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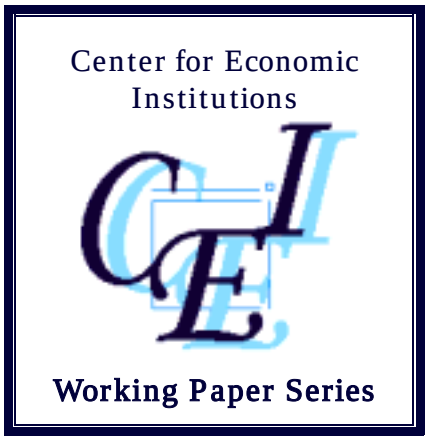

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Pyramid Business Groups in East Asia: Insurance or Tunneling?

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Abstract

A business group with a pyramid ownership structure is a prevalent form in developing countries. I show that the propping up function of pyramid groups exists only in countries without good investor protection where minority shareholders could be expropriated with low cost. A pyramid business group is not insurance mechanism for all group firms. My predictions are supported by the data on East Asian firms in 1990s. Additionally, I find that the pyramid ownership does not affect the valuation of non-distressed firms. This might be the reason that the outsider invested in the group bottom firms before the Asian Crisis.

JEL Classifications: G32, L22, O16
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I. Introduction

Pyramid ownership structures are a common form of corporate ownership around the world. La Porta, Lopez-de-Silanes, and Shleifer (hereafter LLS) (1999) study the 20 largest publicly traded firms in each of the 27 richest countries in the world and find that 26% of the firms that have a large shareholder are controlled through a pyramid ownership structure. A pyramid ownership structure is defined as the chain of shareholding structure in which an ultimate owner is a major shareholder of some firms, which in turn own large portions of shares of other firms. LLS (1999) suggest that corporate ownership would be even more concentrated if one were to consider only ordinary size firms or firms in less developed countries. Claessens, Djankov, and Lang (2000) confirm that 38.7% of the largest publicly traded firms in East Asia are controlled by pyramid ownership.

In this paper, I ask not only why an ultimate owner uses a pyramid ownership structure but also why this controlling mechanism had been sustained. The existing literature emphasizes that pyramid ownership structures expropriate minority shareholders. This occurs because the ultimate owner keeps control of the firms with smaller cash flow ownership, which discourages her from maximizing the profit of controlled firms and instead using these firms for her own private benefit. This separation between cash flow and the control rights reduces firm valuation through so-called "tunneling"[1]. La Porta, Lopez-de-Silanes, Shleifer and Vishny (hereafter LLSV) (2002) study the largest and middle size public firms in the wealthiest 27 economies and find that firms in which the controlling shareholder holds the smaller cash flow rights have

lower Tobin's Qs by investigating. Claessens et al (2002) present similar evidence for nine East Asian economies.

Although it is certainly true that the pyramid structure makes it less costly for the ultimate owner to steal cash flow, pyramid ownership structures may have another role. Firms that share an ultimate owner may also share internal capital, labor, and product sources in the same way as "business groups" do.

A business group is one of the most typical users of pyramid ownership structure. Indeed, many researchers define "Business Groups" by their use of pyramid ownership structures.[2] This pyramid business group is prevalent in developing countries; "business groups dominate private sector activity in most emerging markets around the world." (Khanna and Palepu (2000)) Traditionally, a pyramid business group was justified as a substitute for market mechanism. When capital markets or labor markets are ineffective, as the argument goes, internal markets inside a group but outside firms can alleviate the market failures and provide a mutual insurance mechanism.

However, the recent literature doubts the validity of this claim. Pyramid business groups have been shown to *destroy* value in a number of ways, including over-diversification (Mitton (2002), Claessens et al (1998), Rajan, et al (1999)), inefficient internal capital allocation (Scharfstein and Stein (2000), Scharfstein(1997)), and mergers (Bae et al (2002)). Betrand, Mehta, and Mullainathan (2002) show evidence of tunneling in earning numbers, especially in non-operating profits, of pyramid group firms in India.

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[1] "'Tunneling' is defined as the transfer of assets and profits out of firms for the benefit of their controlling shareholders" (Johnson, La Porta, Lopez-de-Silanes, and Shleifer (hereafter JLLS) (2000)).

[2] According to Khanna (2000), "Economists who have studied business groups have tended to emphasize that group affiliates are linked together through equity cross-ownership patterns." Wolfenson (1999) explains, "'group,' typically has a complex ownership structures. Nevertheless, some highly stylized structures can be identified. A very common one is the pyramidal structure."

On the other hand, other researchers maintain that pyramid business groups still bring benefits. In a series of papers, Khanna and Rivkin (1999) and Khanna and Palepu (1999, 2000) have argued that business groups had been and continue to have a positive role in developing countries. They emphasize the lack of well-established institutions such as capital markets, legal structure and legal enforcement in developing countries and claim that business groups have served as substitutes.

In this paper, I present a model explaining why groups of firms are prevalent and play a larger role in developing countries. I further explain why groups usually take the form of a pyramid ownership structure. The model suggests that the prime function of the group is enhanced by the pyramid ownership structure. Specifically, when a firm affiliated to a group faces financial distress, the ultimate owner of the group props up the troubled firm more willingly under a pyramid ownership structure. Since the pyramid causes a separation of ownership from control among the bottom firms, the controlling owner can divert cash flow from these firms to other companies higher in the chain without losing much cash flow for herself. In contrast with a simple vertical chain, the distinguishing feature of pyramid groups is that there are many firms at the bottom that can be expropriated. Furthermore, this pyramid effect is amplified in countries with ineffective outside investor protection, where the diversion of cash flow is less costly. Among group firms in the pyramid, the ultimate owner of a group of firms prefers to rescue the firms on the top layer in the pyramid than the bottom since the ultimate owner has the larger cash flow ownership in the top firms.

I confirm these predictions by investigating 1,048 firms in eight East Asian countries in 1990s, which includes a period of a financial crisis during which an

unexpected shock hit economies of the entire region. This period also includes time before and after the crisis, when negative shocks were idiosyncratic across firms. First, I find that the effect of group affiliation on market value to book ratio of financially distressed firms is largely positive in countries with ineffective investor protection but becomes weaker as investor protection improves. Second, however, the effect of group affiliation varies across firms, depending on their positions in the pyramid structure. I find that the separation of the cash flow ownership from control rights of the ultimate owner has a large negative effect on the value of financially distressed group firms. Furthermore, the group effect is positive for the firms whose cash flow rights are aligned with control rights but negative for firms where there is a significant separation of ownership from control. Finally, regarding interaction between firms within the same pyramid group, I find that positive shocks experienced by the bottom firms increase valuation of top firms in the same pyramid group whereas negative shocks occurred on the top firms decrease valuation of the bottom firms. This interaction effect indicates that top firms steal cash flow from the bottom firms with extra cash flow and that top firms get propped up in their distress by looting the bottom firms.

These results explain why business groups are more prevalent and appear to have a larger influence, good or bad, in developing countries where investor protection is weak. While some researchers claim that the "institution" of business groups fills the gap created by a lack of a viable capital market and legal institutions (Khanna and Papelu (1999)), I show that this group mechanism is maintained at the expense of inefficient expropriation of outside shareholders. As my results suggest, firms in the top layer of the pyramid ownership group get the positive benefits of propping up while those of the

bottom of the pyramid receive a negative group effect because of looting. The result as to the intermission effect of shocks within the same group dismisses the insurance hypothesis that a business group gives some insurance to fragile firms in the bottom of pyramid groups. In short, I find that groups have a positive effect on valuation only for top firms in the pyramid. Pyramid groups take advantage of a lack of legal institutions rather than serve as their substitutes. Additionally, I find that a separation of ownership from control does not matter much for the valuation of non-distressed firms before Asian Crisis. This might be the reason that the pyramid business group or crony capitalism was not severely criticized and the outsider had invested in the group bottom firms before Asian Crisis.

In the next section, I illustrate in detail the ownership structures typically employed within family groups, focusing on the pyramid ownership structure. In Section III, I present a model indicating how the pyramid group works under financial distress and the effect of the level of investor protection on the function of the pyramid. In Section IV, I describe a database of firms in East Asia and evaluate the predictions of the model. Section V concludes.

II. Pyramid Groups controlled by families

Among the largest publicly traded firms in East Asia, pyramids are a common form of ownership structure. Claessens et al (2000) investigate 2,980 publicly traded firms in nine East Asian countries and find that 38.7% of them are controlled through a pyramid ownership structure. They also show that about half of these firms are ultimately controlled by families, with the exception of Japan (from the Philippines at the lowest

with 44.6% under family control, to Indonesia at the highest with 71.5%). In this section, I illustrate how the ultimate owner forms a group under a pyramid ownership structure in three of the countries in my sample. I show how this affects the valuation of the firms in the pyramid.[3]

In figure 1, I show the Nursalim group in Indonesia (where the level of investor protection is the weakest among East Asian countries I study). This example illustrates a simple pyramid ownership structure. The Nursalim family owns 72% of cash flow rights of Gajah Tunggal Mulia and 50% of cash flow rights of Gajah Tunggal Sakti. In turn, Gajah Tunggal Mulia owns 55% of cash flow rights in Gadjah Tunggal, rubber and tire producing and distributing company. Gajah Tunggal Sakti owns a further 10% of these shares. Through these vertical ownership chains the Nursalim family controls Gadjah Tunggal with 45% (=72%*55%+50%*10%) of cash flow rights and 65% of control rights, as defined by the weakest link in the vertical chain. Gadjah Tunggal, in turn, owns 50% cash flow rights in PT. BDNI Capital, a financial institution that owns 52% of cash flow rights in Bank Dagang Nasional, which is located at the bottom right in Figure 1. Through this vertical chain, the Nursalim Family has 50% of the control rights but only 22% of cash flow rights in PT. BDNI Capital, located in the lower position in the pyramid. Similarly, they have 50% of the control rights and only 12% of cash flow rights in Bank Dangng Nasional, one of the bottom firms in the pyramid. Note that the large differences between ownership and control are more extreme at the bottom of the pyramid. This is typical of such vertical chain ownership.

[3] I use Worldscope, Asian Company Handbook, Korean Company Yearbook, and Hong Kong Corporate Handbook to construct the following example figures of pyramid ownership structures.

Comparing the market value to book ratios of these firms, it appears that the separation between cash flow and control rights has a large effect on firm valuation. In 1995 and 1996, before the Asian Crisis, Gadjah Tunggal had a market value to book ratio close to the industry average of Indonesia (0.95 with an industry average of 0.91 in 1995, 0.85 compared with an industry average of 0.86 in 1996).[4] Through the Crisis, its market value to book ratio improved against the industry average, i.e.1.17 (industry average of 0.68) in 1997, 0.70 (industry average of 0.57) in 1998, and 3.02 (industry average of 1.85) in 1999. On the other hand, PT. BDNI Capital, one layer below Gadjah Tunggal in the pyramid, suffered a loss in market valuation during the Crisis. While its market value to book ratio was 1.41 (industry average of 1.09) in 1995, and 1.78 (1.35 industry) in 1996, it became 0.68 (0.57 industry) in 1997, 0.15 (0.20 industry) in 1998 and 0.15 (0.17 industry) in 1999.

Figure 2 shows the Hyundai Group, the largest business group, or *Chaebol,* in South Korea, a country where judicial efficiency is higher than in Indonesia while the Anti-Director Rights index is as bad as in Indonesia. Similar to the Nursalim group, the pyramid ownership structure creates a divergence between cash flow ownership and control, the worst for the bottom firms. Consider Hyundai Motor Service, motor vehicle sales company, at the bottom right of figure 2. The group founder's family, the Chung family, directly owns 31% of cash flow rights in Hyundai Heavy Industry, which in turn owns 12% of cash flow rights in Hyundai Precision as well as 14% of cash flow rights in Hyundai Motor, the largest automobile manufacturer in South Korea. Hyundai Heavy Industry also controls several other publicly traded firms. Hyundai Precision owns 10%

[4] The industry average is calculated as the average of market value to book ratio of firms in the same two digits SIC code in each country in my data set.

of cash flow rights in Hyundai Motor Service. Through the vertical chain, the Chung family has only 0.3% of cash flow rights of Hyundai Motor Service, while maintaining 10% control.

