000	0.037	0.003	0.095	0.004	0.720	0.009	0.260
-4	<b>-0.014</b>	<b>-2.345</b>	-0.009	-0.344	<b>-0.013</b>	<b>-2.315</b>	-0.010	-0.280	<b>-0.012</b>	<b>-2.160</b>	-0.003	-0.077
-3	-0.003	-0.518	-0.013	-0.459	0.001	0.225	-0.008	-0.243	0.002	0.406	0.000	-0.014
-2	<b>-0.013</b>	<b>-2.131</b>	-0.026	-0.931	-0.006	-1.057	-0.014	-0.414	-0.006	-1.149	-0.007	-0.193
-1	0.002	0.369	-0.023	-0.849	0.002	0.313	-0.013	-0.364	-0.002	-0.350	-0.009	-0.248
0	-0.003	-0.458	-0.026	-0.951	-0.006	-1.158	-0.019	-0.551	-0.005	-0.801	-0.013	-0.373
1	<b>0.051</b>	<b>8.322</b>	0.025	0.893	<b>0.055</b>	<b>9.901</b>	0.036	1.053	<b>0.057</b>	<b>10.033</b>	0.043	1.194
2	<b>0.013</b>	<b>2.050</b>	0.037	1.347	<b>0.012</b>	<b>2.160</b>	0.048	1.403	<b>0.012</b>	<b>2.061</b>	0.055	1.516
3	0.002	0.271	0.039	1.407	0.005	0.962	0.054	1.559	0.004	0.663	0.059	1.620
4	-0.001	-0.098	0.038	1.385	0.002	0.356	0.056	1.617	0.004	0.635	<b>0.062</b>	<b>1.719</b>
5	-0.004	-0.664	0.034	1.238	0.000	-0.064	0.055	1.606	0.004	0.748	<b>0.066</b>	<b>1.836</b>
6	0.004	0.710	0.038	1.395	0.004	0.643	<b>0.059</b>	<b>1.711</b>	0.004	0.651	<b>0.070</b>	<b>1.938</b>
7	<b>0.021</b>	<b>3.376</b>	<b>0.059</b>	<b>2.143</b>	<b>0.018</b>	<b>3.156</b>	<b>0.077</b>	<b>2.222</b>	<b>0.017</b>	<b>2.934</b>	<b>0.087</b>	<b>2.396</b>
8	-0.004	-0.585	<b>0.055</b>	<b>2.013</b>	-0.002	-0.389	<b>0.074</b>	<b>2.159</b>	-0.004	-0.656	<b>0.083</b>	<b>2.294</b>
9	-0.003	-0.416	<b>0.053</b>	<b>1.921</b>	0.002	0.414	<b>0.077</b>	<b>2.226</b>	0.000	0.064	<b>0.083</b>	<b>2.304</b>
10	0.004	0.594	<b>0.057</b>	<b>2.053</b>	<b>0.011</b>	<b>1.995</b>	<b>0.088</b>	<b>2.549</b>	<b>0.010</b>	<b>1.770</b>	<b>0.093</b>	<b>2.580</b>

From the event study of daily stock returns with diverse estimation and test windows, I find that the abnormal returns exhibit the directly-opposed patterns in the pre- and post-announcement periods, and that the cumulative abnormal returns steadily increase in the post-announcement period. This finding clarifies that the public announcement of holding company transition has a positive effect on firm's market value.

### **5.3. Effects on firm's growth and financial performance**

The event study of effects of holding company transition on daily stock returns suggests that the public announcement of transition has a positive effect on market value of a firm, especially after the announcement takes place. This section provides a long-term financial data analysis of effects of holding company transition on firm's growth and financial performances. I conduct a panel data analysis with return on asset (ROA), return on equity (ROE), turnover ratio (operating income/total asset), and revenue growth rate as dependent variables. To correspond with the short-run effectiveness of holding company transition on firm's market value, the panel data regression is conducted with three models for the robustness check: least square dummy variable model (LSDV), fixed-effect model (FE), and random-effect model (RE) using quarterly financial data.

Table 9 describes the effect of holding company transition on return on asset (ROA) with periods ranging from [-1, 1] quarters to [-4, +20] quarters. Quarter 0 denotes the quarter when sample firms converted to holding company. The observation suggests that there is no statistical significance of the effect of holding company transition on ROA. Rather, expenses, cash flow and capital investment exhibit significant effects on ROA throughout the periods. The analysis result is not likely to be changed after adding omitted variables, for it already exhibits insignificant effect on ROA in throughout the various time intervals. Table 10 presents the effect of holding company transition on return on equity (ROE) with periods ranging from [-1, 1] quarters

to [-4, +20] quarters. Like ROA, there is no significant effect of transition on ROE in the long-run. Rather, covariates such as expenses and capital investment have consistently significant coefficients on ROEs, proving that the factors directly related to financial performance of firms such as investment, expense, and debt are more important in considering firm's long-run growth than change in corporate governance.

