What Drives the Listing Effect in Acquirer Returns? Evidence from the Korean, Chinese, and Taiwanese Stock Markets[*]

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Abstract

Purpose – This study investigates whether a listing effect exists in cross-border M&As and whether the effect can be attributed to the uncertainty of the GDP growth rate in the target firm's home country. We apply a joint variable analysis using M&A announcement data from the Korea Exchange (KRX), Shanghai Stock Exchange (SSE), and the Taiwan Stock Exchange (TWSE) from 2004 to 2013. We also conduct an event study using the measure of the uncertainty of the GDP growth rate (based on IMF statistics) in 55 target countries.

Design/methodology – We measure the abnormal return (AR) using the market-adjusted model. We test the significance of the AR and the cumulative abnormal return (CAR) using a one-sample t-test. We examine the characteristics of the CARs depending on whether the target company is listed by applying a difference analysis using CAR as a test variable. In addition, we set CAR (-5, +5) as a dependent variable to identify the cause of the listing effect, and test both the financial characteristic variables of the acquirer and the collective characteristic variables of the merger as independent variables in the multiple regression analysis.

Findings – First, we find the listing effect of cross-border M&As in the KRX, SSE, and TWSE, which represent the capital markets in Korea, China, and Taiwan, respectively. This listing effect persists during the global financial crisis and has a negative effect on the wealth of acquiring shareholders, especially when the target countries are emerging markets. Second, greater uncertainty regarding the target countries' economic growth in cross-border M&As has a negative effect on the wealth of acquiring firms' shareholders. Third, our empirical analysis demonstrates that the listing effect is attributable to the fact that firms listed in a target country with greater uncertainty of economic growth are more directly and greatly exposed to uncertain capital markets through stock markets, than are unlisted firms.

Originality/value – This study is significant in that it presents a new strategic perspective in the study of cross-border M&As by demonstrating empirically that the listing effect is attributable to the uncertainty regarding the economic development of the target firms' home countries.

Keywords: China, Cross-border M&A, GDP Growth Uncertainty, Korea, Listing Effect, Taiwan
JEL Classifications: F14, G15, G34

1. Introduction

Cross-border M&As have been a tool for firms' globalization since the 1990s and play a critical role in foreign direct investment (FDI). Cross-border M&As are a means to secure excellent human resources and technologies as well as market dominance, which take

considerable time and money to obtain within a short period. These ultimately improve firms' management efficiency and global competitiveness (Aybar and Ficici, 2009). They are also a business strategy for survival in the era of globalization amid a rapidly transforming business environment. As cross-border M&As are a critical business strategy, a firm should decide to proceed only when the M&A outcomes align with the goal of increasing shareholders' wealth. However, empirical studies on the impact of the announcement of a cross-border M&A on shareholders' wealth depending on the group attributes of the mergers report mixed results. Moeller and Schlingemann (2005) report a "size effect", whereby small-sized firms gain positive abnormal returns (ARs) from the announcement of cross-border M&As, whereas big firms gain zero or negative AR. On the "diversification effect", the school of thought of increased value, mainly advocated by Lewellen (1971), and that of diminished value, mainly advocated by Levy and Sarnat (1970), present conflicting results regardless of whether the M&As are domestic or cross-border.

Among the group attributes of cross-border M&As, Faccio, McConnell and Stolin (2006) find a "listing effect[1]" in their study of 17 Western European countries regardless of time or nationality. Although they predict that this effect might be due to an economic phenomenon, they do not provide a definite answer as to its causes. Mateev (2017) also report that in the UK and European countries, which have the most active M&As in the world, European acquirers witness positive ARs from both domestic and cross-border acquisitions, but there are significant differences in the means of payment for acquisition and the listing of the target company. Karels, Lawrence and Yu (2011) examine the announcement effect of cross-border M&As between US and Indian firms and conclude that the acquiring firm gains insignificantly positive (+) ARs when the acquiring firm is a listed Indian firm and the target is a listed US firm, while the acquiring firm gains significantly positive (+) ARs when the target firm is a non-listed US firm. This result confirms the existence of the listing effect but does not reveal a clear reason.

Cross-border M&As are a universal tool for FDI (Liou, 2018), in which the target country's GDP affects the investment decision. Bevan and Estrin (2004), Franco and Gerussi (2013) and Resmini (2003) state that the target countries' GDP has a critical effect on decision making related to FDI, and Deichmann (2001) states that GDP is the best indicator of market growth when determining FDI. Additionally, Bekaert, Harvey and Lundblad (2005), Henry (2000), Kenny and Moss (1998), Levine (1997), Levin and Zervos (1998) and Rajan and Zingales (1998) report that economic development has a highly positive correlation with capital markets and Kinateder, Fabich and Wagner (2017) report that the wealth of the target firm's shareholders is positively related to the GDP growth rate in cross-border M&As. Hence, we exploit this intuition to investigate several hypotheses regarding economic volatility and the listing effect. We measure economic volatility in the target countries by dividing the covariance between the worldwide and the target country GDP growth rates by the variance of worldwide GDP growth rate for 10 years. We use a sample of 324 non-financial firms listed on the Korea Exchange (KRX), Shanghai Stock Exchange (SSE), and the Taiwan Stock Exchange (TWSE)[2] that announced (and completed) cross-border M&As between 2004 and 2013 in 55 target countries, and conduct an event study.