We can see the effects of diversion between cash flow and control rights by examining relative performance of these firms before and after the Asian Crisis. Hyundai Motor service had higher market value to book ratio than the industry average of South Korea before the Crisis, i.e. 1.65 against an industry average of 1.24 in 1995 and 1.00 compared with an industry average of 0.89 in 1996. During and after the Crisis, however, it fell below the industry average: 0.28 (0.48 industry) in 1997, 0.47 (0.63 industry) in 1998, and 0.43 (0.75 industry) in 1999. On the other hand, Hyundai Motor, located above Hyundai Motor service in the pyramid, generally had higher market value to book ratio compared to the industry average throughout the Crisis. Its market value to book ratio was 0.72 (0.49 industry) in 1997, 0.51 (0.54 industry) in 1998, and 0.69 (0.51 industry) in 1999 while it was generally below the industry average before the Crisis: 1.28 (1.25 industry) in 1995 and 0.78 (0.91 industry) in 1996.[5]

I note one additional intriguing fact: in both groups in Indonesia and in South Korea, financial institutions are placed at the bottom of the pyramid and generally have lower market value to book ratios. This might indicate that these groups intentionally keep their group financial institutions as tools to expropriate outsiders because there is more room to manipulate accounting numbers in financial institutions and to conduct tunneling through them.[6]

[5] It was 1.57 (2.39 industry) in 1993 and 1.57 (1.85 industry) in 1994.
[6] La Porta et al (2001) show evidence in the case of Mexican banks. Checking several other groups in Indonesia and South Korea, I find the similar pyramid pictures: financial institutions are placed at the bottom.

Indeed, there are plenty of evidence from the press that Hyundai group tried to prop up Hyundai Electronics through Hyundai Securities at the bottom in the pyramid. "[A]t least three Hyundai subsidiaries allegedly supplied a total of 223 billion won ($186m) to Hyundai securities, an investment bank, to prop up the share price of the group's electronics firm [Hyundai Electronics] last year," and these "are part of a broader, more disturbing tale: that the big chaebol have been grabbing ever larger parts of the country's financial-services industry in order to channel money – illegally – to loss-making subsidiaries." (Economist, 1999)

The divergence between ownership and control has little effect in countries with high investor protection. In Figure 3, I examine the Li Ka-Shing Group in Hong Kong where investor protection level is the highest in Asia.[7] The Li Ka-Shing family directly owns 35% of cash flow rights in Cheung Kong, which in turn owns 34% of cash flow rights in Hutchison Whampoa, which in turn owns 44% of cash flow rights in China Strategic Investment located at the bottom (right) of the pyramid. China Strategic Investment suffers from the separation between ownership and control rights, i.e. the Li Ka-Shing family owns only 5% of cash flow rights but 34% of control rights.

Nevertheless, China Strategic Investment generally had higher market value to book ratios than the industry average throughout the Crisis. Its market value to book ratio was 0.94 against the industry average of 0.68 in 1997, 0.26 (0.32 industry) in 1998, and 0.59 (0.44 industry) in 1999. Before the Crisis, it was 0.94 (0.73 industry) in 1995 and 0.86 (0.84 industry) in 1996. In short, China Strategic Investment maintained its market valuation through the Crisis in spite of the separation between ownership and control,

[7] For figure 3, I use the data Claessens et al (2000) present in addition to the sources cited in footnote 3.

which led to a loss of valuation of firms in the former two examples of Indonesia and South Korea.

These three examples illustrate how the effect of pyramid structure on the valuation of firms varies across firms within a group and that the difference of this pyramid effect between countries might be related to the level of investor protection in each country. I formally examine this effect theoretically in the next section. More comprehensive empirical analysis confirms these illustrations in Section IV.

III. Model

In this section, I present a model in which firms have already been established and have already raised necessary capital to finance their investments. The model does not consider the ways how to raise capital but determines how and to what extent the ultimate owner decides to pay dividends, steal, or prop up firms in distress.

Suppose that there are a few firms that share an ultimate owner X. The ultimate owner is defined as the shareholder that controls the management decisions of all firms. There are two ways she can have γ control right of the firm N: (1) directly owning fraction γ of the voting shares of the firm N, or (2) using a "vertical" ownership chain. When X directly controls firm A, which in turn controls the firm B, X is assumed to have the control rights of firm B through a vertical chain as well as control of firm A by direct ownership. I follow LLS (1999) and Claessens et al (2000) and adopt the weakest link method as the definition of control rights. That is, when shareholder X owns fraction *a* of the voting shares of firm A which in turn owns fraction *b* of the voting shares of firm B, the ultimate owner X would have γ control rights of firm B where $\gamma = min[a, b]$. In this

section, it is assumed that the ultimate owner always has α control rights of each firm and that α is determined outside of the model. I assume that firms do not issue shares with different voting rights.[8]

In this paper, I analyze ownership of firms under three different ownership structures: *(1) Horizontal, (2) Vertical*, and *(3) Pyramid* ownership structures. These are defined as follows:

(1) Horizontal: the ultimate owner X controls both firm A and firm B by directly owning fraction α of the voting shares respectively.

(2) Vertical: the ultimate owner X controls firm A by direct ownership and firm B through a "vertical" ownership chain. That is, X owns fraction α of shares of firm A, which in turn owns fraction α of shares of firm B. While X has α control rights and α cash flow rights of firm A, she only has α^2 of cash flow rights though keeping α of control rights of firm B.

(3) Pyramid: the ultimate owner X controls firm A by direct ownership but controls firm B and firm C through a "vertical" ownership chain. She directly owns fraction α of the shares of firm A, which owns α of the shares of firm B and firm C. While X owns both the control rights and cash flow rights with α of firm A, she only owns α^2 cash flow right with α control rights of firm B and firm C.[9]

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[8] Claessens et al (2000) reported that dual-class shares were rare in East Asian countries.

[9] It is fair to discuss that I should compare three ownership structures with the same number of firms, i.e. three firms for each structure. Comparison between the vertical structure with three layers and the pyramid structure with three firms can be interesting. Especially, I should do this comparison if I analyze which ownership structure the ultimate owner chooses to establish at the stage of starting up firm C. In Appendix A, I look at how the ultimate owner chooses and establishes the ownership structure with three firms and discuss why the ultimate owner does not usually use the long vertical chain but typically choose the pyramid structure. In developing countries, most group firms use the pyramid ownership structure while, on the other hand, non group firms usually use the short vertical chain or horizontal structure or they are imply independent firms. Since in the main text of this paper I do not analyze the stage that the ultimate owner chooses and establishes the whole ownership structure of the group but the stage that the ultimate owner

I next consider the allocation of revenues generated by firms, the central concern of the model. In period t=1, each firm i earns cash flow R_i (i = a, b, or c). This cash flow is distributed as a dividend on a pro rata basis to each shareholder unless the ultimate owner steals them. The ultimate owner can divert S_i, a part of cash flow, from the firm i for her own purpose.

While such diversion is legal in most countries, it, however, incurs a cost of legal maneuvering, which depends on the quality of the law.[10] The cost is given by the diversion cost function, $C(k, S_i)$, which depends on the amount of diversion S_i and the quality of the minority shareholder protection, *k*. The better protected are the minority shareholders (the larger *k*), the more resources are wasted to expropriate a given share of firm revenues. For expositional simplicity, I assume that

$$(1) \qquad C(k,S) = \frac{1}{2}kS^2$$

Following other literature, I assume that these costs are borne by those who gain the cash flow benefit from diversion rather than by all the shareholders.[11]

This diversion can occur in two ways: either by stealing the revenues directly to increase the ultimate owner's private cash flow or by transferring them from one firm to the other. While the existing literature does not consider the latter, the model in this paper emphasizes that both types of "tunneling" exist.

Finally, I assume that each firm has a debt requiring a payment P_i at t=1 in order to continue its business. If the firm continues its business after t=1, the ultimate owner

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decides how to use and distribute the cash flow the group firms earn, I focus the difference of cash flow distribution between the pyramid group and vertical or horizontal non-group firms.

[10] Burkhart, Gromb, and Panunzi (1998) is the first paper to model this relationship. JLLS (2000) gives several examples from Europe. LLSV (2002) make a simple model to capture this relationship following Burkhart, Gromb, and Panunzi (1998).

receives a continuation benefit with present value V. If P_i is not paid, she receives no private benefit and the firm fails. Equity and debt structures are already established at t=0. For expositional simplicity, I assume that P_i=1/2 and R_i=1 unless a firm is not in distress.

Under these assumptions, the ultimate owner maximizes the gains from the firms she controls. When she uses the *Horizontal* ownership structure, utility is given by:

$$(2)\ U(H) = \alpha(\frac{1}{2} - S_a) + S_a - \frac{1}{2}kS_a^2 + \alpha(\frac{1}{2} - S_b) + S_b - \frac{1}{2}kS_b^2 + 2V$$

Similarly, if the ultimate owner X uses the *Vertical* structure, she would maximize:

$$(3)\ U(V) = \alpha(\frac{1}{2} - S_a) + S_a - \frac{1}{2}kS_a^2 + \alpha^2(\frac{1}{2} - S_b) + S_b - \frac{1}{2}kS_b^2 + 2V$$

In the case of *Pyramid*, utility is given by:

$$(4)\ U(P) = \alpha(\frac{1}{2} - S_a) + S_a - \frac{1}{2}kS_a^2 + \alpha^2(\frac{1}{2} - S_b) + S_b - \frac{1}{2}kS_b^2 + \alpha^2(\frac{1}{2} - S_c) + S_c - \frac{1}{2}kS_c^2 + 3V$$

These are the payoffs that the ultimate owner X gets if she chooses not to default and if revenues are enough to pay *P*. In this case, X chooses the level of stealing S_i by maximizing these functions. The optimal level of stealing under each of ownership structure is given by:

$$(5)\qquad S_a^*(H) = S_a^*(V) = S_a^*(P) = \frac{1-\alpha}{k} \equiv S^*$$

$$(6)\qquad S_b^*(H) = \frac{1-\alpha}{k} = S^* < S_b^*(V) = S_b^*(P) = S_c^*(P) = \frac{1-\alpha^2}{k} \equiv S^{**}$$

[11] This assumption does not affect my results.

Here, *H, V*, or *P* (in parentheses) after S_i^* represents the ownership structure. It is easy to see that the levels of stealing from firm A are same for all three ownership structures (from (5)) while the level of stealing under Vertical or Pyramid structure is higher than under Horizontal structure for other firms (from (6)). This is because there is a separation between cash flow and control rights for firm B and firm C under *Vertical* or *Pyramid* structure.

Next, consider a case where one firm does not generate enough revenues to pay debts. If the ultimate owner X wants to keep this firm alive, then she has to prop it up. When X chooses propping up, she can inject cash from her own pocket, but she has a cheaper way: expropriating the minority shareholders of other healthy firms in which the ultimate owner has a small part of cash flow rights.

Consider a case that firm A cannot make the debt payment, which leads to the possibility of propping up by transferring cash flow from other firms. Suppose that the revenue of firm A becomes smaller than the debt payment because of the shock, i.e. R_a $=0< P_a=1/2$. For expositional simplicity, I assume that P_a is too large for the ultimate owner to simultaneously steal and transfer from firm B or firm C to prop up firm A.[12] Then, the transfer from firm i to firm j, denoted as T_{ij}, is larger than S^* or S^{**} if the ultimate owner props up firm A. Under a given ownership structure, the ultimate owner X compares payoffs between propping up to save firm A and looting to let firm A die, and then decides whether to prop up firm A. Comparing the ultimate owner's optimal decision under the *Pyramid* ownership structure with ones under other structures, it is found that the Pyramid structure has a positive effect on the distressed firm.

[12] If an amount of transfer to prop up firm A were small enough for the ultimate owner to steal from firm B or firm C, then from Prediction 1 to Prediction 3 would be weakly established.

Prediction 1

When a financially distressed firm is under Pyramid ownership structure, it would be more likely to be propped up than a financially distressed firm under Horizontal or Vertical ownership structure.

Proof: See Appendix A.

There are two factors that make propping up in *Pyramid* more attractive. One is the separation between cash flow and control rights of the ultimate owner. This mechanism is exactly the same as stealing in the *Vertical* or the *Pyramid* structure compared the *Horizontal* structure.

The other factor is that more firms belongs to *Pyramid* ownership structure than in *Vertical* structure. If the ultimate owner controls more firms having separated ownership structures, it is cheaper to prop up troubled firms in her group. This is an intuitive but strong reason that almost all groups in developing countries form not simple vertical ownership chains but real "pyramid" structures. This is consistent with the common observation that group firms are too diversified in developing countries.

Although this prediction is intuitive, it is less straightforward than it looks. This is because the ultimate owner has to give up stealing from firm B or firm C, which could be kept in her own pocket. This fact leads to an interesting implication that outside investors of the healthy firms would not be additionally expropriated much because propping up firm A would be partially financed by reduction of stealing from firm B and firm C.[13]

Next, the effect of investor protection is considered in *Pyramid* structure.

Prediction 2

[13] This implication is consistent with the empirical results in the next section, in which it is found that the separation between a cash flow right and a control right has no effect on the financially healthy group firms.

A financially distressed firm in Pyramid structure is less likely to be propped up when there is better shareholder protection.

Proof: See Appendix A.

Since propping up the distressed firms is financed through expropriation of the healthy firms, this cost increases as the outside shareholder protection improves.

Next, I investigate how the effect of separation between the cash flow and the control rights varies across pyramid group firms. Suppose that the same size of financial shock hit firm B instead of firm A in *Pyramid* structure, that is, R_b=0. Would the decision by the ultimate owner for a financially distressed firm be different?

