

Corporate Governance and Conditional Skewness in the World's Stock Markets*

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Abstract

We investigate why emerging stock market returns tend to be more positively skewed than developed stock market returns. We argue that differences in the quality of corporate governance matter for return skewness. Using stock market index and corporate governance index data from 38 countries, we find that positive skewness is most profound in stock markets with poor corporate governance. The evidence is consistent with the risk-sharing hypothesis that economies that do not protect investors' property rights facilitate risk sharing among affiliated firms through intercorporate income shifting. The evidence is also consistent with the discretionary-disclosure hypothesis that managers in stock markets with poor corporate governance have more discretionary power over the disclosure of bad information, which imparts a degree of positive skewness to stock returns. Further analysis of the firm-level data from the Korean equity market corroborates the evidence from the cross-country analysis.

1. Introduction

It is now well known that stock returns of emerging markets are characterized by higher average returns and higher volatilities than those of developed markets. Less well known is the fact that stock returns of emerging markets are more positively skewed than those of developed markets.¹ In this paper, we investigate why emerging market returns tend to be more positively skewed.

We argue that differences in the quality of corporate governance matter for return skewness. Figure 1 shows the relation between our measure of corporate governance and return skewness across our sample countries. In this figure, we do not control for a number of factors that might influence skewness. Nevertheless, the figure is quite instructive. Countries that have higher (i.e., better) governance scores are associated with more negative skewness.

There are at least two reasons why the quality of corporate governance is related to return asymmetries. First, as Morck et al. (2000) argue, economies that protect public investors' property rights poorly facilitate intercorporate income shifting by controlling insiders. This practice of income shifting, in turn, facilitates risk sharing among affiliated firms or business segments by smoothing the performance of affiliated firms or business segments.

Risk sharing appears to be an important motivation for business groups that are ubiquitous in most emerging markets. Friedman and Johnson (2000) argue that entrepreneurs in emerging markets often use resources from other businesses that they control to bail out a troubled company. Chang and Hong (2000) show that business groups in Korea use extensive cross-subsidization such as debt guarantees, equity investments, and internal transactions to support poorly performing firms at the expense of well-performing firms. Mitton (2002) finds

¹ In Section 2.1, we will discuss in detail the evidence that emerging stock market returns are more positively skewed than those of developed markets.

evidence of “propping” in diversified firms in Indonesia, the Philippines, Korea, Malaysia, and Thailand during the Asian financial crisis of 1997-98. By studying the takeover market in Korea, Bae et al. (2002) show that financially distressed targets that belong to business groups are likely to be merged with more successful member firms, even when such transactions do not maximize the value of the bidding firms.

Bailing out a distressed firm can create a credible commitment by a business group to prop up the performance of its member firms. This will allow the stock returns of firms belonging to business groups to be more positively skewed since a negative shock would not be fully reflected in stock returns of these firms due to the implicit guarantee of bailout. In contrast, an equally negative shock would be fully reflected in stock returns of independent firms that do not have such a guarantee.

Second, stock markets in economies characterized by poor corporate governance tend to have poor information disclosure.² In the U.S., corporate managers are subject to many governance mechanisms that force them to act in the best interests of shareholders. These corporate governance mechanisms are nonexistent or are not practiced in many of the emerging markets. The absence of mechanisms to govern managerial discretion would allow firm managers in these markets to have more discretionary power over the disclosure of information. Managers would have a wider scope for hiding bad news or releasing bad news slowly.

These two factors — risk sharing and discretionary disclosure by managers — will impart positive skewness in stock markets. As a result, *stock returns in economies characterized by poor corporate governance are likely to be more positively skewed.*

² An analysis of recent surveys by Credit Lyonnais Securities Asia (2001, 2002) and Standard and Poor’s (2002) confirms that disclosure and corporate governance are significantly positively correlated.

We find several empirical results that are consistent with our hypothesis. Using the stock market index data from 38 countries and the corporate governance index data constructed by La Porta et al. (1998), we show that positive return skewness is more pronounced in stock markets that have lower scores on the good corporate governance index. This evidence is consistent with the risk-sharing hypothesis and/or the discretionary-disclosure hypothesis, and underscores the importance of corporate governance in explaining cross-sectional differences of return asymmetries across countries.

The significance of the corporate governance variable in explaining conditional skewness is robust to a variety of regression specifications. The results are robust regardless of whether returns are measured in local currencies or in U.S. dollars, whether macroeconomic variables such as market capitalization or GNP are included in the multivariate regressions, or how return asymmetries are measured.

While the cross-country analysis using market index returns is suggestive of risk sharing and discretionary disclosure of information, it does not provide direct evidence on these hypotheses. To shed further light on the issue, we investigate the Korean equity market in depth. The Korean market has a few characteristics that are suitable to our investigation. First, some Korean firms belong to business groups known as *chaebols*. Chaebol-affiliated firms maintain close economic relationships under the direct or indirect control of the controlling family through cross-shareholdings, reciprocal debt guarantees, internal transactions between firms, and exchanges of human resources within the group. This practice would facilitate intercorporate income shifting among chaebol-affiliated firms. Second, during our sample period, important corporate governance mechanisms have been nonexistent. The lack of mechanisms to govern managerial discretion would allow owner-managers of chaebols in

Korea to have more discretionary power, and these managers would have a wider scope for hiding bad news or releasing bad news slowly.

Using individual stock return data from the Korean equity market during the period from 1995 to 2000, we find several results that support our hypotheses. First, we find that large-cap firms show more positive skewness. This is in sharp contrast to the evidence from the U.S. The U.S. evidence shows that skewness is more positive on average for small-cap firms and for firms followed by fewer analysts (Damodaran, 1987; Harvey and Siddique, 2000; Chen et al., 2001). On the one hand, large firms are highly visible, facilitating the detection of opportunistic actions by managers. The evidence from the U.S. is consistent with this view. On the other hand, in a poor corporate governance economy like Korea, it could be that large-cap firms are more difficult to monitor by outside investors and analysts. Large firms are often affiliated with business groups that are highly complex, making it difficult for outsiders to unveil group strategies from a myriad of transactions. These firms are less transparent and their managers have more discretionary power, which imparts positive skewness to their stock returns. In fact, Dewenter et al. (2001), using IPO initial return data from Japan, show that Keiretsu firms in Japan provide the scope for opportunistic behavior against outside investors. Alternatively, it could be that the “too big to fail” principle applies to large-cap firms in Korea and investors assign a lower probability of bankruptcy to large-cap firms.

Second, we find that chaebol-affiliated firms show more positive return skewness. Further, we find that among chaebol-affiliated firms, firms in financial distress do not show more negative return skewness than firms not in financial distress. In contrast, non-chaebol firms in financial distress realize a significantly lower return skewness than those firms that are not in financial distress. These results strongly support the risk-sharing hypothesis that controlling

insiders of Korean chaebols use resources from other businesses that they control to bail out a troubled affiliate, thereby making stock returns of business-group-affiliated firms less negatively skewed.

There is now a large literature that highlights the importance of corporate governance on the various aspects of financial markets. La Porta et al. (1997, 1998, 2000, 2002) argue that the legal protection of investors is a particularly important manifestation of effective corporate governance. Strong investor protection is shown to be associated with higher values of stock markets (La Porta et al., 1997), a higher number of listed firms (La Porta et al., 1997), higher valuation of listed firms relative to their assets (Claessens et al., 2002; La Porta et al., 2002), greater use of external finance (La Porta et al., 1998), and greater investments from external funds (Rajan and Zingales, 1998; Demirgüç-Kunt and Maksimovic, 1998). Morck et al. (2000) show that stock prices move together more in poor economies than in rich economies and attribute this phenomenon to the poor property rights protection of public investors, which impedes informed arbitrage to capitalize on firm-specific information. From an investigation of the Hong Kong equity market, Brockman and Chung (2003) find that poor investor protection is associated with higher liquidity costs.

We contribute to this growing literature by showing that the quality of corporate governance affects the distributional characteristics of stock returns and explains why emerging stock market returns tend to be more positively skewed.

The remainder of the paper is organized as follows. In Section 2, we present the evidence of positive return asymmetries in emerging markets. In Section 3, we review the related literature and develop our main hypothesis. In Section 4, we discuss our country-level data

and report our cross-country regression results. In Section 5, we present the evidence from the firm-level analysis of the Korean equity market. We conclude our paper in Section 6.

2. Return asymmetries in emerging stock markets

The primary objective of our paper is to examine whether or not corporate governance helps explain why emerging stock market returns are more positively skewed. We first present evidence that emerging market returns are indeed more positively skewed relative to developed market returns.

