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Return Skewness, Real Options, and Corporate Governance

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Abstract

We use the data of Taiwanese firms from 2002Q1 to 2012Q3 to examine the effects of corporate governance and real options on return skewness. Firms with a stronger corporate governance structure (including a higher proportion of largest shareholder ownership and managerial ownership, the more independent board, better transparency, and lower agency costs) tend to have positively skewed returns. In addition, firms that possess real options (valuable social capital, significant market potential, and market power) appear to have positively skewed returns because real options lower transaction costs, promote cooperation among parties, and build the firm's brand.

Key words: Dynamic panel regression, social capital, corporate governance, return distribution, discretionary disclosure

I. Introduction

Previous studies have indicated that stock returns are asymmetric (Pindyck (1984), Campbell and Hentschel (1992), and Nelson (1991)), in contrast to typical normality assumptions in the asset pricing theory. Several explanations are proposed to account for asymmetrical stock returns, including the leverage effect hypothesis (Black (1976) and Christie (1982)), the stochastic-bubble hypothesis (Blanchard and Watson (1982)), the volatility feedback hypothesis (Pindyck (1984), French, Schwert, and Stambaugh (1987), and Campbell and Hentschel (1992)), and the difference of opinion hypothesis (Hong and Stein (2003)).[1]

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[1] For a detailed discussion of these hypotheses, please see Section II.

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In a comparative country analysis, Bae, Lim, and Wei (2006) link corporate governance to return skewness, arguing that returns in emerging markets are more positively skewed than those in developed markets. Because managers in emerging markets have greater discretionary power to hide bad news or to release bad news slowly than firms in developed markets, stock returns in emerging markets are often positively skewed. Their discretionary-disclosure hypothesis argues that returns are more positively skewed in opaque and poorly governed markets. In other words, opaque markets have more positive skewness than transparent markets. This study reexamines the discretionary-disclosure hypothesis by investigating the relation between return skewness and corporate governance for firms in the Taiwan stock market.

We find that returns to firms with poor corporate governance tend to be more negatively skewed, while returns to firms with good corporate governance tend to be positively skewed, a result different from Bae, Lim, and Wei's (2006) argument. Our results are intuitive and expected for two reasons. First, although bad news may be hidden or postponed in poorly governed firms, it will be revealed eventually. Second, the literature has demonstrated that good corporate governance can enhance firm performance (e.g., Agrawal and Knoeber (1996), Bai et al. (2004), Cheng (2008), and Erkens, Hung, and Matos (2012)), improve shareholder wealth (e.g., Gompers, Ishii, and Metrick (2003), Drobetz, Schillhofer, and Zimmermann (2004), Cremers and Nair (2005), Core, Guay, and Rusticus (2006), and Ammann, Oesch, and Schmid (2013)), and reduce the cost of capital (e.g., Ashbaugh-Skaife, Collins, and LaFond (2006), Cheng, Collins, and Huang (2006), and Ge, Matsumoto, and Zhang (2011)). Thus, firms with good corporate governance should have positively skewed returns.

Using the Taiwan stock market in our analysis offers an advantage. Because the Taiwan market is characterized by two types of firms, group-affiliated firms and non-group-affiliated firms, we are able to examine the risk-sharing hypothesis. Entrepreneurs in Taiwan often use resources from other businesses they control to bail companies out of trouble. Consequently, we can examine whether returns to group-affiliated firms that receive cross-subsidies are more positively skewed than those to independent firms.

We also argue that real options matter to stock return asymmetry.[2] Firms with real options have flexibility in when and how to exercise them. If real options are managed properly, the market will respond positively and increase the value of the firms; extreme positive returns in the distribution will be translated into skewness. Thus, real options are expected to have a positive effect on skewness.

Although risk sharing appears to be an important motivation for business groups in emerging markets, real options are more reasonable and extensive than risk sharing for return asymmetry. In terms of real options, for group-affiliated

[2] Real options can include opportunities to expand and cease projects if certain conditions arise amongst other choices. Real options are referred to as "real" because they usually pertain to tangible assets, such as capital equipment, rather than financial instruments.

firms with social capital,[3] it is more advantageous to use assistance from internal than from external markets. Group-affiliated firms can smooth out and diversify their income flows, reducing the downside business risk that firms belonging to a business group will find themselves in financial distress. They are also more likely to have lower transaction costs, cooperative relations with other firms, and an entrepreneurial approach; strong supplier relations and regional production networks allow them to benefit from inter-firm learning. In this paper, we propose that the real option argument, not risk sharing, explains return asymmetry and argue that real options have a positive effect on return skewness because they add value to firms by lowering transaction costs, promoting cooperation among different parties, and building an enterprise's brand.

Using the data from the period 2002Q1 to 2012Q3 in a panel data regression analysis, we find a significant and positive relationship between return skewness and market opacity, indicating that returns in a less transparent market tend to be more positively skewed, a result consistent with Bae, Lim, and Wei's (2006) findings. Second, we find that more transparent firms have higher positive return skewness, supporting our prediction that better-governed firms tend to have positively skewed returns. That is, our results support the discretionary-disclosure hypothesis at the market level, but not at the firm level. Third, our findings support the real option/risk-sharing hypotheses. We find that stock returns to group-affiliated firms with more valuable real options are more positively skewed than those to non-group-affiliated firms.

In addition, ownership structure, board independence, and agency costs affect return skewness significantly. Firms with greater managerial ownership, a higher proportion of largest shareholder ownership, the more independent board, and lower agency costs are positively related to return skewness.

The rest of the paper is organized as follows. Section II describes the related literature and hypotheses. Second III presents the framework used to investigate the relation between corporate governance mechanisms and return skewness. Our sample, data sources, and variable measurements are also described. Section IV describes the descriptive statistics and the empirical evidence. Section V concludes the paper.

II. Hypothesis Development

Stock market returns appear to be asymmetrically distributed. In particular, negative skewness in daily returns is common in several aggregate stock market indexes (Pindyck (1984), Campbell and Hentschel (1992), and Nelson (1991)). Positive skewness in returns is also found in individual stocks (Chen, Hong, and

3 Social capital is the expected collective or economic benefit derived from preferential treatment and cooperation between individuals and groups. Social capital can explain the core idea that social networks have value.

Stein (2001) and Bae, Lim, and Wei (2006)). At least five theories have been proposed to explain return asymmetries. They include the leverage effect hypothesis (Black (1976) and Christie (1982)), the volatility feedback hypothesis (Pindyck (1984)), the stochastic-bubble hypothesis (Blanchard and Watson (1982)), the investor-heterogeneity hypothesis (Hong and Stein (2003)), and the corporate governance hypothesis (Hong and Stein (2003) and Bae, Lim, and Wei (2006)).

First, the leverage effect hypothesis highlights the role of financial and operating leverage. For example, if the value of a leveraged firm drops, its equity, in general, becomes more risky, causing the return volatility of the equity to increase (Black (1976) and Christie (1982)). In contrast, if the value of a leveraged firm rises, the financial leverage and the operating leverage decline, reducing the volatility of subsequent stock returns. This asymmetric volatility reaction to the rise and fall of stock prices causes stock returns to be negatively skewed.

The volatility feedback hypothesis (also known as the time-varying risk premium hypothesis) posits that investors ask for a higher risk premium when stock market return volatility increases, affecting the subsequent stock market performance. Bekaert and Wu (2000) further argue that the arrival of either good news or bad news signals an increase in market volatility, which in turn increases the risk premium. This increase in the risk premium offsets part of the positive effect of good news (a cash flow increase), but it amplifies the negative effect of bad news (a cash flow decrease). Therefore, stock prices drop more when there is bad news in the market than when there is good news, which leads to negatively skewed stock returns.

The stochastic-bubble hypothesis developed by Blanchard and Watson (1982) suggests that negative asymmetries in stock market returns are generated when the bubble pops, producing very large, negative returns, although the probability of this happening is very low. The empirical results of Coval and Hirshleifer (1998) also find negative return skewness after positive stock returns. In addition, the difference of opinion model developed by Hong and Stein (2003) suggests that because investors have different opinions about the real value of stocks and the shorting restrictions, stock returns become more negative. As a result, investor heterogeneity is the major reason for negative return asymmetries.

All of the above hypotheses explain return asymmetry from a market reaction perspective. However, the discretionary-disclosure hypothesis proposed by Chen, Hong, and Stein (2001) extends the rationale to the behavior of managers. Bae, Lim, and Wei (2006) suggest that if managers have discretionary power over the disclosure of information, they prefer to announce good news immediately and allow bad news to dribble out slowly, and as such, returns tend to be positively skewed. They further infer that the lack of corporate governance mechanisms to govern managerial discretion allows firm managers to have more discretionary power, leading to positive asymmetries in market returns. However, Bae, Lim, and Wei (2006) use an aggregate market-level corporate governance index to test the discretionary-disclosure hypothesis across 38 countries. In this study, we first

follow Bae, Lim, and Wei (2006) in reexamining the discretionary-disclosure hypothesis by using the market-level data in Taiwan and develop our first information disclosure hypotheses as follows.

Hypothesis 1a:

Stock returns in a market with greater managerial discretion over information dispersal tend to be more positively skewed.

Hypothesis 1b:

Stock returns in a less transparent market tend to be more positively skewed.

This study argues that group affiliation is a type of social network or social capital. Social capital has the potential to add value to a firm by lowering transaction costs, promoting cooperation among parties, and developing good branding for an enterprise (e.g., Murphy (2002), Gabbay and Zuckerman (1998), and Uzzi (1997, 1999)). Therefore, social capital can be a critical factor affecting enterprises' financial performance (see, e.g., Zhang and Fung (2006), Fung, Xu, and Zhang (2007), and Doong, Fung, and Wu (2011)). Firms with social capital have in-the-money real options. They can exercise such options in bringing surprises to the market or eliminating negative impacts when necessary, leading to positive return skewness. Also, real options can be backed by market potential or market power. Hence, we propose that firms that are group-affiliated, attach importance to R&D activities, or have market power in an industry have valuable real options. Once the real options are exercised, the market is shocked and produces extreme positive returns. We state the hypothesis as follows.

Hypothesis 2:

Firms that own valuable real options have more positively skewed returns.

Another rationale raised by Bae, Lim, and Wei (2006) for positive skewness is the risk-sharing hypothesis. Since our sample can be classified as group-affiliated and non-group-affiliated firms, we reexamine the risk-sharing hypothesis and state our third hypothesis related to real options as follows.

Hypothesis 3:

Group-affiliated firms have more valuable real options, which contribute to positively skewed stock returns.

Bae, Lim, and Wei (2006) conclude that stock returns in emerging markets tend to be more positively skewed than those in developed markets based on the discretionary-disclosure and risk-sharing hypotheses, and further propose that more positively skewed returns in emerging markets are caused by weak corporate governance. Most studies find that corporate governance enhances firm performance (e.g., Agrawal and Knoeber (1996), Bai et al. (2004), Cheng (2008), and Erkens, Hung, and Matos (2012)) and shareholder wealth (e.g., Gompers, Ishii, and Metrick (2003), Drobetz, Schillhofer, and Zimmermann (2004), Cremers and Nair (2005), Core, Guay, and Rusticus (2006), and Ammann, Oesch, and Schmid (2013)), reduces the cost of capital (e.g., Ashbaugh-Skaife, Collins,

and LaFond (2006), Cheng, Collins, and Huang (2006), and Ge, Matsumoto, and Zhang (2011)), and protects the interests of stakeholders (La Porta et al. (2002)). That is, well-governed firms should have more stable return volatility than poorly governed firms. In addition, corporate governance can enhance firms' risk-taking capacity (e.g., Cebenoyan, Cooperman, and Register (1999), Gadhoum and Ayadi (2003), Laeven and Levine (2008), and Nguyen (2011)). Well-governed firms are more capable of dealing with negative impacts than are poorly governed firms. Accordingly, we argue that better-governed firms have more positively skewed returns within an emerging market.

Hypothesis 4:

Better-governed firms have more returns that are positively skewed.

III. Methodology

A. Regression Models

We use panel regression analysis to test the discretionary-disclosure, risk-sharing, and real option hypotheses and to examine the relation between corporate governance mechanisms and return skewness. The regression model is set up as:

$$\begin{aligned} RetAsy_{i,\tau+1} = {} & \alpha_0 + \alpha_1 \times RetAsy_{i,\tau} + \sum_{j=1}^{3} \beta_{j,i\tau} \times Disclosure_{j,i\tau} \\ & + \sum_{k=1}^{3} \gamma_{k,i\tau} \times Disclosure^{mkt}_{k,i\tau} + \sum_{l=1}^{4} \delta_{l,i\tau} \times RealOption_{l,i\tau} \\ & + \sum_{m=1}^{9} \theta_{m,i\tau} \times CorGov_{m,i\tau} + \sum_{n=1}^{6} \mu_{n,i\tau} \times Z_{n,i\tau} \\ & + \sum_{o=1}^{18} b_o Industry^{o}_{i} + \sum_{p=1}^{10} C_p Year_p + \varepsilon_{i,\tau}. \end{aligned} \tag{1}$$

A.1. Measures of Dependent Variables

The dependent variable *RetAsy* is one of the three measures of return asymmetry (skewness). Following Bae, Lim, and Wei (2006), we use three measures to evaluate return asymmetry. The first is the conditional coefficient of skewness (*SKEW*), which is computed as the sample's third moment of daily returns divided by the sample variance of daily returns during the investigation period as follows.

$$SKEW_i = \frac{(n(n\text{-}1))^{\frac{3}{2}} \sum_{t=1}^{n} (R_{i,t} - \bar{R}_i)}{(n\text{-}1)(n\text{-}2) \left(\sum_{t=1}^{n} (R_{i,t} - \bar{R}_i)^2 \right)^{\frac{3}{2}}}, \tag{2}$$

where n presents the number of observations of daily returns, $R_{i,t}$ is the daily return for firm i on day t, and $\bar{R}_i$ is the average return for firm i during the sample period. The daily return is calculated as $Ln[(P_{it}+D_{it})/P_{it-1}]$, where P_{it} is the stock price and D_{it} is the dividend on day t. Because financial data can only be obtained quarterly, we measure *SKEW* quarterly for each firm over time.