Prediction 3:

A firm with less separated ownership structure is more likely to be propped up than a firm with more severely separated ownership structure in Pyramid.

Proof: See Appendix A.

This result comes from the fact that propping up occurs more cheaply when the ultimate owner controls more firms with separated ownership structure. While I do not formally model it, there is one additional factor to encourage propping up for the not separated firm. Although I assume private benefits from keeping distressed firms alive are the same across all firms, i.e. $V_a=V_b\equiv V$, it may be the case that the ultimate owner's future benefit from firm A is higher than from firm B. This is true because she has higher cash flow rights in firm A than in firm B. This factor gives another reason that the less separated firm would be propped up more favorably than the seriously separated firm.

Indeed, this private benefit factor strengthens two propositions above. Regarding Prediction 1, the ultimate owner would even more willingly prop up a distressed firm

under *Pyramid* structure, considering the future benefit from a currently distressed firm. This is because she would more often face a chance to prop up if firms are shaped in *Pyramid* structure than in other structures. This higher chance comes from two facts: the ultimate owner has a larger number of firms and she can steal more. If she next faces financial distress in her other firms, she will be able to use the currently distressed firm to prop up others. Regarding shareholder protection in Prediction 2, the weak pyramid group effect to prop up in the good investor protection country would be even further weaker if the different levels of private benefits between countries is considered. This is because the future private benefit from keeping a firm alive is smaller in the better investor protection country. The ultimate owner would get less by stealing revenues from recovered firms in the future and, therefore, the private benefit in the future from controlling recovered firms is smaller.

Finally, the model also has an implication for interaction effect of pyramid group firms not only in financial distress but in all periods.

Prediction 4:

While a positive shock to bottom firms positively affects top firms in the same group, a positive shock to top firms does not affect bottom firms.

Proof: See Appendix A.

This prediction combined with Prediction 3 is crucial to empirically distinguish the insurance hypothesis and the expropriation hypothesis for a pyramid group. Even if prediction 3 is empirically confirmed, it is still possible to claim that the pyramid group has a positive effect on bottom firms because they can gain some benefits from a group on average during non-distress period. For instance, even though bottom firms cannot

gain any benefit in financial distress, they might share the risk and return with the other group firms. However, if prediction 4 is empirically confirmed, the insurance hypothesis for pyramid business groups can be dismissed. The bottom firm in the pyramid group cannot get help from the group in financial distress, when help is most needed and they are also expropriated through non-distress periods. I test these predictions in the next section.

IV. Empirical Results

In this section, I use a sample of firms in East Asia to examine the effects of group affiliation and the separation between cash flow and control rights on firm valuation.

Data

I use ownership data on firms constructed by Claessens et al (2000) covering 2,980 publicly traded firms in nine East Asian countries: Hong Kong, Indonesia, Japan, Malaysia, South Korea, Philippines, Singapore, Taiwan, and Thailand. The data includes the largest firms in East Asia. Using the *Worldscope* database and additionally relying on other country specific sources, Claessens et al (2000) identify all large shareholders who owned more than 5% of outstanding shares of each firm at the end of the 1996 fiscal year *Datastream* is used to collect data on different classes of shares.

Claessens et al (2000) identify the ultimate owners of all firms by tracing indirect ownership through the pyramid chain. They follow the method first described by LLS (1999): if a direct shareholder of a firm is not an individual owner but a separate legal entity (typically a publicly traded firm, a financial institution, or a foundation), then they

trace the owners of these entities upwards until they reach the ultimate controller. In most cases, the ultimate controller is an individual or a family. Claessens et al (2000) do not further breakdown ownership within the family unit.[14]

This process generates data on both cash flow and control rights. The discrepancy between the two is generated either by multiple voting shares or by indirect ownership through the pyramid structure.

I eliminate from the sample Japanese firms that form a disproportionably large share of total observations. The main reason is that Japanese groups are loosely connected through "Main-Banks" that are widely held public financial institutions and not controlled by families, therefore, their behaviors are quite different from family group firms in other East Asian countries.[15][16]

I now turn to the dependent variable. I use market value to book ratio collected from *Datastream* to measure the valuation of the firms. This is defined to be the share price dividend by the net tangible assets per share for each financial year-end, adjusted for capital changes. To minimize the weight of outliers, I cap the two valuation measures at both the 1st and 99th percentiles for each year. If the negative numbers can still be found after this process, those firms with a negative market value to book ratio are eliminated.

[14] They assume that every family owns and votes its shares collectively.
[15] One extra reason is that the Asian Crisis in 1997 directly had a much smaller effect on Japanese firms.
[16] Dropping Japanese firms, I have 1,740 firms with ownership data. Following existing literature, I exclude financial companies since their accounting data structure is different from those in other industries. This process deletes 420 companies and leaves 1,320 firms in the data set. The accounting data are from Worldscope which does not cover all 1,320 firms. The market valuation data are from Datastream whose coverage is smaller than Worldscope since Datastream does not cover companies whose shares have not been regularly traded. Therefore, in some sense, limiting coverage of market valuation variables makes the data less noisy. These two steps lead to around 1,000 observations (firms) for each year.

I next turn to the determinants of firm valuation. Previous empirical works (LLSV (2002) and Claessens et al (2002)) and my model suggest that differences between cash flow and control rights have effects on firm valuation. I create a variable, "Non-Separation," defined as the ratio of cash flow rights to control rights of the ultimate owner of each firm. When the ultimate owner has no discrepancy between cash flow and control rights over the firm, non-separation variable takes the value one. As separation escalates, through the multiple layers in the pyramid chain, this number would be lower. Therefore, firms with the lower "Non-Separation" correspond to the "bottom" firms of *Pyramid*.

Group affiliation comes from Claessens et al (2000). They use the country specific sources and identify whether each firm belongs to a family pyramid ownership group.

Finally, I employ variables on the level of legal investor protection in each country, "Efficiency of the Judiciary System" and "Anti-Director Right, " which are commonly used to describe the legal investment climate in each country.[17] The former index was originally produced by the country risk agency *Business International Corporation*. It takes values from 0 to 10, where lower scores imply lower efficiency levels. Among eight countries in my sample, Hong Kong and Singapore have the best score, 10.00, while Indonesia has the lowest, 2.50, followed by Thailand, 3.25, the Philippines, 4.75. "Anti-Director Rights" index was constructed by LLSV (1997, 1998). This index reflects two aspects of minority shareholders rights, the ease of voting for directors and the existence of a grievance mechanism for oppressed minority

shareholders. The scale is from zero to six: among eight East Asian countries, Hong Kong scores the highest, five, while Indonesia and South Korea have the lowest score, two. These variables correspond to *k* in the model.

I investigate firm valuation in 1990s, which includes both a period of the Asian Crisis during which an unexpected shock hit the whole economy and periods prior to and after the Crisis when a negative shock is idiosyncratic to each firm.[18]

I next sort each firm-year observation into two categories: financially distressed, or not financially distressed. A firm is defined to be in financial distress in a given year if its interest expense is larger than its operating income in each fiscal year.[19] When a firm faces financial distress, it typically requires cash flow injections to survive, sometimes from asset sales. However, in East Asia it is less common to receive cash from outside investors: most firms receive cash flow injections from firms in the same group. I model this in the last section and will test this effect below.

Regression results

The main concern of this paper is how the *Pyramid* ownership group works. Table II reports summary statistics for all firms, group firms and non-group firms. Group firms account for 43% of the total sample firms. It appears that group firms are, on average, larger than non-group firms. Group firms have larger total assets (+20%), larger total

[17] LLSV (1997, 1998) construct the Anti-Director Rights index and make the following literature adopt Efficiency of the Judiciary System as the legal investor protection index. Johnson et al (2000) is one of the most notable examples.

[18] There are two other reasons to use the data from 1995 to 1999 for year by year regressions: (1) many firms have not yet reported accounting number in 2000 fiscal year (when data was collected), (2) more than one-third of the firms in the data set have been listed in the last five years so that I would lose the substantial number of observations by going back to early 1990s. I expand the data period to 1992-2000 when I test firm-year observations with firm fixed effects and year fixed effects.

sales (+34%), and higher operating income (+32%) than non-group firms. On the other hand, they have the lower market valuation, i.e. lower market value to book ratio (-9%) and only 5% larger market capitalization although assets, sales, and income are much larger than non-group firms. Sales growth is also lower for group firms. As for the ownership structure, group firms have more serious separation problem (10% higher separation) while the cash flow ownership level is similar. However, the most conspicuous difference is as to debt. Debt to equity ratio is 1.21 for group firms (0.86 for non-group) and the interest expense for group firms is more than double of that for non-group firms (+143% larger). Much larger standard deviation of financial need/sale[20] for group firms (0.84 versus 0.22) shows that, among group firms, many firms are in deep financial distress while others are rich in cash flow.

In Table III, the group effect is tested for each year from 1995 to 1999, separately for financially distressed firms and not financially distressed ones. The model in Section III predicts that the group affiliation has a positive effect on valuation when firms are in financial distress. Prediction 1 shows that the *Pyramid* group firms would more likely get propped up when they face a financial difficulty than non-group firms without *Pyramid* structure. On the other hand, Prediction 2 indicates that this group effect is weaker in countries with better investor protection.

The results in Table III confirm these predictions. The first column presents a result of a regression of market value to book ratio on group affiliation and judicial efficiency for distressed firms in 1995. It shows that group affiliation increases the market value to book ratio by 1.61 with 1% level significance. The negative number in

[19] This is one of the most common definitions of financial distress. (Asquith, Gertner, and Scharfstein (1994) and Andrade and Kaplan (1998))

the fourth row, -0.25, suggests that the interaction term between the group affiliation and judicial efficiency has a significantly negative effect on the market value to book ratio of distressed firms in 1995, which implies that the positive group effect mentioned above becomes weaker as the index of judicial efficiency increases. For instance, in Indonesia (with the lowest score of the judiciary efficiency 2.50), the total group effect on market value to book ratio in 1995 is 0.985 (=1.61-0.25*2.5). On the other hand, in Hong Kong (with the highest score of 10.00), the total group effect in 1995 is even negative, –0.89 (=1.61-0.25*10). Interestingly, judicial efficiency itself has a positive effect on firm valuation: the number in the third row, 0.13, shows that improvement of judicial efficiency from Indonesia (2.5) to Hong Kong (10.0) increases the market value to book ratio by 0.975 (=0.13*(10.0-2.5)). As for non-distress firms, the result in the second column for 1995 shows that the three variables that are significant for distressed firms have not only insignificant but also negligible size effects on firm valuation.

The results for non-crisis years, 1996 and 1999, are generally the same as those for 1995 explained in the last paragraph. For 1997 and 1998, when the Asian Crisis severely hit East Asia, these three variables show insignificant and small effects on firm valuation for both distressed and non-distressed firms[2122].

These results suggest that the group effect of propping up exists in ordinary environment, i.e. in non-crisis years. However, this group effect disappears in countries

[20] Financial need is defined as interest expense minus operating income.
[21] Exceptions are the negative effects of group affiliation for non-distressed firms in 1997 and for distressed ones in 1998. These facts are consistent with the interesting, although unproven, argument that the ultimate controller of the group firms believed that she could rescue all group firms then used cash flow of healthy group firms. However, in 1998, she recognized that it was not sustainable then she looted the distressed firms.
[22] I repeat the same test as in Table III, but with the Anti-Director Rights instead of Judicial Efficiency. The results in Table III are confirmed and show comparable effects for group affiliation and the interaction term. I also repeat the same test as in Table III with controlling the firm size. This does not affect the result.

with good investor protection. On the other hand, the valuation of non-distressed firms did not considerably worsen in non-crisis years.[23]

Furthermore, these results appear to be consistent with the view that groups are a substitute for the institutions required to protect minority shareholders. While the total effect of judicial efficiency and group affiliation is (in 1995) 1.31 (=1.61+2.5*(0.13-0.25)) for a group firm and 0.32 (=2.5*0.13) for a non-group firm in Indonesia, it is 0.41 (=1.61+10.0*(0.13-0.25)) for a group firm and 1.30 (=10.0*0.13) for non-group firm in Hong Kong. Since Hong Kong has high investor protection, and Indonesia low, this suggests that the good investor protection stops looting of the financially distressed firm in Hong Kong while business group mechanism encourages the ultimate owner to prop up the distressed firm in Indonesia.[24]

Does the group effect, however, benefit all firms in the *Pyramid* groups, both bottom firms and top firms? Prediction 3 indicates that the bottom firms would not be propped up while the top firms would get cash flow transfers from other group firms, which implies that Non-Separation variable should have a positive effect on the valuation of distressed group firms.

Table IV confirms this prediction by examining group firms alone. The first column corresponds to a regression for distressed group firms in 1995. The number of the third row indicates that the increase of non-separation variable from 0 (most separated) to

[23] This is consistent with the model in the section III in which the cost of propping up comes from what would have been stolen unless rescue had occurred. However, it seems that the "deep pocket" of the ultimate owner was not enough to save group firms during Asian Crisis. The shock was too large to be financed by giving up stealing.