Table 11 illustrates the effect on turnover ratio, which is proposed as a profitability index by Kim and Lee (2009). The results in turnover ratio also show no statistical significance in the effect of holding company transition. In sum, converting to holding company does not have a solid effect on long-run profitability represented by ROA, ROE, and turnover ratio. Rather, financial factors such as operating expenses and investment have significant effect on profitability of firms. Table 12 estimates the effect of holding company transition on firm's growth index, revenue growth rate. Like the profitability, the effect of holding company transition on revenue growth turns out to be statistically insignificant throughout various period set-ups. Therefore, the findings suggest that holding company transition does not have any significant effect on the U.S. firm's profitability and growth.

[Table 9] Regression Results on Return on Assets (ROA)

Variables	[-1, +1]						[-2, +2]						[-4, +4]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
HC	0.007	0.007	0.002	0.003	0.008	0.006	0.017	0.014	0.0043	0.007	0.012	0.009	0.022	0.015	-0.002	0.007	0.001	0.007
Total Asset(in billion \$)	-0.00003**	0.00001	0.0001*	0.00006	-0.00003**	0.00001	-0.00002	-0.00002	0.00008	0.0001	-0.00003	0.00002	-0.00002	0.00002	0.00008	0.00007	-0.00002	0.00002
CAPEX/Sales	-0.036	0.0255	-0.028	0.017	-0.034	0.025	-0.108**	0.052	-0.105**	0.043	-0.109**	0.05	-0.089**	0.04	-0.073*	0.04	-0.08**	0.039
Operating Expense/Revenue	-0.07***	0.011	-0.21***	0.016	-0.07***	0.011	-0.032*	0.018	-0.277***	0.003	-0.06***	0.021	-0.006	0.014	-0.078***	0.024	-0.024	0.016
General Expense/Revenue	0.09***	0.015	0.3***	0.023	0.09***	0.015	0.032	0.024	0.382***	0.05	0.073**	0.029	-0.005	0.015	0.08***	0.03	0.018	0.019
Capital Investment Ratio	-0.009	0.003	0.0009	0.003	-0.009***	0.003	0.015***	0.004	0.04***	0.005	0.020***	0.004	0.01**	0.004	0.015***	0.005	0.012***	0.004
Firm Age(Holding Company - Founded Date)	0.00008*	0.00005			0.00008*	0.00005	0.00006	0.00008			0.0001	0.00	-0.00005	0.00006			-0.00002	0.0001
Cash Flow(in billion \$)	0.02**	0.004	-0.003	0.006	0.02***	0.003	0.01**	0.005	0.02	0.01	0.02***	0.006	0.006*	0.003	0.01*	0.007	0.008*	0.004
Debt Ratio(Total Debt/Total Asset)	0.101***	0.018	0.167**	0.075	.102***	0.018	0.023	0.017	-0.008	0.012	0.02	0.015	0.013	0.011	-0.01	0.012	0.004	0.01
Quarterly Market Stock Return	-0.0288	0.031	0.037	0.029	-0.027	0.03	-0.08*	0.048	-0.067*	0.037	-0.072	0.045	-0.041	0.04	-0.02	0.04	-0.03	0.04
(Constant)	-0.112***	0.0184	-0.187***	0.061	-0.113***	0.018	-0.027	0.024	-0.068***	0.017	-0.048**	0.021	-0.022	0.016	-0.006	0.016	-0.0002	0.015
N	56		56		56		93		93		93		167		167		167	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	11.52***		39.19***				1.94**		11.43***				1.51*		2.15**			
Wald $\chi^2$					128.94***						26.34***						12.84	
Hausman					$\chi^2 = 89.78$						$\chi^2 = 74.41$						$\chi^2 = 149.08$	
Adjusted R <sup>2</sup>	0.678		0.926		0.741		0.117		0.61		0.178		0.05		0.12		0.073	

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 9] Regression Results on Return on Assets (ROA) - Continued