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[1] Faccio, McConnell and Stolin (2006) report a phenomenon in which acquirers achieve zero or negative CARs when acquiring listed targets and positive average CARs when acquiring unlisted targets in studies of M&As. Therefore, they refer to this listing factor as the "listing effect" in acquirers' announcement returns.

[2] We included only completed deals in the sample because—due to high uncertainty—many announced cross-border M&As are eventually cancelled.

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Our main results are as follows. First, we confirm the presence of a listing effect of cross-border M&As in the KRX, SSE, and TWSE, until recently. Second, greater uncertainty of economic growth in the target countries has a negative effect on the wealth of acquiring firms' shareholders in cross-border M&As. Third, we prove empirically that the listing effect in cross-border M&As is more prominent when the uncertainty of economic growth in the target countries is higher because listed firms are more directly and greatly exposed to uncertain capital markets through stock markets, than are unlisted firms.

The remainder of this paper is structured as follows. The next section introduces related prior studies and develops the hypotheses, and Section 3 presents the study methodologies and sample. Section 4 lays out the empirical analysis and the study's findings, and Section 5 sums up the study and presents the conclusions.

2. Preceding Studies and Hypothesis Development

2.1. Literature Review

Chang Sae-Young (1998) examines the listing effect of an M&A, in which the AR is either zero or negative if the target firms are listed and the AR is significantly positive when the target firms are not listed. Chang Sae-Young (1998) reports that the acquisition of unlisted firms leads to a positive AR, but even the acquisition of listed firms can lead to a positive AR for acquiring firms when the transaction is paid for in stock, which shows that the listing effect may differ depending on the payment method of the merger. Additionally, Fuller, Netter and Stegemoller (2002) argue that the acquisition of unlisted firms or affiliated firms results in a positive AR, and paying for the deal in stock—rather than cash—will lead to even greater profit due to the liquidity discount, tax effect, and control effect.

The listing effect is evident not only in cross-border M&As but also in domestic mergers. Conn et al. (2005) study the disclosure effect among British listed firms by distinguishing between domestic and cross-border M&As, and between listed and unlisted firms. They report that the announcement effect related to acquiring a listed firm has a significantly negative correlation with the AR in domestic M&As and is zero for cross-border M&As, while the announcement effect associated with acquiring an unlisted firm has a significantly positive correlation for both domestic and cross-border M&As. Mantecon (2009) examines 6,824 events involving 75 bidder countries and 128 target countries between 1985 and 2005 and finds that listed target firms have a significantly negative correlation with the acquirer's CAR, whereas unlisted target firms have a significantly positive correlation in both domestic and cross-border acquisitions. Chari, Ouimet and Tesar (2009) study multinational firms in industrialized economies between 1986 and 2006 and compare cases where they acquire firms in emerging and advanced markets. They find that the acquisition of unlisted target firms results in a significantly positive AR for the acquirers both in emerging and advanced markets. In short, the listing effect from the announcement of cross-border M&As occurs in both cross-border and domestic mergers, as well as in emerging and developed markets. The acquiring firms' shareholders obtain negative or almost zero gains if the target is a listed company, but obtain a significantly positive AR if the target is an unlisted company.

Faccio, McConnell and Stolin (2006) claim that the hypotheses on the listing effect in the studies by Chang Sae-Young (1998) and Fuller, Netter and Stegemoller (2002) fall short of fully explaining the cause of the listing effect. For 17 Western European countries from 1996 to 2001, Faccio, McConnell and Stolin (2006) include control variables such as payment method at the time of merger, the size of the target company, Tobin's Q, information leakage,

and block deal transactions in the ownership structure. Regardless of the controls, when firms acquire a non-listed company, they gain a significant positive (+) AR, but when firms acquire a listed company, the result is a zero or negative (-) AR. However, these studies argue only that the listing effect is due to economic phenomena of the target countries rather than the peculiar institutional or regulatory characteristics of the target countries—they do not reveal the direct cause.

2.2. Hypothesis Development

Previous studies analyzing the listing effect of cross-border M&As consider only the target country's GDP or GDP growth rate as a control variable, overlooking the uncertainty of the GDP growth rate as a cause variable. Hence, we measure the uncertainty of GDP growth rates in the target countries to explain the causes of the listing effect of cross-border M&As in terms of the uncertainty of economic growth in the target countries, which Faccio, McConnell and Stolin (2006) do not clearly explain. Building on these ideas, we measure the uncertainty of the target countries' economic growth via the GDP index of 189 countries published by the International Monetary Fund (IMF) over the 10 years prior to the acquiring firms' M&A announcement, as below.

