

GOVERNANCE, CROSS-BORDER MERGERS AND STOCK RETURN CO-MOVEMENT⁺

Haksoon Kim*, Sang Koo Kang[†]

Abstract

Two hypotheses are examined in support of Starks and Wei (2004) and Bris and Cabolis (2005) using cross-country¹ individual stock's R-squared and cross-border mergers. Consistent with Starks and Wei (2004) or Bris and Cabolis (2005), there is a negative relationship between target firm's R-squared and corporate governance group after controlling for macroeconomic variables, which implies that the effect of corporate governance on target firm's stock return co-movement is stronger than that on acquirer firm's counterpart.

JEL classification: F21; F23; F31; G14; G15; K22; K33; K42;

Keywords: corporate governance, corporate transparency, cross-border mergers, market model regression, R-squared.

1. INTRODUCTION

The importance of measuring corporate governance and transparency across countries has been widely discussed in the finance and accounting literature (La Porta et al., 1998; La Porta et al. 2002; Bushman, Piotroski and Smith, 2004). Also, the relationship among corporate governance, transparency and R-squared measure or the interpretation of R-squared measure itself has been discussed in the finance literature (Roll, 1998; Morck, Yeung and Yu, 2000; Jin and Myers, 2006; Kim, 2006). Recently, related literature on the cross-border mergers documents the relationship between the firm valuation and corporate governance. Since cross-border mergers can happen between firms in different countries, legal systems and levels of financial development, cross-border mergers are an ideal setting to analyze the valuation effects of changes in investor protection and corporate governance in general (the deterioration or improvement of investor protection) (Starks and Wei, 2004; Bris and Cabolis, 2005). Even though we are not sure whether R-squared is directly related to the valuation of the firm, we can examine the R-squared in the cross-border merger setting and its relationship with corporate governance and corporate transparency because R-squared comes from the market model regression, which is the valuation model, and it is proven to be related to corporate governance and transparency variables related literature (Roll, 1998; Morck, Yeung and Yu, 2000; Jin and Myers, 2006; Kim, 2006). So, we examine the relationship between R-squared, corporate governance and corporate transparency by looking at the cross-border mergers among different countries with different corporate governance and transparency level. If the arguments of Jin and Myers (2006) and Kim (2006) are correct, they should have consistent negative relationship. In support of Jin and Myers (2006) and Kim (2006), we set up following hypotheses. Hypothesis 1: There is a negative relationship between the R-

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* Corresponding author: Haksoon Kim, Department of Accounting, Finance and Law, Sorrell College of Business, Troy University Montgomery Campus, 136 Catoma Street, 2nd Floor, Montgomery, AL 36103, Tel: 1-334-832-7285, Fax: 1-334-241-9734 E-mail: hkim11@troy.edu

[†] Co-author: Sang Koo Kang, Department of Finance, Korea University Business School, Anam-dong, Seongbuk-gu, Seoul 136-701 KOREA, Tel: 82-10-9070-4409, E-mail: fenrir409@yahoo.co.kr

¹ Cross-country individual stock's R-squared means individual stock's R-squared is calculated from the market model regression using each country's market return and US market return.

squared and corporate governance or transparency both for acquirers and targets in the cross-border merger after controlling for macroeconomic variables. Hypothesis 2: The negative relationship should be stronger for target firms than that for acquiring firms after we control for the macroeconomic variables.

2. DATA AND VARIABLE CONSTRUCTION

Following Kim (2006) and Jin and Myers (2006), the stock return data and the rate of change in the exchange rate per U.S. dollar are from Datastream International. The sample period is from 1990 to 2004. The following market model type regression is used as in Morck, Yeung and Yu (2000) to calculate R-squared.²

$$r_{it} = \alpha_i + \beta_{1,i}r_{m,jt} + \beta_{2,i}[r_{US,t} + e_{jt}] + \varepsilon_{it} \quad \dots (1)$$