Variables	[-4, +8]						[-4, +12]						[-4, +16]						[-4, +20]							
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE		OLS		FE		RE			
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE		
HC	0.003	0.013	-0.0009	0.005	0.002	0.005	0.001	0.012	-0.0002	0.004	0.002	0.004	0.02*	0.01	-0.0005	0.004	0.001	0.004	-0.002	0.01	-0.0008	0.004	0.001	0.004		
Total Asset(in billion \$)	-0.00001	0.00001	-0.00001	0.00006	-0.00001	0.00001	-0.00001	0.00	-0.00002	0.00005	-0.00001	0.00	-0.00001	0.00	-0.00002	0.00004	-0.00001	0.00	-0.00	0.00	-0.00002	0.00004	-0.00001*	0.00		
CAPEX/Sales	-0.058**	0.029	-0.036	0.031	-0.06**	0.03	-0.06**	0.025	-0.05*	0.03	-0.06**	0.025	-0.05**	0.02	-0.05**	0.02	-0.06***	0.02	-0.06***	0.02	-0.06***	0.02	-0.06***	0.02		
Operating Expense/Revenue	0.006	0.007	0.0002	0.007	0.004	0.006	0.005	0.005	0.003	0.006	0.004	0.005	0.004	0.005	0.004	0.006	0.003	0.005	0.002	0.004	0.001	0.005	0.001	0.004		
General Expense/Revenue	-0.01*	0.008	-0.009	0.01	-0.013	0.008	-0.013*	0.007	-0.01	0.009	-0.012*	0.006	-0.01**	0.006	-0.01*	0.008	-0.01*	0.006	-0.009*	0.005	-0.01	0.007	-0.008	0.005		
Capital Investment Ratio	0.01***	0.003	0.01***	0.004	0.01***	0.008	0.01***	0.003	0.01***	0.003	0.01***	0.003	0.01***	0.003	0.01***	0.003	0.01***	0.003	0.01***	0.002	0.012***	0.003	0.01***	0.003		
Firm Age(Holding Company - Founded Date)	-0.00007	0.00004			-0.00007	0.00004	-0.00005	0.00003			-0.00005	0.00003	-0.00005	0.00003			-0.00005*	0.00003	-0.00004	0.00003			-0.00004*	0.00003		
Cash Flow(in billion \$)	0.004*	0.002	0.01*	0.005	0.005**	0.002	0.005**	0.002	0.008*	0.004	0.005**	0.002	0.004**	0.002	0.008**	0.004	0.005***	0.002	0.004***	0.001	0.008**	0.003	0.005***	0.001		
Debt Ratio(Total Debt/Total Asset)	0.006	0.009	-0.007	0.01	0.008	0.009	0.005	0.008	-0.006	0.009	0.008	0.008	0.003	0.007	-0.006	0.008	0.006	0.007	0.003	0.006	-0.007	0.008	0.006	0.006		
Quarterly Market Stock Return	-0.04	0.028	-0.04	0.03	-0.03	0.03	-0.026	0.02	-0.02	0.02	-0.02	0.02	-0.02	0.02	-0.02	0.02	-0.02	0.02	-0.015	0.01	-0.016	0.016	-0.015	0.016		
(Constant)	0.005	0.013	0.01	0.01	0.002	0.01	0.005	0.01	0.01	0.01	0.001	0.008	-0.016*	0.01	0.01	0.01	0.002	0.008	0.005	0.009	0.01	0.01	0.0009	0.007		
N	236		236		236		306		306		306		367		367		367		426		426		426			
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO		YES		NO		NO			
F	1.73**		1.4				1.85***		1.90*				1.92***		2.58***				2.00**		3.26***					
Wald $\chi^2$					21.43**						29.13***						35.08***						42.40***			
Hausman			$\chi^2 = 21.59$						$\chi^2 = 19.17$						$\chi^2 = 16.76$						$\chi^2 = 36.05$					
Adjusted R <sup>2</sup>	0.06		0.06		0.09		0.07		0.06		0.09		0.07		0.06		0.09		0.07		0.07		0.09			

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 10] Regression Results on Return on Equity (ROE)

Variables	[-1, +1]						[-2, +2]						[-4, +4]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
HC	0.007	0.015	0.001	0.007	0.008	0.011	0.82	0.51	0.244	0.262	0.448	0.33	0.44	0.38	0.14	0.176	0.28	0.182
Total Asset(in billion \$)	-0.00006**	0.00003	0.0002	0.0001	-0.00007**	0.00003	-0.0003	0.0007	0.0006	0.004	-0.0003	0.0007	-0.0002	0.0004	0.002	0.002	-0.0002	0.0004
CAPEX/Sales	-0.034	0.05	-0.044	0.04	-0.03	0.05	-2.78	1.78	-3.40**	1.615	-2.89	1.75	-1.77*	0.99	-2.14**	1.02	-1.86*	0.98
Operating Expense/Revenue	-0.133***	0.024	-0.378***	0.036	-0.157***	0.026	0.401	0.613	-4.44***	1.27	0.321	0.611	0.204	0.344	-0.997	0.622	0.188	0.34
General Expense/Revenue	0.18***	0.032	0.54***	0.056	0.213***	0.036	-0.8	0.8	5.91***	1.86	-0.679	0.82	-0.414	0.384	0.897	0.758	-0.415	0.38
Capital Investment Ratio	-0.028***	0.006	-0.013*	0.007	-0.0294***	0.007	0.98***	0.158	1.86***	0.183	1.022***	0.157	0.94***	0.112	1.23***	0.12	0.95***	0.11
Firm Age(Holding Company - Founded Date)	0.0002**	0.0001			0.0003**	0.0001	0.0002	0.003			0.0004	0.003	-0.0001	0.0015			-0.00006	0.0015
Cash Flow(in billion \$)	0.04***	0.007	0.012	0.014	0.05***	0.008	0.09	0.17	0.7	0.5	0.12	0.17	0.05	0.08	0.26	0.19	0.05	0.08
Debt Ratio(Total Debt/Total Asset)	0.19***	0.04	0.415**	0.17	0.202***	0.046	0.744	0.577	-0.268	0.463	0.793	0.562	0.4	0.29	-0.32	0.309	0.423	0.29
Quarterly Market Stock Return	-0.04	0.06	0.087	0.066	-0.029	0.068	-2.28	1.66	-3.18**	1.4	-1.808	1.619	-1.78*	1.01	-1.86*	0.99	-1.4	0.985
(Constant)	-0.20***	0.04	-0.424***	0.14	-0.219***	0.043	-0.78	0.82	-1.31*	0.664	-1.008	0.723	-0.676	0.4	-0.233	0.408	-0.515	0.351
N	56		56		56		93		93		93		167		167		167	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	11.90***		33.66***				4.24***		13.62***				5.40***		12.92***			
Wald $\chi^2$					139.12***						53.14***						86.04***	
Hausman					$\chi^2 = 26.00$						$\chi^2 = 2178.86$						$\chi^2 = 28.98$	
Adjusted R <sup>2</sup>	0.686		0.915		0.743		0.314		0.653		0.39		0.31		0.45		0.355	