i) $\text{TGDP}_{i,t} = \frac{(\text{GDP}_{i,t} - \text{GDP}_{i,t-1})}{\text{GDP}_{i,t-1}}$

ii) $\text{WGDP}_{w,t} = \frac{(\text{GDP}_{w,t} - \text{GDP}_{w,t-1})}{\text{GDP}_{w,t-1}}$

iii) $\sigma^2_{\Pi_{WGDP_w}} = \frac{1}{(T-1)} \sum_{t=1}^{T} [\Pi_{WGDP_{w,t}} - \overline{\Pi_{WGDP_w}}]^2$

iv) $\text{Cov}(\Pi_{TGDP_i}, \Pi_{WGDP_w})$
$= \frac{1}{(T-1)} \sum_{t=1}^{T} [(\Pi_{TGDP_{i,t}} - \overline{\Pi_{TGDP_i}}) \times (\Pi_{WGDP_{w,t}} - \overline{\Pi_{WGDP_w}})]$

v) Target country's GDP growth uncertainty $= \frac{Cov(\Pi_{TGDP_i}, \Pi_{WGDP_w})}{\sigma^2_{\Pi_{WGDP_w}}}$, (1)

where (t= -10, -9, -8, -7, -6, -5, -4, -3, -2, -1),

$\text{TGDP}_{i,t}$: target country i's GDP growth rate for the year t immediately prior to the announcement,

$\text{WGDP}_{w,t}$: worldwide average GDP growth rate of 189 countries for the year t immediately prior to the announcement,

$\sigma^2_{\Pi_{WGDP_w}}$: variance of GDP of 189 countries for the 10 years from the year immediately prior to the announcement,

$\text{Cov}(\Pi_{TGDP_i}, \Pi_{WGDP_w})$: covariance between target country i's GDP growth rates and the GDP growth rates of 189 countries for the 10 years from the year immediately prior to the announcement,

Π_{TGDP_i} : average GDP growth rate of target country i for the 10 years from the year immediately prior to the announcement,

Π_{WGDP_w} : average GDP growth rate of the 189 countries for the 10 years from the year immediately preceding announcements, and

Target country's GDP growth uncertainty: target country i's volatility of GDP growth rate.

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When the uncertainty of a target country's GDP calculated as above is high, it suggests that there is high uncertainty regarding the target country's economic growth. Listed firms in a target country with high uncertainty of economic growth are more likely to be greatly exposed to uncertain capital markets through stock markets in light of the findings by Levine and Zervos (1998), who suggest that economic growth has a highly positive correlation with stock markets. Therefore, we expect that firms in countries with high GDP volatility will display a negative listing effect in cross-border M&As. We thus propose the following hypotheses.

> H1: *In the capital markets of Korea, China, and Taiwan, there is a listing effect of cross-border M&As.*
> H2: *Cross-border M&As involving a target firm listed in a country with great uncertainty of economic growth, listed during the financial crisis, or listed in an emerging market, will have a negative effect on the wealth of acquiring firms' shareholders.*

3. Study Methods and Sample

3.1. Study Methods

3.1.1. Calculation of AR

We choose the market-adjusted model over the market model to calculate AR, to minimize the bias in estimating parameters (Bouwman, Fuller and Nain, 2009; Brown and Warner, 1985). Bouwman, Fuller and Nain (2009) recommend the market-adjusted model for event studies for M&As because firms that disclose multiple M&As may experience a bias in estimation results, as the parameter estimation period includes more than one M&A announcement for the market model, resulting in a biased estimator.

$$AR_{i,t} = R_{i,t} - R_{m,t} \tag{2}$$

where

$AR_{i,t}$: AR of individual stock i on day t,
$R_{i,t}$: actual returns of individual stock i on day t, and
$R_{m,t}$: market index returns on day t

For the market returns in the market-adjusted model, we use index returns from the Korea Composite Stock Price Index (KOSPI) for Korea, the Shanghai Stock Exchange Composite Index (SSEC) for China, and the Taiwan Weighted Average Stock Index (TAIEX) for Taiwan. Per CAR, we sum up the ARs throughout the event period. As this study focuses on market reactions to the announcement of cross-border M&As, we use the M&A announcement date as the baseline date to calculate the ARs.

3.1.2. Difference Test on CARs Depending on Whether Target Firms Are Listed

In order to verify how CAR changes depending on whether the target firms are listed, this study performs a difference analysis with a t-test on independent samples where the group variable is whether target firms are listed, and the test variable is CAR. Per classification of the group variable, if Target Public Status from the SDC Platinum Database is marked as Public, the variable is classified as "Listed Targets", and otherwise as "Unlisted Targets." The test statistics for the t-test are as follows.

$$\text{Test statistics on testing difference} = \frac{\overline{CAR_{(t-n,tn),n_1}} - \overline{CAR_{(t-n,tn),n_2}}}{\sqrt{\frac{S_p^2}{n_1} + \frac{S_p^2}{n_1}}}, \tag{3}$$

where,

$S_p^2 = \frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}$,

n_1: number of firms that acquired listed firms,

n_2: number of firms that acquired non-listed firms,

S_1^2: the variance of the aggregated CARs across firms that acquired listed firms, and

S_2^2: the variance of the aggregated CARs across firms that acquired non-listed firms.