, where i is a firm index, j a country market index, t an annual time index, $r_{m,jt}$ a domestic market index, and $r_{US,t}$ the U.S. market return. The rate of change in the exchange rate per U.S. dollar is e_{jt} . The differences between Kim (2006) and Morck, Yeung and Yu (2000) are that Kim (2006) uses non-overlapping, annually-compounded returns from daily total returns to calculate R-squared instead of bi-weekly returns, uses the five percent critical value of R-squared distribution to adjust for the effect of extreme observations instead of R-squared greater than 0.25.³ Logistic transformations are applied to R-squared as in Morck, Yeung and Yu (2000) according to the following procedure.⁴

$$L_{ij} = \log\left(\frac{R_{ij}^2}{1 - R_{ij}^2}\right) \quad \dots (2)$$

, where R_{ij}^2 is the R-squared from the regression equation (1) for firm i and country j . The same corporate governance, transparency and control variables are used as in Kim (2006) for the grouping in the empirical analysis. Following the Pearson correlation approach, Kim (2006) extracts two corporate governance and transparency variables which have the least correlation with each other. Corporate governance variables used in Kim (2006) are *antidirector* and *accounting standard* from La Porta et al. (1998). Corporate transparency variables used in Kim (2006) are *measure* and *analyst* from Bushman, Piotroski and Smith (2004).⁵ Control variables used in this paper are the natural log of country size, the natural log of per capita GDP and the variance of the growth rate of per capita GDP as in Kim (2006). The main source of cross-border mergers is the Securities Data Corporation Mergers and Acquisitions database (SDC Platinum). All disclosed and completed acquisitions of public companies between January 1990 and December 2004 for all available countries. Then, company names and announcement year are matched between cross-border mergers data from SDC and R-squared data from Datastream International. The years of R-squared are matched with the year of the announcement date of each cross-border mergers.⁶ After we

² Jin and Myers (2006) and Kim (2006) also use the same market model regression as in Morck, Yeung and Yu (2000).

³ The reasons of the difference in calculating R-squared is described in Kim (2006), page 538-539.

⁴ Jin and Myers (2006) and Kim (2006) also follow the same logistic transformations and Morck, Yeung and Yu (2000) point out that raw R-squared as a dependent variable can create a problem because it is bounded within the intervals [0,1].

⁵ The detailed description of corporate governance and transparency variables are in Kim (2006), page 539-540. You can also find the detailed description in La Porta et al. (1998) and Bushman, Piotroski and Smith (2004).

⁶ We averaged the individual stock's daily R-squared for each year. If the

matched the year of the announcement date of each cross-border mergers with the years of R-squared, we follow a few steps to clean the data: (1) The names of cross-border target or acquirer firms in SDC should match with those of firms in Datastream International. (2) If the individual firm daily returns of target or acquirer firms in SDC do not meet the criteria, as in Kim (2006), for calculating the R-squared or those data are missing in Datastream International, then we exclude those cross-border mergers. (3) If either corporate governance or corporate transparency variables are missing for the countries of cross-border firms, then we exclude those cross-border mergers. (4) If controlling variables are missing for the countries of cross-border firms, then we exclude those cross-border mergers. There are so many missing companies that are not in Datastream International but in SDC, especially target companies.⁷ So, the final sample for cross-border mergers and R-squared consists of 30 cases and acquirers and targets are from 13 and 14 different countries, respectively. The sample period covers from 1994 to 2000.

3. CROSS-BORDER MERGER ANALYSIS

Table 1 provides the annual average R-squared of acquirers and targets at the year of the cross-border merger announcement. Acquirer's industry is mostly manufacturing. There are one mining, two wholesale trades, one retail trade and one electric service except for manufacturing. Target's industry is also mostly manufacturing. There are one mining, one wholesale trade and one electric service except for manufacturing. Acquirer's and target's R-squared are calculated by averaging R-squared at the year of the cross-border merger announcement annually.⁸ *Tables 1* provide the information of acquirer's and target's nation, industry, announcement date and R-squared. The mean of R-squared for acquirer and target is 0.106 and 0.079, respectively. On average, acquirer's R-squared is greater than that of target. The standard deviation is slightly higher for acquirer's R-squared than for target's R-squared, but the difference is not big. The t-statistic for both acquirer's and target's R-squared is 4.53 and 3.59 and statistically significant within one percent significance level, respectively. *Table 2* provides the summary statistics of corporate governance and transparency variables, macroeconomic variables, R-squared and its logistic transformation for acquirers and targets. $AR_{logistic}$ and $TR_{logistic}$ represents the logistic transformation of R-squared for the acquirer and target firms, respectively. If we compare the Group1 and Group2 variables between the acquirer and target, we can see that the acquirer has higher means of Group1 variables than the target. However, the mean of *measure* in Group2 is lower for acquirer firms, while that of *analyst* in Group2 is higher for target firms. The standard deviation of Group1 variables is lower for acquirer firms than that for target firms, while the standard deviation of Group2 variables is higher for acquirer firms than that for target firms. On average, the acquirer firms have slightly better corporate governance and it does not vary much among them in comparison with the target firms. Macroeconomic variables are similar between overall sample and the target firms in terms of both mean and standard deviation. However, the country size and per capita GDP is higher for the acquirer firms than that for the target firms. The student t-statistics are statistically significant for all the variables within one percent