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 10] Regression Results on Return on Equity (ROE) - Continued

Variables	[-4, +8]						[-4, +12]						[-4, +16]						[-4, +20]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE		
HC	0.05	0.33	0.13	0.13	0.24*	0.14	-0.1	0.29	0.14	0.11	0.22*	0.12	0.3	0.27	0.13	0.1	0.21**	0.1	-0.05	0.26	0.12	0.09	0.20**	0.09
Total Asset(in billion \$)	-0.0001	0.0003	0.0003	0.001	-0.0001	0.0003	-0.0001	0.0002	0.0002	0.001	-0.0001	0.0002	-0.00009	0.0002	0.0001	0.001	-0.0001	0.0002	-0.00007	0.0002	0.00009	0.0009	-0.0001	0.0002
CAPEX/Sales	-1.64**	0.72	-1.55**	0.75	-1.67**	0.71	-1.55**	0.6	-1.75***	0.65	-1.62***	0.62	-1.44***	0.56	-1.68***	0.56	-1.52***	0.55	-1.42***	0.5	-1.73***	0.5	-1.51***	0.49
Operating Expense/Revenue	0.18	0.16	-0.0002	0.18	0.18	0.16	0.17	0.14	0.06	0.15	0.16	0.13	0.16	0.12	0.076	0.14	0.15	0.12	0.11	0.11	0.05	0.11	0.11	0.1
General Expense/Revenue	-0.38*	0.2	-0.2	0.25	-0.39**	0.19	-0.35**	0.17	-0.29	0.22	-0.37**	0.16	-0.32**	0.15	-0.28	0.19	-0.34**	0.15	-0.26**	0.13	-0.24	0.16	-0.28**	0.12
Capital Investment Ratio	0.9***	0.09	1.15***	0.09	0.92***	0.09	0.87***	0.08	1.13***	0.082	0.89***	0.07	-0.85***	0.07	1.10***	0.07	0.87***	0.07	0.82***	0.065	1.08***	0.07	0.84***	0.06
Firm Age(Holding Company - Founded Date)	-0.0002	0.001			-0.0002	0.001	-0.0001	0.0008			-0.0002	0.0008	-0.0001	0.0007			-0.0002	0.0007	-0.0001	0.0006			-0.0001	0.0006
Cash Flow(in billion \$)	0.05	0.06	0.15	0.13	0.05	0.06	0.05	0.05	0.13	0.1	0.06	0.05	0.05	0.04	0.11	0.08	0.06	0.04	0.057	0.04	0.1	0.08	0.06	0.04
Debt Ratio(Total Debt/Total Asset)	0.42*	0.23	-0.2	0.24	0.44	0.23	0.43**	0.19	-0.17	0.21	0.46**	0.19	0.46***	0.17	-0.22	0.19	0.48***	0.17	-0.49***	0.15	-0.24	0.18	0.50***	0.15
Quarterly Market Stock Return	-1.26*	0.7	-1.64**	0.67	-1.01	0.68	-0.9	0.6	-1.19**	0.53	-0.77	0.54	-0.82*	0.47	-0.89**	0.43	-0.68	0.45	-0.66	0.41	-0.82**	0.38	-0.55	0.39
(Constant)	-0.29	0.32	-0.04	0.3	-0.52**	0.26	-0.32	0.27	-0.06	0.27	-0.55**	0.22	-0.73***	0.24	-0.009	0.25	-0.57***	0.19	-0.39	0.22	0.01	0.23	-0.60***	0.17
N	236		236		236		306		306		306		367		367		367		426		426		426	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	6.02***		17.61***				6.26***		22.16***				6.31***		26.12***				6.17***		29.66***			
Wald $\chi^2$					118.30***						146.10***						170.52***						188.79***	
Hausman					$\chi^2 = 44.96$						$\chi^2 = 52.11$						$\chi^2 = 64.89$						$\chi^2 = 80.37$	
Adjusted R <sup>2</sup>	0.31		0.43		0.34		0.301		0.42		0.33		0.29		0.41		0.32		0.28		0.4		0.31	