The second measure is the up-to-down volatility ratio (*VOLRATIO*). It is calculated as the up-day daily demeaned returns divided by the down-day demeaned returns during the sample period. The up-day is defined as the day on which the return is above the sample mean, and the down-day is defined as the day on which the return is below the sample mean. Therefore, the calculation can be described as:

$$VOLRATIO_i = \ln\left[\frac{(n_d-1)\sum_{t\in up}\left(R_{i,t}-\bar{R}_i\right)^2}{(n_u-1)\sum_{t\in down}\left(R_{i,t}-\bar{R}_i\right)^2}\right], \tag{3}$$

where n_u and n_d are the number of up- and down-days respectively. Larger positive (negative) value of *VOLRATIO* indicates that the firm has a more positively skewed (negative skewed) return distribution.

Finally, the third measure is the extreme-return ratio, denoted as *EXTRATIO*. It is calculated as the ratio of the number of days of positive extreme returns ($n_{positive}$) to the number of days of negative extreme returns ($n_{negative}$) over the sample period. If the daily return, say $R_{i,t}$, has the property that $R_{i,t} > 2\sigma_i$ or $R_{i,t} < -2\sigma_i$, where σ_i is the standard deviation of firm i, then it is regarded as a positive (negative) extreme return. The measure is described as follows.

$$EXTRATIO_i = \ln\left[\frac{n_{positive}}{n_{negative}}\right]. \tag{4}$$

If the *EXTRATIO* is found to be 0, then the stock returns follow a normal distribution. Otherwise, the distribution is asymmetric, and the larger the *EXTRATIO* is, the more skewed the return distribution will be.

A.2. Measures of Independent Variables for Testing Hypotheses

The first independent variable is *Disclosure*, as proxy for the following three specific variables: earnings management (*EM*), working capital accruals (*WCAQ*), and timeliness of information release (*TIME*). *EM* is the performance-matched discretionary accrual, which is measured by the Modified Jones Model (Dechow, Sloan, and Sweeney (1995)) and can enhance the reliability of inferences on earnings management. Moreover, this study follows Kothari, Leone, and Wasley (2005) in measuring the quality of firms' working capital accruals (*WCAQ*) and

Ashbaugh-Skaife, Collins, and LaFond (2006) in evaluating the timeliness of a firm's earnings (*TIME*) as the other proxies for managers' discretionary disclosure.[4]

WCAQ is an accounting-based measure of financial reporting quality, and *TIME* captures the transparency of a firm's financial reporting. To facilitate the discussion of our results, we multiply *WCAQ* and *TIME* values by negative one. That is, a larger *WCAQ* implies higher-quality working capital accruals, reflecting a better mapping of working capital accruals to cash flows (Dechow and Dichev (2002)), and a higher *TIME* implies that financial reports are more transparent.

According to Bae, Lim, and Wei (2006), firms are assigned the same *EM* value in a specific market over time. When $EM_{i,\tau}$, $WCAQ_{i,\tau}$, and $TIME_{i,\tau}$ for firm i at quarter τ are computed, we compute the market-level data by summing or averaging the $EM_{i,\tau}$, $WCAQ_{i,\tau}$, and $TIME_{i,\tau}$ of all the listed firms in each quarter and denote them as $EM_{\tau}^{mkt\_sum}$, $EM_{\tau}^{mkt\_ave}$, $WCAQ_{\tau}^{mkt\_sum}$, $WCAQ_{\tau}^{mkt\_ave}$, $TIMES_{\tau}^{mkt\_sum}$, and $TIME_{\tau}^{mkt\_ave}$, We expect $EM_{i,\tau}$ and $EM_{\tau}^{mkt\_sum}$ ($EM_{\tau}^{mkt\_ave}$) to be positively related to *RetAsy* as Hypothesis 1a states, and $WCAQ_{i,\tau}$, $TIME_{i,\tau}$, $WCAQ_{\tau}^{mkt\_sum}$, $WCAQ_{\tau}^{mkt\_ave}$, $TIMES_{\tau}^{mkt\_sum}$, and $TIME_{\tau}^{mkt\_ave}$ to be negatively related to *RetAsy* following Hypothesis 1b.

The second independent variable is *RealOption*, which measures the value of real options to the firm for testing Hypothesis 2 and Hypothesis 3. For the first proxy, *BGp*, we separate our sample of firms into "group-affiliated" and "non-group-affiliated." A group-affiliated firm is defined as one in which its final controller also controls other firms. We denote the *BGp* as the dummy variable of such a group-affiliated firm. The BGp_i equals 1 if firm i is a group-affiliated firm and 0 elsewhere.

We use market potential (proxied by firm's R&D activity) and market power (proxied by the Herfindahl-Hirschman index) to measure the value of firms' real options. A firm with high R&D expenditures or low market power has more potential to accumulate social capital (Doong, Fung, and Wu (2011)). $R\&D_{i,\tau}$ is calculated as the ratio of R&D expenses to the firm's free cash flow in the quarter. For the firm's market power, we follow Gaspar and Massa (2006) in measuring the sales-based Herfindahl-Hirschman index (*Sale_HI*), which is calculated as the ratio of its sales to the industry sales, and the asset-based Herfindahl-Hirschman index (*TA_HI*), which is computed as the ratio of its total assets to the industry total assets. We expect *Sale_HI* and *TA_HI* to have negative signs.

CorpGov represents the corporate governance variable. We employ *CorpGov* to test Hypothesis 4. We use several variables for our analysis. As to the other corporate governance mechanisms, this study focuses on CEO duality (*CEO_Du*), ownership structure, and board independence. *CEO_Du* is a dummy variable, which equals 1 if the CEO also serves as chair of the board and 0 otherwise. Further, this study uses institutional ownership (*IHolder*; Claessens and Fan

4 Please refer to Kothari, Leone, and Wasley (2005), Ashbaugh-Skaife, Collins, and LaFond (2006), and Table I for details.

(2002) and Chung, Firth, and Kim (2002)), managerial ownership (*MHolder*; Bai et al. (2004)), and outside block holders (*OBHolder*; Committee on the Financial Aspects of Corporate Governance (1992)) to proxy for ownership structure. We also include largest shareholder ownership (*LOHolder*), insider ownership (*InHolder*), and final controller ownership (*FCHolder*). These ownership variables are calculated as the ratio of shareholdings of institutional investors, managers, outside block holders, largest shareholders, insiders, and final controllers of firms to the number of shares outstanding for each firm over time. We expect these variables to be positively related to *RetAsy*.

To evaluate board independence, we follow Cheng (2008) in using board composition (*InDS*), which is measured by the number of independent directors on the board scaled by board size. The higher the *InDS*, the more independent the board and the better the corporate governance. In addition, since the corporate governance mechanisms are expected to reduce a firm's agency costs, the smaller the agency costs of a firm, the greater the likelihood that it is better governed; and as such, we follow Wei and Zhang (2008) in using the divergence between control rights and cash flow rights (*DIV_btw_CC*) to measure a firm's agency costs as well to proxy for the firm's governance quality. *DIV_btw_CC* is calculated as the control rights of the final controller divided by the cash flow rights of the final controller. Control rights are the number of shares controlled by the final controller; cash flow rights are the number of shares owned by the final controller. We expect *InDS* (*DIV_btw_CC*) to be positively (negatively) related to *RetAsy*.

We use several control variables *Zs* in Equation (1). First, stock turnover ($TURN_{i,\tau}$) is computed as the average daily stock turnover in that quarter. Based on the difference of opinion hypothesis, we expect *TURN* to be related negatively to return skewness. Second, cumulative stock return ($CAR_{i,\tau}$) is measured as the cumulative daily return over the quarter. Third, financial leverage ($LEV_{i,\tau}$) is evaluated as the ratio of debt to total assets in book value at the end of the quarter. Fourth, return volatility ($VOLRET_{i,\tau}$) is the standard deviation of daily returns in the quarter. According to the stochastic-bubble, leverage effect, and volatility feedback hypotheses, we expect *CAR*, *LEV*, and *VOLRET* to have negative signs. Finally, we use other controls, including the market-to-book ratio ($MTB_{i,\tau}$) and firm size ($Ln(SIZE)_{i,\tau}$).

All the variables (a dependent variable, explanatory variables, and control variables) are defined and explained in Table I.

B. Data

To strengthen corporate governance, since February 2002 the Financial Supervisory Commission (FSC) in Taiwan has stipulated that firms that intend to go public must have at least two independent directors and one supervisor on the board. For this study, we identify 1,265 listed firms in 19 industries from 2002Q1 to 2012Q3, excluding financial, insurance, and security companies. The data we use include stock prices, financial statements, and ownership structure. All the data are gathered from the Taiwan Economic Journal (TEJ) database.

Table I
Definitions of Variables

Variable		Definition
Panel A. Return Asymmetry		
Skewness	$SKEW_{i,\tau}$	*SKEW* is computed as the sample's third moment of daily returns divided by the sample variance of daily returns.
Up-to-Down Volatility Ratio	$VOLRATIO_{i,\tau}$	*VOLRATIO* is calculated as the up-day daily demeaned returns divided by the down-day demeaned returns during the sample period. The up-day is defined as the day on which the return is above the sample mean and the down-day is defined as the day on which the return is below the sample mean.
Extreme-Return Ratio	$EXTRATIO_{i,\tau}$	*EXTRATIO* is calculated as the ratio of the number of days of positive extreme returns to the number of days of negative extreme returns over the sample period. If the daily return, say $R_{i,t}$, has the property that $R_{i,t}>2\sigma_{i,\tau}$ or $R_{i,t}<-2\sigma_{i,\tau}$, where $\sigma_{i,\tau}$ is the standard deviation of firm i at time τ, then it is treated as a positive or negative extreme return respectively.
Panel B. Discretionary Variables (Transparent Variables)		
Earnings Management	$EM_{i,\tau}$	*EM* is the residuals that are from the following cross-sectional estimation of Kothari, Leone, and Wasley's (2005) model: $$\frac{TA_{i,\tau}}{A_{i,\tau-1}}=\alpha_0+\alpha_1\left(\frac{1}{A_{i,\tau-1}}\right)+\alpha_2\left(\frac{(\Delta REV_{i,\tau}-\Delta REC_{i,\tau})}{A_{i,\tau-1}}\right)+\alpha_3\left(\frac{PPE_{i,\tau}}{A_{i,\tau-1}}\right)+\alpha_4 ROA_{i,\tau}+\varepsilon_{i,\tau},$$ where regressions are estimated by industry. $TA_{i,\tau}$ is the total accruals calculated as the change in non-cash current assets minus the change in current liabilities excluding the current portion of long-term debt, minus depreciation and amortization. $A_{i,\tau-1}$ is the lagged total assets. The change in sales ($\Delta REV_{i,\tau}$) or change in account receivable ($\Delta REC_{i,\tau}$) is calculated as the difference in values measured at time τ or time $\tau-1$ respectively. $PPE_{i,\tau}$ is the net property, plant, and equipment, and $ROA_{i,\tau}$ is the return-on-asset.

Table I (Continued)

Variable		Definition
Working Capital Accruals Quality	$WCAQ_{i,\tau}$	*WCAQ* is calculated as negative one times the standard deviation of the firm-specific residual from the prior 3 to 5 quarters, where residuals are from the following cross-sectional estimation of Dechow and Dichev's (2002) model: $$WCA_{i,\tau} = \beta_0 + \beta_1 CFO_{i,\tau-1} + \beta_2 CFO_{i,\tau} + \beta_3 CFO_{i,\tau+1} + \varepsilon_{i,\tau},$$ where $WCA_{i,\tau}$ is the working capital accruals (-(Change in Account Receivable + Change in Inventory + Change in Accounts Payable and Accrued Liabilities + Change in Income Taxes + Change in Assets and Liabilities)) scaled by average total assets, and *CFO* is the cash flow from operations scaled by average total assets.
Timeliness	$TIME_{i,\tau}$	*TIME* is calculated as negative one times the squared residual from the following cross-sectional estimation of Ashbaugh-Skaife, Collins, and LaFond's (2006) model: $$RET_{i,\tau} = \beta_0 + \beta_1 NIBE_{i,\tau} + \beta_2 LOSS_{i,\tau} + \beta_3 NIBE_{i,\tau} \times LOSS_{i,\tau} + \beta_4 \Delta NIBE_{i,\tau} + \varepsilon_{i,\tau},$$ where $RET_{i,\tau}$ is the market-adjusted return, $NIBE_{i,\tau}$ is net income before extraordinary items scaled by beginning of period market value of equity, $LOSS_{i,\tau}$ is 1 if $NIBE_{i,\tau}$ is negative and 0 otherwise, $\Delta NIBE_{i,\tau}$ is the change in net income before extraordinary items scaled by beginning of period market value of equity.
Panel C. Real Option Variables		
Business Group	$BGp_{i,\tau}$	*BGp* is a dummy variable, which equals 1 if the firm is classified as one of group-affiliated firms and 0 elsewhere.
Research and Development Expense Ratio	$R\&D_{i,\tau}$	*R&D* is calculated as the ratio of the R&D expenses to free cash flow in the quarter.
Sales-Based Herfindahl-Hirschman Index	$Sale\_HI_{i,\tau}$	*Sale_HI* is the sales-based Herfindahl-Hirschman index. It is calculated as the ratio of the sales to the industry sales.
Total Asset-Based Herfindahl-Hirschman Index	$TA\_HI_{i,\tau}$	*TA_HI* is the asset-based Herfindahl-Hirschman index. It is calculated as the ratio of the total assets to the industry total assets.