announcement year of cross-border mergers are finalized before that specific year ends, then we averaged the individual stock's daily R-squared for each year by using the available days before the cross-border mergers announcement date.

⁷ Our four criteria also reduces the number of the cross-border mergers substantially.

⁸ We averaged the individual stock's daily R-squared for each year. If the announcement year of cross-border mergers are finalized before that specific year ends, then we averaged the individual stock's daily R-squared for each year by using the available days before the cross-border mergers announcement date.

significance level. *Table 3* shows the OLS regression results of the relationship between R-squared and Group1 or Group2 variables for the cross-border mergers after controlling for the macroeconomic variables. We run the following linear regression equation.

$$AR_{\logistic_{i,j,t}} \text{ or } TR_{\logistic_{i,j,t}} = \alpha + \beta_1 Group1_{j,t} + \beta_2 Group2_{j,t} + \beta_3 \log(countrysize)_{j,t} + \beta_4 \log(percapitaGDP)_{j,t} + \beta_5 Variance(GDPgrowthrate)_{j,t} \dots(4)$$

i, j and t represents stock ID, country ID and year ID, respectively. α is the intercept of the regression. $AR_{\logistic_{i,j,t}}$ and $TR_{\logistic_{i,j,t}}$ is the logistic transformation of individual stocks' annual average across each country for acquirer and target firms, respectively. *Group1* and *Group2* represents the corporate governance group and corporate transparency group for acquirer and target firms, respectively. $\log(countrysize)$ is the log of country size variable for acquirer and target firms. $\log(percapitaGDP)$ is the log of real per capita GDP variable for acquirer and target firms. $Variance(GDPgrowthrate)$ is the variance of real per capita GDP growth rate for acquirer and target firms. The regression results are not consistent with the hypothesis 1 for the regression (1) in *Table 3*. There is no statistically significant relationship between R-squared and Group1 or Group2 variables for the acquirer firms. Only the variance of per capita GDP growth rate is statistically significant within five percent significance level. However, there is a statistically significant negative relationship between the logistic transformation of R-squared and Group1 variable for the target firms. It is significant within ten percent significance level. There is no significant relationship between the logistic transformation of R-squared and Group2 variable for the target firms. The regression results partially support the hypothesis 1 and hypothesis 2. Based on Bris and Cabolis (2005) and Stark and Wei (2004), the negative relationship between R-squared and corporate governance or transparency is stronger for target firms than that for acquiring firms after we control for the macroeconomic variables.

4. CONCLUSION

Two hypotheses are examined in this paper. As you can see from the results of *Table 3*, only the relationship between the logistic transformation of R-squared and Group1 variable for target firms shows negative sign. Second, the negative relationship should be stronger for target firms than that for acquiring firms after we control for the macroeconomic variables. The second hypothesis is supported by the regression results in *Table 3*. We can see the statistically significant negative relationship between the logistic transformation of R-squared and Group1 variable for target firms after we control for macroeconomic variables, but not for acquirer firms. This result implies the stronger negative relationship for target firms, which is consistent with the hypothesis 2.