3.1.3. Multiple Regression Analysis of Market Reactions

To verify the listing effect of cross-border M&As and attribute it to the uncertainty of the target countries' economic growth, we use 324 events involving non-financial institutions and 55 target countries where the firms announced cross-border M&As in the KRX, SSE, and TWSE between 2004 and 2013 as a sample, and perform a multiple regression analysis. The dependent variable is CAR (-5, 5), calculated by summing the ARs throughout the event period using the market-adjusted model.

The independent variables are the *listed target dummy*, *listed target emerging dummy*, and *listed target 2008crisis dummy*, and the control variables are the *target country's GDP growth uncertainty*, *size of the target country's GDP*, *target country's FDI amount*, *cultural index of the target country*, and *financial characteristics of the acquiring firms*. In addition, we determine the cause of the listing effect from the uncertainty of GDP growth in the target company's country by conducting a multiple regression analysis with a cross-term of the *dummy variable reflecting whether the target firms are listed* and a variable for the *target countries' GDP growth rate uncertainty* as an explanatory variable.

Model 1 is a multiple regression model designed to verify the listing effect of cross-border M&As in the KRX, SSE, and TWSE.

Model 1

$$CAR_i = \alpha_i + \beta_1 \textit{Listed target dummy} + \beta_2 \textit{Target listed in emerging dummy}$$
$$+ \beta_3 \textit{Target listed during 2008crisis dummy}$$
$$+ \beta_4 \textit{Target GDP growth uncertainty} + \beta_5 \textit{GDP of a target country}$$
$$+ \beta_6 \textit{FDI of a target country} + \beta_7 \textit{Culture index of a target country}$$
$$+ \sum_{j=1}^{5} \beta_j \textit{Control variables of acquiring firms} + \varepsilon_i, \tag{4}$$

Model 2 is a multiple regression model designed to determine the cause of the listing effect from the uncertainty of GDP growth of the target country, with the cross-term of the *dummy variable reflecting whether target firms are listed* and *target countries' GDP growth rate uncertainty* as an explanatory variable.

Model 2

$$CAR_i = \alpha_i + \beta_1 \textit{Listed target dummy} \times \textit{Target GDP growth uncertainty}$$
$$+ \beta_2 \textit{Target listed in emerging dummy} \times \textit{Target GDP growth uncertainty}$$

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$+\beta_3$ *Target listed during 2008crisis dummy* $\times$ *Target GDP growth uncertainty*

$+\beta_4$ *Listed target dummy* $+\beta_5$ *Target listed in emerging dummy*

$+\beta_6$ *Target listed during 2008crisis dummy*

$+\beta_7$ *Target GDP growth uncertainty* $+\beta_8$ *GDP of a target country*

$+\beta_9$ *FDI of a target country* $+\beta_{10}$ *Culture index of a target country*

$+\sum_{j=1}^{5} \beta_j$ *Control variables of acquiring firm* $+\varepsilon_i$, $\qquad$ (5)

We define the independent variables in the regression models below.

- **Listed target dummy**: equals 1 if the Target Public Status (an item from the SDC Platinum database) is "public", and 0 otherwise.
- **Target listed in emerging dummy**: equals 1 if the target company is a listed company in a country that is not a G7 country, and 0 otherwise.
- **Target listed during 2008crisis dummy**: equals 1 if a firm acquired a listed company during the 2008 global financial crisis, and 0 otherwise.
- **Target GDP growth uncertainty**: described in Section 2.2 in detail.
- **GDP of a target country:** the natural logarithm of the target country's GDP for the year prior to the M&A announcement.
- **FDI of a target country:** the sum of FDI inflows and FDI outflows divided by the GDP of the target country for the year prior to the M&A announcement.
- **Culture index a target country**: Hofstede's cultural dimensions score.
- **Market value of acquiring firm:** the natural logarithm of the total market capitalization for common stocks (unit: US $1,000) at the end of the year immediately prior to the announcement of cross-border M&As.
- **Leverage of acquiring firm:** the ratio of the total debt divided by the total assets of the year-end balance sheet for the year immediately prior to the M&A.
- **Gross Margin of acquiring firm:** the ratio of the total margin divided by total revenues multiplied by 100.
- **ROA of acquiring firm:** the ratio of net income divided by total assets on the year-end balance sheet for the year immediately prior to the M&A announcement.
- **Tobin's Q of acquiring firm:** the ratio of the sum of the total market capitalization of common stocks and the debt divided by total assets.

3.2. Sample

We select the sample from the data provided by the SDC Platinum Database for non-financial companies that disclosed and completed cross-border M&As in the KRX, SSE, and TWSE, which represent the capital markets in Korea, China, and Taiwan, respectively, between 2004 and 2013. Table 1 shows the sampling process. For stock price and financial data, we collect data from FactSet Research Systems[3].

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[3] FactSet Research Systems is a professional financial data software company that provides analysts at financial institutions and investment bankers with financial data and corporate financial information.