Table I (Continued)

Variable		Definition
Panel D. Corporate Governance Variables		
CEO Duality	$CEO\_Du_{i,\tau}$	*CEO_Du* is a dummy variable, which equals 1 if the CEO also holds the position of chair of the board of directors and 0 otherwise.
Institutional Ownership	$IHolder_{i,\tau}$	*IHolder* is calculated as the holdings of institutional investors.
Managerial Ownership	$MHolder_{i,\tau}$	*MHolder* is calculated as the holdings of managers.
Outsider Block-Holder Ownership	$OBHolder_{i,\tau}$	*OBHolder* is calculated as the holdings of block holders who are not directors or managers.
Largest Outsider Ownership	$LOHolder_{i,\tau}$	*LOHolder* is calculated as the holdings of largest outsiders who are not directors or managers.
Insider Holder Ownership	$InHolder_{i,\tau}$	*InHolder* is calculated as the holdings of insiders who are directors or managers.
Final Controller Ownership	$FCHolder_{i,\tau}$	*FCHolder* is calculated as the holdings of the final controller. If the firms' final controller is a family group, and we use the family-owned firms as a subsample to investigate the effects of family ownership on return asymmetry, *FCHolder* is renamed as *FamHolder*.
The Independent Director/ Supervisor Ratio in the Board	$InDS_{i,\tau}$	*InDS* is calculated as the number of independent directors/supervisors on the board scaled by the size of the board.
Divergence between Control Rights and Cash Flow Rights	$DIV\_btw\_CC_{i,\tau}$	*DIV_btw_CC* is calculated as the control rights of the final controller divided by cash flow rights of the final controller.
Panel E. Control Variables		
Stock Turnover	$TURN_{i,\tau}$	*TURN* is the average daily stock turnover in the quarter.
Cumulative Return	$CAR_{i,\tau}$	*CAR* is the cumulative daily return over the quarter.
Market Size	$Ln(SIZE)_{i,\tau}$	*Ln(SIZE)* is the logarithm of the firm's market value in the quarter.
Leverage Ratio	$LEV_{i,\tau}$	*LEV* is calculated as the ratio of debt to total assets in book value.
Market-to-Book Ratio	$MTB_{i,\tau}$	*MTB* is calculated as the ratio of the market value of equity to the book value of equity.
Return Volatility	$VOLRET_{i,\tau}$	*VOLRET* is the standard deviation of the daily returns in the quarter.

IV. Empirical Results

A. Preliminary Analysis

Table II reports descriptive statistics for the variables. Each variable is computed on a quarterly basis for each firm, and the statistics are derived from these time-series data and then cross-sectionally. The average (median) skewness is 1.1946 (1.1393), the up-to-down volatility ratio is 0.1447 (0.1488), and the extreme-return ratio is 0.1718 (0.1724) for the 1,265 firms. The results differ from what Bae, Lim, and Wei (2006) report for 433 Taiwanese firms for the period from 1995 to 2003. Their study finds the average skewness to be 0.13, while our findings indicate that stock returns in Taiwan are becoming more positively skewed over time.

Table II
Descriptive Statistics

This table presents the descriptive statistics derived from the data gathered from the TEJ database within the period of 2002Q1 to 2012Q3. We report the average, standard deviation (St. Dev.), first quarter, median, and third quarter of the measured variables. The variables include 3 measures of return skewness (*SKEW*, *VOLRATIO*, and *EXTRATIO*), 6 measures of ownership structure (*IHolder*, *MHolder*, *OBHolder*, *LOHolder*, *InHolder*, and *FCHolder*), board independency (*InDS*), divergence between control rights and cash flow rights (*DIV_btw_CC*), 5 proxy variables for the real option hypothesis (*R&D*, *TA_HI*, TA_HI^2, *Sale_HI*, and $Sale\_HI^2$), 3 measures of managerial discretionary disclosure (*EM, WCAQ*, and *TIMELINESS*), and their market sum, market average, industry sum, and industry average. The control variables include financial leverage (*LEV*), cumulative return (*CUMRET*), stock turnover (*TURNOVER*), market-to-book ratio (*MTB*), firm size (*Ln*(*SIZE*)), and stock return volatility (*VOLRET*). The definitions of the variables are reported in Table I.

Variable	Average	St. Dev.	Q1	Median	Q3
Panel A. Return Asymmetry					
$SKEW_{i,\tau}$	1.1946	1.2883	0.5543	1.1393	1.8176
$VOLRATIO_{i,\tau}$	0.1447	0.1660	0.0635	0.1488	0.2286
$EXTRATIO_{i,\tau}$	0.1718	0.1892	0.0689	0.1724	0.2796
Panel B. Managerial Discretionary Disclosure					
$EM_{i,\tau}$	-0.0007	0.0161	-0.0085	-0.0005	0.0063
$EM_{i,\tau}^{mkt\_sum}$	-1.1416	1.2535	-2.1695	-1.3795	0.0157
$EM_{i,\tau}^{mkt\_ave}$	-0.0005	0.0058	-0.0048	-0.0028	0.0013
$WCAQ_{i,\tau}$	-0.1700	0.1185	-0.2075	-0.1415	-0.1014
$WCAQ_{i,\tau}^{mkt\_sum}$	-53.0631	42.6595	-92.8668	-64.8432	-5.5934
$WCAQ_{i,\tau}^{mkt\_ave}$	-0.1646	0.0388	-0.1941	-0.1860	-0.1304
$TIME_{i,\tau}$	-0.0656	0.0480	-0.0832	-0.0531	-0.0354
$TIME_{i,\tau}^{mkt\_sum}$	-20.0461	16.3172	-35.5884	-23.7051	-2.3218
$TIME_{i,\tau}^{mkt\_ave}$	-0.0639	0.0150	-0.0732	-0.0661	-0.0530

Table II (Continued)

Variable	Average	St. Dev.	Q1	Median	Q3
Panel C. Real Option Variables					
$R\&D_{i,\tau}$	3.6785	10.9806	0.0836	1.2940	3.6699
$TA\_HI_{i,\tau}$	0.0192	0.0642	0.0003	0.0014	0.0104
$TA\_HI^2_{i,\tau}$	0.0047	0.0355	0.0000	0.0000	0.0001
$Sale\_HI_{i,\tau}$	0.0193	0.0640	0.0002	0.0016	0.0109
$Sale\_HI^2_{i,\tau}$	0.0046	0.0368	0.0000	0.0000	0.0001
Panel D. Corporate Governance Variables					
$CEO\_Du_{i,\tau}$	0.3284	0.4059	0.0000	0.0556	0.7247
$IHolder_{i,\tau}$	0.0913	0.1233	0.0111	0.0452	0.1196
$MHolder_{i,\tau}$	0.0169	0.0240	0.0017	0.0074	0.0227
$OBHolder_{i,\tau}$	0.1851	0.0936	0.1192	0.1692	0.2324
$LOHolder_{i,\tau}$	0.0330	0.0344	0.0103	0.0236	0.0442
$InHolder_{i,\tau}$	0.3193	0.1785	0.1973	0.2776	0.3828
$FCHolder_{i,\tau}$	0.2874	0.1640	0.1597	0.2618	0.3910
$InDS_{i,\tau}$	0.0012	0.0013	0.0000	0.0008	0.0024
$DIV\_btw\_CC_{i,\tau}$	2.3464	8.8044	1.0264	1.1406	1.5188
Panel E. Control Variables					
$TURN_{i,\tau}$	0.5808	0.4011	0.2863	0.5100	0.7975
$CAR_{i,\tau}$	0.0568	0.0619	0.0259	0.0502	0.0771
$Ln(SIZE)_{i,\tau}$	21.8126	1.4329	20.8025	21.6646	22.6131
$LEV_{i,\tau}$	0.3796	0.1533	0.2665	0.3678	0.4776
$MTB_{i,\tau}$	1.7078	2.1347	0.9756	1.3540	1.9599
$VOLRET_{i,\tau}$	0.0941	0.0320	0.0724	0.0962	0.1151

The average turnover ratio (*TURN*) is 0.5808, which is higher than its median; the same is true for the average cumulative return (*CAR*). These results show that turnover ratios and cumulative returns are positively skewed, providing support for the difference-of-opinion and stochastic-bubble hypotheses. Also, the average volatility of returns (*VOLRET*) is 0.0941, which is less than its median. The statistics are all consistent with Bae, Lim, and Wei's (2006) findings and the hypotheses about return asymmetry.

The averages for the discretionary-disclosure variables (*EM, WCAQ,* and *TIME*) obtained for each firm are -0.0007, -0.1700, and -0.0656 respectively, and their market sums (averages) are -1.1416 (-0.0005), -53.0631 (-0.1646), and -20.0461 (-0.0639). The percentage of shares held by outside block holders is on average 18.51%, providing marginal evidence for Claessens, Simeon, and Lang's (2000) finding that there exists at least one large shareholder in most Asian companies. The proportion of independent directors and supervisors on the board averages 0.12%, showing that many listed firms in Taiwan are still operating under the requirement set up by the Securities and Futures Bureau (SFB) in 2002. The average sales-based (asset-based) Herfindahl-Hirschman index is 0.0192 (0.0193), indicating that not many firms have dominant power in their industry.

Table III
t-Test of Return Distributions between Affiliated and Non-Affiliated Groups

In this table, we use *t*-test to distinguish the differences of S*KEW*, *VOLRATIO*, and *EXTRATIO* between affiliated and non-affiliated groups. *BGp* and *NBGp* represent the affiliated and non-affiliated groups. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Variable	*NBGp-SKEW*		*NBGp-VOLRATIO*		*NBGp-EXTRATIO*	
	t-statistic	*p*-value	*t*-statistic	*p*-value	*t*-statistic	*p*-value
BGp-SKEW	3.2742***	0.0005				
BGp-VOLRATIO			1.9606**	0.0245		
BGp-EXTRATIO					2.5571***	0.0030

Table III shows the *t*-test for distinguishing differences of *SKEW*, *VOLRATIO*, and *EXTRATIO* between affiliated and non-affiliated groups. We find that the returns for firms in affiliated groups are more positively skewed than those for non-affiliated firms. These results support the risk-sharing hypothesis of Bae, Lim, and Wei (2006) when the in-market data are applied.

We also report the correlation of coefficients between the major variables in Table IV. *SKEW* relates closely to *VOLRATIO*, while *EXTRATIO* relates fairly to *SKEW* and *VOLRATIO*, showing that the use of alternative measures is suggestive of capturing return skewness and obtaining robust results. In addition, *SKEW* correlates negatively with *TURN*, *CAR*, *LEV*, and *VOLRET*. These findings again support the different-opinion, stochastic-bubble, leverage effect, and volatility feedback hypotheses.

As for the managerial discretionary-disclosure variables, *EM*, *WCAQ*, and *TIME* at the market level, are significantly correlated with *SKEW*. These results provide support for Bae, Lim, and Wei's (2006) finding that firms in markets where managers exercise more power over discretionary disclosure have more positive return skewness. However, we find that *EM*, *WCAQ*, and *TIME* at the firm level are also significantly correlated with *SKEW* but in the reverse way. That is, the less the managerial discretionary disclosure by firms, the more information transparency and the more positive skewness the firms have. This finding provides support for our interpretation that returns to firms that are better governed tend to be more positively skewed.

We also find that the firm characteristics of high outside block holder ownership (*OBHolder*), largest shareholder ownership (*LOHolder*), insider ownership (*InHolder*), final controller ownership (*FCHolder*), and board independence (*InDS*) are positively related to skewness. In sum, the results in Table IV provide support for the positive association between the quality of corporate governance and stock return skewness. In the following section, we present the results of our regression analyses.

Table IV
Correlation Coefficients

The definitions of variables are reported in Table I. Bold-faced coefficients are significant at the 1% and 5% levels respectively.

Variable		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
$SKEW_{i,\tau}$	A	1.00																																
$VOLRATIO_{i,\tau}$	B	0.75	1.00																															
$EXTRATIO_{i,\tau}$	C	0.48	0.50	1.00																														
$TURN_{i,\tau}$	D	-0.04	-0.03	-0.01	1.00																													
$CAR_{i,\tau}$	E	-0.09	-0.26	-0.04	0.27	1.00																												
$Ln(SIZE)_{i,\tau}$	F	0.02	0.04	0.03	0.19	0.07	1.00																											
$LEV_{i,\tau}$	G	-0.04	-0.03	-0.03	-0.04	0.01	-0.11	1.00																										
$MTB_{i,\tau}$	H	0.01	0.01	0.01	0.09	0.10	0.13	0.06	1.00																									
$VOLRET_{i,\tau}$	I	-0.20	-0.15	-0.06	0.26	-0.18	0.21	-0.09	-0.05	1.00																								
$EM_{i,\tau}$	J	-0.02	-0.02	-0.02	0.00	0.04	-0.03	0.01	-0.03	-0.03	1.00																							
$EM_{i,\tau}^{mkt\_sum}$	K	0.07	0.07	0.07	-0.01	0.08	0.02	0.01	-0.01	-0.09	-0.22	1.00																						
$EM_{i,\tau}^{mkt\_ave}$	L	0.06	0.07	0.06	-0.01	0.09	0.01	0.03	-0.03	-0.08	-0.29	0.71	1.00																					
$VCAQ_{i,\tau}$	M	0.02	0.02	0.01	-0.01	0.01	0.10	-0.10	-0.07	0.01	-0.00	0.02	0.02	1.00																				
$VCAQ_{i,\tau}^{mkt\_sum}$	N	-0.05	-0.04	-0.01	-0.14	0.01	-0.01	0.15	-0.10	-0.26	0.07	-0.20	-0.23	-0.14	1.00																			
$VCAQ_{i,\tau}^{mkt\_ave}$	O	-0.03	-0.02	-0.00	-0.07	0.04	0.04	-0.04	-0.06	-0.19	0.03	-0.11	-0.11	-0.23	0.59	1.00																		
$TIME_{i,\tau}$	P	0.10	0.08	0.10	-0.14	-0.38	0.10	-0.09	-0.06	-0.12	-0.01	0.01	0.01	0.06	-0.08	-0.09	1.00																	
$TIME_{i,\tau}^{mkt\_sum}$	Q	-0.05	-0.05	-0.01	-0.10	-0.01	0.03	0.11	-0.06	-0.32	0.05	-0.17	-0.18	-0.12	0.85	0.51	-0.18	1.00																
$TIME_{i,\tau}^{mkt\_ave}$	R	-0.09	-0.08	0.05	-0.07	-0.05	0.06	-0.03	0.01	-0.31	0.01	-0.04	-0.02	-0.06	0.24	0.25	-0.36	0.51	1.00															
BGp_i	S	0.02	0.01	0.01	0.01	0.00	0.28	0.02	-0.03	0.10	0.02	0.02	0.03	0.05	0.09	0.08	0.02	0.08	0.02	1.00														