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Table 1.: The annual average R-squared of acquirers and targets at the year of the cross-border merger announcement. R-squared is the individual stock's annual average R-squared across countries. The final sample for cross-border mergers and differences of R-squared consists of 30 cases, and acquirers and targets are from 13 and 14 different countries, respectively. The sample period is from 1994 to 2000. Acquirer's and target's industry is mostly manufacturing. There are one mining, two wholesale trades, one retail trade and one electric service except for manufacturing. There are one mining, one wholesale trade and one electric service except for manufacturing. STDEV represents the standard deviation of R-squared. Student's t-statistic from the univariate analyses of the R-squared is reported. The p-value of student's t-statistic is in parenthesis. *** mean one percent significance level.

Acquirer Nation	Acquir SIC	Target Nation	Targ SIC	Announcement Date	Acquirer R-squared	Target R-squared
Malaysia	3366	Australia	3433	08/12/1994	0.00017	0.01565
Japan	5052	Canada	2873	08/15/1995	0.08420	0.00243
USA	3643	South Africa	3694	10/02/1995	0.39162	0.06993
USA	2611	Canada	3275	11/10/1995	0.00313	0.22803
Thailand	3873	Hong Kong	3672	01/18/1996	0.00078	0.00142
Australia	2652	Belgium	2671	05/09/1996	0.31209	0.03060
UK	5044	USA	5043	09/09/1996	0.00570	0.00042
UK	2819	Canada	2819	10/08/1996	0.35013	0.05790
South	5311	Australia	2331	10/16/1997	0.02349	0.05109
Italy	3241	France	3241	03/02/1998	0.00355	0.02114
USA	3479	UK	2851	04/14/1998	0.02147	0.04291
USA	3211	Australia	2952	08/26/1998	0.12928	0.04894
USA	3663	France	3661	10/30/1998	0.03915	0.50238
USA	1021	South Korea	2895	12/18/1998	0.01762	0.18612
USA	3714	South Korea	2531	01/06/1999	0.00033	0.34342

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USA	3714	South Korea	2531	01/06/1999	0.00033	0.34342
USA	3714	UK	4013	03/04/1999	0.02355	0.00750
Spain	4911	Chile	4911	03/09/1999	0.11173	0.02547
USA	3569	UK	2992	03/16/1999	0.00013	0.06007
Netherlan	2064	Finland	2064	04/26/1999	0.00384	0.00188
Austria	2261	USA	3291	07/12/1999	0.12949	0.00990
USA	1311	Canada	1311	10/05/1999	0.05425	0.00407
USA	3564	UK	3564	12/13/1999	0.02452	0.20019
USA	3577	Italy	3827	12/20/1999	0.00024	0.26698
USA	2819	Australia	2819	02/19/2000	0.13509	0.00056
New	2411	Australia	2493	02/21/2000	0.37632	0.03537
USA	3714	UK	3594	03/06/2000	0.06943	0.00641
USA	3594	UK	3826	04/19/2000	0.13952	0.01480
USA	3531	India	3531	06/12/2000	0.35720	0.00056
Singapor	2082	Malaysia	2082	08/07/2000	0.18846	0.12856
USA	2819	India	2851	11/29/2000	0.18364	0.00474
Mean					0.106	0.079
STDEV					0.128	0.120
t-statistic					4.53***	3.59***
					(<.0001)	(0.0012)

Table 2.: The summary statistics for the 30 cross-border mergers. The sample period is from 1994 to 2000. The final sample for cross-border mergers and differences of R-squared consists of 30 cases, and acquirers and targets are from 13 and 14 different countries, respectively. Corporate governance group (Group1) are obtained from La Porta et al. (1998) and IMD. *Antidirector* and *accounting standard* are from La Porta et al. (1998). *Accounting standard* is the index created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. This index is from International accounting and auditing trends, Center for International Financial Analysis and Research. *Antidirector* is the index aggregating the shareholder rights La Porta et al. (1998) labeled as "anti-director rights". Higher *accounting standard* and *antidirector* mean better corporate governance. Corporate transparency group (Group2), *measure* and *analyst*, are from Bushman, Piotroski and Smith (2004). *Measure* is a rough attempt to capture cross-country differences in the accounting principles used. It is from International Accounting and Auditing Trends, Center for Financial Analysis and Research, Inc. (IAAT) database. *Analyst* is the number of analysts following the largest 30 companies in each country in 1996. It is from Chang, Khanna and Palepu (2000). Higher values of *analyst* are associated with higher transparency. Higher values of *measure* are associated with higher transparency. Country size data is from CIA WorldFactbook2000. GDP data is from the international macroeconomic dataset of Economic Research Service, The United States Department of Agriculture. $AR_{logistic}$ and $TR_{logistic}$ represents the logistic transformation of R-squared for acquirer and target firms, respectively. STDEV represents the standard deviation of R-squared, corporate governance and corporate transparency variables. Student's t-statistic from the univariate analyses of the R-squared is reported. The p-value of student's t-statistic is in parenthesis. *** mean one percent significance level.

