Are Agency Costs Fully Priced?
Evidence from Public Listings of Subsidiaries in Japan[*]

Sergey Chernenko
Harvard Business School
schernenko@hbs.edu

Fritz Foley
Harvard Business School and NBER
ffoley@hbs.edu

Robin Greenwood
Harvard Business School and NBER
rgreenwood@hbs.edu

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Abstract

We study the stock market performance of 431 subsidiaries listed in Japan during the 1980-2005 period. By retaining controlling stakes after listing, parent firms are able to divert resources to their own benefit. We find that minority shareholders in subsidiaries do not anticipate the full extent of such diversion and tend to overpay for subsidiary equity at the time of listing. This effect is particularly pronounced among subsidiaries for which resource diversion can be expected ex ante, such as subsidiaries that have a sales relationship with the parent company. Such subsidiaries earn monthly risk-adjusted returns of -71 basis points in the two-years after listing. A quarter of listed subsidiaries are eventually repurchased by their parents, after generating median buy and hold returns of -41.5%. Our findings motivate the mispricing of agency costs as an alternative explanation for the formation of ownership structures that are prone to agency problems

I. Introduction

A large literature in finance and economics illustrates how ownership decisions and other capital structure choices reflect attempts to mitigate agency costs between managers, majority shareholders, and minority shareholders. A common idea is that ownership is set to maximize firm value accounting for potential conflicts between a controlling shareholder and minority investors. When agency costs are high, ownership typically remains concentrated. In large part, the literature linking agency problems to corporate ownership structure has retained the assumption of Jensen and Meckling (1976) that investors fully anticipate the extent of agency problems, and that as a result, insiders bear the agency costs of creating inefficient ownership structures. In other words, market efficiency holds. Given these agency costs, why do firms access the capital markets at all? One common view, described in a recent survey by Morck, Wolfenzon, and Yeung (2005), is that controlling shareholders raise capital by selling shares to new shareholders when internal funds are inadequate but investment opportunities are attractive.

However, other work suggests that firms issue equity opportunistically to time periods of high stock prices. In Graham and Harvey's (2001) survey of Chief Financial Officers, managers claim to try to time the market when deciding to issue equity. Consistent with this idea, Ritter (1991) and Loughran and Ritter (1995), among others, document low average returns following initial public offerings (IPOs) and seasoned equity offerings (SEOs). Baker and Wurgler (2002) show that one implication of such behavior is that firm capital structure reflects past attempts to time the equity market.

In this paper we consider the possibility that investors do not fully anticipate agency problems and propose a new theory--based on stock market mispricing--that may help explain why firms with a controlling majority shareholder turn to the capital markets, even when they

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cannot commit not to expropriate minority shareholders after the fact. Our main idea is that the controlling shareholder takes advantage of stock market mispricing to create ownership arrangements that would otherwise be inefficient. There are good reasons to question the assumption that agency costs are efficiently priced. Cain, Loewenstein, and Moore (2005) show that decision makers tend to ignore conflicts of interest, even when such conflicts are prominently disclosed. Gompers, Ishii, and Metrick (2003) show that U.S. firms with poor corporate governance had poor stock returns and operating performance during the 1990s.[1] And, in an interesting recent study, Perkins, Morck, and Yeung (2008) show that joint ventures between Brazilian telecommunications firms and foreign partners are more likely to fail if the partners are from countries with few business groups – suggesting that these partners underestimate agency problems from dealing with firms that are part of business groups.

Our hypothesis is in part motivated by anecdotal evidence on a particular type of ownership arrangement that is the focus of our empirical tests, the public listing of subsidiaries by Japanese corporations. These listings defy the logic of the standard model of agency in which minority investors correctly anticipate and insiders bear all agency costs. Foley, Greenwood, and Quinn (2008) provide a case study of one of them, NEC Electronics (NECE), the semiconductor subsidiary of Japanese electronics conglomerate NEC. Following its listing in 2003, NECE appeared to perform excessively high levels of investment and research and development and to charge NEC low transfer prices for components that it supplied to NEC. Minority shareholders did not seem to have fully anticipated the extent of agency conflicts between NECE and its parent, as NECE's risk-adjusted stock market performance was considerably below that of the

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[1] Giroud and Mueller (2008) report that this relation is particularly pronounced in non-competitive industries, where product market pressures do not reduce the potential scope of agency problems.