\*p<.1, \*\*p<.05, \*\*\*p<.01

Dependent variable is described in decimal point



[Table 11] Regression Results on Turnover Ratio

Variables	[-1, +1]						[-2, +2]						[-4, +4]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
HC	-0.008	0.01	-0.006	0.006	-0.006	0.008	-0.002	0.01	-0.01*	0.006	-0.004	0.007	0.003	0.009	-0.004	0.004	-0.003	0.004
Total Asset(in billion \$)	-0.00004**	0.00002	0.0001	0.0001	-0.00003*	0.00002	-0.00003**	0.00001	0.00005	0.00009	-0.00003**	0.00002	-0.00002**	0.000009	0.00007	0.00004	-0.00002	0.00001
CAPEX/Sales	-0.027	0.036	-0.017	0.033	-0.025	0.036	-0.058	0.038	-0.045	0.036	-0.056	0.038	-0.03	0.02	-0.016	0.025	-0.019	0.023
Operating Expense/Revenue	-0.098***	0.016	-0.188***	0.03	-0.098***	0.015	-0.071***	0.013	-0.236***	0.029	-0.08***	0.01	-0.04***	0.008	-0.08***	0.015	-0.049***	0.0099
General Expense/Revenue	0.13***	0.022	0.27***	0.043	0.13***	0.02	0.09***	0.017	0.329***	0.042	0.103***	0.019	0.042***	0.009	0.0947***	0.018	0.053***	0.0116
Capital Investment Ratio	-0.02***	0.004	-0.19***	0.006	-0.018***	0.004	-0.006*	0.003	0.002	0.004	-0.006*	0.003	-0.008***	0.002	-0.007**	0.003	-0.0089***	0.0027
Firm Age(Holding Company - Founded Date)	0.000003	0.00007			0.000004	0.00007	-0.00001	0.00006			-0.000002	0.00007	-0.00005	0.00003			-0.00005	0.00005
Cash Flow(in billion \$)	0.02***	0.005	-0.009	0.01	0.02***	0.005	0.01***	0.004	0.01	0.01	0.01***	0.004	0.008***	0.002	0.007*	0.005	0.008***	0.002
Debt Ratio(Total Debt/Total Asset)	0.075***	0.0267	-0.612***	0.14	0.0758***	0.026	0.0137	0.012	-0.004	0.01	0.014	0.012	0.0107	0.007	0.0048	0.0075	0.0089	0.007
Quarterly Market Stock Return	-0.00004	0.0448	0.129**	0.054	0.002	0.04	-0.038	0.036	0.009	0.03	-0.023	0.03	-0.0147	0.0242	0.015	0.024	0.0001	0.023
(Constant)	-0.07***	0.026	.466***	0.115	-0.07***	0.02	-0.015	0.016	-0.03**	0.01	-0.01	0.02	-0.0017	0.009	-0.01	0.009	0.0017	0.009
N	56		56		56		93		93		93		167		167		167	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	9.10***		18.83***				4.48***		11.88***				4.25***		6.58***			
Wald $\chi^2$					101.77***						57.24***						58.83***	
Hausman					$\chi^2 = 68.09$						$\chi^2 = 124.02$						$\chi^2 = 9.32$	
Adjusted R <sup>2</sup>	0.618		0.858		0.693		0.329		0.622		0.407		0.249		0.298		0.295	

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 11] Regression Results on Turnover Ratio - Continued

Variables	[-4, +8]						[-4, +12]						[-4, +16]						[-4, +20]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
HC	-0.007	0.009	-0.002	0.004	-0.003	0.004	0.0004	0.008	-0.002	0.003	-0.003	0.003	0.001	0.008	-0.002	0.003	-0.004	0.003	-0.006	0.008	-0.003	0.003	-0.004	0.003
Total Asset(in billion \$)	-0.00001*	0.00	-0.00003	0.00004	-0.00002*	0.00	-0.00001**	0.00	-0.00003	0.00003	-0.00001**	0.00	-0.00001**	0.00	-0.00003	0.00003	-0.00001**	0.00	-0.00001**	0.00	-0.00002	0.00003	-0.00001***	0.00002
CAPEX/Sales	0.009	0.02	0.008	0.02	0.01	0.02	0.007	0.02	0.005	0.019	0.007	0.018	0.005	0.016	0.001	0.017	0.005	0.016	-0.0007	0.016	-0.004	0.016	-0.0006	0.015
Operating Expense/Revenue	-0.004	0.004	0.002	0.005	-0.003	0.004	-0.004	0.004	0.003	0.005	-0.004	0.004	-0.004	0.004	0.003	0.004	-0.004	0.003	-0.006*	0.003	-0.0006	0.004	-0.006*	0.003
General Expense/Revenue	0.005	0.005	-0.005	0.007	0.004	0.006	0.006	0.005	-0.006	0.006	0.005	0.005	0.005	0.004	-0.007	0.006	0.005	0.004	0.007*	0.004	-0.003	0.005	0.007*	0.004
Capital Investment Ratio	-0.01***	0.002	-0.012***	0.003	-0.01***	0.003	-0.009***	0.002	-0.01***	0.002	-0.009***	0.002	-0.008***	0.002	-0.01***	0.002	-0.007***	0.002	-0.006***	0.002	-0.009***	0.002	-0.005***	0.002
Firm Age(Holding Company - Founded Date)	-0.0001***	0.00003			-0.0001***	0.00003	-0.00007***	0.00002			-0.00007***	0.00003	-0.00006***	0.00002			-0.00006***	0.00002	-0.00005**	0.00002			-0.00005***	0.00002
Cash Flow(in billion \$)	0.005***	0.002	0.006*	0.004	0.005***	0.002	0.005***	0.001	0.006**	0.003	0.005***	0.001	0.005***	0.001	0.006**	0.003	0.005***	0.001	0.005***	0.001	0.006**	0.003	0.005***	0.001
Debt Ratio(Total Debt/Total Asset)	-0.002	0.006	0.005	0.007	0.00008	0.006	-0.004	0.005	0.005	0.006	-0.002	0.005	-0.006	0.005	0.005	0.006	-0.004	0.005	-0.006	0.005	0.005	0.006	-0.005	0.005
Quarterly Market Stock Return	-0.02	0.02	-0.02	0.02	-0.02	0.02	-0.016	0.016	-0.007	0.016	-0.013	0.015	-0.01	0.014	-0.002	0.013	-0.009	0.013	-0.008	0.013	-0.001	0.012	-0.007	0.012
(Constant)	0.02**	0.009	0.008	0.009	0.018**	0.007	0.02**	0.008	0.008	0.008	0.018***	0.006	0.012	0.007	0.008	0.007	0.018***	0.006	0.02***	0.007	0.007	0.007	0.017***	0.005
N	236		236		236		306		306		306		367		367		367		426		426		426	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	2.37***		2.92***				2.29***		3.21***				2.03***		3.30***				1.87***		2.93***			
Wald $\chi^2$					40.04***						47.24***						49.80***						50.63***	
Hausman			$\chi^2 = 0.61$						$\chi^2 = 10.81$						$\chi^2 = 37.39$						$\chi^2 = 59.70$			
Adjusted R <sup>2</sup>	0.11		0.12		0.16		0.1		0.09		0.14		0.08		0.08		0.12		0.06		0.06		0.11	