Table 1. Sample Selection Process

Selection Criteria	Observation			
	Korea	China	Taiwan	Total
Cross-border M&A events between 2004 and 2013 from the SDC Platinum Database	1,015	2,159	553	3,727
LESS:				
- Acquiring firms are not listed	(400)	(1,429)	(207)	(2,036)
- M&As were disclosed but did not take effect	(266)	(366)	(179)	(811)
- Acquiring firms are financial institutions	(20)	(61)	(6)	(87)
- Target firms are financial institutions	(12)	(36)	(3)	(51)
- The ticker symbol for the event cannot be verified	(98)	(193)	(6)	(297)
- Sample observation from SDC Platinum Database	219	74	152	445
- Stock price and financial data are not available for the event	(39)	(24)	(58)	(121)
- Final sample observation	180	50	94	324

Panel A in Table 2 shows the acquiring countries by year. The number of cross-border M&A events increased annually between 2004 and 2013 for the KRX, SSE, and TWSE, with 180 cases, 50 cases, and 94 cases, respectively. Panel B represents target firms by country. In the sample, 56 target firms are from the US, 55 from China, and 23 from Australia. As for listing country, 11 target firms are listed in Australia (18.03%), 8 in Canada (13.11%), and 6 in the US (9.84%).

Table 2. Acquiring Countries by Year and Target Firms by Country

Panel A. Distribution of Acquiring Countries by Year

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Korea (n=180)	7	13	13	9	22	16	27	32	25	16
China (n=50)	5	1	1	4	6	10	7	7	3	6
Taiwan (n=94)	10	7	9	10	7	16	12	6	9	8
Total (n=324)	22	21	23	23	35	42	46	45	37	30

Panel B. Distribution of Target Firms by Country

	N	Listed	Listed portion
United States	56	6	9.84%
China	55	3	4.92%
Australia	23	11	18.03%
Japan	20	3	4.92%
Germany	18	2	3.28%
United Kingdom	13	0	0.00%

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Table 2. (Continued)

Panel B. Distribution of Target Firms by Country

	N	Listed	Listed portion
Canada	12	8	13.11%
Indonesia	11	1	1.64%
India	10	4	6.56%
Brazil	9	2	3.28%
Singapore	8	1	1.64%
Vietnam	8	3	4.92%
France	7	0	0.00%
Hong Kong	7	1	1.64%
Czech Republic	6	0	0.00%
Netherlands	4	2	3.28%
Philippines	4	3	4.92%
Russian Fed	4	1	1.64%
Chile	3	0	0.00%
Italy	3	0	0.00%
Malaysia	3	1	1.64%
Hungary	2	1	1.64%
Israel	2	1	1.64%
Norway	2	1	1.64%
Poland	2	0	0.00%
Slovak Rep	2	0	0.00%
Sweden	2	0	0.00%
Denmark	1	1	1.64%
Finland	1	1	1.64%
Kazakhstan	1	1	1.64%
South Korea	1	1	1.64%
Taiwan	1	1	1.64%
Thailand	1	1	1.64%
Other	22	0	0.01%
Sample of total	324	61	100.00%

Table 3 reports the results of the one-sample t-test to see if there is a significant difference between 0 and the observed values of AR calculated using the market-adjusted model based on the announcement date for the 324 events, as well as for CAR calculated by summing the AR values throughout the event period. The results of the one-sample t-test on AR are 0.34% for day -1, 0.36% on day 0, and 0.39% for day +1, which are all significant. The CAR values are significant and positive, ranging from 0.98% to 1.80% in the results of the one-sample t-test of $CAR_{(t_{-n}, t_n)} = \sum_{t=t_{-n}}^{t_n} AR_t$ (t_{-n}: -1, t_n: 1,2,3,4,5,10), (t_{-n}: -5, t_n: 1,2,3,4,5). These findings suggest that cross-border M&As in the KRX, SSE, and TWSE increase the wealth of acquiring firms' shareholders, and therefore, are in line with findings by Chair, Ouimet and Tesar (2009), Francis, Hasan and Sun (2008), Goergen and Renneboog (2004) and Mantecon (2009).

Table 3. Acquiring Firms' AR and CAR Based on the Disclosure of Cross-Border M&As

Event days	Mean	t-value	Event window	Mean	t-value
-5AR	-0.099	-0.662	CAR(-1,1)	1.105	3.814***
-4AR	0.285	2.208**	CAR(-1,2)	1.107	3.444***
-3AR	0.272	1.794*	CAR(-1,3)	1.168	3.500***
-2AR	0.175	1.084	CAR(-1,4)	0.989	2.859***
-1AR	0.344	2.241**	CAR(-1,5)	1.038	2.767***
0AR	0.368	2.232**	CAR(-5,1)	1.738	4.147***
1AR	0.393	2.680***	CAR(-5,2)	1.741	3.972***
2AR	0.003	0.019	CAR(-5,3)	1.801	4.136***
3AR	0.060	0.428	CAR(-5,4)	1.622	3.800***
4AR	-0.179	-1.217	CAR(-5,5)	1.671	3.805***
5AR	0.048	0.330	CAR(-1,10)	1.033	2.198**

Notes: 1. 324 cross-border M&A events in the KRX, SSE, and TWSE between 2004 and 2013.
     2. We provide heteroskedasticity-robust t-statistics.
     3. *$p<0.1$,**$p<0.05$,***$p<0.01$.

