Intragroup Propping: Evidence from the Stock-Price Effects of Earnings Announcements by Korean Business Groups

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Using earnings announcement events made by firms belonging to Korean chaebols, we examine propping within a chaebol. Consistent with the market's *ex ante* valuation of intragroup propping, we find that the announcement of increased (decreased) earnings by a chaebol-affiliated firm has a positive (negative) effect on the market value of other nonannouncing affiliates. The sensitivity of the change in the market value of nonannouncing affiliates to abnormal returns for the announcing firms is higher if the cash flow right of the announcing firm's controlling shareholder is higher. The sensitivity is also higher if the announcing firm is larger, performs well, and has a higher debt guarantee ratio. (*JEL* G14, G32, G34)

Much research has been devoted to understanding the role of business groups in developing countries. Khanna and Palepu (1997, 2000), for example, argue that business groups in developing countries mimic the beneficial functions of market mechanisms that are present only in advanced economies. When the external capital market is not well developed and has severe imperfections, an internal capital market within business groups can provide benefits in allocating capital more efficiently (Stein, 1997) and decrease information asymmetry problems between managers and outside investors. Supporting this view, Khanna and Palepu (2000) show that the profitability of Indian firms belonging to industrial groups is higher than that of independent firms. Shin and Park (1999) also show that because of their internal capital markets, Korean

firms belonging to the top thirty business groups are subjectto fewer financing constraints than other independent firms.

Business groups, however, also perform an adverse function, especially in developing countries with weak shareholder protection. As La Porta, Lopez-de-Silanes, and Shleifer (1999) argue, in most business groups, ownership is highly concentrated, and controlling shareholders have power over firms that exceeds their cash flow rights. This concentrated ownership provides controlling shareholders with an opportunity for wealth transfer from the member firm for their own benefit (Johnson et al., 2000b; Bertrand, Mehta, and Mullainathan, 2002; Bae, Kang, and Kim, 2002; and Baek, Kang, and Lee, 2006). The self-serving controlling shareholder who wants to increase his own wealth has incentives to transfer resources from firms where he has low cash flow rights to those where he has high cash flow rights. As his cash flow rights in firms decrease, he is better off tunneling resources out of the firms rather than receiving his share of profits. Since moving resources from high- to low-cash-flow-right firms leads to a wealth loss for the controlling shareholder, he has few incentives to move resources in that direction. Thus, "tunneling" within business groups takes place in a unilateral direction, from low- to high-cash-flow-right firms.

Although these studies related to the internal capital market and tunneling have enhanced our understanding of the important functions of business groups in emerging markets, relatively little is known about "propping" within affiliated firms. In a broad sense, propping implies capital reallocation within affiliated firms to save a financially troubled affiliate. Friedman, Johnson, and Mitton (2003), however, use the term "propping" to denote "negative tunneling" in which controlling shareholders use their private cash to temporarily "prop up" troubled group affiliates. Friedman, Johnson, and Mitton (2003) argue that controlling shareholders have incentives to engage in negative tunneling today in order to preserve the option to expropriate profits of troubled firms in the future.[1] Similarly, Riyanto and Toolsema (2004) use the term "reverse tunneling" to mean propping. They describe propping as the reverse of tunneling, and point out that it is used by the controlling family to prevent firms from becoming bankrupt.[2]

In the broad sense of propping, funds can flow in either direction: from a low-cash-flow-right firm to a high-cash-flow-right firm or from a high-cash-flow-right firm to a low-cash-flow-right firm. However, in a narrowly defined sense of propping (i.e., negative tunneling), as used in the literature, funds are expected to flow in the opposite direction to ordinary tunneling. Thus, for propping

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[1] However, as Friedman, Johnson, and Mitton (2003) point out, the financial resources to prop up a troubled firm need not come only from the controlling shareholders' private funds: the resources of other, healthier affiliates may also be used. For instance, the controlling shareholders who want to preserve their options to expropriate the future profits of the financially troubled affiliates might be willing to transfer funds from the healthier firms to the financially distressed firms.

[2] See also Bae, Kang, and Kim (2002); La Porta, Lopez-de-Silanes, and Zamarripa (2003); Bai, Liu, and Song (2004); and Ben-Amar and André (2006) for discussions of negative tunneling.

(negative tunneling) purposes, funds are expected to be transferred from high-cash-flow-right firms to low-cash-flow-right firms in business groups.

In this paper, using a large sample of earnings announcements from firms belonging to business groups, we explore the direct evidence of negative tunneling (hereafter called "propping") within affiliated firms and, more importantly, the market's *ex ante* valuation of this intragroup propping. Our evidence comes from Korean business groups (hereafter called "chaebols") during the period 1993–2001. Understanding intragroup propping is important since it enables us to address an important issue related to owner-managers' incentives in business groups. It can also help to answer a major puzzle about business groups: if minority shareholders in the member firms know that the controlling shareholder expropriates their wealth, then why are they willing to buy stocks and bonds in these firms? One answer is that propping can increase the attractiveness of an affiliated firm to outside investors since bailing it out creates a credible commitment by the business group to prop up its members' performance.

The case of the Samsung Group illustrates how the propping process works. In an attempt to break into the automobile manufacturing industry, the Samsung Group established Samsung Motors Inc. in 1995. However, a sharp drop in domestic car sales, due to the economic crisis in Korea and a slump in demand in the rest of Asia, forced Samsung Motors to file for receivership. The Samsung Group agreed to assume more than 55% of Samsung Motors' total debt of 4,300 billion won, the funds for which were to be realized by the sale of 3.5 million shares in Samsung Life Insurance held by group chairman Lee Kun-Hee (*Financial Times*, August 25, 1999).

Korean chaebols have certain characteristics that make them particularly well suited to an investigation of intragroup propping. One notable feature is that ownership in chaebol firms is heavily concentrated, inasmuch as one individual has almost complete control over all firms within a group. Such an ownership structure, in conjunction with the weak legal environment in Korea, allows owner-managers to exercise substantial control over resource allocations among member firms. It also allows the controlling owner to shuffle resources among affiliates to prop up a financially troubled affiliate if necessary. Another important feature of Korean chaebols during the later years of our sample period is that many chaebol-affiliated firms experienced difficulties because of the financial crisis. During the Asian crisis of 1997 and 1998, Korean banks experienced a severe credit crunch and were forced to curtail lending to the corporate sector. Consequently, their borrowers, including chaebol-affiliated firms, had to turn to alternative sources of financing to survive. However, because of the collapse of external markets, chaebol firms with high leverage or high risk had extreme difficulty obtaining external financing and thus had to rely mostly on internal financing within the chaebol. This suggests that propping within affiliated firms was more prevalent during the crisis than before the crisis. At the same time, however, chaebol firms undertook several structural reforms to improve financial transparency and strengthen their corporate governance structures during the financial crisis. The centerpiece of the reforms was to

halve the number of business units among the top five chaebols in a move to cut large debt to twice the level of equity by the end of 1999. The chaebols were also required to unravel mutual debt guarantees among member firms by March 2000 and to produce consolidated financial statements (*Financial Times*, December 18, 1998). These reforms, coupled with the scarce resources of chaebols, suggest that the incentive and the scope for propping should have been substantially reduced during the economic crisis. Using 1997–1998 as a subperiod therefore allows us to examine how adverse shocks affect owner-managers' incentives to carry out intragroup propping.

To show the existence and the market's *ex ante* valuation of propping within affiliated firms, we examine the effect of an earnings announcement by a chaebol firm on the market value of equity of the other firms in the same group. Propping implies that an affiliate's performance depends not only on its own resources and financial condition, but also on those of the other affiliates. Since earnings are an important indicator of profits and resources generated through a firm's operations, an earnings announcement can serve as a valuable source of information about the firm's ability to prop up other firms and thus affect the equity value of nonannouncing affiliates. For example, since high earnings imply that more resources are available for propping, such an announcement will have a positive effect on the market value of both the announcing and nonannouncing firms in the same group. In contrast, small or negative earnings suggest that fewer resources are available to other member firms, or even that the announcing firm might need to be propped up. In this case, we would expect the effect of an earnings announcement on the value of other member firms to be negative, or at least neutral. Further, unlike other propping-related events that lead to dramatic increases in the firm value, earnings announcements provide a natural experiment because these events are common to all affiliated firms in the chaebol where detailed public information on resource changes is available. This commonness provides us with large sample observations, which increases the statistical power of the tests. Since earnings announcements tend to render more conservative tests on propping behavior than other events that cause dramatic changes in the firm value, they also allow us to easily generalize the results on intragroup propping, if observed, to other cases.

We find that the announcement of increased (decreased) earnings over the previous year by a chaebol-affiliated firm has a positive (negative) and significant effect not only on the abnormal return for the value-weighted portfolio of other firms in the same group (hereafter called "nonannouncing affiliates"), but also on the abnormal return for each individual nonannouncing affiliate. We also find that a positive (negative) abnormal return for an announcing firm is associated with a positive (negative) abnormal return for nonannouncing affiliates. Each increase of 10% in the announcing firm's abnormal return is associated with a 0.93% (1.18%) increase in the abnormal return for the portfolio of nonannouncing affiliates (each individual nonannouncing affiliate). To put things in a different perspective, the abnormal return for the portfolio of

nonannouncing affiliates (each individual nonannouncing affiliate) increases by 1.1% (1.39%) as the announcing firm's abnormal return increases by one standard deviation.

Controlling for common components of performance such as the standing of the controlling family with the government, succession plans at the helm of business groups, and other strategic decisions affecting all firms in the same business group, our cross-sectional analysis shows that the positive association between abnormal returns for the announcing firms and abnormal returns for the value-weighted portfolio of nonannouncing affiliates is stronger when the controlling shareholders hold larger cash flow rights in the announcing firms, which is consistent with the prediction of the propping view for business groups in emerging markets.

The positive association between abnormal returns for the announcing firms and abnormal returns for the value-weighted portfolio of nonannouncing affiliates is also stronger if the announcing firms are large or if they perform well in the past. To the extent that large firms or firms with better performance have more resources to share with other member firms, these results suggest that the propping effect is stronger when resources are transferred from healthier firms to financially troubled firms. We also find that the sensitivity of abnormal returns for the value-weighted portfolio of nonannouncing affiliates to abnormal returns for the announcing firms is higher when the announcing firm has a higher debt guarantee ratio. To the extent that firms providing higher debt guarantees have stronger legal obligations to provide support, this result further supports the propping view regarding business groups. The results using abnormal returns for individual nonannouncing affiliates are qualitatively similar to those using abnormal returns for the value-weighted portfolio of nonannouncing affiliates.

The subperiod analysis indicates that the propping effect is smaller during and after the Asian crisis than before the crisis. This result suggests that both the incentive and scope of propping decreased during and after the crisis, supporting the argument of Friedman, Johnson, and Mitton (2003) that the propensity to prop is not high when there is too large a negative shock to the economy. Structural reforms implemented by the chaebols during and after the crisis might also have restricted the controlling shareholder's incentives to engage in intragroup propping.

To rule out alternative explanations that may also be consistent with our findings, we perform several robustness checks, such as examining potential industry, ownership, and bankruptcy effects, and find that the results are qualitatively unchanged. We also investigate whether our results are explained by the view of efficient internal capital markets within a business group and find that they are not consistent with this view.

Overall, our findings provide strong support for the view that there is propping within business groups in emerging markets, suggesting that the interdependence of performance among the affiliates should be factored in when the value of group firms is being evaluated.

The paper proceeds as follows. Section 1 discusses the institutional background of chaebols, the differences between propping and tunneling and between propping and internal capital markets, and the main hypotheses related to propping. In Section 2, we describe sample selection procedures and methodology. In Sections 3 and 4, we present empirical results using portfolio returns and using individual returns. Section 5 summarizes and concludes the paper.

1. Institutional Background and Main Hypotheses

1.1 The institutional background of business groups in Korea

Diversified business groups are a prevalent organizational form in many countries, both developed and developing. Although the business group is not unique to Korea and can be found in other developing and developed countries such as India, Chile, Spain, and Japan (Khanna and Palepu, 2000; and Guillen, 2000), several features distinguish Korean chaebols from business groups in other countries.[3]

First, the chaebols operate in various industries and their economic power within the Korean economy is substantial. For example, the average number of affiliated firms within the top thirty chaebols in 1997 was 26, and the listed firms belonging to the top thirty chaebols in the Korean Stock Exchange (KSE) accounted for as much as 45.8% of the KSE's total market capitalization. They contributed to 62.5% of the total assets and 72.6% of the gross sales of all listed firms.

Second, despite the huge size and economic power of the chaebols, control over the member firms is retained by an individual owner-manager. Such individuals have substantial discretionary power to transfer capital and managerial resources among affiliate firms. As a result, firms within the same chaebol operate like business units of a large corporation and share each other's resources and risks through an extensive arrangement of reciprocal shareholding agreements and cross-debt guarantees (Chang and Hong, 2000).