In Table 1, we present some distributional characteristics of daily local-currency market index returns for a sample of 38 countries during the period 1995-2001.³ We partition the sample countries into two groups, the emerging and the developed countries, by the median of the GNP per capita. The average (median) GNP per capita for the emerging markets is US\$5,501 (US\$4,148), while for the developed markets it is US\$26,440 (US\$25,524) — five (six) times as large as the figure for emerging markets. The average returns do not show much difference between the emerging and developed markets. Perhaps this is because the sample period includes the 1997 Asian financial crisis and the 1998 Russian debt crisis that hit the emerging markets hard. Not surprisingly, the standard deviation is much higher in the emerging markets. The average volatility is 1.71 percent, which translates into an annual volatility of 27.3 percent. The corresponding number for the developed markets is 19.1 percent. The fifth and sixth columns of the table show the minimum and maximum returns, respectively. The average values of the minimum and maximum returns are much larger in the emerging markets, confirming the higher volatilities in these markets. However, it is

³ We discuss the details of sample selection procedures in Section 3.

interesting to note that the absolute magnitude of the maximum return is larger than that of the minimum return in eight cases in the emerging markets, while there are only four such cases in the developed markets.

The last three columns of the table present three different measures of return asymmetries. The first measure of return asymmetry is the conditional coefficient of skewness, which we call *SKEW*. *SKEW* is computed by taking the sample's third moment of daily returns and dividing it by the sample variance of daily returns raised to the power of 3/2. Specifically, *SKEW* for stock index i over the sample period is calculated as follows:⁴

$$SKEW_i = \frac{(n(n-1))^{3/2} \sum_{t=1}^n R_{it}^3}{(n-1)(n-2) \left(\sum_{t=1}^n R_{it}^2 \right)^{3/2}}, \quad (1)$$

where R_{it} represents the demeaned daily return for stock market index i on day t and n is the number of observations on daily returns during the sample period. Daily returns are computed as $\ln[(P_{it} + D_{it})/P_{it-1}]$, where P_{it} is the index value at the close of day t and D_{it} is the dividend. Scaling the raw third moment by the cubed standard deviation allows us to compare markets with different volatilities. An increase in *SKEW* is associated with a stock market that has a more right-skewed return distribution.

The seventh column in Table 1 presents the skewness of the 38 sample countries. The average (median) skewness of daily market returns for the emerging markets is 0.41 (0.32), while it is -0.26 (-0.26) for the developed markets. Among the 19 emerging markets, 16 show positive skewness. In contrast, only 4 out of the 19 developed markets show positive skewness. The stock markets of the developed markets show much more left-skewed return distributions than those of the emerging markets.

⁴ Basically, we follow the measure of skewness used in Chen et al. (2000).

In addition to *SKEW*, we compute an alternative measure of skewness that does not involve the third moment, and hence is less likely to be particularly influenced by a small number of extreme returns. This alternative measure of skewness is denoted as *VOLRATIO*, for the “up-to-down volatility ratio.” *VOLRATIO* for stock index i over the sample period is calculated as follows:

$$VOLRATIO_i = \ln \left\{ \frac{(n_d - 1) \sum_{t \in UP} R_{it}^2}{(n_u - 1) \sum_{t \in DOWN} R_{it}^2} \right\}, \quad (2)$$

where n_u and n_d are the number of up and down days, respectively. An up (A down) day is a day on which the stock index return is above (below) the sample mean during the sample period. That is, we separate the daily return observations during the sample period into two sub-samples: those returns above the sample mean and those returns below the sample mean. We then calculate the sample variance separately for each sub-sample and take the logarithm of the ratio of the sample variance from the up days to the sample variance from the down days. An increase in *VOLRATIO* is associated with a stock market that has a more right-skewed return distribution.

The eighth column in Table 1 presents the distribution of *VOLRATIO*. The average (median) ratio for the emerging markets is 0.22 (0.24), while it is -0.07 (-0.06) for the developed markets. Consistent with the measure *SKEW*, 16 countries show positive *VOLRATIO* in the emerging market group, while only five countries show positive *VOLRATIO* in the developed market group, confirming the fact that stock market returns of developed markets display more negatively skewed return distributions.

Another way to look at the phenomenon that emerging stock market returns tend to be more positively skewed is to examine the frequency of extreme returns. Our final measure of

return asymmetries is *EXTRATIO*, an “extreme-return ratio.” *EXTRATIO* for stock index *i* over the sample period is calculated as follows:

$$EXTRATIO_i = \ln \left\{ \frac{n_{positive}}{n_{negative}} \right\}, \quad (3)$$

where $n_{positive}$ is the number of positive extreme return days and $n_{negative}$ is the number of negative extreme return days. A demeaned daily return, R_{it} , is treated as a positive (negative) extreme return if $R_{it} > +2*s_i$ ($R_{it} < -2*s_i$), where s_i denotes the standard deviation of stock market *i* returns. If the stock returns follow a normal distribution, *EXTRATIO* would be 0. An increase in *EXTRATIO* is associated with a stock market that has a more fat-tailed return distribution to the right.

The last column of the table shows *EXTRATIO*. The average (median) *EXTRATIO* is 0.06 (0.04) in the emerging markets. The corresponding number for the developed markets is -0.28 (-0.32). Among the 19 emerging countries, 12 countries show positive *EXTRATIO* and only 7 countries show negative *EXTRATIO*. In the developed markets, the numbers are reversed, as 4 and 15 countries show positive and negative extreme return ratios, respectively.

The evidence presented in Table 1 strongly suggests that emerging market returns are more positively skewed. In the next section, we discuss the previous literature to explain return asymmetries in general and develop an argument for the rationale of the pronounced positive return asymmetry in the emerging markets.

3. Related Literature and Hypothesis Development

To motivate our empirical specifications, we review the literature on return asymmetries and suggest the rationale for the linkage between corporate governance and return asymmetries.

3.1 *Related literature on asymmetries in stock returns*

Stock return distribution assumptions have been very important in deriving portfolio theory, capital asset pricing models, and option pricing models. The assumption of a mean-variance return distribution, including normal and lognormal distributions, is most commonly adopted in these models. However, it is well documented that stock returns are asymmetrically distributed. Specifically, negative skewness in daily returns has been found in several aggregate stock market indices, including U.S. market indices. Previous studies have focused on how skewness affects asset pricing models,⁵ while recent research has examined how skewness affects option pricing.⁶

A number of theories have attempted to offer possible explanations for negative asymmetries in stock market returns and the cross-sectional variation of conditional skewness in individual stocks. The earliest theory to explain negative asymmetries in stock market returns is based on leverage effects put forth by Black (1976) and Christie (1982). The leverage-effects hypothesis suggests that when a stock price drops, the financial and operating leverage of the firm increases, which increases the subsequent stock return volatility. On the other hand, when a stock price rises, the financial and operating leverage of the firm decreases,

⁵ To understand how skewness affects asset pricing models, please see Kraus and Litzenberger (1976), Friend and Westerfield (1980), Sears and Wei (1985), and Harvey and Siddique (2000), among others.

⁶ To understand how skewness affects option pricing, please refer to Das and Sundaram (1999) and Chen et al. (2001).

decreasing the subsequent stock return volatility. This asymmetric volatility reaction to the rise and fall of stock prices causes stock returns to be negatively skewed. However, Schwert (1989) and Bekaert and Wu (2000) document that leverage effects are not sufficient enough to explain the magnitude of the observed negative asymmetries in stock market returns.

A second explanation for the negative skewness in stock market returns is based on the stochastic-bubble model developed by Blanchard and Watson (1982). The stochastic-bubble hypothesis suggests that negative asymmetries in stock market returns are generated by popping the bubble, which produces very large negative returns, although the probability for this is very low.

A third theory to explain negative asymmetries in stock market returns comes from the volatility-feedback hypothesis suggested by Pindyck (1984), French et al. (1987), Campbell and Hentschel (1992), and others. The theory of volatility feedback argues 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 the good news (cashflow increase), but it amplifies the negative effect of the bad news (cashflow decrease). As a result, stock prices drop more when there is bad news in the market, which leads to negatively skewed stock returns. Although the theory of volatility feedback is attractive, Poterba and Summers (1986) counter-argue that most market volatility shocks are very short-lived and, hence, changes in market volatility cannot be expected to have an important impact on the risk premium. As a result, volatility feedback cannot account for large proportions of the negative asymmetries in stock market returns.

A recent model developed by Hong and Stein (1999) suggests that investor heterogeneity is the major reason for negative return asymmetries. Using data from the U.S., Chen et al.