3.3. Descriptive Statistics of the Variables

Table 4 reports the descriptive statistics for the dependent and independent variables for the final sample of 324 cases. The mean value of the dependent variable CAR (-5, 5), calculated by summing the AR throughout the event period using the market-adjusted model, is 1.67, and the median is 0.62. The mean market value, which is the natural logarithm of the total market capitalization for common stocks (unit: US$1,000) at the end of the year immediately before the disclosure of cross-border M&A, is 14.68, and the median is 14.86. The mean firm value (Tobin's Q), which is the sum of the total year-end market capitalization of common stocks (unit: US$1,000) for the year immediately prior to the disclosure of cross-border M&As and the total debt on the year-end balance sheet (unit: US$1,000) divided by the total asset on the year-end balance sheet, is greater than 1 for both the mean and median, which suffices as an incentive for new facility investments. Lastly, the mean and median for the target countries' GDP growth rate uncertainty (*Target GDP growth uncertainty*), which is calculated by dividing the covariance of the worldwide GDP growth rate and the target countries' GDP growth rate by the variance of the worldwide GDP growth rate via the GDP index published by the IMF on 189 countries for the past 10 years, are 0.83 and 0.80, respectively, both smaller than 1. However, the value for the third quartile is greater than 1 at 1.04.

Table 4. Descriptive Statistics

Variables	Mean	Median	Standard deviation	First quartile	Third quartile	Sample size
CAR (-5,5) of acquiring firm	1.664	0.540	7.914	-2.750	5.911	324
Target GDP growth uncertainty	0.839	0.810	0.479	0.530	1.050	324
GDP of a target country	28.024	28.302	2.238	27.014	29.261	324

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Table 4. (Continued)

Variables	Mean	Median	Standard deviation	First quartile	Third quartile	Sample size
FDI of a target country	0.389	0.398	0.056	0.373	0.415	324
Culture index of a target country	4.788	5.416	1.730	5.298	5.476	324
Market value of acquiring firm	14.692	14.860	2.140	13.190	16.180	324
Leverage of acquiring firm	47.249	48.978	18.391	32.283	60.755	324
Gross margin of acquiring firm	21.919	17.506	15.699	10.416	29.908	324
ROA of acquiring firm	10.835	11.960	16.000	5.009	18.449	324
Tobin's Q of acquiring firm	1.538	1.233	1.006	0.954	1.638	324

4. Empirical Analysis Results

4.1. Difference Analysis of CARs Depending on Target Firms' Listing Status

Table 5 represents the results of the t-test of the difference analysis of the independent samples, where the group variable is whether the target firms are listed and the test variable is CAR, to examine how CAR changes depending on whether the target firms are listed. For all the $CAR_{(t_{-n},t_n)} = \sum_{t=t_{-n}}^{t_n} AR_t$ (t_{-n}-1 t_n: 1,2,3,4,5,10), (t_{-n}-5 t_n: 1,2,3,4,5) test variables, the group variable of "Listed Targets" displays a mixed result of insignificantly positive and negative correlations, whereas the group variable of "Unlisted Targets" consistently displays a significantly positive result. The difference analysis results for the group variables $CAR_{(t_{-n},t_n)} = \sum_{t=t_{-n}}^{t_n} AR_t$ (t_{-n}-1 t_n: 4,5,10), (t_{-n}-5 t_n: 1,2,3,4,5) consistently display significantly different reactions where the group variable "*Unlisted Targets*" registers a greater AR. This result indicates that the announcement of cross-border M&As in the KRX, SSE, and TWSE has a positive effect on the wealth of acquiring firms' shareholders when the target firms are not listed.

Table 5. Testing for Difference on CAR Depending on Whether Target Firms are Listed

Variables	Listed Targets		Unlisted Targets		Difference	
	Mean (A)	t-value	Mean (B)	t-value	Difference (A) - (B)	t-value
CAR (-1,1) of acquiring firm	0.269	0.353	1.295	4.176***	-1.026	-1.248
CAR (-1,2) of acquiring firm	0.147	0.164	1.326	3.926***	-1.179	-1.233
CAR (-1,3) of acquiring firm	0.416	0.442	1.339	3.829***	-0.923	-0.921

Table 5. (Continued)

Variables	Listed Targets		Unlisted Targets		Difference	
	Mean (A)	t-value	Mean (B)	t-value	Difference (A) - (B)	t-value
CAR (-1,4) of acquiring firm	-0.343	-0.348	1.292	3.598***	-1.635	-1.842*
CAR (-1,5) of acquiring firm	-0.430	-0.424	1.371	3.461***	-1.802	-1.874*
CAR (-5,1) of acquiring firm	-0.485	-0.462	2.243	4.977***	-2.729	-2.551**
CAR (-5,2) of acquiring firm	-0.607	-0.520	2.274	4.916***	-2.881	-2.576***
CAR (-5,3) of acquiring firm	-0.338	-0.273	2.287	5.084***	-2.626	-2.359**
CAR (-5,4) of acquiring firm	-1.097	-0.870	2.240	5.197***	-3.337	-3.076***
CAR (-5,5) of acquiring firm	-1.184	-0.924	2.320	5.211***	-3.504	-3.142***
CAR (-1,10) of acquiring firm	-0.571	-0.473	1.361	2.795***	-1.932	-1.649*

Note: *$p<0.1$, **$p<0.05$, ***$p<0.01$.