To provide a better perspective on the practice of reciprocal shareholding agreements and cross-debt guarantees among firms belonging to the top thirty chaebols, in Appendix A we show the average equity ownership by the controlling family, cross-shareholdings, and debt guarantees for other member firms as of 1998. It shows that the average number of affiliates (including unlisted firms) for the top thirty chaebols was 26.8, with a minimum of 13 (Kohap) and a maximum of 62 (Hyundai). The equity ownership by the controlling family averaged 11%, ranging from 2.9% to 40.8%, and the average cross-shareholding

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[3] The Korea Fair Trade Commission (KFTC) defines a business group as "a group of companies of which more than 30% 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 thirty largest business groups (hereafter called the "top thirty chaebols"). See Bae, Kang, and Kim (2002) for a detailed discussion of the importance of the top thirty chaebols in Korea.

among members was 34.5%, ranging from 22.7% to 56.9%. These findings suggest that cross-shareholding is prevalent among all of the top thirty chaebols and that their owner-managers exercise substantial control over their affiliated firms largely through indirectly owned cross-holdings. Debt guarantees for other member firms are also significant for most of the top thirty chaebols: the mean and median ratios of the amount of debt guarantees to the book value of equity were 75.2% and 43.7%, respectively, with a minimum of 7.3% and a maximum of 409.7%.[4]

1.2 Tunneling versus propping (negative tunneling)

Johnson et al. (2000b) argue that the controlling shareholders in business groups have strong incentives to siphon resources out of firms to increase their wealth. They term such an expropriation "tunneling." La Porta, Lopez-de-Silanes, and Shleifer (1999) argue that the expropriation of minority shareholders by controlling shareholders is particularly serious when the controlling shareholders have concentrated ownership in the firm that exceeds their cash flow rights and have power over the firm. Johnson et al. (2000b) and Friedman, Johnson, and Mitton (2003) further show that the propensity to tunnel is higher for firms belonging to business groups. Supporting these arguments, several studies find evidence of tunneling in countries with weak legal protection of investors (La Porta, Lopez-de-Silanes, and Zamarripa, 2003; Bertrand, Mehta, and Mullainathan, 2002; Bae, Kang, and Kim, 2002; Friedman, Johnson, and Mitton, 2003; and Baek, Kang, and Lee, 2006).

An extensive arrangement of a pyramidal or multilayered shareholding agreement in group-affiliated firms that facilitates tunneling, however, can also facilitate propping. Oftentimes, the controlling shareholders in business groups inject private funds into firms that have minority shareholders in order to preserve their options to expropriate profits of these firms in the future (Friedman, Johnson, and Mitton, 2003). Therefore, economic consequences of propping to controlling shareholders are opposite to those of tunneling: the controlling shareholders benefit through tunneling at the expense of minority shareholders of the firms that are expropriated. In contrast, the controlling shareholders sacrifice their current wealth in order to prop up poorly performing firms, which benefits minority shareholders of these firms (i.e., negative tunneling). However, in the long run, propping can also provide the controlling shareholders with an opportunity for wealth increase if their future private benefits obtained from bailing out the affiliates with financial difficulties outweigh their current losses associated with propping.

The controlling shareholders may transfer funds from other member firms, instead of injecting their private funds, to prop up the financially troubled firm. If funds are transferred out of firms high up in the pyramid toward ones low

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[4] The ratio of the amount of debt guarantees to book equity is negative for two groups, Halla and Jinro, because they had a negative book value of equity.

down in the pyramid to save the latter firms, such negative tunneling will result in the same financial consequences for the controlling shareholders as injecting private funds.

The controlling shareholder's relative cash flow rights stakes in affiliated firms help distinguish whether the transfer of resources between the affiliated firms is intended for propping or tunneling. Bertrand, Mehta, and Mullainathan (2002) develop a stylized model of controlling owners' tunneling behavior in pyramidal ownership structures of business groups. They argue that the controlling shareholder has strong incentives to tunnel resources from firms where he has low cash flow rights to those where he has high cash flow rights. The controlling shareholder would be better off if more resources were in high-cash-flow-right firms. Similarly, Johnson et al. (2000a) argue that the controlling shareholder's incentives for expropriation decrease with his ownership in a firm *ceteris paribus*, suggesting that tunneling is more likely to occur out of the firm in which his ownership is low. These arguments suggest that for tunneling purposes, resources are likely to flow from low- to high-cash-flow-right firms in pyramidal business groups.

However, for propping purposes, funds are expected to be transferred from high- to low-cash-flow-right firms in business groups. For instance, the controlling shareholder who wants to preserve his options to expropriate profits of low-cash-flow-right firms in the future might be willing to transfer funds from high- to low-cash-flow-right firms although it results in the loss of his current wealth (Friedman, Johnson, and Mitton, 2003). He might do this if his future-expected private benefits from low-cash-flow-right firms outweigh his wealth loss today.[5]

1.3 Propping versus internal capital market
The propping view and the traditional view of efficient internal capital markets within a business group have some common features in that they both involve resource transfers among affiliated firms. However, there are fundamental differences between the two. According to the traditional view of efficient internal capital markets (hereafter referred to as the internal capital market view), internal capital markets in developing countries allow business groups to mimic the beneficial functions of various market mechanisms that are present only in advanced economies. When external capital markets are not well developed or accessible, the operation of internal capital markets within business groups can allow affiliated firms to bypass the external capital markets, thereby

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[5] However, propping and tunneling are considered to be two faces of the same coin from the standpoint of other shareholders of the two firms that engage in these activities. For example, if the controlling shareholders in business groups transfer funds from firm A to firm B and firm B does not fully compensate firm A for this transfer, one can say that other shareholders of firm B are propped, while other shareholders of firm A are expropriated. In other words, when a transaction between the two firms belonging to the same group is not done at a fair value, the firm that gains from the transaction is propped while the firm that loses out is expropriated. Therefore, transferring resources from firm A to firm B can be viewed as tunneling from the standpoint of firm A's other shareholders, but propping from that of firm B's other shareholders.

decreasing information asymmetry problems between managers and outside investors. Since the controlling shareholders in a business group are better able to discern investment prospects of their affiliated firms, they can efficiently move resources from firms with poor prospects (i.e., loser firms) to those with good prospects (i.e., winner firms). This "winner-picking" function of internal capital markets can add value to a business group by making value-enhancing reallocations across affiliated firms (Williamson, 1975; and Stein, 1997). Such value-enhancing reallocations mitigate frictions arising from information asymmetry in the external capital markets and enhance the aggregate value of the whole business group. Thus, the relative merits of affiliates' future investment prospects play a key role in the internal capital market view. The arguments above also suggest that the controlling shareholder's personal wealth increases as the internal capital market performs a positive winner-picking function. In contrast, external capital markets are not likely to perform such a positive winner-picking function because of the information asymmetry they face.

While the internal capital markets within a business group are expected to mitigate frictions (i.e., information asymmetry) in the external capital markets, mitigating such frictions is not the primary motivation for propping. As mentioned earlier, propping is driven by the controlling shareholder's incentives to prop up troubled low-cash-flow-right affiliates using his private resources or those of high-cash-flow-right affiliates. Hence, in propping, the allocation of resources across affiliated firms depends on the controlling shareholder's relative ownership stakes in these firms, and not on the relative merits of affiliates' future investment prospects. Furthermore, propping does not necessarily add value to the group since it does not always lead to value-enhancing reallocations across affiliated firms.

1.4 Main hypotheses

As discussed above, the controlling shareholders of business groups have a strong incentive to bail out financially distressed affiliates by injecting private funds and/or transferring resources from financially healthy firms to financially distressed firms, if they expect that such propping will increase their share of future profits in chaebols. Using data on related lending in Mexico, La Porta, Lopez-de-Silanes, and Zamarripa (2003) find that there is propping alongside tunneling within Mexican business groups. Mitton (2002) also finds that during the 1997–1998 Asian financial crisis, diversified conglomerates in Malaysia, Indonesia, Thailand, and Korea engaged in propping to support affiliated firms that got into trouble.

We use earnings released by a chaebol firm as the measure of the extent to which a controlling shareholder and/or an announcing firm props up the performance of other members. If the amount of earnings released is a good proxy for the resources held by the announcing firm, and if these resources can be used to support the operation of other affiliates, we would expect earnings information to affect not only the equity value of the firm that releases earnings, but also the

equity value of the other firms in the group. For example, good news regarding earnings should trigger an increase in the share price of the announcing firms. To the extent that this news is indicative of an increase in the resources available for intragroup propping, it should also have a positive effect on the share value of nonannouncing firms in the same group. In contrast, the announcement of bad news regarding earnings may indicate few resources to share or even the need for reverse propping by nonannouncing affiliates. Therefore, such an announcement should be bad news not only for the announcing firm, but also for other nonannouncing affiliates.

To examine whether the market takes intragroup propping into consideration in pricing stocks of group member firms, we develop four testable hypotheses with respect to capital transfers for propping. First, as we discuss in Section 1.2, the controlling shareholder has incentives to sacrifice his current wealth, moving resources from high- to low-cash-flow-right firms, if propping preserves his options to expropriate profits of low-cash-flow-right firms in the future. These arguments suggest that if the market incorporates the effect of propping in prices of nonannouncing firms, the abnormal returns for nonannouncing firms are likely to increase when the controlling shareholder holds high cash flow rights in the announcing firm. Therefore, we expect a positive relation between concentrated ownership by the controlling shareholder in an announcing firm and abnormal returns for nonannouncing affiliates. In particular, we expect the market's positive valuation of propping to be more pronounced when the announcing firm has good news regarding earnings, and when the cash flow rights of the controlling shareholder in the announcing firm are higher.

Second, propping indicates that the controlling shareholder reallocates resources to bail out financially troubled firms. This suggests that for propping purposes, funds are likely to flow from better performing firms to poorly performing firms. We measure the announcing firm's resource-sharing ability using size and past performance of the announcing firm. Larger firms are more established, have more resources to share, and play a key role in allocating internal resources among member firms. Similarly, announcing firms with good past performance will have more resources available for propping. Therefore, large firms or firms with good performance will tend to assume a relatively important role in intragroup propping. We expect that the sensitivity of abnormal returns for nonannouncing affiliates is higher when the announcing firm is larger or when the announcing firm has performed well in the past. We use the log of the market value of equity as a proxy for firm size and the previous one-year market-adjusted returns as a proxy for past performance.

Third, we postulate that the abnormal returns for nonannouncing affiliates will be positively related to the amount of debt guarantees provided by an announcing firm. The higher the debt guarantees provided by the announcing firm, the higher the risk it must assume if the guaranteed member firms default. Hence, high debt guarantees are good news for shareholders of nonannouncing affiliates. We expect that the sensitivity of abnormal returns for nonannouncing

affiliates is higher when the announcing firm has a higher debt guarantee ratio. We use the ratio of the amount of debt guarantees to the book value of equity for announcing firms as a measure.

Fourth, Khanna and Palepu (2000) show that foreign institutional investors serve a valuable monitoring function as emerging markets integrate with the global economy. This argument suggests that foreign investors have a strong incentive to discourage chaebol owner-managers from engaging in propping. We therefore expect that the sensitivity of abnormal returns for nonannouncing affiliates is lower when foreign ownership of an announcing firm is higher.[6]

2. Data and Methodology

2.1 Data
Our sample consists of listed nonfinancial firms affiliated with the top thirty chaebols during 1993–2001. Since we are investigating the effect of an affiliate's earnings announcement on the market value of other member firms, each announcing firm is required to have at least one listed nonannouncing affiliate. We obtain the list of firms announcing annual earnings from the database compiled by the *Korean Listed Companies' Association.* We then eliminate firms for which no data are available on the daily stock returns file of *the Korean Investor Service-Stock Market Analysis Tool* (*KIS-SMAT*). This screen generates a final sample of 694 observations. Since Korean firms typically announce their earnings immediately after the shareholders' meeting, we use the date on which the shareholders approve the financial statements at a general meeting as the earnings announcement date. Because Korean firms, unlike their U.S. counterparts, do not make preliminary earnings announcements, the shareholders' meeting date is considered to be the first public announcement of earnings information. Recently, some Korean firms have started to voluntarily disclose earnings information (not necessarily audited) in the press before the shareholders' meeting date. However, this was rare during our sample period.

Table 1 presents the frequency distribution of events according to the identity of the top thirty chaebols. The first column lists the names of the chaebols and the second lists the number of earnings announcements made by the firms belonging to each chaebol. Among the top thirty chaebols, the Samsung, Hyundai, and LG groups made the largest numbers of earnings announcements. Taken together, these three groups made 281 announcements (40.5% of the total sample) during the sample period. In contrast, smaller chaebols such as the Hanla, Kohap, Taekwang, and Saehan groups made only two earnings announcements each.

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[6] Chhibber and Majumdar (1999), however, find that Indian firms display superior accounting performance only when foreign ownership exceeds 50%. This result suggests that the positive association between firm performance and foreign ownership exists only when foreign investors have complete control over firms.

Table 1
Number of earnings announcements by affiliated firms in each Korean chaebol during the 1993–2001 period

Group name	Number of earnings announcements
Samsung	114
Hyundai	100
LG	67
Ssangyong	55
Dongkuk Steel	48
SK	48
Hanjin	32
Kolon	32
Hansol	29
Doosan	28
Lotte	20
Hanwha	17
Daelim	17
Kumho	14
Dongbu	14
Youngpoong	9
Anam	8
Tongyang	8
Jinro	6
Hyundai Motors	6
Daewoo	5
Shinho	4
Daesang	3
Samyang	3
Hanla	2
Kohap	2
Taekwang	2
Saehan	2
Total	694

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE.

Table 2 presents descriptive statistics of the variables for our sample of 694 announcing firms. Appendix B summarizes the definitions and sources of the variables used in this paper. The mean (median) market value of equity is 751 (180) billion won and the book value of total assets is 2,191 (929) billion won. The mean (median) previous one-year market-adjusted return is 2.3% (−5.1%). The ratio of the amount of debt guarantees to total assets averages 53.4%. However, the distribution of the debt guarantee ratio is highly skewed, with a median of only 11.8%. The net income on average accounts for 0.6% of total assets and the return on assets (ROA) change is on average 0.1%. The average cash flow right of the controlling shareholders is 20.4%, with a median of 17.09%. We measure the cash flow rights of the controlling shareholders as the sum of the direct and indirect ownership held by the largest shareholder and his family members.[7] Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of

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[7] We thank Hyung-Cheol Kang at the Korea Securities Research Institute for providing data on indirect ownership.