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market on average and the parent company NEC. In the particular case of NECE, the ownership arrangement generated a series of complaints from minority shareholders.

To motivate our empirical work, we consider a simple model of a parent firm deciding whether to list its subsidiary on the stock market and ask how mispricing affects the parent firm's decision. To isolate the impact of mispricing, we assume that parents do not face financial constraints and do not need to list subsidiaries to obtain capital. If the parent maintains a controlling stake after the IPO, it is able to divert resources from the subsidiary to itself, yet doing so incurs deadweight costs. To avoid these costs, the parent company would like to commit not to divert resources from the minority shareholders, but it cannot credibly do so if it maintains control after listing.[2]

We consider the impact of two forms of mispricing on the parent's listing decision: "general mispricing", in which investors incorrectly estimate the value of cash flows produced by the subsidiary, and "agency mispricing", in which investors incorrectly estimate the extent of resource diversion from the subsidiary to the parent. As mentioned earlier, the effects of stock market mispricing more generally are well understood in the corporate finance literature to have an impact on issuance decisions.[3] Yet, the idea that agency costs could be mispriced has not been considered formally by other work.

In our model the implications of mispricing are straightforward. Because there are deadweight costs associated with diversion, parents only list subsidiaries if equity is overpriced. This overpricing may come from either general mispricing, or agency mispricing, or both, although agency mispricing at the margin causes the parent to sell equity while maintaining

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[2] More generally, commitment devices are costly and generate deadweight costs of their own.

[3] See, for example, Ritter (1991) and Stein (1996).

control. The extent of overpricing must be sufficient to offset the deadweight costs that the parent company otherwise has to bear. Thus, listings should occur when valuations are high. While our model says nothing about whether stock market mispricing reverts, it is natural to assume that market efficiency holds in the long-run. In other words, returns earned by minority investors in subsidiaries should be poor after listing. A corollary is that subsidiaries' risk-adjusted returns should be below those of the parent firms.

In our model, the parent trades off the deadweight costs of agency problems with stock market mispricing. Therefore, a distinguishing prediction is that, the greater are the agency problems and the associated deadweight costs, the greater must be the mispricing for the parent to consider a partial listing. The corresponding empirical implication is that when the scope for agency problems is high, the post listing returns to minority shareholders should be lower.

A last set of predictions concerns what happens to subsidiaries after listing. Because mispricing is temporary, we would expect parents to repurchase listed subsidiary equity following a period of poor returns to minority shareholders. Once equity is fairly priced, repurchasing equity is both privately and socially beneficial because it eliminates the deadweight costs of diversion. Weak minority shareholder protection can make parent firms well positioned to capture the gains from repurchase, so they should experience positive announcement effects at the time of reacquisition.

We test these predictions on a sample of 431 subsidiaries listed in Japan during the 1980-2005 period. These companies offer a unique setting for testing our ideas for several reasons. Japan has reasonably well developed capital markets, thereby reducing the salience of explanations of the formation of inefficient ownership arrangements that are based on financial

constraints. However, minority shareholder rights are weak in the domain of policing self-dealing transactions between public companies. Transfer pricing regulations do not place significant requirements on parent companies, and parents have historically had considerable latitude in directing subsidiary activities. Minority squeeze out laws and listing requirements also empower controlling shareholders to the detriment of minority shareholders.

Our results are largely consistent with the predictions discussed above. Subsidiary listings occur when market valuations, as measured by the average market-to-book ratio in the subsidiary's industry, are high. Following listing, investors in subsidiary equity fare poorly, while investors in parent company equity fare relatively well. Over a two-year horizon, average cumulative subsidiary returns are -8.74% while average cumulative parent returns are 2.64%.