Table IV (Continued)

Variable		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
$R\&D_{i,\tau}$	T	0.00	0.01	0.00	**0.01**	0.00	-0.01	**-0.02**	**0.02**	0.00	0.01	**0.02**	0.01	-0.01	**-0.03**	**-0.01**	0.00	**-0.02**	0.00	0.00	1.00													
$Sale\_HI_{i,\tau}$	U	0.00	-0.01	-0.01	**-0.09**	0.01	**0.36**	**0.03**	0.00	**0.01**	0.01	**0.05**	0.06	**0.07**	**0.27**	**0.27**	**0.05**	**0.22**	**0.07**	**0.18**	-0.01	1.00												
$Sale\_HI^2_{i,\tau}$	V	0.00	0.00	0.01	**-0.07**	0.00	**0.25**	-0.01	**0.01**	0.01	0.00	**0.02**	**0.03**	**0.03**	**0.14**	**0.15**	**0.03**	**0.11**	**0.05**	**0.11**	-0.01	**0.89**	1.00											
$TA\_HI_{i,\tau}$	W	-0.01	-0.00	-0.00	**-0.09**	0.00	**0.42**	0.01	**-0.03**	**0.03**	**0.01**	**0.05**	**0.06**	**0.10**	**0.28**	**0.27**	**0.05**	**0.22**	**0.07**	**0.20**	-0.01	**0.91**	**0.80**	1.00										
$TA\_HI^2_{i,\tau}$	X	0.01	0.00	0.00	**-0.06**	0.00	**0.29**	**-0.03**	0.00	**0.02**	0.00	**0.02**	**0.03**	**0.05**	**0.14**	**0.15**	**0.03**	**0.11**	**0.05**	**0.12**	-0.01	**0.82**	**0.91**	**0.89**	1.00									
$CEO\_Du_{i,\tau}$	Y	-0.01	-0.01	-0.01	**0.05**	0.00	**-0.12**	**-0.03**	0.01	**0.01**	0.00	**-0.02**	**-0.03**	**-0.03**	**-0.11**	**-0.09**	**-0.04**	**-0.09**	**-0.03**	**-0.14**	0.00	**-0.10**	**-0.05**	**-0.11**	**-0.06**	1.00								
$IHolder_{i,\tau}$	Z	**-0.01**	-0.01	0.01	**0.02**	**0.02**	**0.55**	**-0.07**	**0.13**	**0.07**	**-0.05**	-0.01	**-0.03**	**0.01**	**-0.05**	**-0.02**	**0.06**	**-0.03**	**0.01**	**0.09**	0.00	**0.20**	**0.12**	**0.16**	**0.10**	**-0.06**	1.00							
$MHolder_{i,\tau}$	AA	**0.01**	0.01	0.00	**0.03**	**0.00**	**-0.09**	**-0.05**	**0.04**	**0.00**	**-0.02**	-0.04	**-0.05**	**-0.06**	**-0.23**	**-0.15**	**0.01**	**-0.19**	**-0.04**	**-0.05**	0.02	**-0.10**	**-0.08**	**-0.15**	**-0.08**	**-0.01**	-0.06	1.00						
$OBHolder_{i,\tau}$	AB	**0.02**	0.02	-0.01	**-0.20**	**0.04**	**-0.08**	**0.05**	**0.06**	**-0.19**	**0.02**	0.01	**0.03**	**-0.05**	**0.09**	**0.03**	**-0.02**	**0.07**	**0.00**	**-0.03**	0.00	**0.01**	**-0.01**	**0.00**	**-0.01**	**0.02**	0.04	-0.07	1.00					
$LOHolder_{i,\tau}$	AC	**0.02**	0.02	0.00	**-0.06**	**0.02**	**-0.06**	**0.02**	**0.02**	**-0.09**	**0.00**	-0.01	**-0.02**	**-0.05**	**-0.01**	**-0.01**	**-0.02**	**-0.01**	**0.01**	**-0.01**	-0.01	**-0.06**	**-0.04**	**-0.06**	**-0.04**	**0.00**	0.01	-0.01	0.10	1.00				
$InHolder_{i,\tau}$	AD	**0.02**	0.01	0.00	**-0.23**	**0.01**	**-0.07**	**0.03**	**0.01**	**-0.20**	**0.01**	0.03	**0.02**	**0.00**	**0.15**	**0.07**	**0.03**	**0.11**	**0.05**	**0.05**	0.00	**0.05**	**0.04**	**0.06**	**0.06**	**-0.07**	0.02	-0.07	-0.12	0.12	1.00			
$FCHolder_{i,\tau}$	AE	**0.05**	0.03	-0.01	**-0.29**	**0.02**	**-0.08**	**0.03**	**0.00**	**-0.21**	**0.02**	0.05	**0.06**	**0.03**	**0.25**	**0.15**	**0.03**	**0.20**	**0.05**	**0.00**	-0.01	**0.09**	**0.07**	**0.11**	**0.09**	**-0.05**	-0.11	-0.23	0.40	-0.14	0.58	1.00		
$InDS_{i,\tau}$	AF	**0.01**	0.01	0.01	**0.05**	**-0.01**	**0.00**	**-0.08**	**0.09**	**0.04**	**-0.05**	-0.07	**-0.10**	**-0.08**	**-0.36**	**-0.25**	**-0.01**	**-0.29**	**-0.05**	**-0.20**	0.01	**-0.15**	**-0.07**	**-0.17**	**-0.08**	**0.09**	0.08	0.12	0.01	-0.03	-0.06	-0.06	1.00	
$DIV\_btw\_CC_{i,\tau}$	AG	**-0.01**	-0.01	-0.01	**0.00**	**0.00**	**0.08**	**-0.03**	**0.01**	**0.04**	**0.00**	-0.02	**-0.03**	**0.00**	**-0.07**	**-0.05**	**-0.01**	**-0.05**	**-0.01**	**0.08**	0.00	**-0.01**	**0.00**	**-0.01**	**0.00**	**-0.03**	0.04	0.05	-0.07	0.02	0.12	-0.02	0.02	1.00

B. Regression Results

We follow Bae, Lim, and Wei (2006) in employing random-effect regression models to test the hypotheses and the effect of corporate governance mechanisms on return skewness. In this section, we use market-level and firm-level data to conduct an empirical analysis. White's (1980) procedure is also used to correct for heteroskedasticity.

B.1. Results from Market-Level Data

The results from Models 1 and 2 shown in Table V support both Hypothesis 1a and Bae, Lim, and Wei's (2006) findings that firms in markets with higher managerial discretionary-disclosure power are associated with more positive return skewness. Also, the significantly negative relations among working capital accruals (*WCAQ*), timeliness of information release (*TIME*) at the market level, and return skewness support Hypothesis 1b that firms in less transparent markets are associated with more positive return skewness. We provide evidence that the discretionary disclosure hypothesis holds at the market level by using data from the Taiwan stock market.

Our empirical results also indicate that stocks with higher turnover (*TURN*) have lower skewness (*SKEW*), supporting Hong and Stein's (2003) findings that higher stock turnover means that investors have different opinions about the real value of stocks, which leads stock returns to be more negatively skewed. We also find that negative skewness is the most significant in stocks that have experienced higher returns in the previous quarter period (*CAR*), and this result supports the stochastic-bubble theory. Also, *SKEW* is significantly negatively associated with *LEV* and *VOLRET*, which is consistent with the leverage effect and volatility feedback hypotheses. In sum, our empirical results support the four well-known hypotheses.

B.2. Results from Firm-Level Data

In this section, we use firm-level and market-level data simultaneously to test our hypotheses. The discretionary-disclosure variables at the market level (e.g., $EM_{\tau}^{mkt\_sum}$ and $EM_{\tau}^{mkt\_ave}$) are used to control for the market effect of poorly governed companies in emerging markets (Bae, Lim, and Wei (2006)). The real option variables are used to test Hypothesis 2, and BGp_i is used to test Hypothesis 3. We use the corporate governance variables and the managerial discretionary-disclosure variables ($EM_{i,\tau}$, $WCAQ_{i,\tau}$, and $TIME_{i,\tau}$) at the firm level to test Hypothesis 4.

As shown in Table VI, the real option variables all display significant relations with return skewness, providing support for Hypothesis 2 that firms that own valuable real options have more positively skewed returns. The R&D also relates positively to skewness. These findings provide support for our assumption that firms that engage in R&D activity have more potential to exercise their real options to improve stock prices, leading to positive skewed returns. In addition,

Table V
Random Effects Regression of the Influence of Market-Level Discretionary Disclosure on Return Skewness

In this table, we regress the return skewness on variables to examine the discretionary-disclosure hypothesis. The independent variables are the three measures of managerial discretionary disclosure at the market level ($EM_{i,\tau}^{mkt\_sum}$, $EM_{i,\tau}^{mkt\_ave}$, $WCAQ_{i,\tau}^{mkt\_sum}$, $WCAQ_{i,\tau}^{mkt\_ave}$, $TIME_{i,\tau}^{mkt\_sum}$, and $TIME_{i,\tau}^{mkt\_ave}$). The control variables include financial leverage (*LEV*), cumulative return (*CAR*), stock turnover (*TURN*), market-to-book ratio (*MTB*), firm size (*Ln(SIZE)*), and return volatility (*VOLRET*). The definitions of the variables are reported in Table I. We use White's (1980) procedure to correct for heteroskedasticity to obtain the standard deviations of the coefficients. The regression model is shown below.

$$\begin{aligned} SKEW_{i,\tau+1} = {} & \alpha_0 + \alpha_1 SKEW_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt\_sum}(EM_{i,\tau}^{mkt\_ave}) \\ & + \beta_2 WCAQ_{i,\tau}^{mkt\_sum}(WCAQ_{i,\tau}^{mkt\_ave}) + \beta_3 TIME_{i,\tau}^{mkt\_sum}(TIME_{i,\tau}^{mkt\_ave}) \\ & + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\ & + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{19} C_k Year_k + \varepsilon_{i,\tau+1}. \end{aligned}$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$	
	(1)	(2)
Intercept	0.8155 (0.1542)	0.6694 (0.2457)
$SKEW_{i,\tau}$(?)	0.0888*** (0.0000)	0.0863*** (0.0000)
Panel A. Managerial Discretionary Disclosure (Market Level)		
$EM_{i,\tau}^{mkt\_sum}$(+)	0.0151*** (0.0001)	
$EM_{i,\tau}^{mkt\_ave}$(+)		4.6631*** (0.0000)
$WCAQ_{i,\tau}^{mkt\_sum}$(–)	-0.0130** (0.0345)	
$WCAQ_{i,\tau}^{mkt\_ave}$(–)		-0.8183** (0.0267)
$TIME_{i,\tau}^{mkt\_sum}$(–)	-0.0229*** (0.0061)	
$TIME_{i,\tau}^{mkt\_ave}$(–)		-1.2743*** (0.0020)
Panel B. Control Variables		
$TURN_{i,\tau}$(–)	-0.3633*** (0.0000)	-0.3541*** (0.0000)
$CAR_{i,\tau}$(–)	-0.2554*** (0.0001)	-0.2565*** (0.0001)
$Ln(SIZE)_{i,\tau}$(–)	0.0777*** (0.0051)	0.0775*** (0.0055)
$LEV_{i,\tau}$(–)	-0.6154** (0.0200)	-0.6169** (0.0201)
$MTB_{i,\tau}$(?)	0.0454*** (0.0000)	0.0428*** (0.0000)
$VOLRET_{i,\tau}$(–)	-1.9874** (0.0254)	-1.9969** (0.0119)
Time Dummy Variables	Yes	Yes
Industry Dummy Variables	Yes	Yes
Adj R^2	0.0668	0.0781
Number of Observations	31,384	31,384

the sales-based Herfindahl-Hirschman index (*Sale_HI*) and the asset-based Herfindahl-Hirschman index (*TA_HI*) display a quadratic relation with skewness. This U-shaped relation indicates that firms with less market power are associated with negative return skewness, whereas firms with more market power are capable of exercising their real options at the right time. We show that firms with more social networks, market potential, and market power obtain real options that are valuable as well as intangible capital. If those real options are exercised at a bad time, the result is positive return skewness. In addition, the group-affiliated dummy variable (*BGp*) also relates positively to skewness. Our empirical results show that group-affiliated firms are associated with positive return skewness.

The results shown in Table VI also indicate that *MHolder*, *LOHolder*, and *InDS* are positively related to skewness and that *DIV_btw_CC* is negatively associated with skewness, supporting Hypothesis 4. These results indicate that firms with higher managerial ownership, higher largest shareholder ownership, and more independent board have more positive skewness. Higher managerial and largest shareholder ownership cause the interests of shareholders and management to converge or to be closely tied. In other words, the fewer agency problems a firm has, the more positive skewness it has. This interpretation is also supported by the finding that the less the divergence between control rights and cash flow rights, the lower the agency costs, and such a divergence is associated with more positive skewness. In sum, we argue that good corporate governance can bring together the interests of shareholders and management and reduce agency costs, making it more probable that firms will have positive stock returns and consequently positively skewed returns.

Similar to Table V, the results in Table VI show that the stocks with higher stock turnover (*TURN*) have lower skewness (*SKEW*) and that the skewness is negatively associated with firms that experienced higher returns in the previous quarter. Also, *SKEW* is significantly negatively associated with return volatility (*VOLRET*). Our results again support the different-options, stochastic-bubble, leverage effect, and volatility feedback hypotheses in the emerging Taiwan market.

In addition, we find that the discretionary-disclosure variables at the firm level relate significantly to skewness. Managerial discretionary disclosure is also regarded as a corporate governance mechanism. Under the control of the market-level discretionary-disclosure variables, we find that firms with better informational transparency have more positive return skewness. Our findings indicate that in a less transparent market, firms that are better at disclosing financial information have more positive return skewness; this finding supports Hypothesis 4. Further, the discretionary-disclosure variables at the market level still relate significantly to return skewness, which is consistent with Hypothesis 1.