Table 2
Descriptive statistics for announcing firms' financial characteristics

Variable	Full sample	Before the crisis (1993 to November 21, 1997)	During and after the crisis (November 22, 1997 to 2001)	Difference: *t*-test [Wilcoxon's *Z*-test]
	Mean (median)	Mean (median)	Mean (median)	
Market value of equity (billion won)	751.0 (180.0)	480.1 (224.0)	943.2 (148.4)	2.18** [2.99]***
Total assets (billion won)	2,190.6 (928.5)	1,527.8 (833.1)	2,660.8 (1,232.7)	4.33*** [3.49]***
Previous one-year market-adjusted returns	0.023 (−0.051)	0.078 (−0.007)	−0.016 (−0.115)	2.48** [4.58]***
Debt guarantee ratio (debt guarantees for member firms/total assets)	0.534 (0.118)	0.782 (0.268)	0.357 (0.052)	3.79*** [7.72]***
ROA (net income/total assets)	0.006 (0.010)	0.013 (0.012)	0.000 (0.009)	2.47** [1.85]*
ROA change (change in net income/total assets)	0.001 (0.002)	0.000 (0.002)	0.002 (0.003)	0.51 [0.91]
Cash flow rights of the controlling shareholders (%)	20.40 (17.09)	19.50 (17.48)	21.03 (16.63)	1.30 [0.85]
Equity ownership by foreign investors (%)	8.98 (4.84)	8.01 (6.23)	9.68 (3.57)	2.05** [2.10]**

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the KSE between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. Cash flow rights of the controlling shareholders are the sum of direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains.

control chains. If the controlling shareholder has 10% direct holdings in firm A, which in turn has 20% direct holdings in firm B, which in turn has 30% direct holdings in firm C, then the controlling shareholder has 0.6% (=0.1 ∗ 0.2 ∗ 0.3) indirect holdings in firm C. The mean (median) equity ownership by foreign investors is 8.98% (4.84%).

Table 2 also presents the summary statistics for our sample firms in the two subperiods: before, and during and after the crisis. Following Bae, Kang, and Lim (2002), we set November 21, 1997 as the cutoff date. November 21 is the date on which Korea sought a rescue package from the International Monetary Fund to overcome the financial crisis that had started with the sharp decline of the Korean won against the U.S. dollar earlier that month. In unreported tests, we use June 30, 1997 as an alternative cutoff date and obtain results very similar to those reported in this paper.

An important finding of the subperiod analysis is that the average debt guarantee ratio decreases from 78.2% to 35.7% after the crisis. This result suggests that the economic difficulties, particularly the financial market crash, made debt financing expensive and difficult to obtain. The decrease in the debt guarantee ratio also suggests that the financial crisis substantially reduced firms'

risk-sharing ability and willingness to support other member firms. As expected, the average ROA and previous one-year market-adjusted return decrease significantly from 1.3% to 0.0% and from 7.8% to -1.6%, respectively, indicating that the economic shock in Korea imposed significant financial constraints on chaebol firms.

2.2 Measures of earnings news

We use two measures of earnings news to capture the propping-related information released during the earnings announcement: the change in ROA and the abnormal return for the announcing firm. The ROA change, which is a direct measure of earnings news, is the ratio of the change in earnings from year $t - 1$ to year t to total assets in year $t - 1$ (i.e., it uses the prior year's earnings as the market expectation of future earnings).[8]

However, the prior year's earnings may not be a good proxy for the resources available for propping because they reflect the short-term profitability of the firm's operations and can be affected by changes in accounting procedures. For this reason, we use the abnormal return around an earnings announcement as an indirect, but perhaps better measure of the earnings news. If the stock market fully incorporates the information content of earnings announcements, and the magnitude of the stock-price reaction reflects an announcing firm's ability to prop up the performance of other member firms, we will expect a positive relation between the abnormal return for the announcing firm and the abnormal return for nonannouncing affiliates.

However, abnormal returns also have a shortcoming in that they underestimate the true extent of the propping effect. If the market anticipates an unexpected increase in resources of the announcing firm to be used for propping, the price change of the announcing firm will incorporate the expected loss of resources due to the propping as well as the effect of an unexpected increase in resources (i.e., the abnormal return for the announcing firm is net of these two opposite effects). For example, in an extreme case, an unexpected increase in resources in the announcing firm will have no effect on its price if the market expects the entire windfall to be used to prop up the other firms. Therefore, the abnormal-return measure underestimates the propping effect in prices, suggesting that the theoretical association between price changes and ability to prop could be tenuous. Another limitation of using the magnitude of the cumulative abnormal returns (CARs) for announcing firms as the proxy for the degree of propping is that it reflects not only announcing firms' ability to prop up the performance of other member firms, but also other relevant information related to announcing firms' future cash flows. To the extent that accounting-based measures of propping such as ROA are immune from the

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[8] In unreported tests, we also experiment with the ratio of the change in earnings before interest (after tax) to total assets, and find that our results do not change when we use this alternative measure. Further, since our tests are focused on equity returns, it would probably make more sense to use book equity as the numerator rather than total assets. We find that the results are qualitatively unchanged.

market perception of propping, if the ROA approach yields the same results as the abnormal-return approach for the propping view, we expect that the downward bias in the abnormal-return measure is less likely to change our inferences in the paper.

We calculate the abnormal returns for announcing firms by using standard event-study methodology. We implement the test procedure by computing *ex post* abnormal returns as

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}), \tag{1}$$

where R_{it} and R_{mt} are the daily return for the announcing firm i at time t and the daily market index (KOSPI, Korea Composite Stock Price Index) return at time t, respectively. The coefficients $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the ordinary least squares estimates of the intercept and slope, respectively, of the market model regression estimated using 180 daily returns beginning with day $t = -200$ and ending with $t = -21$ relative to the announcement date. We construct the CAR$_i$ between any two dates *T1* and *T2* by cumulating daily abnormal returns from day *T1* to day *T2*.

We estimate the abnormal returns for nonannouncing affiliates using the portfolio approach. Specifically, we estimate the market-model parameters using the returns for the value-weighted portfolio of nonannouncing firms in the same group. We then estimate the daily abnormal returns for the portfolio using the market model parameters and accumulate the daily abnormal returns to obtain the portfolio CAR from day $-t$ to day $+t$ relative to the earnings announcement date.

We use a portfolio approach rather than an individual firm approach because of the cross-sectional dependence of returns for individual nonannouncing affiliates. A potential problem with individual returns is that the assumption of the cross-sectional independence in the OLS regression might not be justified, since the events we consider are perfectly clustered among nonannouncing affiliates that belong to the same group as the earnings-announcing firm. In other words, since we use the market-model approach to estimate abnormal returns for nonannouncing affiliates around earnings announcements of the announcing firm in the same business group, the event windows and estimation periods (day -220 to day -20) to compute their abnormal returns perfectly overlap. As a result, it is likely that the *t*-statistics in the analyses of abnormal returns using individual returns are biased upward. The portfolio approach is not subject to this problem because it tends to diversify away the cross-sectional dependence of individual returns. However, the portfolio returns do not allow us to examine the effect of the nonannouncing firms' financial characteristics on propping. Therefore, we also conduct analyses with individual returns in our tests and report the results in Section 4.

Table 3
Cumulative abnormal returns (CARs) for announcing firms and the portfolios of nonannouncing affiliates in the same group

	Panel A: Mean and median CARs for the total sample							
Event windows	Announcing firms ($N = 694$)				Portfolios of nonannouncing affiliates ($N = 694$)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
$(-1, 1)$	−0.314	−3.767	−.667***	2.566	0.397**	−1.929	0.288***	2.123
	(0.185)		(0.006)		(0.015)		(0.170)	
$(-5, 5)$	−0.158	−5.851	−0.382	5.271	−0.059	−3.612	−0.312	3.623
	(0.731)		(0.251)		(0.848)		(0.522)	

	Panel B: Mean and median CARs $(-5, 5)$ by the sign of the announcing firms' CAR $(-5, 5)$							
Negative CAR $(-5, 5)$	Announcing firms ($N = 363$)				Portfolios of nonannouncing affiliates ($N = 363$)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	−7.829***	−10.175	−5.602***	−2.541	−0.794*	−4.779	−1.068***	2.757
	(0.000)		(0.000)		(0.064)		(0.005)	
Positive CAR $(-5, 5)$	Announcing firms ($N = 331$)				Portfolios of nonannouncing affiliates ($N = 331$)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	8.278***	2.253	5.551***	11.253	0.749*	−2.456	0.220**	4.059
	(0.000)		(0.000)		(0.086)		(0.042)	

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. Numbers in parentheses are p-values for the test that the mean/median is equal to zero. ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

3. Empirical Results Using Portfolio Returns

3.1 Abnormal returns for announcing firms and the portfolios of nonannouncing affiliates

Table 3 presents the CAR $(-1, 1)$ and CAR $(-5, 5)$ for the announcing firms and for the portfolios of nonannouncing affiliates. Panel A of Table 3 shows the announcement returns for the total sample. The average CAR $(-1, 1)$ and CAR $(-5, 5)$ for the announcing firms are −0.31% and −0.16%, respectively, and are not statistically significant. The corresponding median CARs are −0.67% and −0.38%, respectively, and the median CAR $(-1, 1)$ is significant at the 0.01 level.[9]

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[9] The subperiod results (not reported) show that announcing firms realize larger negative CARs during the precrisis period than during the crisis and postcrisis periods. During the precrisis period, the mean (median) CARs for the three- and eleven-day periods around the announcement dates are −0.31% (−0.49%) and −1.33% (−1.24%), respectively. The mean and median CARs for the eleven-day period are significant at the 0.01 level. In contrast, the mean and median CARs during the crisis and postcrisis periods are not significant except for the median CAR $(-1, 1)$ of −0.76%, which is significant at the 0.05 level.

For the portfolios of nonannouncing affiliates, the mean (median) CARs for the three- and eleven-day periods around the announcement dates are 0.40% (0.29%) and −0.06% (−0.31%), respectively. The mean and median CARs (−1, 1) are significant at the 0.05 and 0.01 levels, respectively.

The relatively small magnitude of the CARs for announcing and nonannouncing firms and the lack of statistical significance in panel A of Table 3 are expected because the announcement effects of an earnings increase and those of an earnings decrease tend to offset each other. To unambiguously investigate the relation between the returns of announcing and nonannouncing firms, as set out in panel B of Table 3, we divide our sample firms into two subgroups based on whether or not the CAR (−5, 5) for the announcing firm is positive or negative. If the magnitude of the stock-price effect for nonannouncing affiliates is attributable to the resource-sharing ability of the announcing firm, we will expect a positive relation between the CAR for the portfolios of nonannouncing and announcing firms.

We focus on the CAR (−5, 5) rather than the CAR for the short event periods such as CAR (−1, 1) because of the daily price limits in the KSE during our sample period. Since the KSE opened, it has imposed restrictive price limit rules. Before April 5, 1995, the closing price level of the stock determined the range within which the price of a stock could increase or decrease in a trading day. Since April 5, 1995, the price limit has been set at 15% for all stocks. These price limit rules suggest that investors might have continued to react even after the earnings announcement. Using day −5 also helps incorporate the effect of possible information leakage of the earnings figure before the shareholders' meeting. In tests not reported here, we repeated our analysis with CARs (−1, 1). The results are similar to those reported in panel B.

The results show that the mean and median CARs (−5, 5) for the subgroup of announcing firms with a negative sign for the CARs (−5, 5) are −7.83% and −5.60%, respectively, both of which are significant at the 0.01 level. The mean and median CARs (−5, 5) for the corresponding portfolios of nonannouncing affiliates are −0.79% and −1.07%, respectively, which are statistically significant at least at the 0.10 level. In contrast, the subgroup of announcing firms with a positive sign for the CARs (−5, 5) shows significant mean and median returns of 8.28% and 5.55%, respectively, and the corresponding portfolios of nonannouncing affiliates show significant mean and median returns of 0.75% and 0.22%, respectively. These findings suggest that an earnings announcement by an affiliate firm has a "spillover" effect on the share price of the nonannouncing firms within the same group.

As an alternative test for propping within affiliated firms, in panel A of Table 4, we split the sample according to the sign of the ROA change for the announcing firms. We find that the results are qualitatively similar to those reported in panel B of Table 3. For the subgroup with a negative sign for the ROA change, the average CARs (−5, 5) for the announcing firms and the portfolios of nonannouncing affiliates are −0.75% and −1.23%, respectively.

Table 4
Eleven-day cumulative abnormal returns (CARs) for the announcing firms and the portfolios of nonan-nouncing affiliates by the sign of the ROA change and the sign of the CARs (−5, 5) for the announcing firms

Panel A: CARs (−5, 5) by the sign of the ROA change (the ratio of the change in net income to total assets) for announcing firms

Negative ROA change	Announcing firms (N = 309)				Portfolios of nonannouncing affiliates (N = 309)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	−0.748 (0.356)	−6.249	−1.317 (0.161)	5.504	−1.231*** (0.007)	−4.735	−1.030*** (0.005)	2.699

Positive ROA change	Announcing firms (N = 385)				Portfolios of nonannouncing affiliates (N = 385)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	0.314 (0.541) (0.541)	−5.275	0.086 (0.844) (0.844)	5.097	0.879** (0.031) (0.031)	−2.876	0.080* (0.067) (0.067)	4.415

Panel B: CARs (−5, 5) by the sign of the ROA change and the sign of the CARs (−5, 5) for announcing firms

Negative ROA change/negative CAR	Announcing firms (N = 174)				Portfolios of nonannouncing affiliates (N = 174)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	−8.801*** (0.000)	−10.429	−5.612*** (0.000)	−2.928	−1.999*** (0.005)	−5.682	−1.412*** (0.000)	1.862

Positive ROA change/positive CAR	Announcing firms (N = 196)				Portfolios of nonannouncing affiliates (N = 196)			
	Mean	25%	Median	75%	Mean	25%	Median	75%
	7.345*** (0.000)	2.080	5.071*** (0.000)	10.224	1.431*** (0.008)	−2.044	0.512** (0.013)	4.371

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. Numbers in parentheses are *p*-values for the test that the mean/median is equal to zero. ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

The average CAR (−5, 5) for the portfolios of nonannouncing affiliates is significant at the 0.01 level. For the subgroup with a positive sign for the ROA change, the corresponding average returns are 0.31% and 0.88%, respectively, and the portfolio CAR is again significant at the 0.05 level.