[24] For robust ness check, I divide eight countries into two groups, higher judicial efficiency score countries(top four countries: Hong Kong, Singapore, Malaysia, and Taiwan) and lower score countries, then repeat the same test as in Table III without the judicial efficiency and its interaction term with the group dummy but with the country dummies. For lower score countries, the coefficients of the group

1 (not separated at all) improves the market value to book ratio by 1.82. This means that a firm whose ratio of cash flow rights to control rights is the median among all group firms (non-separation variable = 0.68) has the lower market value to book ratio than a firm without separation (non-separation variable =1) by 0.58 (=1.82*(1-0.68)) in 1995. The effects of the Non-Separation variable are similar in other non-crisis years, 1996 and 1999. In 1996 and 1999, the coefficients of Non-Separation variable are significant and positive, 0.92 in 1996 and 2.27 in 1999. For non-distressed firms, the Non-Separation variable has an insignificant effect in all years.[25] These results confirm that the effect of separation between cash flow and control rights on firm valuation become substantial under financial distress while separation does not affect firm valuation when there is no financial distress.[26]

I next ask a central question raised by Prediction 3: whether the bottom firms in the *Pyramid* group get the positive benefit from its group or they suffer from negative group effects under financial distress? The former case is still possible even though the propping up effect is much larger for the non-separated top firms.

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dummy and the non-separation are positive in most years and often significant for distressed firms. On the other hand, for high score countries, those coefficients are not significant and sometimes negative.

[25] I repeat the same test as in Table IV, but with the Anti-Director Rights instead of Judicial Efficiency. The results in Table IV are confirmed and show a comparable separation effect.

[26] One intriguing fact in Table IV is that the separation effect is very weak for not distressed firms. There are at least a few possible interpretations. One is that in the growth economy, such as in East Asia, the ultimate owner does not want to steal but to invest cash flow in a profitable project that a firm plans if the firm is doing business well. It is more beneficial than stealing even for the ultimate owner as well as outside shareholders. Another explanation is that the accounting number of group firms is the number after looting. The separated ownership firm was not swamped in a distress by a real business shock but trapped into a financial trouble by the ultimate owner's looting. The separated firm was "the ultimate owner's pick" to be distressed.

However, the latter attractive story is not confirmed by data. Comparing the separation variables between the distress firms and the not distressed firms, I found little difference in the extent of separation between two groups. If the first story is applicable, then this can be the reason that outsiders invest in the group firms with the pyramid ownership structures in the low investor protection countries. If outside investors expect little risk of economic downturn in emerging market, whether rationally or not, then they do not care about the separation ownership structure.

In Panel A of Table V, distressed firms are classified into more separated or less separated using the median non-separation value (0.68) and these two sets of firms are separately tested for each year. In Panel A, the coefficients of group affiliation for separated firms, in the second row of odd columns, are negative in all years except 1999 and significant in the Crisis years, 1997 and 1998. On the other hand, less separated firms have a positive and significant group effect in all years except 1998. As for interaction term between group affiliation and judicial efficiency, its coefficients are positive for separated firms in all years except for 1999 while they are negative and significant for less separated firms in all years but 1998. These coefficients always have opposite signs of the coefficients of group affiliation.

In Panel B of Table V, group firms are pooled into those with separation or those without. That is, the Non-Separation variable is less than equal to 1 for Separated Firms, on the other hand, it is equal to one for Not Separated Firms. While the coefficients of group affiliation are positive and significant for Not Separated firms in all years but 1998 (the second row in even columns in Panel B), they are negative for Separated Firms in 1996, 1997 and 1998. Comparing Panel B with Panel A of Table V, you can see that a positive group effect for Not Separated Firms in Panel B is generally larger than that for Less Separated Firms in Panel A. On the other hand, the group coefficient for Separated Firms is generally less negative than that for More Separated Firms in Panel A whose non-separation variables score below the median. This is consistent with the Prediction 3 implying that a positive group effect gradually decreases and turns negative as the separation escalates.

These results suggest that top firms in the *Pyramid* structure get propped up by other member firms in the group whereas the group firms in the bottom of the *Pyramid* get looted by the ultimate owner under financial distress. Moreover, these positive and negative group effects become weaker as the investor protection improves. Both facts, the opposite group effect for top firms versus one for bottom firms in pyramid and the positive and negative group effects exist only in low investor protection countries, support the prediction that these group effects are generated through expropriation of outside investors.

Why did outside investors want to be expropriated?

One interesting fact that can be related to Asian Crisis is recognized in Table V. The positive group effect for less separated firms is more strongly significant in non-crisis years both in Panel A and Panel B while the negative group effect for more separated firms is significant only in Crisis years. This fact may shed light on a mystery as to a pyramid group: why did outside shareholders willingly invest in the firms that have a separated ownership structure in spite of expected possibility of expropriation? One possible answer is that outside investors, whether correctly or incorrectly, expected forever East Asian Miracle: the high growth economy in East Asia would continue forever. Then, it may not be irrational that the outside investors thought that the ultimate controlling family would not expropriate them much since there were numerous opportunities for the controlling family to invest cash flow in highly positive net present value projects rather than tunneling cash flow.

The explanation above is also consistent with the results in Table III and Table IV: the group affiliation and non-separation do not matter for not distressed firms. Unless each firm suffers own idiosyncratic shock or an industry shock, the ultimate owner would not tunnel its cash flow since a good investment opportunity would give the ultimate owner higher cash flow (benefit) than tunneling.[27]

However, the expected forever East Asian Miracle was not realized and the Crisis hit the economy. Then, cash flow of group firms with separated ownership structure was tunneled and the market valuation of those firms dived and all investors and economists had suddenly started to criticize the pyramid business group after the Crisis.

Tracing a transmission effect within a group

In order to trace propping up or looting within a pyramid group and to test Prediction 4 in the last section, I use another approach to test the effects on firm valuations among group firms in Table VI through XI. In Table VI, the market value to book ratio of a firm is regressed on the industry average of the market value to book ratio in a given country with the year fixed effect and the firm fixed effect.[28] This approach follows the regression strategy of Bertrand, Mehta, and Mullainathan (2002). They interpret the industry average variable in a given year as a firm specific shock that each firm cannot control.[29] As the firm fixed effect is added, the *level* of the market to book

[27] Friedman and Johnson (2000) model this point. Please see also footnote 26.
[28] Industry controlling groups are defined at the two-digit SIC code level whenever there are at least three firms (excluding sample firms) in a given country in the data set. If they are less than three, I use twelve broad industry categories defined by Campbell (1996).
[29] While Bertrand, Mehta, and Mullainathan (2002) use accounting data (earnings) as a dependent variable, I use the market valuation. They use the accounting number and not the market valuation data for two reasons. One reason is that they intend to directly capture cash transfer to show the existence of tunneling. The other is that their stock price data for India is very noisy because they cover relatively small public firms. I use the market valuation data instead of the accounting data for three reasons. First, my data set

ratio should be considered as a shock. Since this paper focuses on the financial distress effect, which varies depending on the group affiliation or the position within the pyramid group, I add two independent variables: the financial distress dummy and the interaction term between group affiliation and the financial distress dummy. Then, bottom firms and top firms are tested separately. Group firms are classified into the bottom or the top firms according to the relative size of non-separation variable within a given group. Firms with large number of non-separation variable (close to one) are categorized to top firms. For non-group firms, this ranking is defined by the relative size of non-separation level within a given country. If the bottom firms in the pyramid group get looted more than non-group firms during financial distress, the coefficient of the interaction term between group affiliation and financial distress should show a negative sign.

In Table VI, the coefficients of the interaction term between group affiliation and the financial distress are significant and negative for bottom firms (the third row in odd columns) while they are positive for top firms (the third row in even columns). Even after controlled for the firm fixed effect, the industry shock and the economic environment in a given year, financial distress additionally decreases the market value to book ratio by 0.21 for the bottom half group firms (third row in the third column) but additionally increases by 0.10 for the top half firms compared with non-group firms (third row in the

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covers relatively large public firms in eight East Asian countries for which Datastream gives the reliable market price data. Second, in East Asia, it is said that the pyramid business group props up or loots group firms by indirect mechanism and not by cash transfers or transfer pricing. One of the most typical methods is loan guarantee. Therefore, the market valuation data captures the indirect and whole effect of within-group transmission. Finally, since the stock price shows the valuation for outside shareholders and the accounting number itself is not directly related to the payoff for outside shareholders, it is preferable to use the valuation data to measure the group effect on the outside shareholders, whether expropriation or propping up.

fourth column).[30] This firm specific financial distress effect is not negative or significant for non-group firms whose ownership is separated from control. In Table VII, I restrict my samples to group firms and repeat the test in Table VI. I confirm my prior results. While the coefficients of financial distress dummy are negative for bottom firms in all four specifications (the second row in odd columns), they are positive or zero for top firms (the second row in even columns). In Table VIII, group firms are classified to bottom firms or top firms not according to non-separation but according to cash flow ownership within a group. Although the significance level is weaker, the result is consistent with those of Table VI and Table VII: financial distress dummy shows the negative coefficient for bottom group firms but positive for top group firms.[31]

While the results of these three tables confirm the former results up to Table V, the current regression strategy different from the one up to Table V makes it possible to test two opposite hypotheses: tunneling versus insurance. As mentioned in the paragraph related to Prediction 4 in the last section, the tunneling hypothesis is that the bottom firms in the pyramid group are expropriated through tunneling and do not gain any benefit from the group. On the other hand, the insurance hypothesis is that the bottom firms get some benefits under difficult circumstances and they pay some fees for this insurance when they have less difficulty. The results through Table III to Table VIII suggest that the bottom group firms lose their market valuations in their financial distress although the top firms in the pyramid are protected from losing their market valuations. That is, if the insurance hypothesis is applied, it appears that the bottom firms pay insurance fee when

[30] These numbers are compared with non-group firms. The total effect of financial distress on group firms is –0.11 (=-0.21+0.10) for bottom one-half firms and 0.05 (=0.10+(-0.05)) for top one-half firms.

they most need the group insurance in distress so as to gain some kind of group benefit that I can not have identified so far. However, it is not impossible to argue, for instance, that the ultimate controlling family selectively decides to rescue a distressed firm on the top of the pyramid because the whole group cannot survive without the core firm. In the face of a crisis for the whole group, the bottom firms would be looted, but, in the case of mild distress for a single firm (for instance, a negative industry shock), the bottom firms would get insurance. Then, I have to more specifically identify the transmission mechanism of the valuation of firms within a group for the whole period not only during financial distress.

In Table IX, I classify an industry shock into a positive or a negative shock. Using the first difference specification, a change of market value to book ratio of a firm is regressed on a positive or a negative change of an industry average within a given country of market value to book ratio. This is regarded as an own shock of a given firm. Moreover, I add as the independent variables the shocks occurred to other firms in the same group in order to investigate the effects of group shocks on each firm. I classify these group shocks into four categories: the weighted average of positive [negative] shocks occurred to bottom [top] firms.[32] The weight for each firm is calculated as the ratio of its total asset to the sum of the total assets of all group firms in a given group. If the ultimate owner steals from the bottom firms on behalf of the top firms, then the coefficient of positive shock of the bottom firms should be positive for the top firms but

[31] Regressions in Table VI, Table VII and Table VIII are repeated with a different dependent variable: row stock return instead of the market to book ratio for robustness check. The results are weaker but similar to the results through Table VI to Table VIII.

[32] Bertrand and et al (2002) also investigate an effect of group shock on each firm, they do not distinguish between a positive and a negative group shocks. By classifying group shocks into positive and negative, I can identify a transmission effect within a group as I investigate below.

not for the bottom firms. Furthermore, if the top firms get propped up in their distress by looting the bottom firms, I should find a positive coefficient of negative shock of top firms for the bottom firms but not for top firms.[33]

In even columns of Table IX (for top firms), the coefficients for a positive shock of the group bottom firms are significant and positive. This means that the group top firms would increase their market valuations when the bottom firms in the same pyramid business group receive their own positive shock. On the other hand, the coefficients for a positive shock of the group bottom firms are insignificant for bottom firms (in odd columns). That is, a positive shock to the bottom firms only benefits the top firms, but not the bottom firms. Then, how about a negative shock of the top firms? In odd columns (for bottom firms), a negative shock of top firms shows a positive coefficient and it is significant in two cases out of the three. On the other hand, it is not significant at all with zero or even a negative sign for the top firms (in even columns). These facts suggest that a negative shock occurred to a top firm is transmitted to the valuation of the bottom firms but not to other top firms in the same group.

The result of Table IX supports the tunneling hypothesis against the group insurance hypothesis. The bottom firms in the pyramid group get looted to prop up the top firms in the same group when the top firms receive a negative shock and the top firms steal from the bottom firms when the bottom firms have a positive shock.