A distinctive feature of this study is that we extend Bae, Lim, and Wei's (2006) investigation to examine how managerial discretionary disclosure affects return skewness in a poorly governed market. Obviously, firms perform differently according to their discretionary disclosure in a market. Our study controls external

market factors and proves that better corporate governance leads to more positive return skewness.

Table VI
Random Effects Regressions for Skewness on the Real Option and Corporate Governance Variables

In this table, we regress the lagged conditional coefficients of skewness on all the independent variables. The independent and control variables are the same as those used in Table V. We further use 3 firm-level managerial discretionary-disclosure variables (*Disclosure, WCAQ*, and *TIME*), 6 proxy variables for the real option hypothesis (*BGp*, *R&D*, *TA_HI*, *TA_HI*^{2}, *Sale_HI*, and *Sale_HI*^{2}), the variables of CEO duality (*CEO_Du*), ownership structure (*IHolder*, *MHolder*, *OBHolder*, *LOHolder*, *InHolder*, and *FCHolder*), and board independency (*InDS*), and divergence between control rights and cash flow rights (*DIV_btw_CC)*. The definitions of the variables are reported in Table I. White's (1980) procedure is used to correct for heteroskedasticity to obtain the standard deviations of the coefficients. The regression model is shown below:

$$
\begin{aligned}
SKEW_{i,\tau+1} = {} & \alpha_0 + \alpha_1 SKEW_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt\_sum}(EM_{i,\tau}^{mkt\_ave}) + \beta_2 WCAQ_{i,\tau} \\
& + \beta_3 WCAQ_{i,\tau}^{mkt\_sum}(WCAQ_{i,\tau}^{mkt\_ave}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt\_sum}(TIME_{i,\tau}^{mkt\_ave}) \\
& + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^2(TA\_HI_{i,\tau}^2) \\
& + \beta_{10} CEO\_Du_{i,\tau} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\
& + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV\_btw\_CC_{i,\tau} \\
& + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\
& + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{19} C_k Year_k + \varepsilon_{i,\tau+1}.
\end{aligned}
$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	-2.5254***	-2.7869***	-2.5565***	-2.8066***
	(0.0019)	(0.0013)	(0.0020)	(0.0015)
$SKEW_{i,\tau}$ (?)	0.0912***	0.0911***	0.0910***	0.0910***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$ (–)	-0.1666*	-0.1585*	-0.1676*	-0.1592*
	(0.0603)	(0.0588)	(0.0609)	(0.0589)
$EM_{i,\tau}^{mkt\_sum}$ (+)	0.0080**		0.0080**	
	(0.0101)		(0.0105)	
$EM_{i,\tau}^{mkt\_ave}$ (+)		5.6676***		5.7234***
		(0.0000)		(0.0000)
$WCAQ_{i,\tau}$ (+)	0.2252***	0.2315***	0.2353***	0.2679***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$WCAQ_{i,\tau}^{mkt\_sum}$ (–)	-0.0123***		-0.0138***	
	(0.0003)		(0.0004)	
$WCAQ_{i,\tau}^{mkt\_ave}$ (–)		-1.3333***		-1.3373***
		(0.0064)		(0.0066)
$TIME_{i,\tau}$ (+)	-0.1111	-0.1121	-0.1116	-0.1123
	(0.7887)	(0.7890)	(0.7748)	(0.7885)
$TIME_{i,\tau}^{mkt\_sum}$ (–)	0.0163		0.0164	
	(0.2121)		(0.2133)	
$TIME_{i,\tau}^{mkt\_ave}$ (–)		0.6868		0.6859
		(0.3344)		(0.3386)

Table VI (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Panel B. Real Option Variables				
BGp_i(+)	0.1005** (0.0155)	0.1007** (0.0152)	0.1005** (0.0151)	0.1006** (0.0156)
$R\&D_{i,\tau}$(+)	6.66×10^{-5}** (0.0118)	6.69×10^{-5}** (0.0117)	6.63×10^{-5}** (0.0118)	6.61×10^{-5}** (0.0118)
$Sale\_HI_{i,\tau}$(−)	-4.0808** (0.0115)	-4.0568** (0.0118)		
$Sale\_HI^2_{i,\tau}$(+)	6.0333** (0.0498)	6.0343* (0.0503)		
$TA\_HI_{i,\tau}$(−)			-6.0001*** (0.0003)	-5.9947*** (0.0002)
$TA\_HI^2_{i,\tau}$(+)			8.1234** (0.0333)	8.1228** (0.0364)
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}$(−)	-0.0118 (0.8560)	-0.0125 (0.8672)	-0.0119 (0.8510)	-0.025 (0.8670)
$IHolder_{i,\tau}$(+)	-2.2563*** (0.0000)	-2.2448*** (0.0000)	-2.2588*** (0.0000)	-2.2477*** (0.0000)
$MHolder_{i,\tau}$(+)	0.2121* (0.0683)	0.2115* (0.0688)	0.1005* (0.0553)	-0.1011* (0.0555)
$OBHolder_{i,\tau}$(+)	0.3339 (0.5359)	0.3333 (0.5633)	0.3055 (0.5847)	0.3049 (0.5912)
$LOHolder_{i,\tau}$(+)	0.1787*** (0.0000)	0.1789*** (0.0000)	0.1801*** (0.0000)	0.1800*** (0.0000)
$InHolder_{i,\tau}$(+)	-0.0010 (0.6898)	-0.0011 (0.6997)	-0.0009 (0.6896)	-0.0009 (0.6897)
$FCHolder_{i,\tau}$(+)	0.0133 (0.3553)	0.0143 (0.3552)	0.0138 (0.3598)	0.0139 (0.3600)
$InDS_{i,\tau}$(+)	33.6852** (0.0464)	33.4998** (0.0454)	38.2161** (0.0475)	38.2079** (0.0485)
$DIV\_btw\_CC_{i,\tau}$(−)	-0.2136*** (0.0000)	-0.2225*** (0.0000)	-0.2388*** (0.0000)	-0.2167*** (0.0000)
Panel D. Control Variables				
$TURN_{i,\tau}$(−)	-0.2615*** (0.0000)	-0.2611*** (0.0000)	-0.2616*** (0.0000)	-0.2611*** (0.0000)
$CAR_{i,\tau}$(−)	-0.4168*** (0.0000)	-0.4166*** (0.0000)	-0.4170*** (0.0000)	-0.4166*** (0.0000)
$Ln(SIZE)_{i,\tau}$(−)	0.2002*** (0.0000)	0.2007*** (0.0000)	0.2001*** (0.0000)	0.2002*** (0.0000)
$LEV_{i,\tau}$(−)	-0.5655*** (0.0001)	-0.5864*** (0.0001)	-0.5676*** (0.0002)	-0.5833*** (0.0002)
$MTB_{i,\tau}$(?)	0.1251** (0.0121)	0.1314** (0.0126)	0.1269** (0.0155)	0.1334** (0.0134)
$VOLRET_{i,\tau}$(−)	-3.2019** (0.0211)	-3.1868** (0.0233)	-3.1946** (0.0221)	-3.2001** (0.0234)
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.1019	0.1033	0.1047	0.1040
Number of Observations	31,384	31,384	31,384	31,384

Standing with Shleifer and Vishny (1986), we expect institutional ownership to play a role in forcing firms to focus on economic performance, leading to positive return skewness. However, the empirical results show a negative relation between

IHolder and return skewness. This negative relation somewhat supports Rubin and Smith's (2009) finding that firms with greater institutional ownership have more information about stock prices. More information about a firm's stock price may drive higher turnover and cause returns to be less positively skewed.

B.3. Results from Alternative Measures of Return Asymmetry

VOLRATIO and *EXTRATIO* are used to replace traditional skewness to check the sensitivity of our results. Tables VII and VIII report the results when *VOLRATIO* and *EXTRATIO* are used as the dependent variables respectively. The findings are somewhat similar to those shown in Table VI, and consequently provide solid support for our results.

Table VII
Random Effects Regressions for the Up-to-Down Volatility Ratio on the Real Option and Corporate Governance Variables

In this table, we regress the lagged up-to-down volatility ratio *VOLRATIO* on the variables which are the same as those used in Table VI, and the definitions of the variables are reported in Table I. White's (1980) procedure is used to correct for heteroskedasticity to obtain the standard deviations of the coefficients. The regression model is shown below:

$$\begin{aligned} VOLRATIO_{i,\tau+1} = {} & \alpha_0 + \alpha_1 VOLRATIO_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt\_sum}(EM_{i,\tau}^{mkt\_ave}) + \beta_2 WCAQ_{i,\tau} \\ & + \beta_3 WCAQ_{i,\tau}^{mkt\_sum}(WCAQ_{i,\tau}^{mkt\_ave}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt\_sum}(TIME_{i,\tau}^{mkt\_ave}) \\ & + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^{2}(TA\_HI_{i,\tau}^{2}) \\ & + \beta_{10} CEO\_Du_{i,\tau} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\ & + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV\_btw\_CC_{i,\tau} \\ & + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\ & + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}. \end{aligned}$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $VOLRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	0.0895 (0.1968)	0.0888 (0.4581)	0.0864 (0.1958)	0.0902 (0.6321)
$VOLRATIO_{i,\tau}$(?)	0.1141*** (0.0000)	0.1565*** (0.0000)	0.1481*** (0.0000)	0.1332*** (0.0000)
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$(–)	-0.0959 (0.8863)	-0.1111 (0.5631)	-0.0989 (0.8715)	-0.1162 (0.5361)
$EM_{i,\tau}^{mkt\_sum}$(+)	0.0010** (0.0331)		0.0013** (0.0302)	
$EM_{i,\tau}^{mkt\_ave}$(+)		0.8252*** (0.0000)		0.6995*** (0.0000)
$WCAQ_{i,\tau}$(+)	0.0999*** (0.0000)	0.0974*** (0.0000)	0.0944*** (0.0000)	0.0957*** (0.0000)
$WCAQ_{i,\tau}^{mkt\_sum}$(–)	-0.0023*** (0.0000)		-0.0018*** (0.0000)	
$WCAQ_{i,\tau}^{mkt\_ave}$(–)		-0.0743 (0.7887)		-0.0784 (0.7141)

Table VII (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $VOLRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
$TIME_{i,\tau}^{mkt\_sum}$ (–)	-0.0003***		-0.0006**	
	(0.0221)		(0.0258)	
$TIME_{i,\tau}$ (+)	0.1500***	0.1603***	0.1712***	0.1661***
	(0.0007)	(0.0005)	(0.0005)	(0.0005)
$TIME_{i,\tau}^{mkt\_ave}$ (–)		0.0883		0.0890
		(0.9155)		(0.9346)
Panel B. Real Option Variables				
BGp_i (+)	0.0145**	0.0133**	0.0168**	0.0149**
	(0.0255)	(0.0320)	(0.0277)	(0.0283)
$R\&D_{i,\tau}$ (+)	-4.21×10^{-5}	-3.95×10^{-5}	-4.02×10^{-5}	-3.99×10^{-5}
	(0.1633)	(0.2699)	(0.3058)	(0.1987)
$Sale\_HI_{i,\tau}$ (–)	-0.0818*	-0.0855*		
	(0.0715)	(0.0783)		
$Sale\_HI_{i,\tau}^2$ (+)	0.3368**	0.2967**		
	(0.0098)	(0.0090)		
$TA\_HI_{i,\tau}$ (–)			-0.1545*	-0.1733**
			(0.0632)	(0.0493)
$TA\_HI_{i,\tau}^2$ (+)			0.4777	0.6017
			(0.1102)	(0.1088)
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}$ (–)	-0.0044	-0.0069	-0.0058	-0.0070
	(0.6509)	(0.7157)	(0.6332)	(0.8014)
$IHolder_{i,\tau}$ (+)	-0.0886*	-0.0761	-0.0913*	-0.0905*
	(0.0993)	(0.1003)	(0.0922)	(0.0942)
$MHolder_{i,\tau}$ (+)	0.1588	0.1267	0.1349	0.1448
	(0.6338)	(0.5154)	(0.6031)	(0.5242)
$OBHolder_{i,\tau}$ (+)	-0.0289	-0.0310	-0.0266	-0.0300
	(0.7885)	(0.7347)	(0.6972)	(0.7150)
$LOHolder_{i,\tau}$ (+)	0.0042**	0.0038**	0.0032**	0.0040**
	(0.0331)	(0.0340)	(0.0329)	(0.0357)
$InHolder_{i,\tau}$ (+)	-0.0010	-0.0011	-0.0009	-0.0009
	(0.2877)	(0.2642)	(0.2755)	(0.2808)
$FCHolder_{i,\tau}$ (+)	0.0033	0.0041	0.0038	0.0040
	(0.2222)	(0.2182)	(0.2276)	(0.2389)
$InDS_{i,\tau}$ (+)	7.6852**	7.3215**	7.5287**	7.4149**
	(0.0164)	(0.0314)	(0.0188)	(0.0297)
$DIV\_btw\_CC_{i,\tau}$ (–)	-0.0021***	-0.0019***	-6.02×10^{-5}***	-6.35×10^{-5}***
	(0.0005)	(0.0007)	(0.0055)	(0.0048)
Panel D. Control Variables				
$TURN_{i,\tau}$ (–)	-0.0655	-0.0753	-0.0748	-0.0689
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$CAR_{i,\tau}$ (–)	-0.2060	-0.2122	-0.2139	-0.2160
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$Ln(SIZE)_{i,\tau}$ (–)	0.0003	0.0004	0.0111	0.0113
	(0.5569)	(0.5555)	(0.0333)	(0.0330)
$LEV_{i,\tau}$ (–)	-0.0853	-0.0863	-0.0888	-0.0855
	(0.0881)	(0.0878)	(0.0862)	(0.0880)
$MTB_{i,\tau}$ (?)	-0.0085	-0.0087	-0.0085	-0.0086
	(0.0021)	(0.0030)	(0.0025)	(0.0029)
$VOLRET_{i,\tau}$ (–)	-0.1555	-0.1548	-0.1605	-0.1583
	(0.3212)	(0.2953)	(0.3263)	(0.2988)
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.0858	0.0879	0.0843	0.0866
Number of Observations	31,384	31,384	31,384	31,384