Panel B of Table 4 presents the CARs (−5, 5) for the two subsamples, classified according to the sign of the ROA change and the sign of the CAR (−5, 5). The first subsample includes announcing firms with a negative ROA change and a negative CAR (−5, 5), and the portfolios of their corresponding nonannouncing firms. The second subsample includes announcing firms with a positive ROA change and a positive CAR (−5, 5), and the portfolios of their

corresponding nonannouncing firms. Since propping effects are more likely to manifest in firms that experience extremes of performance, we expect the CARs for the portfolios of nonannouncing affiliates to be more closely related to those of announcing firms in these two subsamples.

The results show that the portfolios of nonannouncing affiliates in both subsamples experience significant CARs $(-5, 5)$, but with opposite signs. The mean and median CARs for the announcing firms (the portfolios of nonannouncing affiliates) in the first subsample are -8.80% (-2.00%) and -5.61% (-1.41%), respectively, both of which are significant at the 0.01 level. The CARs for the portfolios of nonannouncing affiliates are positively correlated with those for the announcing firms (p-value < 0.01). For the announcing firms (the portfolios of nonannouncing affiliates) in the second subsample, the corresponding CARs are 7.35% (1.43%) and 5.07% (0.51%), both of which are statistically significant. The correlation between the returns for the portfolios of nonannouncing affiliates and those for the announcing firms is also positive and significant (p-value < 0.01).

3.2 Effects of the common component of performance

The results in Tables 3 and 4 suggest that the returns for the announcing firms are positively related to the returns for nonannouncing firms in the same chaebol. These findings are consistent with the view that member firms within the same chaebol share resources. However, there is a possibility that the positive association between returns for the announcing firms and returns for the portfolio of nonannouncing affiliates is driven by news of factors that affect the common component of performance of business groups, and not by the expectation of capital reallocation. To address this issue, we consider three common components as potential factors that affect all affiliates in the same business group, and examine whether the significance of the correlation between returns for the announcing firms and returns for the nonannouncing firms is different across the subsamples with different common component characteristics.

First, we divide our sample business groups into two subgroups based on whether there is a succession plan at the helm of the business group. A business group is classified as having a succession plan if the succession has already taken place successfully or if the group has a known, well-accepted successor. If the business group experiences disputes during the succession process and thus does not have successors or is divided into several small business groups because of the disputes, the business group is classified as having no succession plan. We were unable to identify the succession plans for two chaebols, Daelim and Dongbu, and so classify them into the no succession plan group. We then regress the CARs $(-5, 5)$ for the portfolios of nonannouncing firms on the CARs $(-5, 5)$ for the announcing firms separately for each subgroup and examine whether the positive coefficient on the CARs $(-5, 5)$ for the announcing firms is driven by the subgroup of firms with succession plans at the helm of the business group. The second and third columns of Table 5 show the regression

Table 5
Tests of the common component view

| | Succession plans at the helm of the business group | | The standing of the controlling family with the government | | | | Strategic decisions | | | |
| | | | Regional background of the controlling family | | Government-owned main banks | | Change in chaebol ranking | | Change in the number of firms in the group | |
	Yes	No	The controlling shareholder and the incumbent president were born in the same region	The controlling shareholder and the incumbent president were born in different regions	Yes	No	Increase	Decrease or no change	Addition of member firms	Decrease or no change in the number of member firms
Intercept	0.002	0.009	−0.043	−0.005	−0.040	0.020	−0.007	−0.004	−0.031	0.025
	(0.04)	(0.24)	(1.56)	(0.19)	(1.19)	(0.84)	(0.39)	(0.63)	(1.45)	(0.70)
CAR (−5, 5) for announcing firms	.087**	.080**	.144***	.082***	.081*	.104***	.074***	.092*	.073**	.094**
	(2.47)	(2.06)	(3.06)	(2.71)	(1.65)	(3.66)	(2.61)	(1.74)	(1.97)	(2.54)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-value	2.07***	1.41*	1.15	1.65**	1.26	1.83***	1.81***	1.15	1.22	1.14
Adjusted R-square (%)	6.21	2.74	1.79	3.73	2.65	4.67	4.21	2.26	1.57	1.39
Sample size	309	385	211	483	214	480	498	196	378	316

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. A business group is classified as having a succession plan if the succession has already taken place successfully or has a known, well-accepted successor, and as having no succession plan otherwise.

results. We find that the coefficient on CARs $(-5, 5)$ for the announcing firms is 0.087 for the subgroup with succession plans and 0.08 for the subgroup with no succession plans, both of which are significant at the 0.05 level. These results indicate that the positive association between returns for the announcing firms and returns for the nonannouncing firms documented in Tables 3 and 4 is not entirely driven by succession plans that exist in business groups.

Second, we consider the standing of the controlling family with the government as another common component of the performance of chaebol-affiliated firms. Friedman, Johnson, and Mitton (2003) show that politically connected firms in Malaysia have greater access to debt financing than nonconnected firms. Faccio, Masulis, and McConnell (2006) also find that political connections around the world lead to preferential corporate bailouts.[10] These results suggest that the current standing of the controlling family with the government may affect all affiliates in the business group and thus drive the positive association between returns for the announcing firms and returns for the nonannouncing firms. We measure current standing of the controlling family with the government using the regional background of the controlling family and the main bank's identity of chaebol firms.

In Korea, regionalism is one of the most important features that decide the outcome of the presidential vote. It has been widely argued that an incumbent president who was born in a certain region allocates a disproportionally large amount of intergovernmental transfers to that region, in which there are a large number of loyal supporters (Horiuchi and Lee, 2004), and that a chaebol whose controlling family has the same regional background as the incumbent president tends to enjoy more favors from the government. Examples of such favors include exclusive permission to enter a regulated industry, financial aid through government-controlled banks, government sponsored bailouts, relaxed government regulation, and so on. Thus, we posit that a chaebol gets along well with the government if the controlling shareholder was born in the same region (i.e., province) as the incumbent president. In the fourth and fifth columns of Table 5, we report the regression results separately for chaebol firms whose controlling shareholder was born in the same region as the incumbent president and for chaebol firms whose controlling shareholder was born in a region different from the incumbent president. The coefficient on CARs $(-5, 5)$ for the announcing firms is 0.144 for the first group of chaebols and 0.082 for the second group, both of which are significant at the 0.01 level. These results suggest that the close relation between the controlling family and the government is unlikely to capture the whole story behind the positive link between returns for the announcing firms and returns for the nonannouncing firms.

As an additional test, we use the identity of the main bank of each chaebol firm as a proxy for political connections of chaebols. Since previous research

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[10] Khwaja and Mian (2005) also find that politically connected firms in Pakistan borrow twice as much as nonconnected firms and they borrow exclusively from government-owned banks. Charumirind, Kali, and Wiwattanakantang (2006) find similar results for Thailand firms.

shows that politically connected firms borrow extensively from government-owned banks (Khwaja and Mian, 2005), we expect that the government hands out more favors to chaebols if their main banks are government owned. Thus, we divide the sample chaebols into two subgroups according to whether their main banks are owned by the government or not, and estimate the regression model separately for each subgroup. The regression results are reported in the sixth and seventh columns of Table 5. The coefficient on CARs $(-5, 5)$ for the announcing firms whose main banks are government owned is 0.081, significant at the 0.10 level, and the coefficient on CARs $(-5, 5)$ for the announcing firms whose main banks are not government owned is 0.104, significant at the 0.01 level. These results further suggest that the positive association between CARs $(-5, 5)$ for the announcing firms and CARs $(-5, 5)$ for the nonannouncing firms is not entirely driven by the current standing of the controlling family with the government.

Third, we investigate the possibility that the positive association between returns for the announcing firms and returns for the nonannouncing firms is driven by news of other strategic decisions that affect all the affiliates of business groups. As discussed in footnote 3, each year the Korea Fair Trade Commission (KFTC) ranks business groups according to the size of their total assets and identifies the thirty largest. These top thirty chaebols have come to represent Korea's most prominent chaebols during the past three decades. Korean banks have traditionally allocated their credit according to the size of chaebols' total assets and thus chaebols had strong incentives to move their ranking up by increasing their size beyond the optimal level. Furthermore, the Korean government's emphasis on an export-oriented economic policy has allowed the top thirty chaebols to enjoy favorable treatment in the allocation of resources. All these factors suggest that increasing the ranking of the chaebol is one of the most important strategic decisions that affect the performance of all affiliates in the same group. Therefore, we split the sample into two subgroups according to the change in chaebol ranking (increase versus decrease or no change). The regression results estimated for each subgroup are reported in columns 8 and 9 of Table 5. We find that the coefficients on CARs $(-5, 5)$ for the announcing firms are positive and significant for both subgroups, suggesting that the positive association between the CARs $(-5, 5)$ for the announcing firms and the CARs $(-5, 5)$ for the nonannouncing firms is not entirely driven by changes in the chaebol ranking.

As an additional test, we use an expansion (contraction) of member firms as a proxy for other strategic decisions that affect all affiliates of the business group. To the extent that member firms within the same chaebol are connected by cross-shareholding and also engage in interfirm transactions, a decision as to whether to add a new affiliate or sell (discontinue) an existing affiliate is likely to significantly affect the performance of all affiliates in the same chaebol. Thus, we split the sample into two subgroups: chaebols that add new affiliates and chaebols that sell (discontinue) existing affiliates or do not add new affiliates.

The last two columns of Table 5 present the regression estimates. We again find that the coefficients on CARs $(-5, 5)$ for the announcing firms are positive and significant for both subgroups.

Overall, the results in Table 5 suggest that the positive association between returns for the announcing firms and returns for the nonannouncing firms is not affected by factors that affect the common component of performance, although we cannot entirely rule out the possibility of such an effect in our abnormal returns.

3.3 Relation between announcement returns for the portfolios of nonannouncing affiliates and financial characteristics of announcing firms

The previous sections investigated the hypothesis that returns for the announcing firms and those for the nonannouncing affiliates are related, possibly due to propping within chaebols. In this section, we show that the abnormal returns for a portfolio of nonannouncing affiliates are closely related to the financial characteristics of the announcing firm, which act as a proxy for the announcing firm's ability to prop up other affiliates. Table 6 reports the regression estimates. In panel A, we use the CARs $(-5, 5)$ for the portfolios of nonannouncing affiliates as the dependent variable. In the first regression, we use as the explanatory variables the CARs $(-5, 5)$ for the announcing firms, five dummy variables that measure common components of performance, which are discussed in the previous section, and eighteen industry dummy variables to control for a possible industry effect.[11] We find that the coefficient on the CAR $(-5, 5)$ for the announcing firm is 0.093, which is significant at the 0.01 level. Evaluating the estimated coefficient at the mean indicates that all else being constant, a 10% increase in the CARs for the announcing firms results in about a 0.93% increase in the CARs for the portfolios of nonannouncing affiliates. To put it in a different perspective, the abnormal return for the portfolio of nonannouncing affiliates increases by 1.1% as the announcing firm's CAR increases by one standard deviation (11.8%). Therefore, the effect of earnings announcements on the market value of nonannouncing affiliates seems to be both statistically and economically significant.

In the second regression, we add as explanatory variables the variables listed in Table 2 (previous one-year market-adjusted returns, cash flow rights of the controlling shareholders, debt guarantee ratio, and equity ownership by foreign investors) as well as two time dummy variables: a dummy variable for the crisis period that takes the value of 1 if earnings are announced from November

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[11] The results in Table 5 show that the positive association between returns for the announcing firms and returns for the nonannouncing firms is not entirely driven by factors that affect the common component of performance. Nevertheless, we include common component variables in the regression to rule out the possibility that this positive association is caused by the fact that good news in one group firm implies good news for the common component and hence, good news to all firms in the group. Thus, controlling for the common components of performance ensures that the sensitivity of abnormal returns for the nonannouncing affiliates is not driven by the common component explanation.