We identify three types of subsidiaries for which the potential for agency problems is particularly high using subsidiary characteristics at the time of listing. First, we determine if subsidiaries have a sales relationship with their parents. Sales relationships allow parents to divert resources from subsidiaries by manipulating transfer prices and by forcing subsidiaries to incur costs like R&D or certain specific investments that benefit the parent. Second, as suggested by Burkart, Gromb, and Panunzi (1998) and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002), the incentive to divert resources from minority shareholders is particularly strong when parents have effective control over subsidiaries but have limited exposure to subsidiary performance. We therefore identify subsidiaries in which the parent's ownership stake after listing is between 20% and 50%. Such stakes are sufficient to maintain control but are likely to be too low to align parent's and minority shareholders' incentives. Finally, we identify subsidiaries whose market capitalization at listing exceeds 20% of parent market capitalization. Because these subsidiaries are larger, parents can divert more resources from them, while it

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might not be worthwhile to divert resources from a small subsidiary. All three groups of subsidiaries with significant ex-ante scope for agency problems exhibit dramatic stock market underperformance. For example, over a two-year horizon after listing, monthly risk adjusted returns to subsidiaries that have a sales relationship with their parents are -71 basis points per month.

Changes in subsidiary ownership structure are also consistent with our predictions. Approximately one quarter of the subsidiaries listed during the sample period are repurchased by the parent, and typically at a discount to the original listing price. The median buy-and-hold return earned by a stockholder of a repurchased subsidiary from the beginning of the month following listing to the repurchase date is -41.5%. When repurchases are announced, both the acquiring parent and the target subsidiary experience positive abnormal returns. Acquiring parent returns average about 18% of the market capitalization of the repurchased subsidiary.

Our findings are related to an extensive literature documenting expropriation of minority shareholders in different countries. Bertrand, Mehta, and Mullainathan (2002) find evidence of tunneling within Indian business group structures, and Bae, Kang, and Kim (2002), and Baek, Kang, and Lee (2006) illustrate how group relationships allow insiders to use mergers and acquisitions as well as security issuance to benefit controlling shareholders. Claessens, Djankov, Fan, and Lang (2002) and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) show that corporate valuations are lower when minority shareholder protection is weaker, yet do not analyze whether these discounts are adequate given future stock returns.

Finally, our results are related to research on the motivations for equity carveouts, surveyed by Eckbo and Thorburn (2008). In explaining carveouts, researchers have considered

hypotheses related to increases in corporate focus (Vijh (2002)), obtaining financing (Schipper and Smith (1986)), addressing information asymmetries (Nanda (1991) and Slovin and Shuska (1997)), and beginning the process of firm restructuring (Klein, Rosenfeld, and Beranek (1991) and Perotti and Rossetto (2007)). Mispriced agency costs are not mutually exclusive with any of these alternative stories but offer a complementary explanation for the emergence of ownership structures in which minority shareholders may be expropriated. Atanasov, Boone, and Haushalter (2008) consider the possibility that parent firms behave opportunistically toward their publicly listed subsidiaries, but do not analyze the implications for valuations and returns.

The next section develops our main predictions in the context of a simple model. Section III provides a brief background on the protection of minority shareholders under Japanese law, and section IV describes our data. Section V analyzes the valuations and performance of subsidiary listings. Section VI looks at what happens to the ownership of subsidiaries following their listing, and section VII concludes.

II. Stock market mispricing and ownership structure: Predictions

In this section, we outline the role that stock market mispricing may have in sustaining inefficient ownership structures. Our objective here is not to provide a fully specified model of all the reasons that firms go public but only to highlight the tradeoffs induced by mispricing.

Basic setup

We consider a parent firm operating a fully-owned subsidiary that will generate $1 of cash flow next period. We assume that this initial ownership structure is efficient in the sense that the parent derives some non-contractible synergies Ω from the subsidiary firm or alternatively that the subsidiary provides some inputs to the parent production process for which

there could be hold-up if the subsidiary were to operate independently (e.g., Grossman and Hart (1986), Hart and Moore (1990), Hart (1995)).