One possible counter-argument is that the top firms are so influential and the bottom firms so fragile that the bottom firms would be affected by group shocks. The result in Table IX does not support this argument. The positive shocks of top firms have

[33] Since a negative shock takes a negative value (not absolute value), if a distressed top firm negatively affects a bottom firm within a group, then a coefficient for an negative shocks of top firms would be

no effect on the bottom firms although the negative shocks of the top firms significantly affect the bottom firms. The influential top firms asymmetrically affect the bottom firms. Also, the bottom firms asymmetrically affect the top firms. Positive shocks of the bottom firms affect the top firms although the negative ones do not.

5. Conclusion

In this paper, I show that group affiliation has a positive effect on valuation of firms when a firm is in financial distress although this only holds true in low quality investor protection countries and not in those with the good investor protection. Propping up by a group would benefit the controlling owner as well as outside investors in the top firms which, although, is achieved by expropriating outside investors in the bottom firms. This group effect is larger in a country with the lower investor protection because the transfer from the bottom firms can be made at a lower cost and because the private benefit to keep member firms alive is larger in bad investor protection countries. This argument explains why groups are more prevalent in developing countries. Although the group looks like a substitute for legal investor protection, this role is played under higher inefficient expropriation cost and it is incompatible with development of legal outside investor protection. More importantly, evidence shows that a firm belonging to a pyramid group gets propped up only if it is one of top firms in a pyramid. A bottom firm in a pyramid group gets looted under financial distress because its ownership structure entails the separation between cash flow and control rights. In short, I find that groups have a positive effect on valuation only for top firms in the pyramid. Pyramid groups exploit a lack of legal institutions rather than serve as substitutes for them.

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positive.

Additionally, the evidence in Section IV shows that the group firms do not suffer from lower valuation by market because of the separation between cash flow and the control rights unless they are in financial distress. This might be a reason why outsiders invest in the group firms with the pyramid ownership structures in the low investor protection countries. If outside investors expect little risk of economic downturn in emerging market, whether rationally or not, then they do not care about the separation ownership structure.

Appendix A

If the ultimate owner props up firm A, her payoff for each ownership structure is as follows,

(7) $$U(H, PA) = \alpha(\frac{1}{2} - T_{ba}) - \frac{1}{2}kT_{ba}^2 + 2V$$

(8) $$U(V, PA) = \alpha^2(\frac{1}{2} - T_{ba}) - \frac{1}{2}kT_{ba}^2 + 2V$$

(9) $$U(P, PA) = \alpha^2(\frac{1}{2} - T_{ba}) - \frac{1}{2}kT_{ba}^2 + \alpha^2(\frac{1}{2} - T_{ca}) - \frac{1}{2}kT_{ca}^2 + 3V$$

where T_{ij} is the transfer from firm i to firm j.

On the other hand, if the ultimate owner X decides to let firm A die, she gets

(11) $$U(H, LA) = \alpha(\frac{1}{2} - S^*) - \frac{1}{2}kS^{*2} + V$$

(12) $$U(V, LA) = \alpha^2(\frac{1}{2} - S^{**}) - \frac{1}{2}kS^{**2} + V$$

(13) $$U(P, LA) = 2\alpha^2(\frac{1}{2} - S^{**}) - kS^{**2} + 2V$$

Under each ownership structure, the ultimate owner X compares payoffs between propping up to save firm A and looting to let firm A die. She props up firm A if

(14) $U(i,PA)-U(i,LA)>0$ (i = H,V,P)

This condition for each ownership structure can be written,

(15) $H: V-\alpha(T_{ba}-S^{*})-\frac{1}{2}k(T_{ba}^{2}-S^{*2})-S^{*}>0$

(16) $V: V-\alpha^{2}(T_{ba}-S^{**})-\frac{1}{2}k(T_{ba}^{2}-S^{**2})-S^{**}>0$

(17) $P: V-\alpha^{2}(T_{ba}+T_{ca}-2S^{**})-\frac{1}{2}k(T_{ba}^{2}+T_{ca}^{2}-2S^{**2})-2S^{**}>0$

Comparing the *Pyramid* ownership structure with other structures, it is found that the Pyramid structure has a positive effect on the distressed firm.

Proof of Prediction 1

First, *Pyramid* is compared with *Vertical* structure. Taking a difference between the left hand sides of (16) and (15),

$$(16)-(15): \frac{1}{2}kS^{**2}-S^{**}-\alpha^{2}(T_{ba}(P)-S^{**})+\frac{1}{2}kS^{**2}-S^{**}-\alpha^{2}(T_{ca}(P)-S^{**})$$
$$-\frac{1}{2}k(S^{**2}+S^{**}+\alpha^{2}(T_{ba}(V)-S^{**})-\frac{1}{2}k((T_{ba}(P))^{2}-\frac{1}{2}k((T_{ca}(P))^{2}+\frac{1}{2}k((T_{ba}(V))^{2}$$

As the ultimate owner wants to minimize transfers into firm A,

(17) $T_{ba}(P)+T_{ca}(P)=T_{ba}(V)=P_{a}\equiv 2S^{**}+\delta$ ($\delta>0$)

Last equality comes from the assumption that propping needs more than the stolen cash flow. From (17),

$$(16)-(15): \frac{1}{4}kP_{a}^{2}-\frac{1}{2}kS^{**2}=\frac{1}{2}kS^{**2}+kS^{**}\delta+\frac{1}{4}k\delta^{2}>0$$

Therefore, the financially distressed firm in *Pyramid* structure is more likely propped up than in *Vertical* structure.

Similarly, comparing *Pyramid* with *Horizontal* structure, it is found by taking a difference between that the left hand sides of (16) and (14),

$$(18) \qquad (16)-(14)=\frac{1}{2}kS^{**2}+kS^{**}\delta+\frac{1}{4}k\delta^2+(\alpha-\alpha^2)\delta+(S^{**}-S^{*})(1-\frac{1}{2}(\alpha+\alpha^2))$$

Since $S^{**}>S^{*}$ from (6), (18)>0. The distressed firm in *Pyramid* structure is more likely propped up than in *Horizontal* structure. ▪

Proof of Prediction 2

Differentiating the left hand side of (16) with respect to k, it is obtained that:

$$(19) \qquad \begin{aligned}\frac{\partial}{\partial k} &= -\frac{1}{2}T_{ba}^2-\frac{1}{2}T_{ca}^2+\frac{1}{2}S^{**2}+\frac{1}{2}S^{**2}+2kS^{**}\frac{\partial S^{**}}{\partial k}-2\frac{\partial S^{**}}{\partial k}+2\alpha^2\frac{\partial S^{**}}{\partial k}\\ &= -\frac{1}{2}(T_{ba}^2-S^{**2})-\frac{1}{2}(T_{ca}^2-S^{**2})\end{aligned}$$

From (17), (19)<0. The ultimate owner would less likely choose to prop up rather than let troubled firms die as the shareholder protection improves.▪

Proof of Prediction 3

When firm A is financially distressed, the ultimate owner X would consider the equation (16) to decide whether she props up firm A or not. Similarly, when firm B is financially distressed, she would consider the following condition:

$$(20) \qquad V_b-\frac{1}{2}k(T_{ab}-S^{*2})-S^{*}-\alpha(T_{ab}-S^{*})-\frac{1}{2}k(T_{cb}^2-S^{**2})-S^{**}-\alpha^2(T_{ba}-S^{**})>0$$

Comparing the left hand sides of (16) and (20),

$$(21)\qquad (16)-(20): V_a - V_b - \frac{1}{2}k\{T_{ba}^2 + T_{ca}^2 - T_{ab}^2 - T_{cb}^2\} + \frac{1}{2}k(S^{**2} - S^{*2}) - S^{**} + S^{*} \\ -\alpha^2(T_{ba}(P) - S^{**} + T_{ca} - T_{cb}) + \alpha(T_{ab} - S^{*})$$

To minimize the diversion costs, when firm A is propped up, the transfer from firm B should be same amount as from firm C, that is, $T_{ba}=T_{ca}\equiv t=P_a/2$. Also, when firm is propped up, the marginal cost of diversion should be same for firm A and firm C. This means:

$$(22)\qquad kT_{ab} + \alpha = kT_{cb} + \alpha^2 \Leftrightarrow T_{cb} - T_{ab} = \frac{\alpha - \alpha^2}{k}$$

Since $T_{cb}+T_{ab}=P_b=P_a=2t$, (22) leads to

$$(23)\qquad T_{cb} = t + \frac{\alpha - \alpha^2}{2k} \quad , \; T_{ab} = t - \frac{\alpha - \alpha^2}{2k}$$

Assume that $V_a=V_b$. Then, (22) becomes

$$(24)\qquad k\left(\frac{\alpha - \alpha^2}{2k}\right)^2 + \alpha(1-\alpha)\delta$$

From (19), $\delta>0$, then (24)>0. Therefore, the ultimate owner would more willingly prop up firm A, not separated ownership structure firm, than firm B with separated ownership structure.▪

Proof of Prediction 4

Until now, I assume that both transfer and stealing do not simultaneously occur since a large amount of transfer is needed to prop up in financial distress. As for Prediction 4, I now have to think that both transfer and stealing simultaneously occur because a positive shock gives a plenty of cash flow to transfer and steal.

Suppose that transfer entails a lower cost than stealing since stealing cash flow into the pocket of the ultimate owner more directly violates the laws than transferring cash flow of one public firm into other public firms in the same group in most countries. Then, the utility function for the ultimate owner is as follows:

$$\begin{aligned} U(P) &= \alpha(\frac{1}{2} - S_a - T_{ab} - T_{ac} + T_{ba} + T_{ca}) + S_a - \frac{1}{2}kS_a^2 - \frac{1}{2}\lambda k(T_{ab} + T_{ac})^2 \\ &+ \alpha^2(\frac{1}{2} - S_b - T_{ba} - T_{bc} + T_{ab} + T_{cb}) + S_b - \frac{1}{2}kS_b^2 - \frac{1}{2}\lambda k(T_{ba} + T_{bc})^2 \\ &+ \alpha^2(\frac{1}{2} - S_c - T_{ca} - T_{cb} + T_{ac} + T_{bc}) + S_c - \frac{1}{2}kS_c^2 - \frac{1}{2}\lambda k(T_{ca} + T_{cb})^2 + 3V \end{aligned} \quad (25)$$

where $0<\lambda<1$. In the case of positive shock occurs to Firm B (bottom firm), i.e. if cash flow of Firm B is large enough, then the ultimate owner will steal and transfer as follows:

$$S_a = S^* = \frac{1-\alpha}{k}\ ,\ S_b = S_c = S^{**} = \frac{1-\alpha^2}{k}$$

$$T_{ba} \equiv T^* = \frac{1-\alpha}{\lambda k}\ ,\ T_{bc} = 0$$

For simplicity, I only focus on the transfer from the firm with a positive shock (here, Firm B) and ignore the transfer from firms without positive shocks (Firm A and Firm C). There is no merit to transfer cash flow from one bottom firm into other bottom firms with transferring cost. However, there is an incentive to transfer form the bottom firm to the top firm, i.e. from Firm B to Firm A, because transferring entails lower cost than stealing

directly into own pocket in spite of getting only partial amount of cash flow transferred ($\alpha<1$).

In the cash of positive shock occurred to the top firm, Firm A, on the other hand, the ultimate owner will steal and transfer as follows:

$$S_a = S^* = \frac{1-\alpha}{k}\ ,\ S_b = S_c = S^{**} = \frac{1-\alpha^2}{k}$$

$$T_{ab} = T_{ac} = 0$$

There is no merit to transfer cash flow from the top firm into the bottom firms with transferring cost even though the transferring cost is cheaper than stealing. Therefore, a positive shock occurred in bottom firms positively affects top firms in the same group through transferring ($T_{ba} > 0$), a positive shock of top firms does not affect bottom firms ($T_{ab} = T_{ac} = 0$). ▪

Appendix B

Suppose that the ultimate owner X has already established the firm A and the firm B by the *Vertical* ownership structure: X directly owns α cash flow right of the firm A, which in turn owns α cash flow right of the firm B, then X controls the firm B with owning α^2 cash flow right through vertical chain. Now X wants to establish a new firm, firm C, and X has three choices: *Horizontal* (X directly owns α cash flow right of firm C), *Pyramid* (firm A owns α cash flow right of firm C as well a α cash flow right of firm C s one of firm B), and *Vertical* (firm B whose α cash flow right is owned by firm A in turn owns α cash flow right of firm C). I analyze here only the simplest case that α is fixed, that is, the initial owner of firm C would sell the fixed amount of shares to outside

shareholders, 1-α. The initial owner would get the cash flow the outside investors pay for 1-α shares of firm C. However, he should also pay a starting up cost ***I*** that is required to set up firm C. That is, X in the horizontal case, firm A in the pyramid case, and firm B in the vertical case, they would pay the starting up cost and get the cash flow paid by outside investors. This assumption follows Wolfenzon (1999).