Table 6
OLS regression of the eleven-day cumulative abnormal returns (CARs) and ROA changes for the portfolios of nonannouncing affiliates on the financial characteristics of the announcing firms

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Using CARs (−5, 5) as the dependent variable					
Intercept	−0.011	−0.034	−0.256***	−0.233***	−0.240***	−0.254***
	(0.58)	(1.46)	(4.61)	(4.02)	(4.04)	(4.23)
CAR (−5, 5) for announcing firms (A)	0.093***	0.092***	0.096***	0.047	0.039	0.097***
	(3.70)	(3.53)	(3.89)	(1.61)	(1.08)	(3.05)
A* Dummy for large size (B)		0.175**				
		(2.07)				
A* Dummy for good past stock performance (C)			0.172**			
			(2.10)			
A* Dummy for high cash flow rights of the controlling shareholders (D)				0.180***		
				(3.02)		
A* Dummy for high debt guarantees (E)					0.104**	
					(2.00)	
A* Dummy for high foreign ownership (F)						−0.036
						(0.66)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.020***	0.003	0.006	0.0004	−0.008
		(2.67)	(0.51)	(0.74)	(0.05)	(1.02)
Log (market value of equity)			.013***	.011***	.011***	.012***
			(4.79)	(3.97)	(3.98)	(4.10)
Previous one-year market-adjusted returns		0.009		0.007	0.008	0.004
		(1.25)		(1.06)	(.14)	(0.60)
Cash flow rights of the controlling shareholders		0.045*	0.056**		0.005*	0.034
		(1.76)	(2.39)		(1.96)	(1.35)
Debt guarantee ratio (debt guarantees for member firms/total assets)		0.007**	0.006**	0.007**		0.007**
		(2.18)	(2.07)	(2.36)		(2.27)
Equity ownership by foreign investors		−0.047	−0.110***	−0.068**	−0.076**	
		(1.43)	(3.26)	(1.98)	(2.20)	
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)		0.009	0.008	0.012	0.011	0.013
		(0.89)	(0.79)	(1.26)	(1.10)	(1.22)
Dummy for the postcrisis period (equals 1 if earnings are announced after March 1999)		0.009	0.031	0.008	0.009	0.005
		(0.81)	(0.75)	(0.80)	(0.85)	(0.48)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	2.15***	2.18***	2.80***	2.51***	2.41***	2.25***
Adjusted *R*-square (%)	4.56	7.31	9.90	9.14	8.78	7.65
Sample size	694	630	630	630	630	630
	Panel B: Using ROA changes (the ratio of the change in net income to total assets) as the dependent variable					
Intercept	−0.012	−0.032	−0.246***	−0.214***	−0.212***	−0.250***
	(0.63)	(1.38)	(4.42)	(3.68)	(3.56)	(4.40)
ROA changes of announcing firms (A)	0.120***	0.174***	0.174***	0.161***	0.160***	0.100**
	(2.81)	(3.60)	(3.64)	(3.37)	(3.37)	(2.30)
A* Dummy for large size (B)		0.019**				
		(2.65)				
A* Dummy for good past stock performance (C)			0.107**			
			(2.53)			
A* Dummy for high cash flow rights of the controlling shareholders (D)				0.222***		
				(4.25)		

Table 6
(Continued)

	(1)	(2)	(3)	(4)	(5)	(6)
A* Dummy for high debt guarantees (E)					0.140***	
					(3.81)	
A* Dummy for high foreign ownership (F)						−0.095
						(0.38)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.054	0.003	0.004	−0.000	−0.062**
		(1.21)	(0.44)	(0.50)	(0.03)	(2.34)
Log (market value of equity)			0.012***	0.010***	0.010***	0.011***
			(4.59)	(3.67)	(3.60)	(4.39)
Previous one-year market-adjusted returns		0.008		0.005	0.006	0.005
		(1.19)		(0.79)	(0.81)	(0.79)
Cash flow rights of the controlling shareholders		0.042*	0.049**		0.045*	0.044*
		(1.64)	(2.11)		(1.78)	(1.71)
Debt guarantee ratio (debt guarantees for member firms/total assets)		0.006**	0.006*	0.007**		0.007**
		(2.10)	(1.97)	(2.27)		(2.19)
Equity ownership by foreign investors		−0.050	−0.110***	−0.073**	−0.084**	
		(1.50)	(3.24)	(2.15)	(2.44)	
Dummy for the crisis period (equals 1 if earnings are announced from January 1998 to March 1999)		0.011	0.009	0.014	0.012	0.016
		(1.11)	(.90)	(1.41)	(1.19)	(1.55)
Dummy for the postcrisis period (equals 1 if earnings are announced after March 1999)		0.011	0.004	0.009	0.009	0.009
		(1.04)	(0.43)	(0.85)	(0.84)	(0.82)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	1.93***	2.12***	2.80***	2.75***	2.69***	2.24***
Adjusted *R*-square (%)	3.74	6.95	9.90	10.47	10.34	7.59
Sample size	694	630	630	630	630	630

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. The cash flow right of the controlling shareholders is the sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains. The dummy variable for large size takes the value of 1 if the market value of equity for the announcing firm is above its cross-sectional median. The dummy variable for good past stock performance takes the value of 1 if the previous one-year market-adjusted return for the announcing firm is above its cross-sectional median. The dummy variable for high cash flow rights of the controlling shareholders takes the value of 1 if the cash flow right of the controlling shareholders in the announcing firm is above its cross-sectional median. The dummy variable for high debt guarantees takes the value of 1 if the debt guarantee ratio in the announcing firm is above its cross-sectional median. The dummy variable for high foreign ownership takes the value of 1 if the foreign ownership in the announcing firm is above its cross-sectional median. The common component variables are five dummy variables that are used in Table 5: succession plans at the helm of the business group, regional background of the controlling family, government-owned main banks, change in chaebol ranking, and change in the number of firms in the business group. *t*-statistics are in parentheses; ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

1997 to March 1999 (i.e., earnings for the fiscal years 1997 and 1998), and a dummy variable for the postcrisis period that takes the value of 1 if earnings are announced after March 1999 (i.e., earnings for the fiscal year 1999 and thereafter).[12] To focus on whether the sensitivity of abnormal returns for the

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[12] Since the adverse effect of the financial crisis in Korea was most severe from November 1997 to December 1998, we also experiment with an alternative definition of the crisis (postcrisis) period using the fiscal year 1997

value-weighted portfolio of nonannouncing affiliates is higher when the announcing firm's ability to prop up other affiliates is stronger, we also include a dummy variable for large size and an interaction term between this dummy and the CAR (−5, 5) for the announcing firm. The dummy variable for large size takes the value of 1 if the market value of equity for the announcing firm is above the sample median, and 0 otherwise. Here, therefore, the CAR (−5, 5) for the announcing firm measures the effect of a small announcing firm's CAR (−5, 5) on the CAR (−5, 5) for the portfolio of nonannouncing affiliates. We find that the coefficients on both the CAR (−5, 5) for the announcing firm and its interaction with the dummy for large size are positive and significant. Thus, relative to small announcing firms, the large announcing firms that experience positive returns have a stronger valuation effect on other member firms in the same group. This result is consistent with the view that the market's positive valuation of propping is more pronounced when the announcing firm has more resources to share. However, neither the coefficient on the crisis dummy nor the coefficient on the postcrisis dummy is significant.

In the third regression, we replace the dummy variable for large size in the second regression with a dummy variable for good past stock performance. The dummy variable for good past stock performance takes the value of 1 if the previous one-year market-adjusted returns for the announcing firm are above the sample median, and 0 otherwise. We find that the coefficients on both the CAR (−5, 5) for the announcing firm and its interaction with the dummy for good past stock performance are positive and significant. Thus, the positive relation between the returns for the announcing firms and the returns for the nonannouncing affiliates is stronger when the announcing firms have performed well in the past. This result is again consistent with the propping view regarding business groups in emerging markets.

In the fourth regression, we examine whether the effect of the CAR (−5, 5) for the announcing firm on the CAR (−5, 5) for the portfolio of nonannouncing affiliates is different between announcing firms with high cash flow rights of the controlling shareholders and those with low cash flow rights of the controlling shareholders. To make this comparison, we use a dummy for high cash flow rights and an interaction term between this dummy and the CAR (−5, 5) for the announcing firms. A dummy variable for high cash flow rights takes the value of 1 if the cash flow right of the controlling shareholder for the announcing firm is above the sample median, and 0 otherwise. The coefficient on the interaction term is positive and significant while the coefficient on the CAR (−5, 5) for the announcing firms is positive, but insignificant. Thus, nonannouncing firms respond more positively to the good news of the announcing firms when the controlling shareholder has higher cash flow rights in the announcing firms.

(fiscal year 1998 and thereafter), which covers earnings announced from November 1997 to December 1998 (after January 1999), and find that the results are qualitatively unchanged.

The positive coefficient on the interaction term reflects the market's *ex ante* perception that the controlling owner has incentives to transfer resources out of firms where he holds high cash flow rights in order to prop up other firms within the same business group.

In the fifth regression, we repeat the analysis of the previous regressions, but use a dummy variable for high debt guarantees. The dummy variable for high debt guarantees takes the value of 1 if the ratio of the amount of debt guarantees to total assets for the announcing firm is above the sample median, and 0 otherwise. The higher the debt guarantees provided by the announcing firm, the higher the risk it must assume if the guaranteed member firms default. Hence, high debt guarantees are good news for shareholders of nonannouncing affiliates, suggesting that the sensitivity of abnormal returns for nonannouncing affiliates is higher when the announcing firms guarantee larger amounts of debt for other affiliates. We find that although the coefficient on the CAR $(-5, 5)$ for the announcing firm is insignificant, the coefficient on its interaction with the dummy for high debt guarantees is positive and significant with a *t*-statistic of 2.00, supporting the prediction of the propping view.

In the last regression, we repeat the same analysis using a dummy variable for high foreign ownership. A dummy variable for high foreign ownership takes the value of 1 if equity ownership by foreign investors in the announcing firm is above the sample median, and 0 otherwise. To the extent that foreign investors hold equity in a few selected large affiliated firms with good performance (Kang and Stulz, 1997), which suggests that they are likely to be distributors rather than recipients of resources if intragroup propping takes place, we expect that foreign investors have a strong incentive to discourage chaebol owner-managers from engaging in propping. Consequently, propping is less likely to take place when there are high levels of foreign ownership. Consistent with this prediction, we find that the coefficient on the interaction term between the dummy variable for announcing firms with high foreign ownership and the CAR $(-5, 5)$ for the announcing firm is negative, *albeit* insignificant.

The potential explanation for the insignificant coefficient on the interaction term is that during our sample period, there were limits to foreign ownership in the KSE. Ceilings for each foreign investor's holdings in each individual firm were initially set at 10% in 1992, raised to 20% in 1996 and 55% in December 1997, and then were completely eliminated in May 1998. These changes in foreign ownership limits during the 1992–1998 period suggest that share estimates held by foreign investors in each year reflect binding constraints on foreign ownership and therefore the data on foreign ownership do not reflect the choices of foreign investors. These ownership restrictions can introduce severe noises in the efficiency and reliability of the regression results.

Alternatively, as shown in Kang and Stulz (1997), foreign ownership may be highly correlated with firm size and firm performance, so including these

variables in the same regression may cause collinearity problems.[13] Furthermore, as Chhibber and Majumdar (1999) show, foreign investors may be able to influence management teams only when they have substantial control over firms. To examine this possibility, we reestimate the regressions without size and past stock performance variables, but adding an interaction term between the CARs (−5, 5) for the announcing firms and a dummy variable that takes the value of 1 if foreign ownership is above 90% of the sample distribution (i.e., 23.9%), and 0 otherwise. The foreign ownership of 23.9% is slightly higher than the mean cash flow rights of the controlling shareholders (20.4%), so it should give foreign investors significant control over the firms. In those specifications, the coefficient on the interaction term between the CAR for the announcing firms and the foreign ownership dummy is negative and significant.

In panel B of Table 6, we replace the CARs (−5, 5) for the announcing firms with the ROA change of the announcing firms.[14] In the first regression, the coefficient on the ROA change is 0.12 with a *t*-statistic of 2.81. Evaluating the estimated coefficient at the mean indicates that if everything else is constant, a 10% increase in the ROA change results in about a 1.2% increase in the CARs for the portfolios of other members. In the second through sixth regressions, we add the interaction terms between the ROA change of the announcing firm and the dummy variables that proxy for the announcing firm's ability/incentive to prop up other affiliates. We find that the results for interaction terms are consistent with those in panel A.

Overall, the results in panels A and B of Table 6 suggest that the market value of equity for nonannouncing firms in a chaebol is affected by the announcing firm's financial resources and ownership structure. The sensitivity of abnormal returns for the nonannouncing affiliates is higher when controlling shareholders in announcing firms have higher cash flow rights and when announcing firms have greater financial resources/debt guarantee ratios. Taken together, these results are consistent with the hypothesis that propping takes place within chaebol firms and point to the market's *ex ante* valuation of intragroup propping.

3.4 Robustness tests
To check the robustness of the results, we conduct several additional tests. Below, we briefly summarize the results of these tests. Since the results using the ROA change of the announcing firms are similar to those using the CARs for the announcing firms, we report only the results using the CARs.

3.4.1 Industry effect. Prior research shows that a firm's release of earnings or earnings forecasts affects the stock price of other firms in the same industry (Foster, 1981; Clinch and Sinclair, 1987; and Han, Wild, and Ramesh,

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[13] For example, in our sample, the correlation coefficients between foreign ownership and firm size, and between foreign ownership and past stock performance are 0.52 and 0.29, respectively.

[14] In tests not reported here, we also experiment with the ratio of the change in cash flows (net income plus depreciation) to total assets and obtain qualitatively similar results.

1989). Since a chaebol has many member firms, it could be argued that our results are susceptible to such intraindustry information transfers. However, given that a chaebol tends not to focus on a certain industry and its member firms operate in many different lines of business (Bae, Kang, and Lim, 2002), it is unlikely that our results are driven by the industry effect. Nevertheless, to examine more closely the potential industry effect in our results, we eliminate nonannouncing firms that operate in the same two-digit industry as the announcing firm. We then construct the portfolio of nonannouncing firms that do not belong to the same industry as the announcing firm and reestimate the regression.

The results presented in Table 7 show that the coefficient on the CAR $(-5, 5)$ for the announcing firms is still positive and significant. The coefficients on interaction terms between the CARs for the announcing firms and a dummy variable for good past stock performance, between the CARs for the announcing firm and a dummy variable for high cash flow rights of the controlling shareholders, and between the CARs for the announcing firm and a dummy variable for high debt guarantees are also positive and significant. The coefficient on interaction terms between the CARs for the announcing firms and a dummy variable for large size is also positive but insignificant. The evidence, therefore, indicates that our primary results are not driven mainly by the transfer of common industry earnings information.