While the efficient outcome is for the subsidiary to remain in-house, the parent has two other options. First, the parent may sell the subsidiary completely into the public equity market. In this case, the non-contractible synergies are lost, but the parent reaps whatever proceeds come from the IPO.

A second option is for the parent firm to sell a fraction α of the subsidiary to the capital market, but retain effective control. By retaining effective control, however, the parent now faces an agency problem with respect to minority shareholders. Specifically, after listing, the parent would like to divert some fraction θ of subsidiary cash flows to its own advantage. For example, the parent may ask the subsidiary to perform excess R&D, or perhaps it shifts value away from the subsidiary through transfer pricing. Following the literature, we assume that it is impossible for the parent company to commit not to divert resources post-listing, and that diversion is costly, incurring a deadweight cost $C>0$ borne by the parent. These costs could reflect the costs of disguising diversion of other inefficiencies generated by diversion.

Parent firm's options and payoffs are therefore as follows:

Maintain full control: $Y^{\text{In-house}} = 1$ (1)

Sell α: $Y^{\alpha} = (1-\alpha)(1-\theta) + \theta - C + P(\cdot)\alpha$ (2)

Sell entirely: $Y^{\text{Sell All}} = P(\cdot) - \Omega$ (3)

where Y denotes the payoff to the parent company, and P denotes the price per share. If market efficiency holds, minority shareholders get a fair deal and thus $P=1$ when the parent sells

entirely, and $P=1-\theta$ when the parent sells share α. Thus, because $\Omega>0$, the parent maintains the subsidiary in-house. Crucially, under market efficiency and the other assumptions we have made, because the parent bears the deadweight costs of diversion, a partial sale never occurs.

Stock market mispricing

Our main question is what happens to the tradeoff between options (1), (2) and (3) above in the event of stock market mispricing. We consider two forms of mispricing: (i) general mispricing, in which investors misestimate the potential cash flow produced by the subsidiary, and (ii) agency mispricing, in which investors misunderstand the extent of equilibrium resource diversion. The price per share is given by:

$$P = \beta - \gamma\theta. \tag{4}$$

where β is generic mispricing or sentiment and γ is the mispricing of resource diversion. The latter is mispriced whenever $\gamma \neq 1$. Equity is overpriced overall if $\beta - \gamma\theta > 1-\theta$.

We can substitute (4) into (1), (2) and (3) above to characterize the outcome chosen by the parent firm

Maintain full control if: $Y^{\text{In-house}} = 1 > (1-\alpha)(1-\theta)+\theta-C+(\beta-\gamma\theta)\alpha$ and $1 > \beta-\Omega$ (5)

Sell α if: $Y^{\alpha} = (1-\alpha)(1-\theta)+\theta-C+(\beta-\gamma\theta)\alpha > \beta-\Omega$ and $Y^{\alpha} > 1$ (6)

Sell entirely if: $Y^{\text{SellAll}} = \beta-\Omega > (1-\alpha)(1-\theta)+\theta-C+(\beta-\gamma\theta)\alpha$ and $Y^{\text{SellAll}} > 1$ (7)

Discussion

Figure 1 plots the solution to the parent's listing decision as a function of γ and β, for positive Ω. As remarked earlier, with no mispricing (ie, β =1, γ=1), the parent chooses the efficient outcome of running the subsidiary in-house. However, as general mispricing β increases, or as investors tend to discount agency costs (as γ falls), it becomes more likely that the parent chooses to list the subsidiary, either in whole or in part. Our first observation, therefore, is that subsidiary listings are more likely during periods of mispricing.