For expositional simplicity, I assume that the firm C exists for only one period. Using the same notation in section 3, the ultimate owner X will get

$$C(H) = \alpha(1 - S^*) + S^* - \frac{1}{2}kS^{*2} + \{(1-\alpha)(1-S^*) - I\} \quad \text{(B1)}$$

$$C(P) = \alpha^2(1 - S^{**}) + S^{**} - \frac{1}{2}kS^{**2} + \alpha\{(1-\alpha)(1-S^*) - I\} \quad \text{(B2)}$$

$$C(V) = \alpha^3(1 - S^{***}) + S^{***} - \frac{1}{2}kS^{***2} + \alpha^2\{(1-\alpha)(1-S^{***}) - I\} \quad \text{(B3)}$$

where $S^* = \frac{1-\alpha}{k}, S^{**} = \frac{1-\alpha^2}{k}, S^{***} = \frac{1-\alpha^3}{k}$

if he chooses H(horizontal), P(pyramid), or V(vertical) respectively. In each equation, the first two terms represent the cash flow that the ultimate owner X would get through stealing after establishment of firm C and the last term shows a upfront payment that the outside investors pay upfront for 1-α shares of firm C. The ultimate owner X would get this upfront payment directly (horizontal case) or through his ownership of the cash flow right of firm A (pyramid case) or firm B (vertical case).

To compare the payoffs for X under three ownership structures, I take the differences between (B1), (B2), and (B3):

$$C(H) - C(P) = (1-\alpha)\{1 - I - \frac{(1-\alpha)(2-\alpha^2)}{2k}\} < 0 \quad \text{(B4)}$$

$$C(P) - C(V) = \alpha(1-\alpha)\{1 - I - \frac{\alpha(1-\alpha)(2-\alpha^2)}{2k}\} > 0 \quad \text{(B5)}$$

Pyramid ownership structure will be chosen if (B4) and (B5) are satisfied. It is easily found that it depends on the range of parameters. This range is

$$\frac{\alpha(1-\alpha)(2-\alpha^2)}{2k} < 1 - I < \frac{(1-\alpha)(2-\alpha^2)}{2k} \quad \text{(B6)}$$

For instance, if I=0.8 (20% investment return), when α=0.25, (B6) will be 0.89<k<3.55; when α=0.5, (B6) will be 1.09<k<2.19. If k is smaller (larger) than this range, the vertical (horizontal) ownership will be chosen. This simple calculation is informative. Although it is very difficult to interpret the absolute level of k as the index of investor protection level, k can be regarded as the relative size to profit level (normalized one) and other variables. From the analysis in section 3 and this Appendix B, you can see that the ultimate owner would steal all of cash flow in firms under a wide range of α if k were smaller than one (S^{**} would be larger than one, for instance, if α<0.45 when k=0.8). Therefore, if you think that the model in this paper as well as ones in other literature is applicable to capture the relationship between tunneling and investor protection in the real world, then k should be larger than one even in developing countries. If k is larger than one, for ordinary α (roughly speaking less than 0.5), the ultimate owner should use the pyramid structure (when k is small) or the horizontal structure (when k is large) but he would not want to use the vertical structure for firm C. This argument is consistent with the fact that the business group does not usually use the long vertical chain in real world.

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Table I: Description of Variables

Variables	Description
Control Rights	*Claessens et al (2000).* Equal to the fraction of the firm's voting rights owned by its controlling shareholder. To measure control rights, they combine a shareholder's direct (i.e. through shares registered in her name) and indirect (i.e. through shares held by entities that, in turn, she control) voting rights in the firm. A shareholder has an x% indirect control of the firm A if (1) she controls directly the firm B which, in turn, directly control x% of the votes in the firm A, or (2) she controls directly the firm C which in turn controls the firm B which, in turn, directly controls x% of the votes in the firm A.
Cash Flow Rights	*Claessens et al (2000).* Ultimate cash flow right of the controlling shareholder in the sample firm. Cash flow rights are computed as the product of all the equity stakes along the control chain.
Non-Separation	The ratio of the Cash flow rights to the control rights.
Efficiency of Judiciary system	By the country-risk rating agency *Business International Corporation.* This is the assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms." It "may be taken to represent investors' assessments of conditions in the country in question." Average between 1980-1983. *LLSV(1998).*
Anti-Director Rights	*LLSV(1998).* This index is formed by adding one when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholder meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of shre capital that entitles a shareholder to call for an Extraordinary Shareholers' Meeting is less than or equal to ten percent; (6) or when shareholders have preemptive rights that can only be waved by a shareholders meeting.
Non-Separation* judicial efficiency	Equal to the product of Non-separation and Efficiency of Judiciary system.
Non-Separation* Anti-Director Rights	Equal to the product of Non-separation and anti-Director Rights.
Group	Equal to 1 if a firm is belong to a family business group in each country, otherwise 0. *Claessens et al (2000).*
Market Value to Book Ratio	This is the share price dividend by the net tangible assets per share for each financial year-end, adjusted for capital changes. *Datastream*.

Table I: Description of Variables (Continue)

Variables	Description
Financial Distress	A firm is defined to be in financial distress in a given year if its interest expense is larger than its operating income in each fiscal year. Interest expense and operating income from *Worldscope*.
Financial need	Interest expense minus operating income.
Ranking of non-separation	Ranking within a given group in respect of the relative size of non-separation variable. Firms with large number of non-separation variable (close to one) are categorized to top firms. For non-group firms, this ranking is defined by the relative size of non-separation level within a given country.
Ranking of cash flow	Ranking within a given group in respect of the relative size of non-separation variable. Firms with large number of cash flow ownership are categorized to top firms.
Industry shock	An industry average of the market value to book ratio within a country in each year. Industry controlling groups are defined at the two-digit SIC code level whenever there are at least three firms (excluding sample firms) in a given country in the data set. If they are less than three, I use twelve broad industry categories defined by *Campbell (1996).*
Group shock	A weighted average (by sales) of an industry shock for each firm within a given group. An own shock, an industry shock for a given firm is excluded. This group shock is classified into four categories: positive [negative] shock of bottom [top] firms.

Table II: Summery Statistics for Group and Non-Group Firms

Sample:	*All Firms*	*Group Firms*	*Non-Group Firms*
Total Assets	1,371 (4,065)	1,522 (4,206)	1,264 (3,963)
Total Sales	434 (1,318)	508 (1,304)	380 (1,327)
Market Capitalization	889 (2,946)	914 (2,618)	872 (3,170)
Sales Growth	1.23 (0.85)	1.19 (0.43)	1.27 (1.07)
Operating Income	70.4 (266.9)	81.8 (205.5)	61.8 (266.9)
Interest Expense	30.7 (101.9)	46.3 (135.1)	19.0 (64.7)
Debt to Equity Ratio	1.02 (1.48)	1.21 (1.67)	0.86 (1.31)
Financial Need/Sale	-0.06 (0.57)	-0.05 (0.84)	-0.07 (0.22)
Price to Book Value	1.82 (1.39)	1.72 (1.40)	1.89 (1.38)
Cash Flow ownership (%)	25.0 (12.9)	24.4 (13.0)	25.5 (12.9)
Non-Separation	0.84 (0.22)	0.79 (0.24)	0.88 (0.22)
Year of Establish	1967 (20.2)	1967 (22.5)	1967 (18.1)
Number of Firms	1048	453	595

1. Data source: *Worldscope, Claessens et al (2000).* All data represent in the end of 1996 fiscal year. All monetary variables are expressed in thousand US dollar.
2. Standard deviations are in prentheses.

Table III: Group Effect with Judicial Efficiency

Ordinary least square regressions of the market value to book ratio on group affiliation, judicial efficiency and selected control variables. Regressions are performed separately for distressed and not distressed firms. A firm is defined to be in financial distress if its interest expense is larger than its operating income in each fiscal year. The independent variables are (1) Financial Needs: the interest expense minus operating income, (2) Group: equal to 1 if a firm belongs to an industrial group in each country, otherwise 0, (3) Judicial Efficiency: the index of Judicial Efficiency of the country in which the firm is incorporated, (4) the interaction between Group and Efficiency of the judiciary system, (5) Non-Separation: the ratio of cash flow right to control right of the controlling shareholder. (6) Cash Flow ownership: cash flow rights of the controlling shareholder. Industry dummies are included but not reported in all specifications. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: Market Value to Book Ratio*									
	1995		*1996*		*1997*		*1998*		*1999*	
	Distressed Firms	*Not distressed*	*Distressed Firms*	*Not distressed*	*Distressed Firms*	*Not distressed*	*Distressed Firms*	*Not Distressed*	*Distressed Firms*	*Not Distressed*
Financial needs	-0.01	-2.36 [a]	0.03	-2.88 [a]	-0.03	-2.60 [a]	-0.05	-1.67 [a]	0.00	-2.58 [a]
	(0.88)	(0.00)	(0.69)	(0.00)	(0.66)	(0.00)	(0.26)	(0.00)	(0.64)	(0.00)
Group (GP)	1.61 [a]	0.00	0.65	-0.07	0.23	-0.64 [c]	-0.34	-0.20	1.96 [a]	0.81
	(0.00)	(0.99)	(0.18)	(0.85)	(0.53)	(0.06)	(0.14)	(0.52)	(0.00)	(0.11)
Judicial Efficiency (JEF)	0.13 [a]	0.03	0.14 [a]	0.06 [c]	0.003	-0.03	-0.03 [c]	-0.04	0.14 [a]	0.07 [c]
	(0.01)	(0.27)	(0.00)	(0.06)	(0.92)	(0.25)	(0.08)	(0.13)	(0.01)	(0.09)
GP * JEF	-0.25 [a]	-0.01	-0.13 [b]	-0.01	-0.04	0.04	0.03	0.008	-0.23 [a]	-0.12 [c]
	(0.00)	(0.73)	(0.03)	(0.83)	(0.35)	(0.28)	(0.28)	(0.82)	(0.00)	(0.06)
Non-Separation	0.78	-0.13	0.18	-0.00	-0.20	0.15	-0.25	0.43	1.19 [b]	0.37
	(0.11)	(0.68)	(0.62)	(0.97)	(0.57)	(0.59)	(0.21)	(0.11)	(0.05)	(0.46)
Cash Flow Ownership	-0.25	0.49	-0.08	0.61	0.49	0.13	0.04	-0.28	-2.83 [a]	0.27
	(0.79)	(0.38)	(0.92)	(0.29)	(0.41)	(0.79)	(0.89)	(0.55)	(0.01)	(0.74)
Growth of sales	-0.09	-0.00	0.00	0.65 [a]	-0.01	-0.09	0.00	0.06	0.13	0.30
	(0.63)	(0.92)	(0.91)	(0.00)	(0.80)	(0.52)	(0.59)	(0.40)	(0.64)	(0.18)
Debt to equity ratio	0.03	-0.02	0.02	-0.07	0.00	0.01	0.002 [b]	-0.06	0.06 [a]	0.03
	(0.40)	(0.75)	(0.59)	(0.36)	(0.64)	(0.54)	(0.05)	(0.12)	(0.00)	(0.64)
Intercept	0.17	1.79 [a]	1.13	0.61	0.98	0.92 [c]	1.28 [a]	1.22 [a]	-1.83	0.30
	(0.82)	(0.00)	(0.16)	(0.31)	(0.12)	(0.08)	(0.00)	(0.00)	(0.14)	(0.70)
N	131	418	198	503	238	499	348	383	172	302
R^2	0.18	0.08	0.15	0.13	0.12	0.11	0.07	0.12	0.29	0.14

Table IV: Separation effect for Group firms (with Judicial Efficiency)