3.4.2 Ownership effect. As discussed in Section 1, member firms within chaebols are connected by an extensive arrangement of reciprocal shareholding agreements. These reciprocal shareholding agreements suggest that even if a chaebol's owner-manager does not have an incentive to prop up the performance of affiliates, the stock prices of affiliates can be affected simply because they are linked by equity investment. In other words, if an affiliate announces earnings, its stock price will react to earnings information included in the announcement, and this stock price change will affect the stock price of nonannouncing affiliates via a change in the market value of their equity holdings in the announcing affiliate. In this case, we would expect a change in the stock price of nonannouncing affiliates even if there is no intragroup propping. In order to address this possibility, we estimate the full regressions separately for the portfolios of nonannouncing affiliates that do not hold equity of announcing firms and for the portfolios of nonannouncing affiliates that hold equity of announcing firms.

The results are reported in Table 8. An implication of the ownership effect is that if the ownership effect fully explains our results, the positive relation between the CAR for the announcing firms and the CAR for the nonannouncing affiliates should be observed only for affiliates that hold equity in announcing firms. However, we find that the coefficients on the CAR for the announcing firms are positive and significant for both subsamples. Furthermore, the coefficients on interaction terms between the CARs for the announcing firms and

Table 7
OLS regression of the eleven-day cumulative abnormal returns (CARs) for the portfolios of nonannouncing firms that do not operate in the same two-digit industry as the announcing firms

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.007	−0.001	−0.052	−0.128**	−0.101	−0.151**
	(0.36)	(0.04)	(0.86)	(2.07)	(1.61)	(2.52)
CAR (−5, 5) for announcing firms (A)	0.139***	0.091***	0v.135***	0v.052	0.046	0.099***
	(5.02)	(3.18)	(4.86)	(1.62)	(1.17)	(3.24)
A* Dummy for large size (B)		0.087				
		(1.02)				
A* Dummy for good past stock performance (C)			0.142*			
			(1.67)			
A* Dummy for high cash flow rights of the controlling shareholders (D)				0.169***		
				(2.59)		
A* Dummy for high debt guarantees (E)					0.102*	
					(1.78)	
A* Dummy for high foreign ownership (F)						−0.058
						(0.65)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.006	0.011*	−0.004	0.008	−0.014
		(0.85)	(1.69)	(0.56)	(0.96)	(1.30)
Log (market value of equity)			0.004	0.007**	0.006*	0.008***
			(1.22)	(2.32)	(1.89)	(2.91)
Previous one-year market-adjusted returns		0.014*		0.013*	0.013*	0.012*
		(1.92)		(1.84)	(1.80)	(1.65)
Cash flow rights of the controlling shareholders		0.012	−0.007		0.015	0.007
		(0.49)	(0.31)		(0.64)	(0.29)
Debt guarantee ratio (debt guarantees for member firms/total assets)		0.008***	0.007**	0.009***		0.009***
		(2.59)	(2.32)	(2.86)		(2.71)
Equity ownership by foreign investors		−0.006	−0.021	−0.021	−0.021	
		(0.18)	(0.59)	(0.60)	(0.60)	
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)		0.0003	0.006	−0.001	−0.001	0.005
		(0.03)	(0.62)	(0.13)	(0.13)	(0.45)
Dummy for the post-crisis period (equals 1 if earnings are announced after March 1999)		0.002	−0.003	−0.002	0.002	0.003
		(.16)	(0.31)	(0.14)	(0.14)	(0.25)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	2.84***	2.24***	2.74***	2.54***	2.26***	2.36***
Adjusted *R*-square (%)	7.45	7.89	10.01	9.58	7.99	8.46
Sample size	664	609	609	609	609	609

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms that do not belong to the same two-digit industry as the announcing firm are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. The cash flow right of the controlling shareholders is the sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains. See Table 6 for the definition of each dummy variable. The common component variables are five dummy variables that are used in Table 5: succession plans at the helm of the business group, regional background of the controlling family, government-owned main banks, change in chaebol ranking, and change in the number of firms in the business group. *t*-statistics are in parentheses; ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

Table 8
OLS regression of the eleven-day cumulative abnormal returns (CARs) for the portfolios of non-announcing firms on the financial characteristics of the announcing firms: by equity holdings in the announcing firms

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: CAR for the portfolio of nonannouncing firms that do not hold equity of the announcing firms						
Intercept	−0.010	−0.023	−0.084	−0.112**	−0.107*	−0.136***
	(0.51)	(1.02)	(1.55)	(2.10)	(1.98)	(2.61)
CAR (−5, 5) for announcing firms (A)	0.082***	0.110***	0.080***	0.042	0.040	0.085***
	(3.37)	(3.64)	(2.73)	(1.50)	(1.17)	(3.34)
A* Dummy for large size (B)		0.089*				
		(1.81)				
A* Dummy for good past stock performance (C)			0.082*			
			(1.70)			
A* Dummy for high cash flow rights of the controlling shareholders (D)				0.100***		
				(2.10)		
A* Dummy for high debt guarantees (E)					0.067	
					(1.41)	
A* Dummy for high foreign ownership (F)						−0.111
						(1.46)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.004	−0.001	0.001	−0.001	−0.011
		(0.54)	(0.15)	(0.15)	(0.12)	(1.11)
Log (market value of equity)			0.004	0.005**	0.005*	0.005**
			(1.51)	(1.98)	(1.82)	(2.32)
Previous one-year market-adjusted returns		0.008		0.006	0.005	0.003
		(1.22)		(0.87)	(0.75)	(0.52)
Cash flow rights of the controlling shareholders		0.027	0.025		0.033	0.026
		(1.28)	(1.16)		(1.55)	(1.21)
Debt guarantee ratio (debt guarantees for member firms/total assets)		0.004*	0.004*	0.005**		0.005*
		(1.65)	(1.56)	(2.05)		(1.84)
Equity ownership by foreign investors		−0.032	−0.054*	−0.048	−0.050	
		(1.06)	(1.72)	(1.53)	(1.60)	
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)		−0.011	−0.012	−0.012	−0.010	−0.006
		(1.13)	(1.32)	(1.26)	(1.07)	(0.59)
Dummy for the post-crisis period (equals 1 if earnings are announced after March 1999)		0.004	0.003	0.001	0.002	0.004
		(0.36)	(0.33)	(0.07)	(0.23)	(0.40)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	1.59**	1.71***	1.72***	1.79***	1.69***	1.72***
Adjusted *R*-square (%)	2.93	4.55	4.36	5.03	4.46	4.55
Sample size	645	603	603	603	603	603
Panel B: CAR for the portfolio of nonannouncing firms that hold equity of the announcing firms						
Intercept	−0.002	−0.065*	−0.192*	−0.195*	−0.148	−0.191*
	(0.06)	(1.66)	(1.85)	(1.66)	(1.23)	(1.66)
CAR (−5, 5) for announcing firms (A)	0.125***	0.042	0.129***	0.123***	0.114**	0.131***
	(3.39)	(.82)	(3.50)	(3.06)	(2.18)	(3.05)
A* Dummy for large size (B)		0.220***				
		(2.65)				
A* Dummy for good past stock performance (C)			0.278*			
			(1.85)			
A* Dummy for high cash flow rights of the controlling shareholders (D)				0.628*		
				(1.70)		
A* Dummy for high debt guarantees (E)					0.035	
					(0.42)	
A* Dummy for high foreign ownership (F)						−0.039
						(0.31)

Table 8
(Continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.014 (1.07)	0.011 (1.04)	0.023 (1.59)	0.017 (1.29)	−0.014 (0.87)
Log (market value of equity)			0.008 (1.59)	0.007 (1.70)	0.007 (1.70)	0.007 (1.30)
Previous one-year market-adjusted returns		0.024** (2.32)		0.024** (2.34)	0.028*** (2.64)	0.028*** (2.65)
Cash flow rights of the controlling shareholders		0.062 (1.49)	0.051 (1.33)		0.061 (1.44)	0.059 (1.42)
Debt guarantee ratio (debt guarantees for member firms/total assets)		0.011** (2.38)	0.010** (2.12)	0.010** (2.26)		0.010** (2.19)
Equity ownership by foreign investors		−0.021 (0.41)	−0.025 (0.47)	−0.027 (0.49)	−0.016 (0.28)	
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)		0.012 (0.67)	0.005 (0.31)	0.018 (0.94)	0.008 (0.43)	0.013 (0.72)
Dummy for the post-crisis period (equals 1 if earnings are announced after March 1999)		.028 (1.33)	.014 (.76)	.030 (1.40)	.019 (.91)	.024 (1.14)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	1.38*	1.72***	1.52**	1.64**	1.43*	1.58**
Adjusted *R*-square (%)	2.81	6.83	4.81	6.10	4.16	5.52
Sample size	395	364	364	364	364	364

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for the announcing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. To obtain the CARs for the portfolios of nonannouncing firms in the same group, the firms that do not have any equity ownership in announcing firms are combined into a single value-weighted portfolio and the announcement returns corresponding to each event are computed. The cash flow right of the controlling shareholders is the sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains. See Table 6 for the definition of each dummy variable. The common component variables are five dummy variables that are used in Table 5: succession plans at the helm of the business group, regional background of the controlling family, government-owned main banks, change in chaebol ranking, and change in the number of firms in the business group. *t*-statistics are in parentheses; ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

a dummy variable for large size, between the CARs for the announcing firms and a dummy variable for good past stock performance, and between the CARs for the announcing firms and a dummy variable for high cash flow rights of the controlling shareholders are also positive and significant for both subsamples. These results clearly suggest that the positive coefficients on the CAR for the announcing firm in the previous regressions are not entirely due to interlocking equity ownership among the chaebol member firms.

3.4.3 Impact of the 1997 Asian crisis. To examine whether the effect of propping is different between crisis and noncrisis periods, in untabulated tests, we divide the sample into precrisis, crisis, and postcrisis periods and estimate the regressions in Table 6 separately for each subperiod. Although the coefficient on the CAR for the announcing firms is positive and significant during all

subperiods, its magnitudes during the crisis and postcrisis periods are smaller than its magnitude during the precrisis period.[15] We also find that during the precrisis period, the coefficients on interaction terms between the CARs for the announcing firms and a dummy variable for large size, and between the CARs for the announcing firms and a dummy variable for good past stock performance are positive and significant. But during the crisis and postcrisis periods, only the coefficient on the interaction term between the CARs for the announcing firms and a dummy variable for good past stock performance is positive and significant. These results suggest that the propping effect is smaller during and after an economic shock than before the shock. Friedman, Johnson, and Mitton (2003) argue that the propensity to prop is higher when there is a large, but not too large, negative shock to the economy. If the shock is too large, tunneling occurs. Since Baek, Kang, and Park (2004) show that there is tunneling within chaebols during the Asian crisis, these results, coupled with our findings, suggest that the Asian crisis provides the controlling shareholders with strong incentives to tunnel, rather than to prop.

3.4.4 Impact of overlapping estimation and event periods.

One concern in the estimation of the abnormal returns is the impact of overlapping estimation periods on the independence of the computed returns. Since we use the market-model approach to estimate abnormal returns for the events and since the estimation periods (day -200 to day -20) of different events overlap in many cases, it is likely that the *t*-statistics in the analyses of the abnormal returns are biased upward. To see whether the overlapping estimation period affects our results in a significant way, in tests not reported here, we repeat all the analyses described above using the market-adjusted-return method and obtain results that are qualitatively similar to those reported above. We also experiment with the constant-mean-return model for which the benchmark return is estimated by averaging the returns from day -244 to day -6, and find that our results do not change when we use this approach. Therefore, our results do not seem to be affected by overlapping estimation periods.

In addition, in other unreported tests, to avoid having the results confounded by earnings announcements that cluster during a short time period, we eliminate nonannouncing affiliates whose earnings announcements occur within

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[15] The coefficient on the CAR for the announcing firms during the pre-crisis period is 0.167 with a *t*-statistic of 4.60. This propping effect seems to be larger than the tunneling effect of 0.91% as reported by Bae, Kang, and Kim (2002) for their sample period of 1981–1997. In Bae, Kang, and Kim's (2002) sample, there are only two observations in 1997. Thus, our precrisis period is essentially their sample period. We also find that the coefficients on the CARs for the announcing firms during the crisis and postcrisis periods are 0.112 and 0.056, respectively. In comparison, Baek, Kang, and Park (2004) show that for firms belonging to top thirty chaebols, a 10% increase in the ratio of financial securities invested in affiliated firms is associated with a 2.06% decrease in the CARs from five days before November 18, 1997 to thirty-two days after November 18, 1997. Although their tunneling results are not directly comparable to our results due to differences in return metrics and regression models, both results together suggest that the market's *ex ante* valuation of tunneling effects outweighs that of propping effects during the crisis period.

eleven-day periods around the announcement date of the announcing firm. We obtain results similar to those reported here.

3.4.5 Different event windows. So far we have focused on the event window from day -5 to day $+5$ to account for the potential effect of the daily price limits in the KSE on market reactions. To check the robustness of our results, we change the definition of the event window from $(-5, 5)$ to $(-1, 1)$, $(-3, 3)$, and $(-10, 10)$, but use the same explanatory variables as those in Table 6. We obtain qualitatively identical results, suggesting that the event window of $(-5, 5)$ used in the previous regressions is robust enough to illustrate the propping effect. For brevity, these results are not included in the table.