(2001) have comprehensively tested the cross-sectional determination of conditional skewness in the daily returns of individual stocks and in the time series of the aggregate market daily returns. They find that negative skewness is most profound in stocks that have experienced an increase in trading volume relative to the trend over the previous six months and have had higher returns over the previous 36-month period. The first finding appears to support the Hong-Stein differences-of-opinion model and the second finding appears to support the Blanchard-Watson (1982) stochastic-bubble theory.

The last and most notable hypothesis, for our purposes at least, is the discretionary-disclosure hypothesis. This hypothesis argues that managers have some degree of discretion over the disclosure of information, and that they prefer to announce any good news immediately but allow bad news to dribble out slowly. This managerial behavior will then impart a degree of positive skewness to stock returns. Furthermore, this managerial discretion tends to be more pronounced for small-cap firms or firms with fewer analysts following them, since managers of these firms have a wider scope for hiding bad news from the market. In fact, Harvey and Siddique (2000) and Chen et al. (2001) find that skewness is more positive on average for small-cap firms. Moreover, Chen et al. (2001) find that skewness is more positive for firms followed by fewer analysts. Using U.S. data from 1979 to 1983, Damodaran (1987) also finds that firms followed by fewer analysts have higher positively skewed returns.

3.2 Corporate governance and return asymmetries in stock returns

There are now numerous studies showing the impact of investor protection (or the quality of corporate governance in general) on the various aspects of financial markets. These studies show that stock markets in good corporate governance economies have larger and deeper

capital markets (La Porta et al., 1997, 1998), have higher firm valuations (La Porta et al., 2002; Claessens et al., 2002), can sustain market declines better during a financial crisis (Johnson et al., 2000; Mitton, 2002), provide better liquidity (Brockman and Chung, 2003), provide higher quality of accounting information (Hung, 2001; Ball et al., 2002; Fan and Wong, 2002; Leuz et al., 2003), and are more useful as processors of economic information than are stock markets in poor corporate governance economies (Morck et al., 2000). However, to the best of our knowledge, no previous study has analyzed distributional characteristics of stock returns in poor corporate governance economies. Although Bris et al. (2003) examine the impact of a good government index on return skewness, their focus is on whether short-sale restrictions affect the stock returns, not specifically on whether the quality of governance matters to return skewness.

There are at least two reasons why the quality of corporate governance matters to the return asymmetries factors — risk sharing and discretionary disclosure by managers.

First, as Morck et al. (2000) argue, economies that protect public investors' property rights poorly facilitate intercorporate income shifting by controlling insiders among affiliated firms of business groups or business segments. Business groups facilitate risk sharing or coinsurance by smoothing income flows and by reallocating resources among affiliated firms.⁷ They use extensive cross-subsidization such as debt guarantees, equity investments, and internal transactions to support poorly performing firms at the expense of well-performing firms. This risk-sharing/coinsurance hypothesis suggests that due to coinsurance or cross-subsidies among group-affiliated firms, earnings or returns of group-affiliated firms will be less left-skewed than they will be for independent firms. Since business groups are a

⁷ Please see Khanna and Yafeh (2002), and the references therein.

more prevalent organizational form in emerging markets, positive skewness would be more pronounced for the emerging markets.

Second, stock markets in economies characterized by poor corporate governance tend to have poor information disclosure. This is because the lack of mechanisms to govern managerial discretion in these economies allows firm managers to be more opportunistic in their disclosing of information. Managers in poor corporate governance economies have a wider scope to hide bad news or to release bad news slowly than managers in good corporate governance economies. That is, the gradual diffusion of bad information should be more of a problem for stock markets with poor corporate governance and bad news will not be released instantaneously and fully in these markets.

In the following sections, we test the predictions of these two hypotheses, the discretionary hypothesis and the risk-sharing hypothesis, using a cross-country analysis of 38 countries' market index returns, as well as using a firm-level analysis of individual stock return data from the Korean equity market.

4. Cross-country analysis

4.1 Data and the construction of variables

We first start with the list of 42 countries covered by Datastream International Ltd. for which equity market data are available. Out of these 42 countries, the data on the corporate governance index as constructed by Morck et al. (2000) are available for only 39 countries. Trading volume data on Ireland were missing from the Datastream International database, leaving us with a final sample of 38 countries. For these 38 countries, we collect the daily stock market index returns, dividends, trading values, market capitalization in both local and

U.S. dollar currencies, and exchange rates relative to U.S. dollars during the period from 1995 to 2001.

In our regressions, we use non-overlapping one-year observations, from January 1 to December 31, to compute our three measures of return asymmetries, *SKEW*, *VOLRATIO*, and *EXTRATIO*. The choice of a one-year horizon to measure skewness is to make our skewness measure correspond to the availability of some of our macroeconomic variables to be discussed below. To test our hypothesis, we need to have a measure for corporate governance. In this paper, we follow Morck et al. (2000) in using the degree of protection in property rights as a proxy for corporate governance, which we denote as CG_{it} . Morck et al. (2000) construct the good corporate governance index as the sum of the following three indices taken from La Porta et al. (1998): (i) government corruption; (ii) the risk of expropriation of private property by the government; and (iii) the risk of the government repudiating contracts, with each index ranging from 0 to 10. A higher score on this index indicates more respect for investor protection.

We also include the following controlling variables in our regressions. $SIGMA_{it}$ is the standard deviation of daily returns on market index i over the one-year period t . $CUMRET_{it}$ is the cumulative return on stock index i measured over the same one-year period t . $TURNOVER_{it}$ is the average daily turnover in the sample year t . $LNSIZE_{it}$ is the average of the logarithm of market capitalization for stock market i over the sample year t . Market capitalization is expressed in terms of U.S. dollars. $LNGNP_{it}$ is the logarithm of GNP in U.S. dollars for country i in the sample year t . Since we are dealing with international markets, we also include $SIGMACUR_{it}$ in our regressions, which is the standard deviation of daily currency returns in country i over the sample year t . $SIGMACUR_{it}$ controls for the possible

impact of currency fluctuation on negative skewness in stock market returns. Exchange rates are expressed in terms of local currencies per U.S. dollar. That is, a positive return on a currency suggests an appreciation in the currency and vice versa.

In their study of how corporate governance affected the performance of stock and currency markets during the Asian financial crisis, Johnson et al. (2000) find that some macroeconomic variables have an impact on their inferences. To control for the possible influences of macroeconomic variables on our inferences, we follow Johnson et al. (2000) in including the following nine macroeconomics variables in our regressions: (1) current account as a percentage of GDP; (2) total foreign debt (in U.S. dollars); (3) foreign debt as a percentage of exports; (4) external debt-to-GDP ratio; (5) government budget balance as a percentage of GDP; (6) import coverage (in months); (7) interest payments as a percentage of exports; (8) broad money growth; and (9) total reserves (in U.S. dollars).

Panel A of Table 2 reports the summary statistics of our key variables during the period from 1995 to 2001. Each variable in this table is first computed for each year for each country and then the statistics are derived from these time series and cross-sectional observations. Our key variable, the corporate governance index, has a mean value of 23.99 out of a full score of 30, ranging from 12.94 to 29.96. The average *SKEW* is 0.04, suggesting that these pooled returns from each year and each country are, on average, positively skewed. The average daily volatility is 2.38 percent, which is about two times higher than the average currency volatility of 0.77 percent.⁸ The average turnover ratio is 2.37 times, while average cumulative past one-year return is 19.9 percent.

⁸ It is noted that the currency return volatility for the U.S. is 0, since we use U.S. dollars as our denomination.

We partition the sample countries into three groups by the corporate governance index. It is interesting to note that a subgroup of countries with poor governance scores tends to have a more positive *SKEW*. The countries that belong to the poor corporate governance group have an average *SKEW* of 0.47, while those that belong to the better corporate governance group have an average *SKEW* of -0.23. The other measures of return asymmetries, *VOLRATIO* and *EXTRATIO*, show a similar pattern. In addition, those countries that have poor corporate governance scores tend to have higher return and currency volatilities, lower turnover, smaller market capitalization, and lower GNP per capita.

Panel B of Table 2 reports the correlation coefficients among our key variables. *SKEW* is significantly negatively correlated with lagged GNP (*LNGNP*), lagged market capitalization (*LNSIZE*), and the good corporate governance index (*CG*), indicating support for the discretionary-disclosure hypothesis. *SKEW* is negatively though not significantly correlated with lagged cumulative returns (*CUMRET*), which implies that the support for the stochastic-bubble model is limited. We also observe that *SKEW* is negatively though not significantly correlated with lagged turnover (*TURNOVER*), which provides limited support for the differences-of-opinion hypothesis of Hong and Stein (1999). In addition, *CG* is highly correlated with *LNGNP* and *LNSIZE*, especially the former (correlation coefficient = 0.888). This is not surprising given the fact that La Porta et al. (1997) find that well-governed economies have larger capital markets. Finally, *LNGNP* and *LNSIZE* are also highly correlated.