Table VIII
Random Effects Regressions of the Influence of the Real Option and Corporate Governance Variables on the Extreme-Return Ratio

In this table, we regress the lagged extreme-return volatility ratio *EXTRATIO* on the variables which are the same as those used in Table VI, and the definitions of the variables are reported in Table I. We use White's (1980) procedure to correct for heteroskedasticity to obtain the standard deviations of the coefficients. The regression model is shown below:

$$
\begin{aligned}
EXTRATIO_{i,\tau+1} = {} & \alpha_0 + \alpha_1 EXTRATIO_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt-sum}(EM_{i,\tau}^{mkt-ave}) + \beta_2 WCAQ_{i,\tau} \\
& + \beta_3 WCAQ_{i,\tau}^{mkt-sum}(WCAQ_{i,\tau}^{mkt-ave}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt-sum}(TIME_{i,\tau}^{mkt-ave}) \\
& + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^2(TA\_HI_{i,\tau}^2) \\
& + \beta_{10} CEO\_Du_{i,\tau} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\
& + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV\_btw\_CC_{i,\tau} \\
& + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\
& + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}.
\end{aligned}
$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $EXTRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	-0.5624*** (0.0000)	-0.4857*** (0.0000)	-0.5249*** (0.0000)	-0.4997*** (0.0000)
$EXTRATIO_{i,\tau}$(?)	0.0546*** (0.0001)	0.0611*** (0.0001)	0.0523*** (0.0001)	0.0658*** (0.0001)
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$(−)	-0.0471* (0.0863)	-0.0633* (0.0930)	-0.0591* (0.0881)	-0.0601* (0.0903)
$EM_{i,\tau}^{mkt\_sum}$(+)	-0.0010 (0.1555)		-0.0010 (0.1621)	
$EM_{i,\tau}^{mkt\_ave}$(+)		0.2010 (0.6321)		0.1988 (0.6404)
$WCAQ_{i,\tau}$(+)	0.0749*** (0.0000)	0.0802*** (0.0000)	0.0788*** (0.0000)	0.0801*** (0.0000)
$WCAQ_{i,\tau}^{mkt\_sum}$(−)	-0.0055*** (0.0000)		-0.0054*** (0.0000)	
$WCAQ_{i,\tau}^{mkt\_ave}$(−)		0.1858 (0.1520)		0.1731 (0.1379)
$TIME_{i,\tau}$(+)	0.0631 (0.4821)	0.0533 (0.4963)	0.0709 (0.5003)	0.0684 (0.4999)
$TIME_{i,\tau}^{mkt\_sum}$(−)	-0.0022*** (0.0000)		-0.0023*** (0.0000)	
$TIME_{i,\tau}^{mkt\_ave}$(−)		-0.5124*** (0.0011)		-0.4988*** (0.0011)
Panel B. Real Option Variables				
BGp_i(+)	0.0300* (0.0709)	0.0299* (0.0811)	0.0308* (0.0700)	0.0293* (0.0799)
$R\&D_{i,\tau}$(+)	5.12×10^{-5}*** (0.0022)	6.63×10^{-5}*** (0.0015)	5.11×10^{-5}*** (0.0023)	6.69×10^{-5}*** (0.0014)
$Sale\_HI_{i,\tau}$(−)	-0.2222 (0.2858)	-0.2233 (0.2544)		
$Sale\_HI_{i,\tau}^2$(+)	0.3999 (0.2674)	0.4107 (0.2701)		

Table VIII (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $EXTRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
$TA\_HI_{i,\tau}(-)$			-0.6337***	-0.6872***
			(0.0055)	(0.0049)
$TA\_HI^2_{i,\tau}(+)$			1.1741**	1.1808**
			(0.0433)	(0.0418)
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}(-)$	-0.0079	-0.0088	-0.0073	-0.0085
	(0.5064)	(0.4147)	(0.5648)	(0.4937)
$IHolder_{i,\tau}(+)$	-0.3521***	-0.3957***	-0.3667***	-0.4000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$MHolder_{i,\tau}(+)$	-0.0934	-0.1121	-0.1003	-0.1188
	(0.5499)	(0.4933)	(0.5178)	(0.4899)
$OBHolder_{i,\tau}(+)$	-0.0999*	-0.0888*	-0.1021*	-0.0903*
	(0.0604)	(0.0719)	(0.0588)	(0.0687)
$LOHolder_{i,\tau}(+)$	-0.0002	-0.0004	-0.0004	-0.0003
	(0.5555)	(0.6017)	(0.5987)	(0.5871)
$InHolder_{i,\tau}(+)$	-0.0010	0.0003	0.0003	0.0003
	(0.2877)	0.4809	0.4258	0.4534
$FCHolder_{i,\tau}(+)$	-0.0013	-0.0011	-0.0013	-0.0012
	(0.3158)	(0.4087)	(0.3946)	(0.4099)
$InDS_{i,\tau}(+)$	1.5839**	1.0555**	1.6325**	1.0891**
	(0.0330)	(0.0439)	(0.0299)	(0.0408)
$DIV\_btw\_CC_{i,\tau}(-)$	-2.41×10^{-5}*	-4.48×10^{-5}*	-6.21×10^{-5}*	-5.49×10^{-5}*
	(0.0777)	(0.0682)	(0.0588)	(0.0618)
Panel D. Control Variables				
$TURN_{i,\tau}(-)$	0.0216	0.0201	0.0202	0.0211
	(0.2005)	(0.1998)	(0.2010)	(0.2000)
$CAR_{i,\tau}(-)$	-0.0663***	-0.0710***	-0.0808***	-0.0754***
	(0.0010)	(0.0011)	(0.0012)	(0.0010)
$Ln(SIZE)_{i,\tau}(-)$	0.0323***	0.0299***	0.0310***	0.0315***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$LEV_{i,\tau}(-)$	-0.0123*	-0.0105*	-0.0120*	-0.0108
	(0.0958)	(0.0998)	(0.0966)	(0.1001)
$MTB_{i,\tau}(?)$	-0.0045**	-0.0045**	-0.0038*	-0.0038*
	(0.0441)	(0.0438)	(0.0515)	(0.0509)
$VOLRET_{i,\tau}(-)$	-0.0345	-0.0108	-0.0315	-0.0111
	(0.8157)	(0.9459)	(0.8275)	(0.9399)
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.0155	0.0149	0.0161	0.0157
Number of Observations	31,384	31,384	31,384	31,384

C. Robustness Check from a Dynamic Panel Data Analysis

Flannery and Hankins (2013) indicate that dynamic panel models play an increasingly prominent role in corporate finance research; lagged dependent variables included in the explanatory variables should employ the dynamic panel regression to avoid estimating bias. We follow Arellano and Bond (1991) in using the generalized method of moments (GMM) to estimate the coefficients of our regression model as a robustness check. In addition, we use the Sargan test on the adaptability of our instrument variables.

The results of the dynamic panel data analysis are similar to those presented in Section IV. The results shown in Table IX also support Bae, Lim, and Wei's (2006) findings that a market in which managers have greater discretion over information disclosure has more positive return skewness. The significant difference between Table X and Table VI is ownership structure. In the dynamic panel analysis, institutional ownership (*IHolder*) is not significant. The other corporate governance variables produce similar results.

Additional findings from the results shown in Table XI are that CEO duality (*CEO_Du*) and insider ownership (*InHolder*) are significantly related to *VOLRATIO*. Firms in which the CEO does not serve as chairman of the board and that have more insider ownership have a more positive *VOLRATIO*. There are no additional findings from Table XII. The results of the dynamic panel data analysis are similar to those of the panel data analysis. The results of this study are robust.

V. Conclusions

Bae, Lim, and Wei (2006) provide evidence that stock returns in emerging markets tend to be more positively skewed than those in developed markets based on the discretionary-disclosure and risk-sharing hypotheses. They also find that returns to poorly governed firms tend to be more positively skewed than those to well-governed firms in emerging markets. This study reexamines their interpretation by using a sample of firms in Taiwan. Our investigation makes the study of return skewness more complete in three ways. First, the data for group-affiliated and non-group-affiliated firms improve the test of the risk-sharing hypothesis. Second, we use the firm-level and market-level data to examine the hypotheses and provide clearer and more precise results as to how corporate governance mechanisms affect return skewness. Finally, this study proposes the real option argument that effective management of real options that are backed by a firm's social network, market power, or market potential at a hard time leads to positive return skewness.

This study provides evidence that return skewness is positively associated with the quality of discretionary disclosure when markets are poorly governed, a finding that supports the discretionary-disclosure hypothesis. However, we find that return skewness is negatively related to discretionary disclosure at the firm level. These results indicate that firms with greater information transparency are associated with more positive return skewness. Firms can benefit from reducing information asymmetry. In addition, we find evidence that individual corporate governance mechanisms matter for return skewness. Firms with greater managerial ownership, higher largest shareholder ownership, independent boards, and low agency costs have more positive skewness. We argue that agency costs play a critical role in return asymmetry. Most interestingly, we find support for the risk-sharing and real option hypotheses. In sum, we conclude that firms in emerging markets should work to create their own social capital and improve the quality of corporate governance to produce more positively skewed returns.

Table IX
Dynamic Panel Regression of the Influence of Market-Level Discretionary Disclosure on Return Skewness

In this table, we regress the return skewness on variables to examine the discretionary-disclosure hypothesis. The independent variables are three measures of managerial discretionary disclosure at the market level ($EM^{sum}_{i,\tau}$, $EM^{ave}_{i,\tau}$, $WCAQ^{sum}_{i,\tau}$, $WCAQ^{ave}_{i,\tau}$, $TIME^{sum}_{i,\tau}$, and $TIME^{ave}_{i,\tau}$). The control variables include financial leverage (*LEV*), cumulative return (*CAR*), stock turnover (*TURN*), market-to-book ratio (*MTB*), firm size (*Ln*(*SIZE*)), and return volatility (*VOLRET*). The definitions of the variables are reported in Table I. We follow Arellano and Bond (1991) and use the GMM (Arellano and Bond (1991)) to estimate the coefficients of our empirical model. The regression model is shown below:

$$\begin{aligned} SKEW_{i,\tau+1} = {} & \alpha_0 + \alpha_1 SKEW_{i,\tau} + \beta_1 EM^{mkt\_sum}_{i,\tau}(EM^{mkt\_ave}_{i,\tau}) \\ & + \beta_2 WCAQ^{mkt\_sum}_{i,\tau}(WCAQ^{mkt\_ave}_{i,\tau}) + \beta_3 TIME^{mkt\_sum}_{i,\tau}(TIME^{mkt\_ave}_{i,\tau}) \\ & + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\ & + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}. \end{aligned}$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$	
	(1)	(2)
Intercept	1.3228 (0.6842)	1.6113 (0.6051)
$SKEW_{i,\tau}$(?)	0.5373*** (0.0000)	0.5456*** (0.0000)
Panel A. Managerial Discretionary Disclosure (Market Level)		
$EM^{mkt\_sum}_{i,\tau}$(+)	0.0371*** (0.0000)	
$EM^{mkt\_ave}_{i,\tau}$(+)		7.8602*** (0.0000)
$WCAQ^{mkt\_sum}_{i,\tau}$(–)	-0.0217* (0.0900)	
$WCAQ^{mkt\_ave}_{i,\tau}$(–)		-0.3556** (0.0323)
$TIME^{mkt\_sum}_{i,\tau}$(–)	-0.0203*** (0.0000)	
$TIME^{mkt\_ave}_{i,\tau}$(–)		-0.6463** (0.0249)
Panel B. Control Variables		
$TURN_{i,\tau}$(–)	-0.1591** (0.0232)	-0.2492*** (0.0038)
$CAR_{i,\tau}$(–)	-0.1788* (0.0955)	-0.4624*** (0.0000)
$Ln(SIZE)_{i,\tau}$(–)	-1.0212*** (0.0000)	-1.5072*** (0.0000)
$LEV_{i,\tau}$(–)	-2.3903*** (0.0000)	-2.4281*** (0.0000)
$MTB_{i,\tau}$(?)	0.0204** (0.0308)	-0.0006 (0.9686)
$VOLRET_{i,\tau}$(–)	-4.2201*** (0.0000)	-6.1884*** (0.0000)
Time Dummy Variables	Yes	Yes
Industry Dummy Variables	Yes	Yes
Adj R^2	0.0125	0.137
Sargan Test	21.5098 (0.4894)	19.5607 (0.6104)
Number of Observations	31,384	31,384

Table X
Dynamic Panel Data Regressions for Skewness on the Real Option and Corporate Governance Variables