Acquirer	N	Mean	STDEV	t-statistic
Dependent Variable				
R-squared	30	0.106	0.128	4.53*** (<.0001)
AR _{logistic}	30	-3.623	2.600	-7.63*** (<.0001)
Explanatory Variables				
<i>Group1</i>				
accounting standard	30	70.167	4.990	77.01*** (<.0001)
antidirector	30	4.367	1.129	21.18*** (<.0001)
<i>Group2</i>				
measure	30	61.277	24.867	13.50*** (<.0001)
analyst	30	24.353	8.125	16.42*** (<.0001)
Control Variables				
log(country size)	30	14.448	2.347	33.71*** (<.0001)
log(per capita GDP)	30	14.519	1.697	46.86*** (<.0001)
variance(GDP growth rate)	30	0.0004	0.0007	3.58*** (0.0012)
Target				
Dependent Variable				
R-squared	30	0.079	0.120	3.59*** (0.0012)
TR _{logistic}	30	-3.811	2.118	-9.852*** (<.0001)
Explanatory Variables				
<i>Group 1</i>				
accounting standard	30	70.800	7.378	52.56*** (<.0001)
antidirector	30	4.100	1.348	16.66*** (<.0001)
<i>Group 2</i>				
measure	30	80.073	22.774	19.26*** (<.0001)
analyst	30	17.000	6.079	15.32*** (<.0001)
Control Variables				
log(country size)	30	13.757	2.205	34.18*** (<.0001)
log(per capita GDP)	30	12.983	2.440	29.14*** (<.0001)
variance(GDP growth rate)	30	0.0005	0.0006	4.92*** (<.0001)

Table 3.: OLS regression results. The dependent variable is the logistic transformation of the annual average R-squared of acquirer and target firms at the year of the cross-border merger announcement. The explanatory variables are the group1 and group2. Group2 is the combination of *measure* and *analyst*. Group1 is the combination of *accounting standard* and *antidirector*. *measure* from International Accounting and Auditing Trends, Center for Financial Analysis and Research, Inc. (IAAT) database, *analyst* from Chang, Khanna and Palepu (2000), *accounting standard* and *antidirector* from La Porta et al. (1998). The controlling variables are the country size from CIA WorldFactbook2000, the GDP data from the international macroeconomic dataset of Economic Research Service, The United States Department of Agriculture. $AR_{logistic}$ and $TR_{logistic}$ represents the logistic transformation of R-squared for acquirer and target firms, respectively. The t-statistics are reported in the parentheses except for Chi-squared for White (1980)'s Heteroskedasticity Test. For Chi-squared for White (1980)'s Heteroskedasticity Test, p-values are reported in parentheses. * and ** means five percent and ten percent significance level, respectively.

Dependent Variable: $AR_{logistic}$ or $TR_{logistic}$	Regression (1) : $AR_{logistic}$	Regression (2) : $TR_{logistic}$
Independent Variables		
Group1 [=antidirector($\times 10^{-3}$)+ accounting standard($\times 10^{-4}$)]	737.76 (1.39)	-700.89 (-1.97)*
Group2 [=measure($\times 10^{-4}$)+ nanalyst($\times 10^{-4}$)]	-332.23 (-0.81)	406.20 (1.56)
log(country size) ($\times 10^{-3}$)	-268.74 (-0.75)	121.05 (0.54)
log(per capita GDP) ($\times 10^{-4}$)	-7633.35 (-1.13)	-847.63 (-0.42)
variance(GDP growth rate)	-2255.18 (-2.29)**	567.30 (0.62)
Adjusted R2	0.06	0.06
Chi-squared for White (1980)'s Heteroskedasticity Test	9.46 (0.74)	9.83 (0.88)
Sample Size	30	30