While not reported, the measures of return asymmetries, *SKEW*, *VOLRATIO*, and *EXTRATIO*, are all highly correlated with each other, although they use different approaches to measure return asymmetries. *SKEW* has a correlation coefficient of 0.78 with *VOLRATIO*,

while *VOLRATIO* has a correlation coefficient of 0.58 with *EXTRATIO*. *SKEW* has the relatively smaller correlation coefficient of 0.41 with *EXTRATIO*.

4.2 Results from predictive pooled regression

We employ the following regression model to predict the skewness in the daily returns of the world's stock market indices, using pooled data across time and countries:

$$\begin{aligned}
SKEW_{i,t+1} = & a_0 + a_1 SKEW_{it} + a_2 SIGMA_{it} + a_3 SIGMACUR_{it} \\
& + a_4 TURNOVER_{it} + a_5 CUMRET_{it} + a_6 LNSIZE_{it} \\
& + a_7 LNGNP_{it} + a_8 CG_{it} \\
& + \sum_{j=9}^{17} a_j \text{Macroeconomic Variables}_{it}^j + \\
& + \sum_{k=1}^5 b_k Year_{kt} + e_{i,t+1},
\end{aligned} \tag{3}$$

where all variables are defined as in Section 4.1. The currency volatility variable, *SIGMACUR*, is included, since *SKEW* may be influenced by the fluctuation of exchange rates due to changes in a country's fundamentals. The prediction of the signs for the key regression coefficients is as follows. According to the differences-of-opinion hypothesis of Hong and Stein (1999), we would expect that the regression coefficient on *TURNOVER*, a_4 , is negative. Based on the stochastic-bubble theory of Blanchard and Watson (1982), it is expected that the regression coefficient on *CUMRET*, a_5 , is negative. Based on the discretionary-disclosure or the risk-sharing hypothesis, we predict that the regression coefficient on *CG*, a_8 , is negative. Since market capitalization and GDP may be proxies for corporate governance, a_6 and a_7 are expected to be negative. The other macroeconomic variables are included to indicate if our results are sensitive to regression specifications.

Table 3 presents our multivariate regression results using local-currency returns. Model (1) is our baseline specification. Model (1) includes the following explanatory variables:

intercept, lagged variables of *SKEW*, return volatility (*SIGMA*), currency return volatility (*SIGMACUR*), turnover (*TURNOVER*), cumulative return (*CUMRET*), and market size (*LNSIZE*). The result from Model (1) indicates that stock markets that have larger market capitalization (*LNSIZE*) have lower positive skewness (*SKEW*). This result mirrors the findings of Chen et al. (2001) and Harvey and Siddique (2000) at the firm level. They find that skewness is more negative on average among large-cap firms. In Model (2), we add *LNGNP* to the explanatory variables and still find that *LNSIZE* is significant and negative. However, when *CG* is included in the multivariate regression (Model (3)), we find that *LNSIZE* is no longer significant, but *CG* is significant at the 5 percent level. When both *LNSIZE* and *LNGNP* are included in the multivariate regression (Model (4)), *CG* is still significant at the 5 percent level.

Looking at other controlling variables, we find that the regression coefficient on lagged *SKEW* is always negative, although it is not significant. Market return volatility (*SIGMA*) is positive, suggesting that higher past market volatility leads to greater positive skewness. However, this relation is not robust to the model specifications. Currency volatility (*SIGMASUR*) is significant and positive except in Model (2). This result suggests that high currency volatility in the previous year leads to more positive skewness. This result is perhaps due to the Asian currency crisis. Many Asian stock markets have recovered from the currency shock quickly. Turnover and the past cumulative return are negatively correlated with *SKEW* but they are not significant.

4.3 *Regression results from alternative tests*

To check the sensitivity of our results to the choice of currency, we first replicate the regression results in Table 3 based on U.S. dollar returns. The results from Model (1) in Table 4 show that our baseline results from Table 3 do not change. The regression coefficient on the corporate governance index (*CG*) is significant and negative at the 5 percent level. This suggests that stock markets with poorer corporate governance have greater positive skewness than stock markets with better corporate governance, regardless of the choice of currency in measuring returns. While not reported, *LNSIZE* is significant only when *CG* is excluded from the regression. The inclusion of *CG* subsumes the significance of *LNSIZE*.

To check the sensitivity of our results to the choice of skewness measures, we report results from alternative measures of return asymmetries. Models (2) and (3) use *VOLRATIO* and *EXTRATIO* as dependent variables, respectively. Consistent with the previous results using *SKEW*, the estimated coefficients on the corporate governance index (*CG*) are all negative and statistically significant. Estimates of other variables are also similar to the previous results using *SKEW*, indicating that our results are robust.

In their recent paper, Bris et al. (2003) investigate the impact of short-sale restriction on stock return distributions. They find that in markets where short selling is either prohibited or not practiced, returns display more positive skewness, and the frequency of extreme negative returns is lower. Since our results could be driven by the short-sale restrictions that are more popular in the emerging markets, we add a short-sale dummy variable that takes the value of one if a country allows and practices short selling in Model (4). The results show that even when we include the short-sale dummy, the corporate governance index variable is still significant and negative.

Finally, we add nine macroeconomic variables in regression Model (5) following Johnson

et al. (2000). We should be cautious in interpreting the result, since not every country for a given year includes all these variables. In fact, we lose more than half of the observations to end up with only 110 observations. Nevertheless, our baseline result that *CG* is negatively correlated with *SKEW* does not change.

Overall, based on the evidence presented in Tables 3 and 4, we conclude that stock markets with better corporate governance are associated with greater negative skewness. Our results are robust to a variety of regression specifications and to alternative measures of skewness. The evidence provides support for the discretionary-disclosure or risk-sharing hypothesis and underscores the importance of corporate governance in explaining cross-sectional differences of return asymmetries across countries.

5. Evidence from the Korean equity market

In the previous section, we showed that in markets where the quality of corporate governance is poor, stock returns are more positively skewed. To do so, we made use of skewness measures obtained from the daily market index returns from 38 countries around the world. While the evidence is consistent with the risk-sharing or discretionary-disclosure hypothesis, a cross-country analysis does not tackle the issue in a direct way. Since the hypotheses of risk sharing and discretionary disclosure are in nature about the behavior of firm managers, one has to investigate the firm-level data to ascertain the predictions of these hypotheses. In this section, we study the Korean equity market in depth to provide further evidence on the risk-sharing and discretionary-disclosure hypotheses.

5.1 Business groups in Korea: Chaebols

In Korea, a large business group is often called a *chaebol*.⁹ The Korea Fair Trade Commission (KFTC) defines a business group as “a group of companies of which more than 30 percent of shares are owned by the group’s controlling shareholder and its affiliated companies.” Each year, the KFTC ranks business groups according to the size of their total assets and identifies the 30 largest groups. Although smaller business groups are organized in the same way as the top 30 business groups, several features distinguish the top 30 business groups (hereafter called “chaebols”) from other, smaller business groups and independent firms (hereafter called “non-chaebols”).

One unique feature of chaebols is that controlling power is heavily concentrated in an individual or a single family. Even though the chaebol’s owner-managers put up a relatively small portion of the total stake in the group (low cashflow rights), they have full control over member firms (high control rights). This is made possible because there exist extensive reciprocal shareholding agreements among member firms and there are few mechanisms to control the discretionary power of owner-managers.

Under the direct or indirect control of the controlling family, chaebol-affiliated firms maintain close economic relationships through cross-shareholdings, reciprocal debt guarantees, internal transactions between firms, and exchanges of human resources within the group. This practice would facilitate intercorporate income shifting among chaebol-affiliated firms. Chang and Hong (2000) show that chaebols in Korea use extensive cross-subsidization such as debt guarantees, equity investments, and internal transactions to support poorly performing firms at the expense of well-performing firms. By studying the takeover market in Korea, Bae et al. (2002) show that financially distressed targets that belong to business groups

⁹ Bae et al. (2002) provide a detailed description of Korean business groups.

are likely to be merged with more successful member firms, even when such transactions do not maximize the value of the bidding firms.