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 12] Regression Results on Revenue Growth

Variables	[-1, +1]						[-2, +2]						[-4, +4]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
HC	-0.057	0.0845	0.021	0.075	0.0068	0.07	0.48	0.4	0.189	0.273	0.154	0.266	0.02	0.58	-0.11	0.272	-0.099	0.281
Total Asset(in billion \$)	-0.0003**	0.0002	-0.001	0.001	-0.0003*	0.0002	-0.0005	0.0006	-0.00	0.004	-0.0004	0.0006	0.001***	0.0006	0.01***	0.003	0.001***	0.0006
CAPEX/Sales	-1.319***	-0.305	-1.42***	0.406	-1.25***	0.3	-1.85	1.41	-4.54***	1.68	-1.94	1.44	0.337	1.53	-0.147	1.58	0.148	1.52
Operating Expense/Revenue	-0.379***	0.134	-0.16	0.36	-0.378***	0.136	-0.217	0.487	-0.06	1.33	-0.284	0.486	0.263	0.531	-2.67***	0.96	0.193	0.526
General Expense/Revenue	0.585***	0.182	0.11	0.527	0.596***	0.184	0.311	0.651	-0.3	1.94	0.419	0.651	0.073	0.592	3.13***	1.17	0.174	0.587
Capital Investment Ratio	-0.0275	0.0365	-0.053	0.07	-0.029	0.036	-0.025	0.126	-0.046	0.19	-0.0005	0.126	-0.077	0.172	0.194	0.185	-0.038	0.169
Firm Age(Holding Company - Founded Date)	-0.0009	0.0006			-0.0008	0.0006	0.001	0.002			0.002	0.002	-0.0002	0.002			-0.0002	0.002
Cash Flow(in billion \$)	0.07**	0.04	0.4***	0.15	0.07*	0.04	-0.02	0.12	0.378	0.54	0.009	0.14	-0.07	0.13	0.67**	0.29	-0.05	0.13
Debt Ratio(Total Debt/Total Asset)	0.291	0.224	1.74	1.72	0.314	0.226	0.018	0.452	0.025	0.48	0.103	0.453	-0.116	0.454	-0.136	0.478	-0.021	0.449
Quarterly Market Stock Return	0.326	0.375	0.15	0.66	0.411	0.375	0.57	1.32	0.767	1.46	1.08	1.3	-0.107	1.56	-0.507	1.54	-0.093	1.52
(Constant)	-0.239	0.22	-1.46	1.4	-0.267	0.222	0.07	0.587	-0.137	0.692	-0.19	0.58	-0.123	0.622	-1.88***	0.63	0.078	0.542
N	56		56		56		93		93		93		167		167		167	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	6.54***		4.90***				0.75		1.08				0.97		4.23***			
Wald $\chi^2$					68.18***						5.32						9.99	
Hausman					$\chi^2 = 14.54$						$\chi^2 = 11.36$						$\chi^2 = 39.79$	
Adjusted R <sup>2</sup>	0.525		0.612		0.602		-0.03		0.13		0.06		-0.003		0.21		0.06	