Ordinary least square regressions of the market value to book ratio on separation index, judicial efficiency and selected control variables. Regressions are performed separately for distressed and not distressed firms. A firm is defined to be in financial distress if its interest expense is larger than its operating income in each fiscal year. The independent variables are (1) Financial Needs: the interest expense minus operating income, (2) Judicial Efficiency: the index of Efficiency of the judiciary system of the country in which the firm is incorporated, (3) Non-Separation: the ratio of cash flow right to control right of the controlling shareholder, (4) Cash Flow ownership: cash flow rights of the controlling shareholder. Industry dummies are included but not reported in all specifications. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: Market Value to Book Ratio*									
	1995		*1996*		*1997*		*1998*		*1999*	
	Distressed Firms	*Not distressed*	*Distressed Firms*	*Not distressed*	*Distressed Firms*	*Not distressed*	*Distressed Firms*	*Not Distressed*	*Distressed Firms*	*Not Distressed*
Financial needs	-0.09	-2.82 [b]	0.02	-4.68 [a]	-0.08	-2.17 [a]	-0.05	-1.50 [b]	0.00	-2.69 [b]
	(0.85)	(0.02)	(0.81)	(0.00)	(0.40)	(0.01)	(0.39)	(0.02)	(0.66)	(0.04)
Judicial Efficiency (JEF)	-0.08	0.01	0.01	0.05 [d]	-0.04	0.00	-0.00	-0.03	-0.00	-0.00
	(0.15)	(0.61)	(0.68)	(0.15)	(0.31)	(0.92)	(0.78)	(0.34)	(0.95)	(0.90)
Non-Separation	1.82 [a]	-0.30	0.92	-0.06	0.68 [c]	0.26	-0.04	0.29	2.27 [b]	-0.57
	(0.01)	(0.57)	(0.13)	(0.90)	(0.28)	(0.57)	(0.89)	(0.46)	(0.03)	(0.43)
Cash Flow Ownership	-0.42	1.06	-0.24	0.75	0.48	-0.28	-0.04	-0.15	-2.99 [c]	2.06
	(0.80)	(0.25)	(0.84)	(0.44)	(0.61)	(0.75)	(0.93)	(0.84)	(0.08)	(0.14)
Growth of sales	0.13	0.00	0.38	0.67 [b]	0.01	-0.43	0.00	0.06	0.48	-0.25
	(0.59)	(0.94)	(0.27)	(0.03)	(0.85)	(0.16)	(0.74)	(0.68)	(0.34)	(0.31)
Debt to equity ratio	0.05	-0.04	-0.00	-0.08	0.00	0.02	0.00	-0.02	0.14 [a]	0.26
	(0.25)	(0.69)	(0.88)	(0.50)	(0.43)	(0.39)	(0.72)	(0.65)	(0.00)	(0.11)
Intercept	0.07	1.50	-0.18	-0.32	0.13	0.90	0.57	0.84	-1.50	1.04
	(0.92)	(0.17)	(0.83)	(0.75)	(0.86)	(0.38)	(0.30)	(0.24)	(0.33)	(0.40)
N	61	177	81	213	97	206	149	149	79	117
R^2	0.34	0.09	0.12	0.18	0.15	0.07	0.07	0.14	0.43	0.20

Table V: Group effect for Separated and Non-Separated Distressed firms

Ordinary least square regressions of firms in eight East Asian countries. The distressed firm is defined as the firm whose interest expense is larger than operating income. In Panel A, Separated Firms and Less Separated Firms are divided by the median Non-separation value in the data set (0.68). In Panel B, Separated Firms have the separation ownership between the cash flow and the control rights. Not-Separated Firms do not have it: i.e. non-separation variable equal one for them. The dependent variables are calendar year end numbers of price to book value for each company. The independent variables are (1) Efficiency of the judiciary system: the index of Efficiency of the judiciary system of the country in which the firm is incorporated, (2) Group: equal to 1 if a firm belongs to industrial group in each country, otherwise 0. Sales growth, and Debt to equity ratio are controlled and industry dummies are included. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

(Panel A)

Independent Variables	*Dependent Variable: Market Value to Book Ratio*									
	1995		*1996*		*1997*		*1998*		*1999*	
	More Separated	*Less Separated*	*More Separated*	*Less Separated*	*More Separated*	*Less Separated*	*More Separated*	*Less Separated*	*More Separated*	*Less Separated*
Judicial Efficiency (JEF)	-0.15	0.14 [a]	-0.02	0.17 [a]	-0.28 [a]	0.02	-0.15 [b]	-0.02	0.15 [d]	0.11 [d]
	(0.46)	(0.00)	(0.78)	(0.00)	(0.00)	(0.45)	(0.04)	(0.25)	(0.14)	(0.11)
Group (GP)	-1.87	1.66 [a]	-0.88	1.13 [c]	-2.64 [a]	0.73 [c]	-1.80 [a]	-0.03	0.95	1.72 [a]
	(0.27)	(0.01)	(0.35)	(0.06)	(0.00)	(0.08)	(0.01)	(0.88)	(0.28)	(0.01)
GP*JEF	0.12	-0.26 [a]	0.01	-0.18 [b]	0.29 [a]	-0.10 [c]	0.20 [b]	-0.00	-0.15	-0.18 [c]
	(0.56)	(0.00)	(0.88)	(0.02)	(0.01)	(0.08)	(0.02)	(0.96)	(0.16)	(0.07)
N	34	97	61	137	64	174	83	267	46	126
R^2	0.33	0.27	0.33	0.23	0.43	0.11	0.31	0.06	0.37	0.34

(Panel B)

Independent Variables	*Dependent Variable: Market Value to Book Ratio*									
	1995		*1996*		*1997*		*1998*		*1999*	
	Separated Firms	*Not Separated*	*Separated Firms*	*Not Separated*	*Separated Firms*	*Not Separated*	*Separated Firms*	*Not Separated*	*Separated Firms*	*Not Separated*
Judicial Efficiency (JEF)	0.17	0.12 [b]	0.05	0.18 [a]	-0.06 [a]	0.03	-0.05	-0.03	0.24 [a]	0.08
	(0.16)	(0.03)	(0.56)	(0.00)	(0.42)	(0.42)	(0.27)	(0.20)	(0.00)	(0.30)
Group (GP)	1.04	2.06 [a]	-0.31	1.61 [b]	-1.27 [c]	1.13 [b]	-0.95 [b]	0.05	1.60 [b]	1.30
	(0.35)	(0.00)	(0.67)	(0.02)	(0.08)	(0.02)	(0.05)	(0.84)	(0.03)	(0.11)
GP*JEF	-0.23	-0.32 [a]	-0.05	-0.24 [a]	0.12	-0.15 [b]	0.12 [b]	-0.02	-0.24 [a]	-0.12
	(0.11)	(0.00)	(0.63)	(0.00)	(0.16)	(0.02)	(0.05)	(0.66)	(0.01)	(0.30)
N	48	83	80	118	89	149	126	224	70	102
R^2	0.32	0.35	0.20	0.30	0.21	0.20	0.22	0.08	0.69	0.31

Table VI: Distress Effects on Separated and Non-Separated firms

Firm fixed effects regressions of market value to book for years from 1992 to 2000 on industry shock, financially distressed dummy, the interaction term between group affiliation and financially distressed dummy and selected control variables. Regressions are performed separately for highly separated and less separated firms. Firms are divided by the ranking of non-separation within a family group (for group firms) or within a country (for non-group firms) into bottom firms or top ones. A top firm has the largest non-separation index within each group or each country. The independent variables are (1) Industry shock: an industry average of the market value to book ratio within a country in each year, (2) financial distress dummy: equal to 1 if a firm's interest expense is larger than its operating income in each fiscal year, (3) the interaction between Group and Financial distress dummy. Year fixed effects and firm fixed effects are included. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: The Market Value to Book Ratio*							
Ranking of Non-Separation	*Bottom 1/3*	*Top 2/3*	*Bottom 1/2*	*Top 1/2*	*Bottom 2/3*	*Top 1/3*	*Below Top*	*Topmost*
Industry shock	0.70 [a]	1.06 [a]	0.83 [a]	1.06 [a]	0.85 [a]	1.06 [a]	0.90 [a]	1.04 [a]
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Financial Distress dummy	0.06	-0.03	0.10	-0.05	0.08	-0.07	0.07	-0.06
	(0.49)	(0.55)	(0.22)	(0.35)	(0.28)	(0.24)	(0.33)	(0.28)
Group* Financial Distress	-0.19	0.05	-0.21 [c]	0.10	-0.18 [c]	0.13	-0.14	0.14
	(0.17)	(0.56)	(0.08)	(0.22)	(0.10)	(0.13)	(0.18)	(0.15)
Growth of sales	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.77)	(0.77)	(0.84)	(0.77)	(0.86)	(0.75)	(0.86)	(0.74)
Debt to equity ratio	-0.02 [c]	0.01 [a]	-0.01	0.01 [a]	0.004 [c]	0.04 [a]	0.006 [a]	0.03 [a]
	(0.09)	(0.00)	(0.33)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)
Log of total sales	-0.07	0.04	0.01	0.04	0.00	0.05	-0.00	0.06
	(0.33)	(0.24)	(0.80)	(0.30)	(0.98)	(0.22)	(0.89)	(0.16)
N	649	2910	962	2597	1187	2372	1304	2255
Adjusted R^2	0.72	0.71	0.71	0.72	0.72	0.72	0.71	0.72

Table VII: Distress Effect on Separated and Non-Separated Group firms

Firm fixed effects regressions of market value to book for years from 1992 to 2000 on industry shock, financially distressed dummy, and selected control variables. Regressions are performed separately for highly separated and less separated group firms. Group firms are divided by the ranking of non-separation within a family group. A top firm has the largest non-separation index within each group. The independent variables are (1) Industry shock: an industry average of the market value to book ratio within a country in each year, (2) financial distress dummy: equal to 1 if a firm's interest expense is larger than its operating income in each fiscal year. Year fixed effects and firm fixed effects are included. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: The Market Value to Book Ratio*							
Ranking of Non-Separation	*Bottom 1/3*	*Top 2/3*	*Bottom 1/2*	*Top 1/2*	*Bottom 2/3*	*Top 1/3*	*Below Top*	*Topmost*
Industry shock	0.47 [a]	1.04 [a]	0.65 [a]	1.04 [a]	0.73 [a]	1.02 [a]	0.82 [a]	1.00 [a]
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Financial Distress Dummy	-0.15	0.01	-0.15	0.05	-0.13	0.03	-0.10	0.06
	(0.17)	(0.85)	(0.11)	(0.46)	(0.11)	(0.64)	(0.22)	(0.46)
Growth of sales	-0.12	-0.00	-0.16 [c]	-0.00	-0.09	-0.00	-0.09	-0.00
	(0.36)	(0.45)	(0.07)	(0.47)	(0.16)	(0.42)	(0.15)	(0.42)
Debt to equity ratio	-0.14 [b]	0.008 [a]	-0.00	0.008 [a]	0.005 [b]	0.06 [a]	0.007 [a]	0.04 [a]
	(0.02)	(0.00)	(0.87)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
Log of total sales	0.00	0.03 [a]	0.03	0.05	0.01	0.05	0.00	0.08
	(0.95)	(0.55)	(0.56)	(0.41)	(0.82)	(0.44)	(0.88)	(0.28)
N	260	1217	433	1044	572	905	663	814
Adjusted R^2	0.68	0.70	0.69	0.70	0.71	0.70	0.69	0.70

Table VIII: Distress Effect on Separated and Non-Separated Group firms

Firm fixed effects regressions of market value to book for years from 1992 to 2000 on industry shock, financially distressed dummy, and selected control variables. Regressions are performed separately for firms with highly separated and less separated firms. Firms are divided by the ranking of cash flow ownership within a family group. A top firm has the largest cash flow ownership share within each group. The independent variables are (1) Industry shock: an industry average of the market value to book ratio within a country in each year, (2) financial distress dummy: equal to 1 if a firm's interest expense is larger than its operating income in each fiscal year. Year fixed effects and firm fixed effects are included. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: The Market Value to Book Ratio*							
Cash Flow ownership	*Bottom 1/3*	*Top 2/3*	*Bottom 1/2*	*Top 1/2*	*Bottom 2/3*	*Top 1/3*	*Below Top*	*Topmost*
Industry shock	0.67 [a]	1.00 [a]	0.80 [a]	1.02 [a]	0.77 [a]	1.10 [a]	0.86 [a]	1.28 [a]
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Financial Distress Dummy	-0.15	0.02	-0.12	0.07	-0.07	0.09	0.00	0.04
	(0.22)	(0.67)	(0.18)	(0.36)	(0.29)	(0.40)	(0.95)	(0.81)
Growth of sales	-0.07	-0.00	-0.03	-0.00	-0.02	-0.00	0.00	-0.00
	(0.40)	(0.39)	(0.62)	(0.36)	(0.69)	(0.42)	(0.42)	(0.36)
Debt to equity ratio	0.11 [a]	0.006 [b]	0.007 [a]	0.04 [a]	0.007 [a]	0.04 [a]	0.009 [a]	-0.00
	(0.00)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.79)
Log of total sales	0.10	0.00	0.05	0.03	0.05	0.04	0.02	-0.05
	(0.33)	(0.90)	(0.42)	(0.64)	(0.30)	(0.65)	(0.61)	(0.81)
N	367	1110	599	878	832	645	1202	275
Adjusted R^2	0.69	0.70	0.68	0.71	0.70	0.70	0.70	0.67

Table IX: Own and Group Effects on the Bottom and the Top firms

First difference of the market value to book for years from 1992 to 2000 is regressed on own and group shocks and selected control variables. Regressions are performed separately for firms with the bottom and the top firms. Firms are divided by the ranking of cash flow ownership within a family group (Last two columns are with or without separation of cash flow rights from control rights.). The independent variables are (1) Own positive or negative shock: first difference of an industry average of the market value to book ratio within a country in a given year, (2) Group shocks of the bottom [top] firms: weighted average of the industry shocks to all firms in the same group (excluding the firm itself) that have below [above] median level of cash flow rights. Sales growth, and Debt to equity ratio, log of total sales and year effects are included. P-values are shown in parentheses. a=Significant at 1% level; b=Significant at 5% level; c=Significant at 10% level.