As mentioned in the introduction, important corporate governance systems were not well established in Korea during our sample period. In the U.S., corporate managers are subject to many governance mechanisms that force them to act in the best interests of shareholders. These governance systems include outside directors (Fama and Jensen, 1983); incentive-based compensation contracts such as stock options, proxy fights, and disciplinary takeovers (Jensen and Ruback, 1983; Scharfstein, 1988); and the managerial labor market (Fama, 1980). These corporate governance systems have been nonexistent or have not been practiced in Korea. The absence of mechanisms to govern managerial discretion would allow owner-managers in Korea more discretionary power in disclosing information. Managers would have a wider scope for hiding bad news or releasing bad news slowly.

5.2 *Data*

Table 5 presents descriptive statistics of the variables used in the analysis. We obtained the stock price data from the daily return file of the Korea Securities Research Institute (KSRI) database, which includes all firms listed on the Korean Stock Exchange. We obtained financial statement data from the Listed Company Database of the Korean Listed Companies Association. The sample period is 1995-2000. All variables in the table are first computed for each year for each firm and then the statistics are derived from these time series and cross-sectional observations. We partition the sample firms into chaebol and non-chaebol firms to make comparisons between the two groups. For all the sample firms during the period 1995-

2000, we have 2,699 firm-year observations, of which 704 observations are from chaebol-affiliated firms.

Several features are worth noting. Chaebol firms are in general larger than non-chaebol firms. The average market capitalization of chaebol firms is three times larger than that of non-chaebol firms. Leverage measured by the ratio of total debt to total assets is significantly different between the two groups. The mean leverage ratios for the chaebol firms and non-chaebol firms are 0.73 and 0.62, respectively. The median shows a similar pattern. The average (median) book-to-market ratio for all sample firms is 2.32 (1.58). This indicates that the Korean firms are valued by the stock market much below their book values. Some commentators argue that the undervaluation of Korean firms is due to the poor corporate governance structure inherent in the structure of Korean business groups. Consistent with this argument, the book-to-market ratios of chaebol firms are higher than those of non-chaebol firms. The differences in firm size, leverage, and the book-to-market ratio between the two groups are all statistically significant at the 1 percent level. In sum, chaebol firms are larger, more leveraged, and more undervalued than non-chaebol firms.

The three measures of return asymmetries are all positive, suggesting that on average Korean firms are positively skewed. The comparison between chaebol and non-chaebol firms shows that chaebol firms are more positively skewed. To the extent that the chaebol firms suffer more from poor corporate governance, the evidence is consistent with the risk-sharing and discretionary-disclosure hypotheses.

SIGMA is significantly lower for chaebol firms than for non-chaebol firms, which is not surprising given the difference in firm size between the two groups of firms. *TURNOVER* is

also lower for chaebol firms. Finally, during our sample period, non-chaebol firms performed better as both mean and median *CUMRET*s are higher for non-chaebol firms.

5.3 *Skewness, chaebol affiliation, and financial distress*

In Table 6, we partition the sample according to key firm characteristics and then compare the return skewness across these characteristics. In panel A, we divide the sample firms into four subgroups according to the median of firm size (measured by market capitalization) and chaebol affiliation. Several interesting results emerge. First, among chaebol firms, large firms have more positive skewness. The average and median *SKEW*s for large firms are 0.28 and 0.29, respectively, while the corresponding numbers are 0.19 and 0.20 for small firms. The differences are significant at the 1 percent level. However, for non-chaebol firms, firm size makes no difference to skewness. One cannot reject the hypothesis of equal *SKEW* between large and small firms. Second, controlling for firm size, chaebol firms have more positive skewness than non-chaebol firms. However, this phenomenon is only observed for large firms, not for small firms. These results are consistent with the view that large chaebol firms are more complex in nature and are difficult to monitor by outside investors, and thus managers of chaebol firms have more discretionary power in terms of disclosing information that they want to release or hide. This discretionary power of chaebol managers will impart positive skewness in their stock returns.

An alternative interpretation is that chaebol-affiliated firms are insured against each other. When member firms of the chaebol are in financial trouble, other member firms step in and rescue them. Bailing out a distressed firm can create a credible commitment by chaebol firms to prop up the performance of its member firms. This will allow the stock returns of these

firms to be more positively skewed, since a negative shock would not be fully reflected in the stock returns of member firms in the business groups due to the implicit guarantees of bailout. However, an equally negative shock would be fully reflected in the stock returns of independent firms, since they do not have the implicit guarantees of bailout available.

To further test the risk-sharing hypothesis, we partition the sample into four subgroups according to chaebol affiliation and financial distress. We define a financially distressed firm as one that does not service interest payments. Specifically, if the earnings before interest and taxes (EBIT) of a sample firm in year t are less than interest payments made, we treat the firm as being financially distressed. Panel B reports the results.

The results show that when a firm is not in financial trouble, there are no differences in skewness between chaebol and non-chaebol firms. However, when in financial trouble, chaebol firms show much higher positive skewness. The average (median) skewness for chaebol firms is 0.26 (0.28), but it is only 0.17 (0.17) for non-chaebol firms. The differences are significant at the 1 percent level. An alternative way of looking at the phenomenon is that chaebol firms do not display any difference regardless of whether they are financially distressed or not, whereas non-chaebol firms show significantly lower skewness when they are financially distressed. These results strongly support the risk-sharing hypothesis that member firms of business groups tend to have more positive return skewness due to the implicit guarantee of bailout. Non-chaebol firms do not have such a guarantee, imparting more negative skewness when they are in financial trouble.

One can argue that chaebol firms are less likely to be in financial distress due to the operation of internal capital markets and that our results are driven by the fewer cases of financial distress in chaebol firms. However, the number of observations in panel B shows

that 39 percent of chaebol firm-year observations reflect financial distress and 35 percent of non-chaebol firm-year observations reflect financial distress, indicating that our results are not driven by the asymmetry in the frequency of financial distress between chaebol and non-chaebol firms.

5.4 Regression results

To understand better the cross-sectional variation in skewness, we present the estimates from multivariate regressions. We follow Chen et al. (2001) to explain the cross-sectional variation in the skewness of Korean stock returns. We include a lagged dependent variable, return volatility (*SIGMA*), turnover (*TURNOVER*), past one-year cumulative returns (*CUMRET*), book-to-market ratios, leverage, firm size, industry-dummy, and year-dummy variables as controlling variables. Table 7 presents the results. Models (1) and (2) use *SKEW* as the dependent variable. Models (3) and (4) use *VOLRATIO* and Models (5) and (6) use *EXTRATIO* as dependent variables.

In addition to the controlling variables, Model (1) adds the chaebol dummy that equals 1 if the sample firm belongs to a chaebol and 0 otherwise. The coefficient on the chaebol dummy is significant and positive. This evidence is consistent with the risk-sharing and discretionary-disclosure hypotheses. To further examine the risk-sharing hypothesis, we add two interaction variables in Model (2): (i) the chaebol dummy times the financial distress dummy, and (ii) the non-chaebol dummy times the financial distress dummy. The financial distress dummy takes the value of 1 if interest payments exceed earnings before interest and taxes. Consistent with the evidence presented in Table 6, the results show that the interaction variable of the non-chaebol dummy times the financial distress dummy is significant and negative. The F-test of

equal coefficients on the two interaction variables is easily rejected with a p-value of 0.00. This result implies that the stock returns of chaebol firms tend to be more positively skewed, since a negative shock would not be fully reflected in the stock returns of these firms due to the implicit guarantee of bailout, whereas an equally negative shock would be fully reflected in the stock returns of non-chaebol firms that do not have such a guarantee, imparting more negative skewness to the stock returns of these firms.

The results from using alternative measures of return asymmetries also provide consistent evidence, indicating that our results are robust (Models (4)-(6)). The chaebol dummy is significant and positive. The interaction of the non-chaebol dummy and the financial distress dummy is significant and negative.

Although it is not the focus of this paper, we compare our results with those of Chen et al. (2001). Consistent with their results, we find that the coefficient on lagged skewness is always positive and significant. We also find consistent results that past return volatility (*SIGMA*) is significant and negative, except for Models (1) and (2), indicating that higher past stock volatility leads to greater positive skewness. Past cumulative return is associated with negative skewness, supporting the stochastic-bubble hypothesis. High leverage is associated with negative skewness, supporting the leverage-effect hypothesis. However, the book-to-market and turnover ratios are never significant. Finally, we find that firm size is significant and positive in all regression models, which is in sharp contrast to Chen et al. (2001) who find a significantly negative coefficient for firm size. We believe this sharp difference is attributable to the different corporate governance structures of the U.S. and Korean markets.