\*p < .1, \*\*p < .05, \*\*\*p < .01

Dependent variable is described in decimal point

[Table 12] Regression Results on Revenue Growth – Continued

Variables	[-4,+8]						[-4,+12]						[-4,+16]						[-4,+20]					
	OLS		FE		RE		OLS		FE		RE		OLS		FE		RE		OLS		FE		RE	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE		
HC	-0.01	0.5	-0.16	0.21	-0.19	0.21	0.04	0.46	-0.17	0.18	-0.24	0.18	0.024	0.43	-0.21	0.16	-0.26	0.16	-0.12	0.42	-0.24	0.15	-0.26*	0.15
Total Asset(in billion \$)	0.001***	0.0004	0.01***	0.002	0.001***	0.0004	0.0008**	0.0003	0.01***	0.002	0.0008**	0.0003	0.0007**	0.0003	0.01***	0.001	0.0006**	0.0003	0.0005**	0.0002	0.008***	0.001	0.0005*	0.0003
CAPEX/Sales	-0.09	1.12	-0.88	1.18	-0.18	1.11	-0.05	1.00	-0.64	1.03	-0.19	0.97	-0.07	0.88	-0.33	0.91	-0.18	0.86	-0.17	0.83	-0.3	0.86	-0.25	0.82
Operating Expense/Revenue	0.07	0.25	-0.27	0.28	0.06	0.25	0.06	0.22	0.16	0.25	0.05	0.21	0.05	0.19	-0.16	0.22	0.03	0.19	0.03	0.17	-0.13	0.19	0.019	0.17
General Expense/Revenue	0.21	0.31	0.38	0.4	0.25	0.3	0.16	0.27	0.36	0.35	0.19	0.26	0.15	0.24	0.35	0.31	0.18	0.24	0.15	0.21	0.32	0.27	0.18	0.21
Capital Investment Ratio	-0.04	0.14	0.03	0.15	-0.002	0.14	-0.03	0.12	0.02	0.13	0.007	0.12	0.0008	0.11	0.03	0.12	0.04	0.11	0.02	0.1	0.05	0.11	0.06	0.1
Firm Age(Holding Company - Founded Date)	0.0001	0.0016			0.0001	0.001	0.0005	0.001			0.0005	0.001	0.0003	0.001			0.0003	0.001	0.00003	0.001			0.000006	0.001
Cash Flow(in billion \$)	-0.05	0.09	0.42**	0.21	-0.03	0.09	-0.04	0.08	0.26	0.16	-0.015	0.08	-0.03	0.07	0.26*	0.14	-0.008	0.07	-0.03	0.07	0.26*	0.14	-0.01	0.07
Debt Ratio(Total Debt/Total Asset)	-0.13	0.36	-0.06	0.39	-0.035	0.35	-0.13	0.3	-0.06	0.34	-0.046	0.3	-0.15	0.27	-0.08	0.31	-0.06	0.27	-0.13	0.25	-0.1	0.3	-0.04	0.25
Quarterly Market Stock Return	-0.16	1.09	-0.79	1.06	-0.24	1.06	-0.03	0.87	-0.42	0.85	-0.14	0.84	0.006	0.74	-0.25	0.7	-0.09	0.72	-0.2	0.67	-0.48	0.64	-0.28	0.65
(Constant)	-0.07	0.49	-1.18**	0.49	0.11	0.39	-0.04	0.43	-1.09**	0.44	0.16	0.34	-0.026	0.38	-0.97**	0.4	0.21	0.3	0.03	0.37	-0.85**	0.38	0.24	0.28
N	236		236		236		306		306		306		367		367		367		426		426		426	
Time Dummy	YES		NO		NO		YES		NO		NO		YES		NO		NO		YES		NO		NO	
F	1.00		4.14***				0.94		4.47***				0.91		4.97***				0.86		4.93***			
Wald $\chi^2$					11.44						10.38						10.84						10.22	
Hausman					$\chi^2 = 53.66$						$\chi^2 = 39.52$						$\chi^2 = 56.19$						$\chi^2 = 50.10$	
Adjusted R <sup>2</sup>	0.0003		0.15		0.05		-0.005		0.13		0.03		-0.007		0.12		0.03		-0.01		0.1		0.02	

\*p<.1, \*\*p<.05, \*\*\*p<.01

Dependent variable is described in decimal point

#### **5.4. Discussion**

Through the event study of daily abnormal stock returns, I find the significant positive returns after the transition is publicly announced. In addition, applying into three event study frameworks proposed by Brown and Warner (1985), I prove the consistency of the patterns of abnormal returns, suggesting that investor's perception is directly changed by the corporate event. In contrast, the effects on firm's profitability and growth are not proven to be significant by conducting the long-run panel data analysis. In sum, holding company governance mostly influences perception of shareholders and investors reflected in firm's market value through the public announcement, whereas it does not have a significant impact on firm's long-run performances.

From this contradiction between the effects on the short-run stock prices and the long-run performances, I suggest several implications. First, the operating holding companies such as Alphabet Inc. and Activision conducted their specific growth strategies prior to the transition. Therefore, founding holding companies in their corporate governance structures does not have an outstanding impact especially on revenue growth other than pre-existed business strategies. Second, the financial holding companies such as Sears Holdings and Citigroup have already had a similar form of corporate governance primarily controlled by shareholding structures. Therefore, adopting holding company system does not have any significant impact only to result in declaring their detailed corporate governance in public. Third, several investment businesses, such as Goldman Sachs and Morgan Stanley, are urged to convert to holding companies to receive financial support from the federal government during 2008 financial crisis. These firms can work as outliers with sharp decrease in firm's revenue before and after the transition, causing increase in variance of estimates among small number of samples.

Fourth, holding company transition in the United States is not an activity which creates any specific values that affects a firm's performances and growth potential, but only a means of stabilizing subsidiary management and ensuring transparent corporate

governance, thereby improving investors' perception on the firm's value. In other words, by improving corporate governance, holding company system is adopted to increase a firm's stock price by promoting the managerial efficiencies and enables investors to get an easier access to firm's performances and finances for their investment decisions. The system does not directly affect the firm's financial performances, but induces investors to expect the positive effects on managerial environment, and this effect on investors is described in the increase in the abnormal stock returns after the public announcement of holding company transition.