Independent Variables	*Dependent Variable: First difference of the Market Value to Book Ratio*					
Cash Flow or Separation	*Bottom 1/2*	*Top 1/2*	*Bottom 2/3*	*Top 1/3*	*Separated Firms*	*Non-Separated*
Own positive shock	1.05 [a]	1.15 [a]	1.03 [a]	1.15 [a]	0.73 [a]	1.19 [a]
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Own negative shock	0.69 [a]	0.97 [a]	0.58 [a]	1.10 [a]	0.50 [a]	1.09 [a]
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Group shocks						
Positive shock of bottom firms	-0.55	0.78 [a]	-0.38	0.80 [a]	0.47	0.56 [b]
	(0.21)	(0.00)	(0.31)	(0.00)	(0.19)	(0.04)
Negative shock of bottom firms	-0.10	0.35	-0.03	0.34	0.40	-0.09
	(0.27)	(0.43)	(0.91)	(0.56)	(0.16)	(0.86)
Positive shock of top firms	-0.36	0.02	-0.00	-0.09	-0.15	0.00
	(0.20)	(0.90)	(0.99)	(0.68)	(0.44)	(0.99)
Negative shock of top firms	0.36	0.00	0.51 [a]	-0.14	0.53 [a]	-0.16
	(0.18)	(0.99)	(0.01)	(0.59)	(0.00)	(0.51)
N	305	449	420	334	341	413
Adjusted R^2	0.38	0.37	0.40	0.36	0.42	0.37

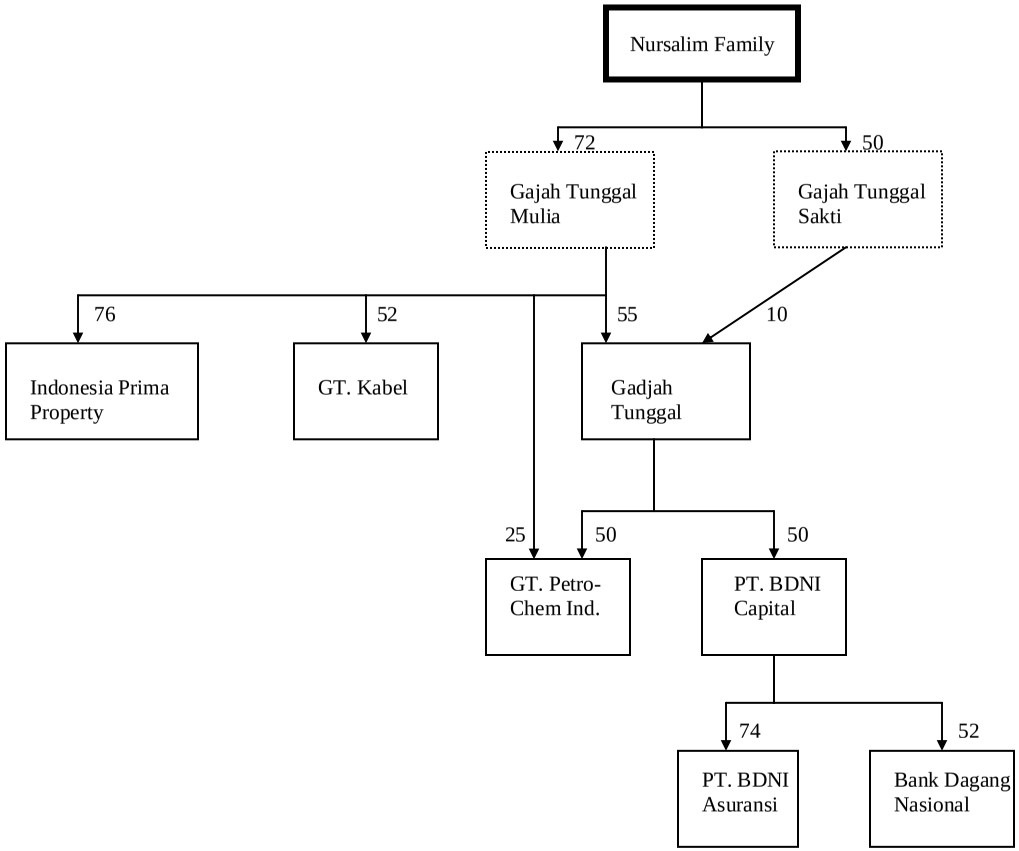

Figure 1

Nursalim group (Indonesia)

Ownership structure of the Nursalim Group in Indonesia. The controlling owner is shown in the thick-bordered boxes. Arrows represent ownership shares, expressed as a fraction of cash flow rights. Broken line box indicates privately held firms, otherwise firms are publicly traded.

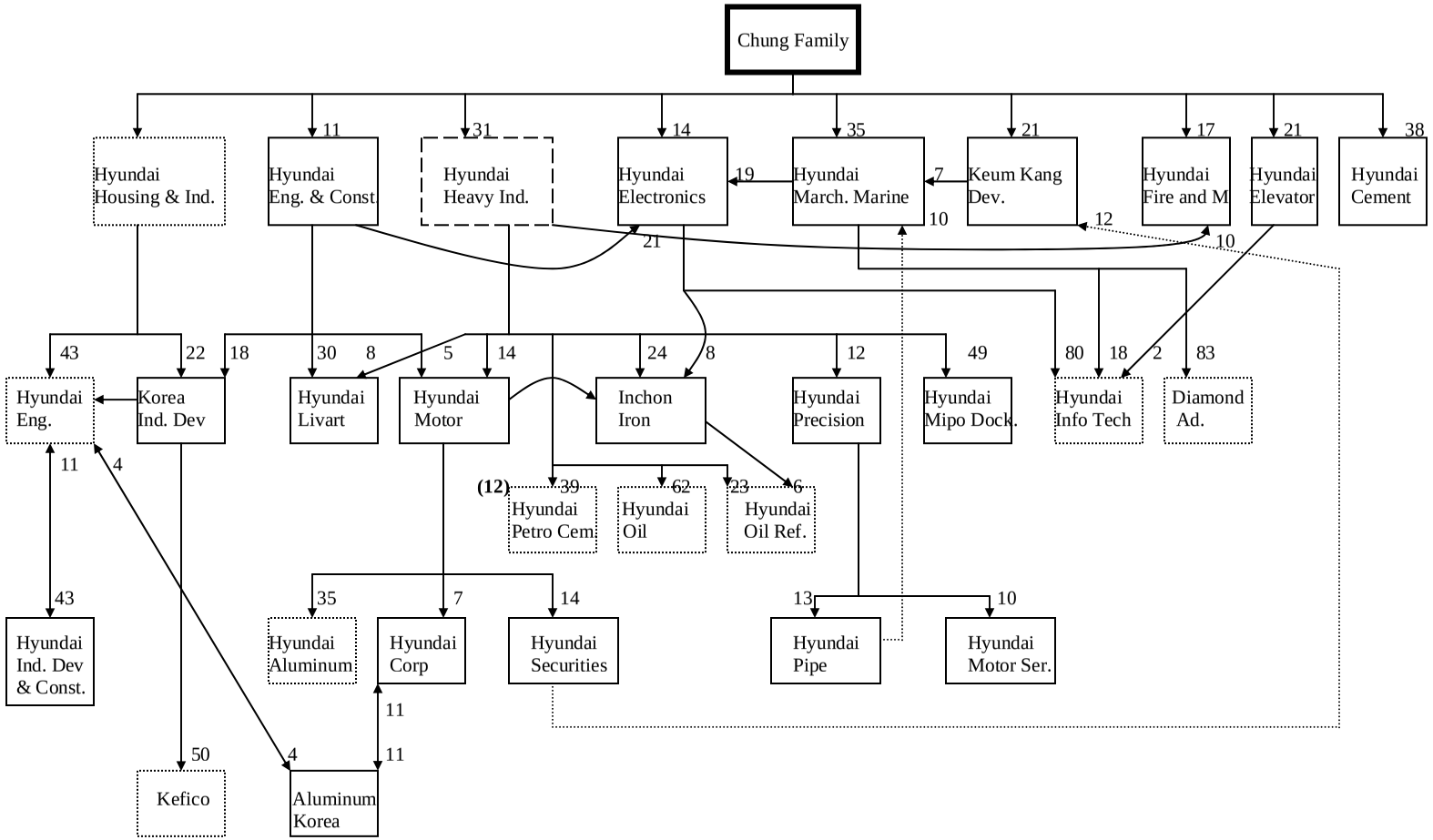

Figure 2

Hyundai Group (South Korea)

Ownership structure of the Hyundai Group in South Korea. The controlling owner is shown in the thick-bordered boxes. Arrows represent ownership shares, expressed as a fraction of cash flow rights. Broken line arrows represent cross-holding shares. Broken line box indicates privately held firms, otherwise firms are publicly traded.

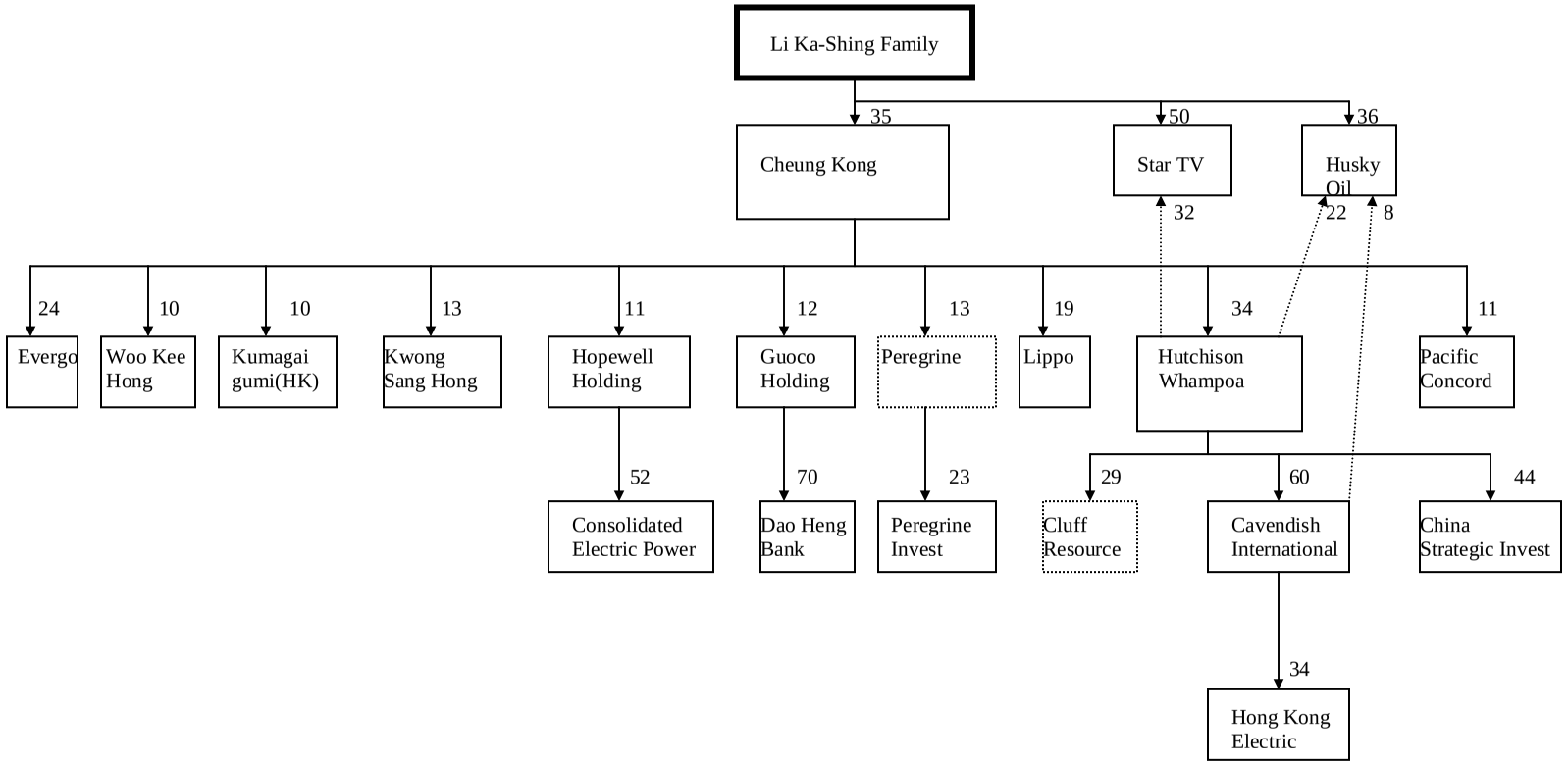

Figure 3

Li Ka-Shing Group (Hong Kong)

Ownership structure of the Li Ka-Shing Group in Hong Kong. The controlling owner is shown in the thick-bordered boxes. Arrows represent ownership shares, expressed as a fraction of cash flow rights. Broken line arrows represent cross-holding shares. Broken line box indicates privately held firms, otherwise firms are publicly traded.