4.2. Multiple Regression Analysis of the Listing Effect of Cross-Border M&As

Table 6 presents the results of the multiple regression analysis using Model 1 to verify the listing effect of cross-border M&As in the KRX, SSE, and TWSE. In columns (1) and (2), the independent variables *Listed target dummy* and *Target listed in emerging dummy* show a significant negative (-) market response, and in column (3), the independent variable *Target listed during 2008crisis dummy* shows an insignificant negative (-) market reaction. This market reaction means that the listing effect exists in Korea, China and Taiwan. In addition, in all columns (1), (2), and (3), the control variable *Target GDP growth uncertainty* shows a positively significant negative market response. Thus, the economic uncertainty of the target firm's country has a negative impact on the wealth of the acquirer's shareholders. In addition, the control variable for the market value of the acquiring firm shows a significant negative (-) market response in all columns (1), (2), and (3), indicating a size effect. The results of this empirical analysis positively support *Hypothesis 1* that the listing effect of cross-border M&As appears in the capital markets of Korea, China and Taiwan, and that when companies listed in emerging markets are acquired, the listing effect is stronger.

Table 6. Market Reactions to the Listing Effect of Cross-Border M&As

Variables	<Model 1>		
	(1)	(2)	(3)
Listed target dummy	-3.846*** (-3.411)		
Target listed in emerging dummy		-5.194*** (-3.681)	
Target listed during 2008 crisis dummy			-5.122 (-1.487)

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Table 6. (Continued)

Variables	<Model 1>		
	(1)	(2)	(3)
Target GDP growth uncertainty	-2.539***	-2.596***	-2.315**
	(-2.699)	(-2.765)	(-2.402)
GDP of a target country	0.042	-0.095	0.075
	(0.154)	(-0.341)	(0.267)
FDI of a target country	4.539	3.375	2.297
	(0.433)	(0.324)	(0.216)
Culture index of a target country	-0.201	-0.035	-0.085
	(-0.759)	(-0.133)	(-0.316)
Market value of acquiring firm	-0.698***	-0.699***	-0.702***
	(-3.092)	(-3.110)	(-3.066)
Leverage of acquiring firm	0.002	0.006	0.006
	(0.066)	(0.228)	(0.191)
Gross margin of acquiring firm	0.025	0.021	0.011
	(0.690)	(0.578)	(0.309)
ROA of acquiring firm	-0.017	-0.015	-0.018
	(-0.579)	(-0.490)	(-0.603)
Tobin's Q of acquiring firm	-0.046	0.014	0.164
	(-0.091)	(0.028)	(0.317)
Year dummy effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Sample size	324	324	324
F-value	2.746	2.860	2.186
Adj.R^2	0.093	0.099	0.065

Notes: 1. We report heteroskedasticity-robust t-values in parentheses.

2. *$p<0.1$, **$p<0.05$, ***$p<0.01$.

Table 7 represents the results of the multiple regression analysis using Model 2 to attribute the listing effect of cross-border M&As to the uncertainty of target countries' economic growth. In Model 2, we interact the independent variables *Listed target dummy*, *Target listed in emerging dummy*, and *target listed during 2008crisis dummy* with the variable *Target GDP growth uncertainty* and input the cross-terms as explanatory variables. Column (1) reports the result for the cross-term *Listed target dummy×Target GDP growth uncertainty*, which shows a significant negative (-) market response. We can interpret this result to mean that the acquisition of a listed company in a country with high uncertainty in its GDP growth rate negatively affects the wealth of the acquiring shareholders. In other words, companies listed in countries with high uncertainty in GDP growth will negatively affect the wealth of shareholders of acquiring companies because listed companies are more directly exposed to uncertain capital markets than are non-listed companies through the stock market, supporting *Hypothesis 2*. Column (2) is the result for the cross-term *Target listed in emerging dummy×Target GDP growth uncertainty*, which also shows a significant negative market

response. When acquiring companies listed in emerging capital markets, the higher the uncertainty in the target country's GDP growth rate, the more negatively it will affect the wealth of the acquirer's shareholders, thus lending stronger support to *Hypothesis 2*. In addition, in column (3), the *Target listed during 2008crisis dummy×Target GDP growth uncertainty* variable shows a significant negative (-) market response, implying the listing effect appeared even during the global financial crisis, and the cause is the GDP growth rate of the target country. In sum, the listing effect negatively affects the wealth of the acquirer's shareholders because companies listed in countries with high uncertainty in the GDP growth rate are more directly exposed to the uncertain capital markets through the stock market. This empirically proves that the uncertainty of the GDP growth rate of the target country is the cause of the listing effect, which has not yet been clearly explained in prior studies of cross-border M&As.