6. Summary and conclusion

In this paper, we used the world's stock market indices to examine a number of theories to explain the cross-sectional variation of return asymmetries. Using data from 38 stock market indices across the world and the corporate governance index, we found that stock returns are more positively skewed in stock markets that have lower scores on the good corporate governance index. Using firm-level data from the Korean stock market, we also found that firms belonging to business groups are more positively skewed and that they do not display negative skewness even when they are in financial distress.

Our findings are consistent with the discretionary-disclosure hypothesis. In poor governance economies, managers of diversified business groups have discretionary power to disclose good news immediately, while releasing bad news slowly. Our results are also consistent with the risk-sharing hypothesis that economies which protect the public investor's property rights poorly encourage intercorporate income shifting by controlling insiders, thereby facilitating risk sharing among affiliated firms. Overall, our results suggest that stock markets in more advanced or well-governed economies are more useful as processors of economic information than are stock markets in developing or poorly governed economies.

Recent empirical evidence suggests that diversified business groups in emerging markets suffer from serious agency problems. In business groups of emerging markets, ownership is highly concentrated, and controlling shareholders have power over firms that exceed their cashflow rights (e.g., Claessens et al., 2000). Given a large disparity between cashflow and control rights, Johnson et al. (2000) argue that controlling shareholders have strong incentives to siphon resources out of a firm to increase their wealth. To describe the transfer of resources out of firms for the benefit of their controlling shareholders, Johnson et al. use the term

“tunneling.”¹⁰ The agency problem between controlling and minority shareholders can be particularly serious when there are few mechanisms to protect minority investors and to control the discretionary power of controlling shareholders.

If minority shareholders in business-group firms know that neither corporate governance mechanisms nor laws protect them from expropriation by controlling shareholders, then why are they willing to buy stocks and bonds of these firms? Our evidence appears to suggest that the implicit guarantee of a bailout for member firms of business groups in distress could be attractive to outside investors.

¹⁰ See La Porta et al. (1999), Bae et al. (2002), Joh (2003), and Bertrand et al. (2002) for evidence of tunneling.

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Table 1**Distributional characteristics of daily local -currency stock index returns from 38 world markets**

This table presents distributional characteristics of the daily local-currency index return data for 38 sample countries during the period 1995-2001. The sample countries are partitioned into two subgroups, emerging markets and developed markets, by the median of the GNP per capita. The last three columns of the table present three measures of return asymmetries: (1) skewness (*SKEW*); (2) the volatility ratio (*VOLRATIO*); and (3) the extreme return ratio (*EXTRATIO*). Skewness is measured as :

$$SKEW_i = [(n(n-1))^{3/2} \sum_{t=1}^n R_{it}^3] \div [(n-1)(n-2) \left(\sum_{t=1}^n R_{it}^2 \right)^{3/2}],$$

where R_{it} represents the demeaned daily return with dividends for stock market i on day t and n is the number of observations on daily returns during the sample period. Daily returns are computed as $\ln[(P_{it} + D_{it})/P_{it-1}]$, where P_{it} is the index value at the close of day t and D_{it} is the dividend. The volatility ratio is measured as :

$$VOLRATIO_i = \ln \left\{ (n_d - 1) \sum_{t \in UP} R_{it}^2 \div (n_u - 1) \sum_{t \in DOWN} R_{it}^2 \right\},$$

where n_u and n_d are the number of up and down days, respectively. An up (A down) day is a day on which the stock index return is above (below) the sample mean during the sample period. The extreme return ratio is measured as the log of the ratio of the number of positive extreme return days to the number of negative extreme return days. A demeaned daily return, R_{it} , is treated as a positive (negative) extreme return if $R_{it} > 2*s_i$ ($R_{it} < -2*s_i$), where s_i denotes the standard deviation of returns of stock market i . The data are drawn from Datastream International.

Country	GNP	Mean return	Standard deviation	Minimum	Maximum	Skewness	VOL- RATIO	EXT- RATIO
<i>Panel A: Emerging markets</i>								
Argentina	7,833	0.00	1.90	-13.38	12.01	0.35	0.12	-0.02
Brazil	3,940	0.05	1.87	-10.55	19.55	0.80	0.16	-0.04
Chile	4,806	0.01	0.94	-4.62	6.70	0.44	0.30	0.00
Colombia	2,369	-0.01	0.93	-10.19	9.90	0.26	-0.01	0.17
Greece	11,646	0.07	1.78	-9.68	7.54	0.09	0.25	0.11
India	436	0.00	1.63	-7.68	8.74	0.00	0.14	-0.30
Indonesia	833	-0.01	2.07	-13.91	14.17	0.58	0.33	0.13
Korea	9,573	0.01	2.43	-12.68	11.35	0.28	0.34	0.31
Malaysia	4,105	-0.01	1.91	-22.20	20.40	1.54	0.51	0.15
Mexico	4,456	0.05	1.51	-9.92	10.61	0.27	0.23	0.27
Peru	2,088	0.01	1.20	-10.22	9.96	0.81	0.36	0.07
The Philippines	1,031	-0.03	1.51	-8.56	14.81	1.25	0.15	-0.06
Portugal	11,079	0.04	1.01	-8.00	6.19	-0.41	0.06	0.02
South Africa	3,222	0.05	1.26	-13.67	7.86	-0.91	-0.13	-0.22
Spain	15,050	0.07	1.24	-6.63	5.69	-0.31	-0.14	-0.41
Taiwan	12,836	0.01	1.79	-10.29	8.19	0.13	0.29	0.48
Thailand	2,271	-0.06	2.21	-11.81	12.14	0.90	0.39	0.65
Turkey	2,764	0.23	3.30	-19.45	17.03	0.23	0.30	-0.12
Venezuela	4,191	0.06	1.96	-10.85	19.46	1.43	0.53	0.00
Mean	5,501	0.03	1.71	-11.28	11.70	0.41	0.22	0.06
Median	4,148	0.01	1.75	-10.42	10.98	0.32	0.24	0.04

Table 1 (continued)

Country	GNP	Mean return	Standard deviation	Minimum	Maximum	Skewness	VOL- RATIO	EXT- RATIO
<i>Panel B: Developed markets</i>								
Australia	20,132	0.05	0.85	-6.97	5.78	-0.38	-0.06	-0.19
Austria	26,072	0.01	0.82	-6.63	4.00	-0.70	-0.14	-0.29
Belgium	25,003	0.05	0.87	-4.94	5.34	-0.06	-0.03	-0.48
Canada	21,408	0.05	0.99	-7.24	4.86	-0.61	-0.24	-0.45
Denmark	32,634	0.06	0.97	-7.06	6.01	-0.46	-0.13	-0.63
Finland	24,641	0.10	2.34	-18.24	15.35	-0.23	-0.05	-0.33
France	24,672	0.06	1.19	-7.35	6.03	-0.23	-0.04	-0.42
Germany	26,043	0.04	1.21	-7.20	5.49	-0.42	-0.18	-0.39
Hong Kong	24,167	0.03	1.83	-13.58	15.55	0.35	0.15	-0.19
Italy	20,339	0.05	1.38	-7.78	6.92	-0.08	0.07	-0.10
Japan	35,906	-0.01	1.23	-6.52	6.39	0.07	0.01	0.20
The Netherlands	25,006	0.06	1.15	-6.19	5.88	-0.32	-0.17	-0.34
New Zealand	15,669	0.03	0.93	-12.76	9.17	-0.79	-0.06	0.19
Norway	34,957	0.03	1.16	-7.09	6.10	-0.40	-0.12	-0.56
Singapore	26,620	0.00	1.35	-8.55	8.91	0.18	0.00	0.00
Sweden	26,705	0.07	1.52	-8.49	10.87	0.08	0.01	-0.40
Switzerland	37,445	0.05	1.05	-6.89	6.44	-0.43	-0.16	-0.31
U.K.	22,660	0.04	0.94	-5.36	3.86	-0.26	-0.15	-0.41
U.S.	32,279	0.06	1.12	-7.02	5.33	-0.21	-0.04	-0.24
Mean	26,440	0.04	1.20	-8.20	7.28	-0.26	-0.07	-0.28
Median	25,524	0.05	1.15	-7.15	6.06	-0.26	-0.06	-0.32

Table 2
Summary statistics

This table presents summary statistics of the variables used in the empirical analysis of the 38 sample countries during the period 1995-2001. *SKEW*, *VOLRATIO*, and *EXTRATIO* are defined as in Table 1. All variables are obtained by using returns in the one-year period for each sample country and for each year. Thus, for each sample country, seven observations are obtained for each variable. The sample countries are partitioned into three groups by the corporate governance index (*CG*). The corporate governance index is the sum of the three indices taken from La Porta et al. (1998): (i) government corruption; (ii) the risk of expropriation by the government; and (iii) the risk of the government repudiating contracts, with each ranging from 0 to 10. A high score on the index indicates better protection of property rights. Return volatility ($SIGMA_t$) is the standard deviation of daily returns in the year t . Currency volatility ($SIGMACUR_t$) is the standard deviation of daily currency returns in the year t . Turnover $_t$ ($TURNOVER_t$) is the average daily turnover in the year t . Cumulative return $_t$ ($CUMRET_t$) is the cumulative return over the year t . $LNSIZE_t$ is the average (of the logarithm of) market capitalization (in U.S. dollars) in the year t . $LNGNP_t$ is the (logarithm of) GNP (in U.S. dollars) in the year t .