We can doubt the necessity of holding company system unless the holding company system has positive effects on performances. However, if the holding company transition significantly affects a firm's stock price, I conjecture that "short-termism" of investors causes the firms to have the holding company system. According to Lee (2016), the short-termism prevails under the shareholder capitalism: investors prefer short-run profits and dividends to the firm's long-run growth. Therefore, the short-termism makes investors to prioritize profit margin of stock price. In this sense, the U.S. firms suffering from stagnant stock prices or discount need to improve their reputations among investors, and the holding company system is one device to increase the investment value by ameliorating corporate governance. However, at the same time, the investment made after the holding company transition is not consistent, for investors take their money back after receiving short-term profit margin. For this reason, the holding company transitions of the U.S. companies increase stock prices in the short run, while it does not have an effect on the long-run performances. In addition, this phenomenon can be related to the inefficiencies of the U.S. stock market dealing with holding company system. Stock prices evaluate the future value of companies by considering its growth potentials and profitability. However, if the holding company system has the effects on the market values of the firms only in the short-run, it is plausible to argue that the stock market merely reflects the short-term values of the firms converting to the holding company system.

## **6. Conclusion**

This study analyzes the effects of holding company transition on market value, long-run profitability and growth of a firm. Due to its efficient internal capital market, transparent corporate governance, independence in activities of subsidiaries, and freedom from financial and legal liabilities of affiliates, holding company system has been regarded as a device for a diversifying firm to cope with investors' concerns on possible business failure and asymmetric information about management in detail. Furthermore, CEOs and firm owners, most of whom are major shareholders, can enhance their ownership, thereby easily defending against hostile takeovers, and actively implementing their corporate strategies. In this sense, holding company governance is an effective system for a firm, which conducts diversification strategy for the growth such as banking, IT, and automobile industries.

However, through the event study and the panel regression analyses, it turns out that the effect of holding company transition is not significant to the long-run financial performance of firms, but only significant to the short-run firm's market value measured by daily stock returns. In other words, holding company governance has the immediate impacts on investors' perception on firm's management after the public announcement of the event. In the view of firm's financial performance, foundation of holding company changes corporate governance structure, but it does not contribute significantly to firm's growth and increase in profitability. Considering the discrepancies of the effects of holding company transition in market values and performances of the firms, the results propose the inefficiencies of the U.S. stock market that it only reflects the short-run value of the firms converting to the holding company system.

Moreover, it needs more research for the analyses of the U.S. holding companies to be applied into other countries unless the same approach is conducted. Considering the case of Korea, Asian Institute of Corporate Governance (2010) exhibits the same results on stock prices as this paper, but the performance analysis is not conducted, but deals only with the effects on the financial status indices of Korean

holding companies, such as total asset and debt ratio. In addition, it is necessary to compare the economic conditions of the U.S. and Korea that lead a firm to decide to adopt the holding company system. While the U.S. firms prioritize the managerial efficiencies in considering the holding company transition, the Korean firms try to avoid the government interference by removing cross-subsidization through the holding company transition (Kwak, 2017). In this sense, this study offers an insight on further research that needs to clarify the impacts of holding company governance structure assorted by the differences between pure and operating holding companies and among various industries and countries.



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## 국 문 초 록

본 연구에서는 지주회사 전환이 미국 상장기업의 시장가치와 경영성과에 미치는 영향을 실증적으로 분석하였다. Brown and Warner (1985)가 제안한 세 가지 사건 연구 모델을 기반으로 일별 비정상 주가 수익률 (daily abnormal stock returns)을 측정하여 상장기업의 시장가치에 대한 지주회사 전환 공시 효과를 분석한 결과, 지주회사 전환 공시 직후 기업의 주가가 상승하였다. 이로 인해 기존 문헌에서 제기된 지주회사 체제의 경영 효율성에 대한 긍정적 효과가 주주 및 투자자들의 인식에 영향을 주어 기업의 시장가치에 반영됨을 알 수 있었다.

반면, 본 연구는 동 기업의 분기별 재무 데이터를 이용한 패널 분석에서 지주회사 전환이 가지는 총자산순이익률 (ROA), 자기자본이익률 (ROE), 총자산영업이익률 (turnover ratio), 매출성장률로 분석한 기업의 경영 성과와 성장 전망성에 대한 효과가 통계적으로 유의하지 않음을 보였다. 경영 성과에 대한 분석에서 본 연구는 지주회사 전환은 기업의 수익성과 성장성에 대해 특별한 부가가치 창출원이 아니며, 투자가치 제고를 통한 주가 상승 효과를 가짐을 제안하였다. 이에 더하여 기업의 미래 가치를 대표하는 주가의 성격을 고려할 때, 미국 상장기업의 지주회사 전환에 대하여 주식시장이 단기적인 시장 가치만을 반영한다는 점은 단기적 성과와 배당을 중시하는 주주 및 투자자의 단기주의(short-termism)에 기인한 주식시장의 비효율성을 대변한다고 할 수 있다.

**주제어:** 지주회사, 기업지배구조, 사건연구, 비정상수익률, 패널분석, 주가.

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