In this table, we regress the lagged conditional coefficient of skewness on all the independent variables. The independent and control variables are the same as those used in Table V. We further use 3 firm-level managerial discretionary-disclosure variables (*EM, WCAQ*, and *TIME*), 6 proxy variables for the real option hypothesis (*BGp*, *R&D*, *TA_HI*, *TA_HI*^{2}, *Sale_HI*, and *Sale_HI*^{2}), the variables of CEO duality (*CEO_Du*), ownership structure (*IHolder*, *MHolder*, *OBHolder*, *LOHolder*, *InHolder*, and *FCHolder*), and board independency (*InDS*), and divergence between control rights and cash flow rights (*DIV_btw_CC).* The definitions of the variables are reported in Table I. We follow Arellano and Bond (1991) and use the GMM (Arellano and Bond (1991)) to estimate the coefficients of our empirical model. The regression model is shown below:

$$
\begin{aligned}
SKEW_{i,\tau+1} = {} & \alpha_0 + \alpha_1 SKEW_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt_{sum}}(EM_{i,\tau}^{mkt_{ave}}) + \beta_2 WCAQ_{i,\tau} \\
& + \beta_3 WCAQ_{i,\tau}^{mkt_{sum}}(WCAQ_{i,\tau}^{mkt_{ave}}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt_{sum}}(TIME_{i,\tau}^{mkt_{ave}}) \\
& + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^2(TA\_HI_{i,\tau}^2) \\
& + \beta_{10} CEO_{Du\,i,\tau} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\
& + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV_{btw_{CC}\,i,\tau} \\
& + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\
& + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}.
\end{aligned}
$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	-0.2012	-0.3697	-0.2039	-0.0237
	0.9453	0.8992	0.9457	0.9937
$SKEW_{i,\tau}$(?)	0.5721***	0.5698***	0.5721***	0.5697***
	0.0000	0.0000	0.0000	0.0000
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$(−)	-1.0675***	-0.8121**	-1.0493***	-0.7984**
	0.0033	0.0242	0.0039	0.0266
$EM_{i,\tau}^{mkt\_sum}$(+)	0.0167**		0.0167**	
	0.0000		0.0000	
$EM_{i,\tau}^{mkt\_ave}$(+)		7.9568***		7.9019***
		0.0000		0.0000
$WCAQ_{i,\tau}$(+)	0.0615	0.0890	0.0672	0.0943
	0.5802	0.4283	0.5438	0.4014
$WCAQ_{i,\tau}^{mkt\_sum}$(−)	-0.0350***		-0.0349***	
	0.0000		0.0000	
$WCAQ_{i,\tau}^{mkt\_ave}$(−)		-2.2338		2.2220
		0.1868		0.1888
$TIME_{i,\tau}$(+)	0.8841***	0.6893***	0.8881***	0.6917***
	0.0000	0.0000	0.0000	0.0000
$TIME_{i,\tau}^{mkt\_sum}$(−)	-0.0249***		-0.0248***	
	0.0000		0.0000	
$TIME_{i,\tau}^{mkt\_ave}$(−)		-3.1004***		-3.0731***
		0.0000		0.0000
Panel B. Real Option Variables				
BGp_i(+)	0.8525**	0.7134*	0.8499**	0.7111*
	0.0384	0.0955	0.0395	0.0969

Table X (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $SKEW_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
$R\&D_{i,\tau}$ (+)	-5.54×10^{-5}	-0.0001	-5.52×10^{-5}	-0.0001
	0.6488	0.3880	0.6495	0.3894
$Sale\_HI_{i,\tau}$ (−)	-3.1272**	-2.1010**		
	0.0480	0.0460		
$Sale\_HI^2_{i,\tau}$ (+)	0.5567*	1.2328*		
	0.0965	0.0922		
$TA\_HI_{i,\tau}$ (−)			-30.6778***	-29.7832***
			0.0017	0.0023
$TA\_HI^2_{i,\tau}$ (+)			45.5779**	43.8752**
			0.0226	0.0267
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}$ (−)	0.1946	0.2313	0.1902	0.2270
	0.4304	0.3481	0.4408	0.3571
$IHolder_{i,\tau}$ (+)	-1.1480	-1.0748	-1.0934	-1.0227
	0.3175	0.3458	0.3414	0.3699
$MHolder_{i,\tau}$ (+)	0.3972***	2.2237***	0.4191***	2.2362***
	0.0000	0.0000	0.0000	0.0000
$OBHolder_{i,\tau}$ (+)	1.1483***	1.1753***	1.1501***	1.1749***
	0.0002	0.0001	0.0003	0.0001
$LOHolder_{i,\tau}$ (+)	-0.0387	-0.0357	-0.0383	-0.0353
	0.1833	0.1093	0.1866	0.1130
$InHolder_{i,\tau}$ (+)	0.0282	0.0285	0.0280	0.0282
	0.6513	0.6954	0.7641	0.6636
$FCHolder_{i,\tau}$ (+)	-0.0084	-0.0035	-0.0083	-0.0034
	0.4463	0.7520	0.4518	0.7581
$InDS_{i,\tau}$ (+)	-100.5190*	105.9733*	-99.6724*	-104.9187*
	0.0553	0.0652	0.0591	0.0697
$DIV\_btw\_CC_{i,\tau}$ (−)	-0.0090**	-0.0083**	-0.0090**	-0.0083**
	0.0225	0.0271	0.0230	0.0277
Panel D. Control Variables				
$TURN_{i,\tau}$ (−)	-0.3067***	-0.2901***	-0.3066***	-0.2901***
	0.0000	0.0000	0.0000	0.0000
$CAR_{i,\tau}$ (−)	-0.4974***	-0.4313***	-0.5000***	-0.4343***
	0.0000	0.0001	0.0000	0.0000
$Ln(SIZE)_{i,\tau}$ (−)	-1.1767***	1.1774***	-1.1892***	1.1894***
	0.0000	0.0000	0.0000	0.0000
$LEV_{i,\tau}$ (−)	-2.5493***	-2.9569***	-2.4557***	-2.8635***
	0.0000	0.0000	0.0000	0.0000
$MTB_{i,\tau}$ (?)	0.0206*	0.0219**	0.0208*	0.0221**
	0.0598	0.0455	0.0581	0.0444
$VOLRET_{i,\tau}$ (−)	3.8299***	5.4719***	-3.8732***	-5.5096***
	0.0000	0.0000	0.0000	0.0000
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.2301	0.2280	0.2375	0.2446
Sargan Test	40.0113 (0.1046)	38.5221 (0.1368)	40.1288 (0.1023)	39.2155 (0.1209)
Number of Observations	31,384	31,384	31,384	31,384

Table XI
Dynamic Panel Data Regressions for the Up-to-Down Volatility Ratio on the Real Option and Corporate Governance Variables

In this table, we regress the lagged up-to-down volatility ratio *VOLRATIO* on the variables which are the same as those used in Table VI, and the definitions of the variables are reported in Table I. We follow Arellano and Bond (1991) and use the GMM (Arellano and Bond (1991)) to estimate the coefficients of our empirical model. The regression model is shown below:

$$
\begin{aligned}
VOLRATIO_{i,\tau+1} = {} & \alpha_0 + \alpha_1 VOLRATIO_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt_{sum}}(EM_{i,\tau}^{mkt_{ave}}) + \beta_2 WCAQ_{i,\tau} \\
& + \beta_3 WCAQ_{i,\tau}^{mkt_{sum}}(WCAQ_{i,\tau}^{mkt_{ave}}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt_{sum}}(TIME_{i,\tau}^{mkt_{ave}}) \\
& + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^2(TA\_HI_{i,\tau}^2) \\
& + \beta_{10} CEO_{Du_{i,\tau}} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\
& + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV_{btw_{CC}{}_{i,\tau}} \\
& + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\
& + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}.
\end{aligned}
$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively.

Explanatory Variable (Expected Sign)	Dependent Variable: $VOLRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	0.4456***	0.4856***	0.4165***	0.4588***
	0.0000	0.0000	0.0000	0.0000
$VOLRATIO_{i,\tau}$(?)	0.5969***	0.5910***	-0.5970***	0.5911***
	0.0000	0.0000	0.0000	0.0000
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$(–)	-0.0724	-0.0146	-0.0705	-0.0136
	0.1550	0.7773	0.1660	0.7924
$EM_{i,\tau}^{mkt\_sum}$(+)	0.0020***		0.0020***	
	0.0000		0.0000	
$EM_{i,\tau}^{mkt\_ave}$(+)		1.0749***		1.0645***
		0.0000		0.0000
$WCAQ_{i,\tau}$(+)	0.0455**	0.0419**	0.0458**	0.0422**
	0.0225	0.0279	0.0215	0.0268
$WCAQ_{i,\tau}^{mkt\_sum}$(–)	-0.0081***		-0.0081***	
	0.0000		0.0000	
$WCAQ_{i,\tau}^{mkt\_ave}$(–)		-0.7201***		-0.7153***
		0.0036		0.0038
$TIME_{i,\tau}$(+)	0.1777***	0.0993***	0.1782***	0.0994***
	0.0000	0.0017	0.0000	0.0017
$TIME_{i,\tau}^{mkt\_sum}$(–)	-0.0029***		-0.0029**	
	0.0000		0.0000	
$TIME_{i,\tau}^{mkt\_ave}$(–)		-0.0141		-0.0184
		0.8872		0.8531
Panel B. Real Option Variables				
BGp_i(+)	0.1933**	0.1719*	0.1927**	0.1713*
	0.0425	0.0908	0.0435	0.0919
$R\&D_{i,\tau}$(+)	4.13×10^{-5}**	-5.17×10^{-5}***	-4.14×10^{-5}**	-5.17×10^{-5}***
	0.0144	0.0029	0.0143	0.0029

Table XI (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $VOLRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
$Sale\_HI_{i,\tau}$ (–)	-0.9717*	0.9869*		
	0.0952	0.0839		
$Sale\_HI^2_{i,\tau}$ (+)	0.9498**	0.9576**		
	0.0131	0.0368		
$TA\_HI_{i,\tau}$ (–)			-5.6132***	-5.2935***
			0.0001	0.0002
$TA\_HI^2_{i,\tau}$ (+)			9.7523***	9.3565***
			0.0011	0.0018
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}$ (–)	-0.0698**	-0.0647**	-0.0704**	-0.0652**
	0.0239	0.0377	0.0228	0.0361
$IHolder_{i,\tau}$ (+)	-0.0543	-0.0263	-0.0462	-0.0187
	0.7092	0.8560	0.7509	0.8971
$MHolder_{i,\tau}$ (+)	1.5422*	1.8332**	1.5419*	1.8333**
	0.0948	0.0461	0.0949	0.0461
$OBHolder_{i,\tau}$ (+)	-0.0293*	-0.0340**	-0.0264*	-0.0312**
	0.0744	0.0350	0.0867	0.0465
$LOHolder_{i,\tau}$ (+)	0.0058	0.0062	0.0058	0.0062
	0.1534	0.2063	0.1522	0.2057
$InHolder_{i,\tau}$ (+)	0.0026*	0.0027**	0.0026*	0.0027**
	0.0517	0.0424	0.0559	0.0457
$FCHolder_{i,\tau}$ (+)	0.0036	0.0044	0.0036	0.0044
	0.1909	0.5839	0.1463	0.5638
$InDS_{i,\tau}$ (+)	2.0570*	0.9767**	2.1796*	0.8328**
	0.0909	0.0389	0.0899	0.0386
$DIV\_btw\_CC_{i,\tau}$ (–)	-0.0006**	-0.0005**	-0.0006**	-0.0005**
	0.0412	0.0455	0.0428	0.0470
Panel D. Control Variables				
$TURN_{i,\tau}$ (–)	-0.0212**	-0.0135	-0.0212**	-0.0135
	0.0282	0.1664	0.0282	0.1659
$CAR_{i,\tau}$ (–)	-0.2698***	-0.2442***	-0.2702***	-0.2447***
	0.0000	0.0000	0.0000	0.0000
$Ln(SIZE)_{i,\tau}$ (–)	-0.5737***	-0.5614***	-0.5753***	-0.5630***
	0.0000	0.0000	0.0000	0.0000
$LEV_{i,\tau}$ (–)	-0.1425*	-0.2528***	-0.1268	-0.2378***
	0.0858	0.0029	0.1290	0.0054
$MTB_{i,\tau}$ (?)	0.0066**	0.0073**	0.0066**	0.0073**
	0.0477	0.0288	0.0465	0.0280
$VOLRET_{i,\tau}$ (–)	-1.1393***	-1.3518***	-1.1476***	-1.3592***
	0.0000	0.0000	0.0000	0.0000
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.1705	0.1696	0.1599	0.1687
Sargan Test	35.2212 (0.2346)	35.6889 (0.2184)	34.5159 (0.2606)	34.3797 (0.2659)
Number of Observations	31,384	31,384	31,384	31,384

Table XII
Dynamic Panel Data Regressions of the Influence of the Real Option and Corporate Governance Variables on Extreme-Return Ratio

In this table, we regress the lagged extreme-return volatility ratio *EXTRATIO* on the variables which are the same as those used in Table VI, and the definitions of the variables are reported in Table I. We follow Arellano and Bond (1991) and use the GMM (Arellano and Bond (1991)) to estimate the coefficients of our empirical model. The regression model is shown below:

$$\begin{aligned} EXTRATIO_{i,\tau+1} = {} & \alpha_0 + \alpha_1 EXTRATIO_{i,\tau} + \beta_1 EM_{i,\tau} + \beta_1 EM_{i,\tau}^{mkt_{sum}}(EM_{i,\tau}^{mkt_{ave}}) + \beta_2 WCAQ_{i,\tau} \\ & + \beta_3 WCAQ_{i,\tau}^{mkt_{sum}}(WCAQ_{i,\tau}^{mkt_{ave}}) + \beta_4 TIME_{i,\tau} + \beta_5 TIME_{i,\tau}^{mkt_{sum}}(TIME_{i,\tau}^{mkt_{ave}}) \\ & + \beta_6 BGp_{i,\tau} + \beta_7 R\&D_{i,\tau} + \beta_8 Sale\_HI_{i,\tau}(TA\_HI_{i,\tau}) + \beta_9 Sale\_HI_{i,\tau}^2(TA\_HI_{i,\tau}^2) \\ & + \beta_{10} CEO_{Du_{i,\tau}} + \beta_{11} IHalder_{i,\tau} + \beta_{12} MHalder_{i,\tau} + \beta_{13} OBHalder_{i,\tau} + \beta_{14} LOHalder_{i,\tau} \\ & + \beta_{15} InHalder_{i,\tau} + \beta_{16} FCHalder_{i,\tau} + \beta_{17} InDS_{i,\tau} + \beta_{18} DIV_{btw_{CC}{}_{i,\tau}} \\ & + \gamma_1 TURN_{i,\tau} + \gamma_2 CAR_{i,\tau} + \gamma_3 Ln(SIZE)_{i,\tau} + \gamma_4 LEV_{i,\tau} + \gamma_5 MTB_{i,\tau} \\ & + \gamma_6 VOLRET_{i,\tau} + \sum_{j=1}^{18} b_j Industry_i^j + \sum_{k=1}^{10} C_k Year_k + \varepsilon_{i,\tau+1}. \end{aligned}$$

The *p*-values are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels respectively