3.4.6 Bankruptcy effect. The controlling shareholder tends to have less incentive to inject private funds into the group if it has little chance of surviving the external shock. This is because his option to expropriate future profits of member firms has less value in this scenario. To address this issue, we reestimate the full regression separately for firms belonging to the Daewoo, Doosan, Hanla, Hyundai, Jinro, and Tongyang groups that went bankrupt or defaulted on their debts after the crisis and for firms belonging to other groups. In unreported tests, we find that the results for the subsample of nonbankrupt groups mirror those for the full sample in Table 6. In contrast, for the subsample of bankrupt groups, the coefficient on the CAR for the announcing firms is not significant and the coefficients on only a couple of interaction variables are significant. These results suggest that controlling shareholders in financially distressed groups have few incentives to prop.

4. Empirical Results Using Individual Returns

4.1 Relation between announcement returns for individual nonannouncing affiliates and financial characteristics of nonannouncing firms

A potential problem with the portfolio approach is that it does not allow us to examine the role of financial characteristics of nonannouncing firms in propping within chaebol firms. Although the mean values for financial characteristics of nonannouncing firms within a portfolio can be used as explanatory variables in portfolio regressions, these characteristics tend to be averaged out within a portfolio. To the extent that nonannouncing firms with various financial characteristics are evenly distributed within each chaebol, the mean characteristics of nonannouncing firms within a portfolio will converge to a certain value and will hence show little variation across different chaebols (Bae, Kang, and Lim, 2002). This in turn will give us little statistical power to determine the relation between financial characteristics of nonannouncing firms and portfolio returns.

To avoid this problem, we use three different regression approaches, all of which use the CAR $(-5, 5)$ for each individual nonannouncing firm as the dependent variable, and the variables in Table 6 and the financial

characteristics of each nonannouncing firm as independent variables. These approaches are (1) a simple OLS regression, (2) a fixed-effects regression that includes a dummy variable for each event, and (3) an OLS regression that adjusts the OLS variance-covariance matrix (Froot, 1989). In a fixed-effects regression, any common movement in nonannouncing firms' CARs would be captured by the fixed effect. Therefore, we have a testable hypothesis that common movements across nonannouncing firms in the same group surrounding each announcement are statistically significant, by testing the joint hypothesis that all event dummies have zero coefficients. Unlike the simple OLS regression in which the cross-sectional dependence of individual returns tends to bias *t*-statistics in the analyses upward, Froot's (1989) procedure allows dependence among prespecified subsets of observations and thus allows for nonzero covariance among them in the calculation of *t*-statistics of the regression models.[16]

Table 9 reports results that are estimated by simple OLS procedure. Since the results estimated by the other two approaches are qualitatively similar to those estimated by the simple OLS procedure, we do not report them in the table. To fully utilize the characteristics of individual announcing and nonannouncing firms, we redefine variables that proxy for the announcing firm's ability to prop up other affiliates by incorporating relative information on nonannouncing firms. Specifically, a relative size dummy variable takes the value of 1 if the announcing firm is larger than the nonannouncing firm. A relative past stock performance dummy variable takes the value of 1 if the announcing firm's previous one-year market-adjusted return is larger than the nonannouncing firm's previous one-year market-adjusted return. A relative cash flow rights dummy variable takes the value of 1 if the cash flow right of the controlling shareholder in the announcing firm is larger than that in the nonannouncing firm. A relative debt guarantee ratio dummy variable takes the value of 1 if the debt guarantee ratio of the announcing firm is larger than that of the nonannouncing firm. A relative foreign ownership dummy variable takes the value of 1 if equity ownership by foreign investors in the announcing firm is larger than that in the nonannouncing firm.

We find that, as in the portfolio approach, the coefficient on the CARs (−5, 5) for announcing firms in the first regression is positive and significant with a *t*-statistic of 6.51. The coefficients on interaction terms between the CARs for the announcing firm and the relative size dummy, between the CARs for the announcing firm and the relative past stock performance dummy, and between the CARs for the announcing firm and the relative cash flow right dummy are positive and significant. These results support the view that the market's *ex ante* perception of benefits from propping is more pronounced when the announcing firm is larger than the nonannouncing firm, when the announcing firm performs better than the nonannouncing firm, and when the controlling

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[16] In our study, the prespecified subsets are nonannouncing firms in the same group for each earnings announcement.

Table 9
OLS regression of the eleven-day cumulative abnormal returns (CARs) for individual nonannouncing firms on the financial characteristics of the announcing and nonannouncing firms

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	−0.006	−0.037**	−0.071	−0.082	−0.036	−0.098*
	(0.79)	(2.32)	(1.30)	(1.62)	(0.70)	(1.88)
CAR (−5, 5) for announcing firms (A)	0.118***	0.082***	0.122***	0.111***	0.101***	0.121***
	(6.51)	(3.13)	(6.09)	(5.74)	(3.69)	(3.50)
A* Relative size dummy (B)		0.072*				
		(1.82)				
A* Relative past stock performance dummy (C)			0.096*			
			(1.67)			
A* Relative cash flow rights dummy (D)				0.091*		
				(1.69)		
A* Relative debt guarantee ratio dummy (E)					0.024	
					(0.59)	
A* Relative foreign ownership dummy (F)						0.026
						(0.63)
Dummy variable in each interaction term (B, C, D, E, and F, respectively)		0.010*	−0.015*	0.007	0.002	0.014
		(1.73)	(1.89)	(1.35)	(0.39)	(0.99)
Log (market value of equity): announcing firm			0.002	0.001	0.001	−0.000
			(0.89)	(1.35)	(0.64)	(0.03)
Log (market value of equity): nonannouncing firm			0.001	0.002	−0.001	0.002
			(0.24)	(0.98)	(0.63)	(1.15)
Previous one-year market-adjusted returns: announcing firm		0.006		0.008	0.007	0.009
		(1.00)		(1.34)	(1.23)	(1.58)
Previous one-year market-adjusted returns: nonannouncing firm		0.023		0.012	0.024	0.013
		(1.07)		(1.03)	(1.35)	(1.10)
Cash flow rights of the controlling shareholders: announcing firm		0.027	0.024		0.029	0.030
		(1.37)	(1.20)		(1.49)	(1.55)
Cash flow rights of the controlling shareholders: nonannouncing firm		0.007	0.013		0.009	0.008
		(0.36)	(0.66)		(0.50)	(0.43)
Debt guarantee ratio (debt guarantees for member firms/total assets): announcing firm		0.006*	0.006*	0.006*		0.007**
		(1.93)	(1.95)	(1.90)		(2.12)
Debt guarantee ratio (debt guarantees for member firms/total assets): nonannouncing firm		0.004	0.003	0.003		0.003
		(0.73)	(0.62)	(0.60)		(0.69)
Equity ownership by foreign investors: announcing firm		−0.0004	−0.0003	−0.0002	−0.001	
		(0.79)	(0.57)	(0.51)	(0.97)	
Equity ownership by foreign investors: nonannouncing firm		0.001	−0.003	0.011	0.011	
		(0.06)	(0.11)	(0.47)	(0.43)	
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)		0.003	0.003	0.006	0.001	0.005
		(0.26)	(0.23)	(0.62)	(0.08)	(0.46)
Dummy for the postcrisis period (equals 1 if earnings are announced after March 1999)		0.004	0.004	0.004	0.005	0.015
		(0.32)	(0.30)	(0.38)	(0.43)	(1.29)

Table 9
(Continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Common component variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-value	4.85***	4.19***	3.76***	3.96***	4.246***	4.44***
Adjusted R-square (%)	2.22	4.50	3.928	4.01	4.38	4.77
Sample size	2,540	2,101	2,101	2,101	2,101	2,101

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for announcing and individual nonannouncing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. The relative size dummy variable takes the value of 1 if the announcing firm is larger than the nonannouncing firm. The relative past stock performance dummy variable takes the value of 1 if the previous one-year market-adjusted returns for the announcing firm are larger than those for the nonannouncing firm. The relative cash flow rights dummy variable takes the value of 1 if the cash flow rights of the controlling shareholder in the announcing firm are larger than those in the nonannouncing firm. The relative debt guarantee ratio dummy variable takes the value of 1 if the debt guarantee ratio of the announcing firm is larger than that of the nonannouncing firm. The relative foreign ownership dummy variable takes the value of 1 if the foreign equity ownership in the announcing firm is larger than that in the nonannouncing firm. The cash flow right of the controlling shareholders is the sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains. The common component variables are five dummy variables that are used in Table 5: succession plans at the helm of the business group, regional background of the controlling family, government-owned main banks, change in chaebol ranking, and change in the number of firms in the business group. t-statistics are in parentheses; ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

shareholders have a lower level of cash flow rights in the nonannouncing firm than in the announcing firm.

In unreported tests, we repeat all analyses in Table 9 replacing the CARs for announcing firms with the ROA changes of announcing firms and obtain results that are qualitatively similar to those reported in the paper.

In sum, the inferences drawn from the individual firm approach are similar to those from the portfolio approach and further support the existence of, and the market's *ex ante* valuation of, intragroup propping in Korean chaebols.

4.2 Tests of the internal capital market view

As discussed in Section 1.3, the internal capital market view also predicts the transfer of resources among affiliated firms within a business group. To examine whether or not the internal capital market view explains some or all of our results, we conduct additional tests in this section. According to the efficient internal capital market view, the controlling shareholder redistributes resources among the affiliated firms in order to engage in winner picking. Thus, if the transfer of resources among the affiliated firms is driven by winner picking, we expect that funds will flow from a loser affiliate to a winner affiliate. Furthermore, the efficient internal capital market can enhance the aggregate value of the whole business group by mitigating financial constraints that the winner firm faces (Billett and Mauer, 2003; and Khanna and Yafeh, 2005). These arguments suggest that nonannouncing firms realize higher announcement

Table 10
Tests of the efficient internal capital market view

	(1)	(2)
Intercept	−0.043 (0.78)	−0.050 (0.88)
CAR (−5, 5) for announcing firms: A	0.115*** (5.74)	
ROA change (change in net income/total assets) of announcing firms: B		0.075** (2.44)
Dummy for value-enhancing resource allocations: C	−0.010 (1.50)	−0.008 (1.31)
A * C	0.083 (1.22)	
B * C		−0.001 (0.01)
Log (market value of equity): announcing firm	0.001 (0.35)	0.001 (0.56)
Log (market value of equity): nonannouncing firm	0.0002 (0.09)	−0.0001 (0.05)
Previous one-year market-adjusted returns: announcing firm	0.012* (1.84)	0.010* (1.64)
Previous one-year market-adjusted returns: nonannouncing firm	0.022* (1.82)	0.022* (1.68)
Cash flow rights of the controlling shareholders: announcing firm	0.023 (1.17)	0.023 (1.18)
Cash flow rights of the controlling shareholders: nonannouncing firm	0.010 (0.50)	0.010 (0.48)
Debt guarantee ratio (debt guarantees for member firms/total assets): announcing firm	0.006* (1.82)	0.006* (1.78)
Debt guarantee ratio (debt guarantees for member firms/total assets): nonannouncing firm	0.003 (0.82)	0.002 (0.52)
Equity ownership by foreign investors: announcing firm	−0.0003 (0.70)	−0.0003 (0.71)
Equity ownership by foreign investors: nonannouncing firm	−0.015 (0.59)	−0.014 (0.55)
Dummy for the crisis period (equals 1 if earnings are announced from November 1997 to March 1999)	0.005 (0.41)	0.007 (0.68)
Dummy for the postcrisis period (equals 1 if earnings are announced after March 1999)	0.003 (0.22)	0.003 (0.28)
Common component variables	Yes	Yes
Industry dummies	Yes	Yes
F-value	3.89***	2.91***
Adjusted *R*-square (%)	4.43	2.92
Sample size	2,101	2,101

The sample includes earnings announcements made by nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. Each announcing firm is required to be affiliated with at least one nonannouncing member firm on the KSE. The CARs for announcing and individual nonannouncing firms are computed as the difference between realized returns and estimated returns, using the market model over the preevent period from day −200 to day −21. The cash flow right of the controlling shareholders is the sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains. The dummy variable for value-enhancing resource allocations takes the value of 1 if the Tobin's *q* of the nonannouncing firm is greater than that of the announcing firm and the leverage of the nonannouncing firm is above its cross-sectional median. *t*-statistics are in parentheses; ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

returns when they face financial constraints, but their future prospects are better than those of announcing firms.

To test this prediction, we use Tobin's *q* and leverage to measure, respectively, nonannouncing firms' future prospects relative to those of announcing firms, and the severity of their financial constraints. Specifically, we define a dummy variable for value-enhancing resource allocations that takes the value of 1 if the Tobin's *q* of the nonannouncing firm is greater than that of the announcing firm and the leverage of the nonannouncing firm is above its cross-sectional median (i.e., the winner firm with financial constraints), and 0 otherwise. The internal capital market view predicts that the coefficient on this dummy variable is positive and significant.

The results are shown in Table 10. In the first regression, we regress the CARs for individual nonannouncing firms on the CARs for announcing firms,

a dummy variable for value-enhancing resource allocations, an interaction term between these two variables, and other financial characteristics of announcing and nonannouncing firms. The results show that the coefficient on the CARs for announcing firms is positive and significant. In contrast, none of the coefficients on a dummy variable for value-enhancing resource allocations and its interaction with the CARs for announcing firms is significant. Thus, our results shown in the previous tables are not likely to be driven by efficient internal capital markets within a chaebol. Replacing the CARs for announcing firms with the ROA changes of announcing firms in the second regression does not change the inferences. In unreported tests, we also experiment with alternative measures for the financial constraints of nonannouncing firms, such as ROA and cash flows, and obtain results that are similar to those reported in this paper.

4.3 Covariation of returns for member firms in chaebols

Friedman, Johnson, and Mitton (2003) argue that the controlling shareholder's incentive to prop is stronger when there is a negative shock to the economy. To investigate this issue, we examine how other events affect the covariation of returns for member firms in chaebols. We consider two external events: changes in the exchange rate and changes in the stock market.