Table 7. Listing Effect of Cross-Border M&As   and the Target Country's GDP Growth Uncertainty

Variables	<Model 2>		
	(1)	(2)	(3)
Listed target dummy×Target GDP growth uncertainty	-2.135** (-2.474)		
Target listed in emerging dummy×Target GDP growth uncertainty		-1.380* (-1.931)	
Target listed during 2008crisis dummy× Target GDP growth uncertainty			-4.147*** (-3.113)
Listed target dummy	-2.287** (-2.084)		
Target listed in emerging dummy		-4.780*** (-3.231)	
Target listed during 2008crisis dummy			-3.036 (-0.877)
Target GDP growth uncertainty	-2.184** (-2.131)	-2.480*** (-2.619)	-1.917** (-1.999)
GDP of a target country	0.047 (0.171)	-0.110 (-0.395)	0.019 (0.070)
FDI of a target country	4.523 (0.432)	3.887 (0.373)	4.472 (0.426)
Culture index of a target country	-0.209 (-0.787)	-0.061 (-0.231)	-0.186 (-0.702)
Control variables of acquiring firm	included	included	included
Year dummy effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Sample size	324	324	324
F-value	2.845	2.759	2.621
Adj.R^2	0.109	0.098	0.091

Notes: 1. We report heteroskedasticity-robust t-values in parentheses.
2. $*p<0.1$, $**p<0.05$, $***p<0.01$.

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Table 8 shows the results of a logistic regression analysis to verify the robustness of the results, considering the heteroscedasticity when performing regression analysis using ARs (Harrington and Shrider, 2007). Column (1) shows that the lower the CAR of the acquiring firms, the higher the target GDP growth uncertainty, and that the smaller the GDP of the target country, the higher the likelihood of the target company being a listed company. Column (2) shows that the lower the CAR of acquiring firms, the higher the target GDP growth uncertainty, and that the smaller the GDP of the acquirer country, the higher the likelihood that the target firm is a listed company in an emerging capital market. Column (3) confirms that the listing effect also existed during the 2008 financial crisis. These research results are consistent with the results reported in Tables 6 and 7. In addition, the fitness test of the logistic regression model and the Hosmer and Lemeshow test have statistically significant values.

Table 8. Robustness Test Using Logistic Regression Analysis

Variables	(1) Listed target dummy	(2) Target listed in emerging markets	(3) Target listed during 2008crisis
CAR(-5, 5) of acquiring firm	-0.066*** (9.326)	-0.093*** (9.477)	-0.099* (2.973)
Target GDP growth uncertainty	1.173*** (9.367)	1.664*** (11.552)	3.569** (5.069)
GDP of a target country	-0.195** (3.992)	-0.840*** (19.388)	-0.507* (3.304)
FDI of a target country	4.670 (1.320)	5.188 (1.357)	16.095 (0.823)
Culture index a target country	-0.148* (3.512)	0.247* (3.623)	0.075 (0.093)
Control variables of acquiring firm	included	included	included
Year dummy effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Sample size	324	324	324
-2 Log L	280.65	174.85	37.32
χ^2	32.37 (0.000)	55.07 (0.000)	22.26 (0.075)
Hosmer and Lemeshow Test			
χ^2	6.222 (0.622)	5.891 (0.659)	10.29 (0.245)

Notes: 1. We report heteroskedasticity-robust Wald-values in parentheses.
2. $*p<0.1$, $**p<0.05$, $***p<0.01$.

5. Conclusion

This study investigates the listing effect of cross-border M&As in terms of the uncertainty of the target country's GDP growth rate. We use a sample of 324 non-financial firms listed in the KRX, SSE, and TWSE that announced and completed cross-border M&As between 2004 and 2013 in 55 target countries using an event study. We confirm the negative ARs on the

wealth of the acquiring company's shareholders when acquiring a listed company in a cross-border M&A. The main empirical analysis results of this study are as follows.

First, the listing effect of cross-border M&As in Korea, China, and Taiwan occurred until recently. When the target company is listed in an emerging capital market, it has a greater negative impact on the wealth of the acquiring company's shareholders. Second, we find that the higher the uncertainty of the target country's GDP growth rate, the more negatively it affects the wealth of the acquirer's shareholders, and that a size effect also appears in cross-border M&As. Third, the listing effect in cross-border M&As is due to the target country's GDP growth uncertainty. We suggest that the higher the uncertainty in the GDP growth rate, the more directly exposed the companies are to the capital market (through the stock market) compared to non-listed companies. In addition, the uncertainty in the GDP growth rate of the target country can explain the listing effects of cross-border M&As when acquiring listed companies in emerging markets and during the 2008 global financial crisis.

The results have great significance in that they present a new perspective in the study of cross-border M&As by demonstrating that the listing effect is caused by the uncertainty of the GDP growth rate of the target country through empirical analysis. Faccio, McConnell and Stolin (2006) failed to show the causes, even though they predict that the listing effect may be due to economic phenomena rather than the institutional or regulatory characteristics of the target country. Recent research demonstrates that management performance improves after cross-border M&As (Lane, Koka and Pathak, 2006; Park and Roh, 2018, etc.), while other results seem to indicate poor management performance (Stahl and Voigt, 2008; Zhu, Xia and Makino, 2015, etc.) in the long-term prospects. Accordingly, we aim to investigate the long-term effect of the listing effects of cross-border M&As on management performance in a future study.

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