Panel A: Summary statistics

	CG_t	$SKEW_t$	$VOL-RATIO_t$	$EXT-RATIO_t$	$SIGMA_t$	$SIGMA-CUR_t$	$TURN-OVER_t$	$CUM-RET_t$	$SIZE_t$	GNP_t
All sample countries										
Mean	23.99	0.04	0.06	-0.16	2.38	0.77	2.37	19.90	531	16,300
Median	25.30	-0.06	0.01	-0.13	1.45	0.27	1.84	15.54	102	15,620
Standard deviation	4.89	0.86	0.35	0.72	2.66	3.55	2.03	51.07	1604	11,803
Minimum	12.94	-5.23	-0.84	-2.08	0.17	0.00	0.10	-53.11	3	378
Maximum	29.96	3.90	1.10	2.20	15.94	43.47	11.53	494.51	14085	43,550
Groups by governance score										
Low	17.53	0.47	0.25	0.23	3.55	1.56	1.44	22.40	46	3,020
Middle	24.84	-0.06	0.05	-0.08	2.33	0.49	2.88	15.95	829	16,789
High	28.77	-0.23	-0.09	-0.59	1.40	0.35	2.67	21.68	655	27,387

Table 2 (continued)

Panel B: Correlation among variables

	$SKEW_{t+1}$	$SKEW_t$	$SIGMA_t$	$SIGMACUR_t$	$TURNOVER_t$	$CUMRET_t$	$LNSIZE_t$	$LNGNP_t$	CG_t
$SKEW_t$	1.000								
$SKEW_t$	-0.031 (0.64)	1.000							
$SIGMA_t$	0.233 (0.00)	0.240 (0.00)	1.000						
$SIGMACUR_t$	0.132 (0.04)	0.140 (0.04)	0.207 (0.00)	1.000					
$TURNOVER_t$	-0.079 (0.23)	-0.133 (0.05)	0.224 (0.00)	-0.073 (0.28)	1.000				
$CUMRET_t$	-0.049 (0.45)	0.029 (0.65)	0.149 (0.03)	0.018 (0.79)	0.143 (0.03)	1.000			
$LNSIZE_t$	-0.037 (0.57)	-0.073 (0.00)	-0.182 (0.01)	-0.189 (0.00)	0.423 (0.00)	-0.018 (0.79)	1.000		
$LNGNP_t$	-0.266 (0.00)	-0.304 (0.00)	-0.327 (0.00)	-0.181 (0.01)	0.243 (0.00)	0.008 (0.90)	0.541 (0.00)	1.000	
CG_t	-0.358 (0.00)	-0.343 (0.00)	-0.347 (0.00)	-0.159 (0.02)	0.286 (0.00)	-0.003 (0.96)	0.580 (0.00)	0.888 (0.00)	1.000

Table 3**Cross-sectional regressions of conditional skewness on the corporate governance index**

This table presents the results of cross-sectional regressions to explain return asymmetries across countries. The dependent variable is $SKEW_{t+1}$, the coefficient of skewness in the year $t+1$ computed using daily local market index returns from each sample country. Return volatility ($SIGMA_t$) is the standard deviation of daily returns in the year t . Currency volatility ($SIGMACUR_t$) is the standard deviation of daily currency returns in the year t . Turnover ($TURNOVER_t$) is the average daily turnover in the year t . Cumulative return ($CUMRET_t$) is the cumulative return over the year t . $LNSIZE_t$ is the average of the logarithm of market capitalization (in U.S. dollars) in the year t . $LNGNP_t$ is the logarithm of GNP (in U.S. dollars) in the year t . The corporate governance index (CG) is the sum of the three indices taken from La Porta et al. (1998): (i) government corruption; (ii) the risk of expropriation by the government; and (iii) the risk of the government repudiating contracts, with each ranging from 0 to 10. A high score on the index indicates better protection of property rights. Numbers in parentheses are White's heteroskedasticity-consistent standard errors. The F-value is the F-statistic used to test the null hypothesis that all slope coefficients are equal to 0. *, **, and *** denote 0.10, 0.05, and 0.01 significance levels, respectively.

Independent variables	(1)	(2)	(3)	(4)
Intercept	0.945* (0.51)	1.774** (0.76)	1.496** (0.57)	1.003 (0.68)
$SKEW_t$	-0.080 (0.19)	-0.108 (0.19)	-0.136 (0.18)	-0.137 (0.19)
Return volatility _t ($SIGMA_t$)	0.059** (0.02)	0.042 (0.02)	0.026 (0.02)	0.026 (0.03)
Currency return volatility _t ($SIGMACUR_t$)	0.017** (0.01)	0.015 (0.01)	0.017** (0.01)	0.019*** (0.01)
$TURNOVER_t$	-0.033 (0.02)	-0.025 (0.02)	-0.013 (0.02)	-0.011 (0.01)
Cumulative return _t ($CUMRET_t$)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)
$LNSIZE_t$	-0.087** (0.03)	-0.042 (0.03)	-0.008 (0.03)	-0.013 (0.03)
$LNGNP_t$		-0.146** (0.07)		0.130 (0.09)
Corporate governance index (CG)			-0.060*** (0.02)	-0.088*** (0.03)
Time dummy variables	Yes	Yes	Yes	Yes
Adjusted R^2	0.094	0.117	0.159	0.163
F-value	3.10***	3.46***	4.52***	4.34***
No. of observations	224	224	224	224

Table 4
Cross-sectional regressions: Alternative tests

This table presents the results of cross-sectional regressions to explain return asymmetries across countries using alternative measures of return asymmetries and regression specifications. All independent variables used are the same as those in Table 3. The first regression uses dollar-currency returns. The second regression uses *VOLRATIO* as the dependent variable. The third regression uses *EXTRATIO* as the dependent variable. The fourth regression uses *SKEW* as the dependent variable and adds a short-sale dummy that takes the value of 1 if a country allows and practices short selling. The fifth regression uses *SKEW* as the dependent variable and adds nine macroeconomic variables that might influence return asymmetries. Numbers in parentheses are White's heteroskedasticity-consistent standard errors. The F-value is the F-statistic used to test the null hypothesis that all slope coefficients are equal to 0. *, **, and *** denote 0.10, 0.05, and 0.01 significance levels, respectively.

Independent variable	Dollar-currency Returns (1)	<i>VOL</i> - <i>RATIO</i> (2)	<i>EXT</i> - <i>RATIO</i> (3)	<i>SKEW</i> (4)	<i>SKEW</i> (5)
Intercept	0.523 (0.61)	0.366 (0.25)	0.311 (0.47)	1.027 (0.65)	1.465 (2.59)
<i>SKEW</i> _{<i>t</i>}	0.086 (0.12)	-0.025 (0.10)	0.115 (0.07)	-0.136 (0.18)	-0.226** (0.10)
Return volatility _{<i>t</i>} (<i>SIGMA</i> _{<i>t</i>})	0.004* (0.00)	0.036*** (0.01)	0.039* (0.02)	0.026 (0.03)	-0.003 (0.06)
Currency return volatility _{<i>t</i>} (<i>SIGMACUR</i> _{<i>t</i>})	0.037 (0.03)	0.012*** (0.00)	0.019*** (0.00)	0.019*** (0.01)	0.003 (0.02)
<i>TURNOVER</i> _{<i>t</i>}	0.004 (0.02)	-0.004 (0.01)	0.004 (0.03)	-0.011 (0.02)	-0.045 (0.09)
Cumulative return _{<i>t</i>} (<i>CUMRET</i> _{<i>t</i>})	-0.003 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)
<i>LNSIZE</i> _{<i>t</i>}	0.017 (0.04)	-0.013 (0.04)	0.023 (0.03)	-0.014 (0.03)	-0.145 (0.18)
<i>LNGNP</i> _{<i>t</i>}	0.103 (0.09)	0.021 (0.04)	0.067 (0.07)	0.131 (0.09)	0.367 (0.26)
Corporate governance index (<i>CG</i>)	-0.074*** (0.03)	-0.021** (0.01)	-0.057*** (0.02)	-0.088*** (0.03)	-0.143*** (0.06)
Short-sale dummy				0.015 (0.12)	
Various macroeconomic variables	No	No	No	No	Yes
Time dummy variables	Yes	Yes	Yes	Yes	Yes
Adjusted <i>R</i> ²	0.224	0.318	0.258	0.158	0.115
F-value	5.94***	9.01***	6.93***	4.01***	1.64**
No. of observations	224	224	224	224	110