Until 1980, the Korean government strictly regulated foreign exchange transactions, and the Korean won was pegged to the U.S. dollar. After 1980, as a result of the introduction of a multiple-basket pegged exchange rate system, the Korean won started to float in reflection of general trends in the international foreign exchange markets, even though it was still tightly regulated by the government. In March 1990, the Korean government adopted the Market Average Exchange Rate System in which the exchange rate was determined on the basis of underlying supply and demand conditions in the interbank market. However, daily fluctuations were still limited within certain bands. In response to the financial crisis in 1997, Korea shifted to a free-floating exchange rate system in December by removing the bands. As the daily bands were removed, the Korean won-U.S. dollar rate skyrocketed in two weeks from 1,187 won per $1 on December 1, 1997 to 1,720 won per $1 on December 11, 1997. The devaluation of the Korean won went on until December 1998 and the Korean won-U.S. dollar rate has been stable since January 1999.

To examine how returns for linked firms in business groups covary in response to the shocks to the exchange rate, we divide our sample period into three subperiods: (1) period I—before the removal of daily bands (1993 to November 1997), (2) period II—after the removal of daily bands, but before the stabilization of the exchange rate (December 1997–December 1998), and (3) period III—after the stabilization of the exchange rate (1999–2001). For each chaebol, we construct four correlation metrics: we first compute equally- and value-weighted returns for the portfolio of member firms in a chaebol, and then calculate Pearson and Spearman correlations between the individual firm

Table 11
Covariation of returns for member firms in chaebols by exchange rate and stock market movements

	Mean (median) of Pearson correlations between		Mean (median) of Spearman correlations between	
	Individual firm returns and equally weighted portfolio returns	Individual firm returns and value-weighted portfolio returns	Individual firm returns and equally weighted portfolio returns	Individual firm returns and value-weighted portfolio returns
Panel A: By exchange rate movements				
Period I—before the removal of daily bands (1993 to November 1997): (A)	0.395 (0.395)	0.366 (0.395)	0.356 (0.354)	0.331 (0.344)
Period II—after the removal of daily bands, but before stabilization of the exchange rate (December 1997 to December 1998): (B)	0.520 (0.568)	0.488 (0.534)	0.502 (0.522)	0.474 (0.512)
Period III—after the stabilization of the exchange rate (1999–2001): (C)	0.422 (0.421)	0.387 (0.374)	0.416 (0.398)	0.387 (0.378)
Test of difference (A–B): t-[Wilcoxon's Z-] test	3.40*** [3.21]***	3.35*** [3.00]***	4.18*** [3.82]***	4.15*** [3.51]***
Test of difference (A–C): t-[Wilcoxon's Z-] test	0.83 [0.76]	0.64 [0.38]	1.98* [1.94]*	1.88* [1.66]*
Test of difference (B–C): t-[Wilcoxon's Z-] test	2.43** [2.44]**	2.54** [2.33]**	2.20** [2.27]**	2.26** [2.23]**
Panel B: By stock market performance				
Period of rising market—time periods in which the KOSPI is in an increasing trend (1993–1994, October 1998–March 2000, and November 2001–June 2002): (D)	0.400 (0.422)	0.364 (0.338)	0.382 (0.406)	0.349 (0.351)
Period of falling market—time periods in which the KOSPI is in a decreasing trend (the rest of the sample period): (E)	0.450 (0.476)	0.419 (0.445)	0.402 (0.428)	0.378 (0.400)
Test of difference (D–E): t-[Wilcoxon's Z-] test	1.52 [1.41]	1.75* [1.83]*	0.76 [1.02]	1.17 [1.30]

The sample includes nonfinancial firms in the top thirty chaebols listed on the Korean Stock Exchange (KSE) between 1993 and 2001. For each chaebol, we construct four correlation metrics: we first compute equally- and value-weighted returns for the portfolio of member firms in a chaebol, and then calculate Pearson and Spearman correlations between the individual firm return and these portfolio returns. When we compute the portfolio returns, we exclude the firms whose returns are correlated with the portfolio returns. We then average out the correlations of individual returns with portfolio returns to estimate the average correlation of the chaebol. We repeat these steps to obtain the average correlations for all top thirty chaebols and then compute the mean and median of these average correlations. ***, **, and * denote the significance of the parameter estimates at the 0.01, 0.05, and 0.10 levels, respectively.

return and these portfolio returns. When we compute the portfolio returns, we exclude the firms whose returns are correlated with the portfolio returns. We then average out the correlations of individual returns with portfolio returns to estimate the average correlation of the chaebol. We repeat these steps to obtain the average correlations for all top thirty chaebols and then compute the mean and median correlations of these average correlations.

The results are reported in panel A of Table 11. The mean Pearson (Spearman) correlations between the individual firm returns and the equally weighted portfolio returns for the three subperiods are 0.395 (0.356), 0.520 (0.502), and 0.422 (0.416), respectively. The correlations during period II are significantly different from those during periods I and III. In contrast, the differences in correlations between periods I and III are not significantly different. These results indicate that stock prices within chaebols tend to covary more when there is higher volatility and risk in the currency market. The correlations between the individual firm returns and the value-weighted portfolio returns show similar patterns.

In panel B of Table 11, we divide our sample period into two subperiods based on the overall performance of the Korean stock market, periods of rising and falling markets. The period of a rising market includes the time periods in which the KOSPI is in an increasing trend (1993–1994, October 1998–March 2000, and November 2001–June 2002). The rest of the sample period is classified into the period of a falling market. The results show that the covariation of returns for member firms in a chaebol is higher in the period of a falling market than in the period of a rising market, suggesting that stock prices within a chaebol move together more closely when the market is relatively unfavorable. The differences in correlations between these two periods, however, are generally not significant.

Overall, stock prices within a chaebol tend to covary more closely when the economy experiences negative shocks. These results are consistent with the view that intragroup propping within a chaebol is more prevalent when there is a negative shock to the economy, during which the controlling shareholder's incentive to prop tends to be stronger.

5. Summary and Conclusions

In this paper, we examine the effect of earnings releases by a chaebol firm on the market value of other firms in the same group. We find that the announcement of an increase in earnings by a chaebol-affiliated firm has a positive effect on the abnormal returns for other member firms in the same group. The abnormal returns for the announcing firms are also positively related to those for nonannouncing affiliates. Furthermore, the positive association between abnormal returns for the value-weighted portfolio of nonannouncing affiliates and abnormal returns for the announcing firms is stronger if the announcing firm is larger, if the announcing firm performs well in the past, if the cash flow right of the announcing firm's controlling shareholder is higher, or if the announcing firm has a higher debt guarantee ratio. These results are consistent with the existence and the market's *ex ante* valuation of intragroup propping.

Although this paper has demonstrated the existence and the market's *ex ante* valuation of intragroup propping and the factors that facilitate it, it has not investigated some of the other important issues related to propping. For example, we have not examined its actual costs and benefits for controlling and minority shareholders of firms, and the issues that arise when controlling shareholders have strong incentives to prop up the performance of their member firms, nor the situation where the costs of propping outweigh the benefits. Analysis of these issues would be a valuable area for future research.

Appendix A: Cross-shareholdings and Cross-debt Guarantee for the Top Thirty Chaebols as of 1998

1998 ranking	Group name	Number of affiliated firms	Equity ownership by the controlling family (%)	Cross-shareholdings (%)	Cross-debt guarantee ratio (the amount of debt guarantee over book equity) (%)
1	Hyundai	62	11.2	41.7	29.8
2	Samsung	61	2.9	40.8	16.9
3	Daewoo	37	7.2	32.9	41.5
4	LG	52	5.3	36.3	18.4
5	SK	45	9.7	46.3	7.3
6	Hanjin	25	17.5	22.7	36.0
7	Ssangyong	22	4.3	30.4	38.0
8	Hanwha	31	4.8	23.4	146.0
9	Kumho	32	3.7	36.5	87.5
10	Dong-ah	22	11.5	42.4	51.0
11	Lotte	28	3.4	21.4	19.9
12	Halla	18	17.6	29.5	−99.1
13	Daelim	21	8.5	26.2	74.5
14	Doosan	23	12.5	36.1	41.3
15	Hansol	19	4.7	27.3	37.0
16	Hyosung	21	12.9	26.7	17.8
17	Kohap	13	6.3	32.5	41.3
18	Kolon	25	7.6	32.2	70.9
19	Dongkuk Steel	17	14.0	41.4	50.1
20	Dongbu	34	10.7	40.8	45.9
21	Anam	15	8.5	21.8	156.9
22	Jinro	15	15.5	29.1	−47.9
23	Tongyang	23	4.7	46.2	66.3
24	HaiTai	15	3.9	26.4	126.5
25	Shinho	28	9.0	22.7	319.4
26	Daesang	20	22.2	40.7	119.1
27	Newcore	18	40.8	56.9	409.7
28	Keopyung	19	19.8	34.6	111.0
29	Kangwon	27	11.5	54.4	185.7
30	Saehan	16	16.5	34.4	35.9
Mean		26.80	10.96	34.49	75.15
Median		22.50	9.35	33.65	43.70

The analysis includes both publicly and privately held firms. Equity ownership by the controlling family means the ownership interests of the individual owner and his family. Cross-shareholdings are equity ownership held by other member firms in the same group.

Appendix B: Definition of Variables

Variable	Definition	Sources
CAR (−5, 5) for (non-) announcing firms	Abnormal returns for (non-) announcing firms cumulated over 11 days from day −5 to day +5 relative to the earnings announcement dates, where the abnormal return is the difference between realized returns and estimated returns, using the market model over the preevent period of day −200 to day −21	Daily stock returns file compiled by the *Korean Investor Service-Stock Market Analysis Tool* (KIS-SMAT)
CAR (−5, 5) for the portfolios of nonannouncing firms	Abnormal returns for the value-weighted portfolio of nonannouncing firms in the same group cumulated over 11 days from day −5 to day +5 relative to the earnings announcement dates, where the abnormal return is the difference between realized returns and estimated returns, using the market model over the preevent period of day −200 to day −21	KIS-SMAT
ROA change	Ratio of the change in earnings from year $t-1$ to year t to total assets in year $t-1$	Financial statements data file compiled by the *Korean Investor Service-Financial Analysis System* (KIS-FAS)
ROA	Ratio of net income to total assets	KIS-FAS
Log (market value of equity)	Log of the market value of equity	KIS-FAS
Previous one-year market-adjusted returns	Market-adjusted returns (difference between realized returns and market returns) cumulated over one year immediately prior to the fiscal year in which earnings are announced	KIS-SMAT
Cash flow rights of the controlling shareholders	The sum of the direct and indirect ownership held by the largest shareholder and his family members. Following La Porta, Lopez-de-Silanes, and Shleifer (1999), the indirect shareholdings are computed by tracing up to two layers of control chains	Database compiled by the *Korean Listed Companies' Association*
Debt guarantee ratio	Debt guarantees for member firms divided by total assets	Database compiled by the *Korean Listed Companies' Association*
Equity ownership by foreign investors	Equity ownership held by foreign investors	Database compiled by the *Korean Listed Companies' Association*
Leverage	Ratio of total debt to total assets	KIS-FAS
Tobin's q	Sum of book value of debt and market value of equity/total assets	KIS-FAS, KIS-SMAT

Variable	Definition	Sources
Dummy variable for large size	Dummy variable that takes the value of 1 if the market value of equity for the announcing firm is above its cross-sectional median.	KIS-FAS, KIS-SMAT
Dummy variable for good past stock performance	Dummy variable that takes the value of 1 if the previous one-year market-adjusted return for the announcing firm is above its cross-sectional median.	KIS-FAS, KIS-SMAT
Dummy variable for high cash flow rights of the controlling shareholders	Dummy variable that takes the value of 1 if the cash flow right of the controlling shareholders in the announcing firm is above its cross-sectional median.	Database compiled by the *Korean Listed Companies' Association*
Dummy variable for high debt guarantees	Dummy variable that takes the value of 1 if the debt guarantee ratio in the announcing firm is above its cross-sectional median.	Database compiled by the *Korean Listed Companies' Association*
Dummy variable for high foreign ownership	Dummy variable that takes the value of 1 if the foreign ownership in the announcing firm is above its cross-sectional median	Database compiled by the *Korean Listed Companies' Association*
Relative size dummy	Dummy variable that takes the value of 1 if the announcing firm is larger than the nonannouncing firm	KIS-FAS, KIS-SMAT
Relative past stock performance dummy	Dummy variable that takes the value of 1 if the previous one-year market-adjusted return for the announcing firm is larger than that for the nonannouncing firm	KIS-FAS, KIS-SMAT
Relative cash flow rights dummy	Dummy variable that takes the value of 1 if the cash flow rights of the controlling shareholder in the announcing firm are larger than those in the nonannouncing firm	Database compiled by the *Korean Listed Companies' Association*
Relative debt guarantee ratio dummy	Dummy variable that takes the value of 1 if the debt guarantee ratio of the announcing firm is larger than that of the nonannouncing firm	Database compiled by the *Korean Listed Companies' Association*
Relative foreign ownership dummy	Dummy variable that takes the value of 1 if the foreign equity ownership in the announcing firm is larger than that in the nonannouncing firm.	Database compiled by the *Korean Listed Companies' Association*
Dummy variables for common components	Five dummy variables that take the value of 1, respectively, if there is a succession plan at the helm of the business group, if the controlling shareholder and the incumbent president were born in the same region, if the firm has a government-owned main bank, if the chaebol ranking increases in terms of total group assets, and if new firms are added in the group.	Annual Statistics of *Korean Listed Companies' Association*, Annual Statistics of *KFTC*, group website and company's annual report, Daily newspapers (*Daily Economics* and *Korean Economics*)

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