Explanatory Variable (Expected Sign)	Dependent Variable: $EXTRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
Intercept	-0.1342	-0.1042	-0.2061**	-0.1713**
	0.1093	0.2121	0.0145	0.0417
$EXTRATIO_{i,\tau}$(?)	-0.5568***	0.5554***	0.5567***	0.5554***
	0.0000	0.0000	0.0000	0.0000
Panel A. Managerial Discretionary Disclosure				
$EM_{i,\tau}$(–)	-0.1940**	-0.1412*	-0.1948**	-0.1422*
	0.0146	0.0852	0.0142	0.0830
$EM_{i,\tau}^{mkt\_sum}$(+)	0.0016***		0.0016***	
	0.0027		0.0028	
$EM_{i,\tau}^{mkt\_ave}$(+)		1.0097***		1.0081***
		0.0000		0.0000
$WCAQ_{i,\tau}$(+)	0.0863**	0.0977**	0.0860**	0.0974**
	0.0368	0.0288	0.0368	0.0288
$WCAQ_{i,\tau}^{mkt\_sum}$(–)	-0.0047***		-0.0047***	
	0.0001		0.0001	
$WCAQ_{i,\tau}^{mkt\_ave}$(–)		0.2549		0.2532
		0.2516		0.2551
$TIME_{i,\tau}$(+)	0.0132	0.0262	0.0136	0.0265
	0.7886	0.6129	0.7830	0.6084
$TIME_{i,\tau}^{mkt\_sum}$(–)	-0.0051***		-0.0051***	
	0.0000		0.0000	
$TIME_{i,\tau}^{mkt\_ave}$(–)		-0.8300***		-0.8301***
		0.0000		0.0000
Panel B. Real Option Variables				
BGp_i(+)	0.0061*	0.0044*	0.0066*	0.0040*
	0.0753	0.0820	0.0732	0.0835
$R\&D_{i,\tau}$(+)	4.52×10^{-5}	3.59×10^{-5}	4.51×10^{-5}	3.59×10^{-5}
	0.2555	0.3364	0.2562	0.3372

Table XII (Continued)

Explanatory Variable (Expected Sign)	Dependent Variable: $EXTRATIO_{i,\tau+1}$			
	(1)	(2)	(3)	(4)
$Sale\_HI_{i,\tau}$(–)	0.8858	-0.9397		
	0.4361	0.4050		
$Sale\_HI^2_{i,\tau}$(+)	0.0804	0.0425		
	0.9605	0.9792		
$TA\_HI_{i,\tau}$(–)			-1.8930*	-1.7202*
			0.0722	0.0794
$TA\_HI^2_{i,\tau}$(+)			4.3860**	4.1554**
			0.0270	0.0325
Panel C. Corporate Governance Variables				
$CEO\_Du_{i,\tau}$(–)	-0.0537	-0.0505	-0.0533	-0.0501
	0.2206	0.2485	0.2241	0.2526
$IHolder_{i,\tau}$(+)	-0.3910**	-0.3727**	-0.3914**	-0.3738**
	0.0159	0.0125	0.0105	0.0116
$MHolder_{i,\tau}$(+)	-1.3612	-1.0524	-1.3663	-1.0569
	0.2936	0.4171	0.2919	0.4152
$OBHolder_{i,\tau}$(+)	0.1967**	0.1965**	0.1962**	0.1961**
	0.0274	0.0258	0.0491	0.0423
$LOHolder_{i,\tau}$(+)	0.0027	0.0035	0.0027	0.0034
	0.3975	0.2842	0.4028	0.2892
$InHolder_{i,\tau}$(+)	0.0001	0.0001	8.32E-05	0.0001
	0.9426	0.9133	0.9549	0.9251
$FCHolder_{i,\tau}$(+)	0.0024	0.0033	0.0024	0.0033
	0.2574	0.1258	0.2590	0.1269
$InDS_{i,\tau}$(+)	16.7420**	13.2870**	16.8314*	13.3986*
	0.0316	0.0425	0.0790	0.0888
$DIV\_btw\_CC_{i,\tau}$(–)	0.0003*	0.0005*	0.0004*	0.0005*
	0.0896	0.0747	0.0856	0.0765
Panel D. Control Variables				
$TURN_{i,\tau}$(–)	-0.0297*	-0.0250	-0.0298**	-0.0251
	0.0505	0.1030	0.0495	0.1014
$CAR_{i,\tau}$(–)	-0.0502**	-0.0426	-0.0503*	-0.0427
	0.0796	0.1279	0.0790	0.1269
$Ln(SIZE)_{i,\tau}$(–)	-0.2381***	-0.2539***	-0.2385***	-0.2542***
	0.0000	0.0000	0.0000	0.0000
$LEV_{i,\tau}$(–)	-0.2294**	-0.3143***	-0.2287**	-0.3142***
	0.0230	0.0020	0.0237	0.0021
$MTB_{i,\tau}$(?)	0.0108***	0.0112***	0.0108***	0.0112***
	0.0097	0.0082	0.0098	0.0082
$VOLRET_{i,\tau}$(–)	-0.5861***	-0.9338***	-0.5892***	-0.9366***
	0.0006	0.0000	0.0006	0.0000
Time Dummy Variables	Yes	Yes	Yes	Yes
Industry Dummy Variables	Yes	Yes	Yes	Yes
Adj R^2	0.0915	0.0923	0.0889	0.0853
Sargan Test	38.4112	37.2269	36.6987	35.6632
	(0.1394)	(0.1706)	(0.1860)	(0.2193)
Number of Observations	31,384	31,384	31,384	31,384

REFERENCES

Agrawal, Anup, and Charles R. Knoeber, 1996, Firm performance and mechanisms to control agency problems between managers and shareholders, *Journal of Financial and Quantitative Analysis* 31, 377-397.

Ammann, Manuel, David Oesch, and Markus M. Schmid, 2013, Product market competition, corporate governance, and firm value: Evidence from the EU area, *European Financial Management* 19, 452-469.

Arellano, Manuel, and Stephen Bond, 1991, Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies* 58, 277-297.

Ashbaugh-Skaife, Hollis, Daniel W. Collins, and Ryan LaFond, 2006, The effects of corporate governance on firms' credit ratings, *Journal of Accounting and Economics* 42, 203-243.

Bae, Kee-Hong, Chanwoo Lim, and Kuo-Chiang J. Wei, 2006, Corporate governance and conditional skewness in the world's stock markets, *Journal of Business* 79, 2999-3028.

Bai, Chong-En, Qiao Liu, Joe Lu, Frank M. Song, and Junxi Zhang, 2004, Corporate governance and market valuation in China, *Journal of Comparative Economics* 32, 599-616.

Bekaert, Geert, and Guojun Wu, 2000, Asymmetric volatility and risk in equity markets, *Review of Financial Studies* 13, 1-42.

Black, Fischer, 1976, Studies of stock price volatility changes, Working paper.

Blanchard, Olivier J., and Mark W. Waston, 1982, Bubbles, rational expectations, and financial markets, Working paper.

Campbell, John Y., and Ludger Hentschel, 1992, No news is good news: An asymmetric model of changing volatility in stock returns, *Journal of Financial Economics* 31, 281-318.

Cebenoyan, Ahmet S., Elizabeth S. Cooperman, and Charles A. Register, 1999, Ownership structure, charter value, and risk-taking behavior for thrifts, *Financial Management* 28, 43-60.

Chen, Joseph, Harrison Hong, and Jeremy C. Stein, 2001, Forecasting crashes: Trading volume, past returns, and conditional skewness in stock prices, *Journal of Financial Economics* 61, 345-381.

Cheng, Shi-Jun, 2008, Board size and the variability of corporate performance, *Journal of Financial Economics* 87, 157-176.

Cheng, Agnes C. S., Denton Collins, and Henry H. Huang, 2006, Shareholder rights, financial disclosure, and the cost of equity capital, *Review of Quantitative Finance and Accounting* 27, 175-204.

Christie, Andrew A., 1982, The stochastic behavior of common stock variances: Value, leverage, and interest rate effects, *Journal of Financial Economics* 10, 407-432.

Chung, Richard, Michael Firth, and Jeong-Bon Kim, 2002, Institutional monitoring and opportunistic earnings management, *Journal of Corporate Finance* 8, 29-48.

Claessens, Stijn, and Joseph P. H. Fan, 2002, Corporate governance in Asia: A survey, *International Review of Finance* 3, 71-103.

Claessens, Stijn, Djankov Simeon, and Larry H. P. Lang, 2000, The separation of ownership and control in East Asian corporations, *Journal of Financial Economics* 58, 81-112.

Committee on the Financial Aspects of Corporate Governance, 1992, *Report of the Committee on the Financial Aspects of Corporate Governance*.

Core, John E., Wayne R. Guay, and Tjomme O. Rusticus, 2006, Does weak governance cause weak stock returns? An examination of firm operating performance and investors' expectations, *Journal of Finance* 61, 655-687.

Coval, Joshua D., and David Hirshleifer, 1998, Trading-Generated news, sidelined investors, and conditional patterns in security return, Working paper.

Cremers, Martijn K. J., and Vinay B. Nair, 2005, Governance mechanisms and equity prices, *Journal of Finance* 60, 2859-2894.

Dechow, Patricia M., and Ilia Dichev, 2002, The quality of accruals and earnings: The role of accrual estimation errors, *Accounting Review* 77, 35-59.

Dechow, Patricia M., Richard G. Sloan, and Amy P. Sweeney, 1995, Detecting earnings management, *Accounting Review* 70, 193-225.

Doong, Shuh-Chyi, Hung-Gay Fung, and Jr-Ya Wu, 2011, Are social, financial, and human capital value enhancing? Evidence from Taiwanese firms, *International Review of Economics and Finance* 20, 395-405.

Drobetz, Wolfgang, Andreas Schillhofer, and Heinz Zimmermann, 2004, Corporate governance and expected stock return: Evidence from Germany, *European Financial Management* 10, 267-293.

Erkens, David H., Mingyi Hung, and Pedro P. Matos, 2012, Corporate governance in the 2007-2008 financial crisis: Evidence from financial institutions worldwide, *Journal of Corporate Finance* 18, 389-411.

Flannery, Mark J., and Kristine W. Hankins, 2013, Estimating dynamic panel models in corporate finance, *Journal of Corporate Finance* 19, 1-19.

French, Kenneth R., William Schwert, and Robert F. Stambaugh, 1987, Expected stock returns and volatility, *Journal of Financial Economics* 19, 3-29.

Fung, Hung-Gay, Xiao-Qing E. Xu, and Qi-Zi Zhang, 2007, On the financial performance of private enterprises in China, *Journal of Developmental Entrepreneurship* 12, 399-414.

Gabbay, Shaul M., and Ezra W. Zuckerman, 1998, Social capital and opportunity in corporate R&D: The contingent effect of contact density on mobility expectations, *Social Science Research* 27, 189-217.

Gadhoum, Yoser, and Mohamed A. Ayadi, 2003, Ownership structure and risk: A Canadian empirical analysis, *Quarterly Journal of Business and Economics* 42, 19-39.

Gaspar, José-Miguel, and Massimo Massa, 2006, Idiosyncratic risk and product market competition, *Journal of Business* 79, 3125-3152.

Ge, Weili, Dawn Matsumoto, and Jenny L. Zhang, 2011, Do CFOs have style? An empirical investigation of the effect of individual CFOs on accounting practices, *Contemporary Accounting Research* 28, 1141-1179.

Gompers, Paul, Joy Ishii, and Andrew Metrick, 2003, Corporate governance and equity prices, *Quarterly Journal of Economics* 118, 107-155.

Hong, Harrison, and Jeremy C. Stein, 2003, Differences of opinion, short-sales constraints, and market crashes, *Review of Financial Studies* 16, 487-525.

Kothari, Sagar P., Andrew J. Leone, and Charles E. Wasley, 2005, Performance matched discretionary accrual measures, *Journal of Accounting and Economics* 39, 163-197.

La Porta, Rafael, Florencio López-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 2002, Investor protection and corporate valuation, *Journal of Finance* 57, 1147-1170.

Laeven, Luc, and Ross Levine, 2008, Complex ownership structures and corporate valuations, *Review of Financial Studies* 21, 579-604.

Murphy, James T., 2002, Networks, trust, and innovation in Tanzania's manufacturing sector, *World Development* 30, 591-619.

Nelson, Daniel B., 1991, Conditional heteroskedasticity in asset returns: A new approach, *Econometrica* 59, 347-370.

Nguyen, Pascal, 2011, Corporate governance and risk-taking: Evidence from Japanese firms, *Pacific-Basin Finance Journal* 19, 278-297.

Pindyck, Robert S., 1984, Risk, inflation, and the stock market, *American Economic Review* 74, 335-351.

Rubin, Amir, and Daniel R. Smith, 2009, Institutional ownership, volatility, and dividends, *Journal of Banking and Finance* 33, 627-639.

Shleifer, Andrei, and Robert W. Vishny, 1986, Large shareholders and corporate control, *Journal of Political Economy* 94, 461-488.

Uzzi, Brian, 1997, Social structure and competition in interfirm networks: The paradox of embeddedness, *Administrative Science Quarterly* 42, 35-67.

Uzzi, Brian, 1999, Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing, *American Sociological Review* 64, 481-505.

Wei, Kuo-Chiang J., and Yi Zhang, 2008, Ownership structure, cash flow, and capital investment: Evidence from East Asian economies before the financial crisis, *Journal of Corporate Finance* 14, 118-132.

White, Halbert, 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817-838.

Zhang, Qi-Zi, and Hung-Gay Fung, 2006, China's social capital and financial performance of private enterprises, *Journal of Small Business and Enterprise Development* 13, 198-207.

報酬偏態、實質選擇權與公司治理

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摘 要

本文以臺灣 2002Q1 到 2012Q3 之資料探討公司治理與實質選擇權對報酬分配的影響。本文發現公司治理品質（較高的最大股東與經理人持股比例、獨立性愈高的董事會、較佳的資訊透明度與較低的代理成本）愈好則公司報酬愈正偏。本文亦發現公司具實質選擇權會降低交易成本、促進各方的合作以及建立公司品牌使公司報酬呈現較為正偏的分配。

關鍵詞：動態追蹤迴歸、社會資本、公司治理、報酬分配、資訊自由裁量權

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