Table 5
Summary statistics of Korean firms

This table presents summary statistics of the variables used in the empirical analysis of the Korean firms during the period 1995-2000. Chaebol firms are those firms that belong to the top 30 business groups and non-chaebol firms are those that do not belong to the top 30 chaebols. *SKEW*, *VOLRATIO*, and *EXTRATIO* are defined as in Table 1. All variables are obtained by using returns in the one-year period for each sample firm and for each year. Return volatility (*SIGMA_t*) is the standard deviation of daily returns in the year *t*. Turnover_{*t*} (*TURNOVER_t*) is the average daily turnover in the year *t*. Cumulative return_{*t*} (*CUMRET_t*) is the cumulative return over the year *t*. *LNSIZE_t* is the average of the logarithm of market capitalization (in Korean won) in the year *t*. Book to market is the book-to-market ratio at the end of the year *t*. Leverage is the ratio of total debt to total assets. Financial distress is a dummy variable that equals 1 if the earnings before interests and taxes (EBIT) of the sample firm in year *t* exceed interest payments made, and 0 otherwise. Difference tests of mean and median are *t*-statistics for the test of equality of means and *p*-values of the Wilcoxon Z-test for equality of medians, respectively. Numbers in parentheses are *p*-values.

Variables	All firms		Chaebol firms		Non-chaebol firms		Difference test	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>SIZE</i> (billion won)	219.9	38.7	482.1	118.8	130.2	29.4	(0.00)	(0.00)
Leverage	0.646	0.645	0.732	0.745	0.616	0.611	(0.00)	(0.00)
Book to market	2.326	1.575	2.610	1.834	2.229	1.490	(0.00)	(0.00)
<i>SKEW</i>	0.226	0.230	0.259	0.279	0.214	0.212	(0.00)	(0.00)
<i>VOLRATIO</i>	0.216	0.221	0.235	0.260	0.210	0.211	(0.06)	(0.04)
<i>EXTRATIO</i>	0.454	0.470	0.528	0.511	0.429	0.452	(0.00)	(0.00)
<i>SIGMA</i>	0.038	0.037	0.033	0.032	0.039	0.038	(0.00)	(0.00)
<i>TURNOVER</i>	0.011	0.008	0.008	0.005	0.012	0.010	(0.00)	(0.00)
<i>CUMRET</i>	0.045	-0.105	-0.016	-0.123	0.066	-0.095	(0.01)	(0.32)
No. of observations	2,699		704		1,995			

Table 6
Distribution of skewness by firm characteristics

This table presents the distribution of skewness for different combinations of firm characteristics including firm size, chaebol affiliation, financial distress, and the number of analysts following a firm. A sample firm in year t is classified as large (small) if market capitalization is greater (smaller) than the median market capitalization of the sample firms in year t . Chaebol firms are those firms that belong to the top 30 business groups and non-chaebol firms are those that do not belong to the top 30 chaebols. A sample firm in year t is classified as financially distressed if the firm's EBIT does not meet interest payments. Difference tests of mean and median are t -statistics for the test of equality of means and p -values of the Wilcoxon Z-test for equality of medians, respectively. Numbers in parentheses are p -values.

Panel A: Size and chaebol affiliation

	Chaebol firms		Non-chaebol firms		Difference test	
	Mean	Median	Mean	Median	Mean	Median
Large firms	0.277	0.286	0.222	0.221	(0.01)	(0.00)
	N=556		N=794			
Small firms	0.185	0.204	0.209	0.204	(0.41)	(0.45)
	N=148		N=1,201			
Difference test	(0.00)	(0.00)	(0.45)	(0.36)		

Panel B: Financial distress and chaebol affiliation

	Chaebol firms		Non-chaebol firms		Difference test	
	Mean	Median	Mean	Median	Mean	Median
No financial distress	0.259	0.277	0.240	0.243	(0.36)	(0.23)
	N=430		N=1,302			
Financial distress	0.255	0.275	0.166	0.165	(0.00)	(0.00)
	N=274		N=693			
Difference test	(0.89)	(0.88)	(0.00)	(0.00)		

Table 7
Cross-sectional regression using firm-level data from Korea

This table presents the results of a pooled regression to explain return asymmetries using firm-level return data from the Korean equity market. The dependent variable of regressions (1) and (2) is $SKEW_{t+1}$, the coefficient of skewness in the year $t+1$ computed using daily local returns from each sample firm. The dependent variable of regressions (3) and (4) is $VOLRATIO_{t+1}$, the up-to-down volatility ratio in the year $t+1$ computed using daily local returns from each sample firm. The dependent variable of regressions (5) and (6) is $EXTRATIO_{t+1}$, the log of the ratio of the number of positive extreme return days to the number of negative extreme return days in the year $t+1$ computed using daily local returns from each sample firm. Return volatility ($SIGMA_t$) is the standard deviation of daily returns in the year t . Turnover _{t} ($TURNOVER_t$) is the average daily turnover in the year t . Cumulative return _{t} ($CUMRET_t$) is the cumulative return over the year t . Book to market is the book-to-market ratio at the end of the year t . Leverage _{t} is the ratio of total debts to total assets at the end of year t . $LNSIZE_t$ is the average of the logarithm of market capitalization (in Korean won) in the year t . Chaebol dummy is a variable that equals 1 if the sample firm belongs to the 30 largest business groups at the end of year t . Financial distress dummy is a dummy variable that equals 1 if the interest payments made exceed earnings before interests and taxes (EBIT) of the sample firm in year t , and 0 otherwise. Numbers in parentheses are White's heteroskedasticity-consistent standard errors. *, **, and *** denote 10, 5, and 1 percent significance levels, respectively.

	$SKEW_{t+1}$		$VOLRATIO_{t+1}$		$EXTRATIO_{t+1}$	
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.567*** (0.10)	0.568*** (0.10)	0.383*** (0.09)	0.383*** (0.08)	0.032 (0.16)	0.034 (0.16)
$SKEW_t$ or $VOLRATIO_t$ or $EXTRATIO_t$	0.030** (0.01)	0.029* (0.01)	0.071*** (0.03)	0.069*** (0.03)	0.066*** (0.02)	0.066*** (0.02)
Return volatility _{t} ($SIGMA_t$)	-0.002 (0.01)	0.000 (0.01)	0.016* (0.01)	0.018* (0.01)	0.051*** (0.02)	0.051*** (0.02)
Turnover ratio ($TURNOVER_t$)	0.007 (0.01)	0.008 (0.01)	0.006 (0.01)	0.006 (0.01)	0.039*** (0.01)	0.039*** (0.01)
Cumulative return _{t} ($CUMRET_t$)	-0.103*** (0.01)	-0.105*** (0.01)	-0.111*** (0.01)	-0.113*** (0.01)	-0.068*** (0.02)	-0.068*** (0.02)
Book to market _{t}	-0.001 (0.00)	-0.001 (0.00)	0.000 (0.00)	0.001 (0.00)	-0.010* (0.01)	-0.010* (0.01)
Leverage _{t}	-0.181*** (0.04)	-0.175*** (0.04)	-0.100*** (0.04)	-0.096*** (0.04)	-0.168** (0.07)	-0.167** (0.07)
$LNSIZE_t$	0.021*** (0.01)	0.020*** (0.01)	0.014** (0.01)	0.014** (0.01)	0.057*** (0.01)	0.057*** (0.01)
Chaebol dummy _{t}	0.041** (0.02)	0.028 (0.02)	0.025* (0.01)	0.018 (0.02)	0.078*** (0.03)	0.069** (0.03)
Chaebol dummy _{t} × Financial distress dummy _{t}		-0.005 (0.02)		-0.011 (0.02)		0.016 (0.04)
Non-chaebol dummy _{t} × Financial distress dummy _{t}		-0.043*** (0.01)		-0.033** (0.01)		-0.010 (0.02)
Industry dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.311	0.313	0.271	0.272	0.193	0.193
F-value	44.57***	42.00***	36.74***	34.58***	24.08***	22.48***
No. of observations	2,699	2,699	2,699	2,699	2,699	2,699

Figure 1. The relation between corporate governance and skewness