We next turn to the tradeoff between partial and full listing of subsidiary. Rearranging equation (6) above, the parent prefers to list the subsidiary but retain controlling stake 1-α when

$$\alpha\theta(1-\gamma)-(\beta-1)(1-\alpha)>C-\Omega \tag{8}$$

Equation (8) says that the parent will list the subsidiary and maintain controlling stake 1-α only if the mispricing of resource diversion $\alpha\theta(1-\gamma)$ net of the opportunity cost of selling more overvalued equity $(\beta-1)(1-\alpha)$ exceeds the deadweight cost that will be incurred by the parent, net of the synergies that are lost when the parent sells out completely. As can be seen in equation (8), and in Figure 1, both types of mispricing can sustain an outcome where the parent lists the subsidiary but maintains control. But, holding everything else constant, greater general mispricing makes partial listing less likely. This is our second observation: subsidiary listings should underperform in the stock market as mispricing is corrected.

It is useful to ask what happens when the potential scope for agency problems increases, that is when θ is higher because parents have a greater ability to divert resources. Holding fixed *β, γ*, and *C*, higher levels of θ are associated with more mispricing when investors underestimate the effect of agency problems because prices correct from $\beta-\gamma\theta$ to $1-\theta$, i.e. drop by

$(\beta-1)+(1-\gamma)\theta$. Higher levels of θ, however, are likely to be associated with higher levels of equilibrium deadweight costs *C*. From equation (8), it is clear that holding fixed *β* and *γ*, raising *C* makes it more likely that the parent sells the subsidiary outright, rather than maintain a controlling stake. That is, to the extent that agency costs loom large, the parent can essentially commit not to steal by selling outright. However, the counterpart to this is that in the instances in which high *C* firms do list subsidiaries, there is greater ex-ante mispricing. Thus, subsidiary listings for which the ex-ante agency costs are high should experience underperformance in the stock market following listing.

Testing this prediction requires empirical proxies for the scope for resource diversion and the potential deadweight costs that are associated with diversion. As mentioned in the introduction, we develop three such proxies using our data. First, we expect agency costs to loom large when the subsidiary and parent firm have a sales relationship. The potential for transfer pricing in this case is high, and it also creates incentives for the parent firm to push the subsidiary to incur excess R&D or capital expenditures. Second, we use a proxy that comes from the model: the share α of the firm that is retained by the parent. The higher is α, the lower is the potential for agency costs.[4] Third, agency costs are likely to be higher when the subsidiary is large relative to the parent firm: if the subsidiary is small relative to the parent firm, it is unlikely that the parent would take on the legal and reputational risk of expropriating minority shareholders with little monetary benefit.

Our last prediction relates to what should happen once mispricing is eliminated after listing. Following the benefit from selling overpriced equity, the parent firms no longer enjoys

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[4] This follows from Jensen and Meckling (1976).

gains from mispricing but incur recurring deadweight costs C from the inefficient ownership structure. Therefore, once mispricing is eliminated, parents have a strong incentive to repurchase listed subsidiaries, thereby eliminating the deadweight costs. Our last prediction is then that we should see parents frequently repurchase their subsidiaries, and they should do so at a discount to listing price. Furthermore, if minority shareholders are in a weak bargaining position when a repurchase takes place, parents should capture many of the gains and should therefore experience positive returns when repurchases are announced.

III.   The protection of minority shareholders in publicly listed subsidiaries

Our discussion above assumes that minority shareholders may be expropriated by the majority owner. While this assumption is commonplace in the law and finance literature, we briefly discuss its applicability to subsidiary listings in Japan. We follow discussions of Japanese corporate law by Nishiyama (2007) and Kamiyama (2008) as well as Tokyo Stock Exchange's listing guidelines, and where possible, we contrast Japanese law with the U.S. benchmark.

Courts in most countries prohibit outright theft from minority shareholders, but beyond obvious cases of stealing, there is substantial variation in what is permitted. Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000) explain that two common legal principles applied by courts are the "duty of care" and the "duty of loyalty". The duty of care requires directors to act in a reasonable, prudent, and rational way and as such does not offer much protection to minority shareholders. The duty of loyalty, or fiduciary duty, addresses conflicts of interest specifically and requires that insiders not divert value from minority shareholders.

In the U.S., directors and controlling shareholders are endowed with both the duty of care and the duty of loyalty and therefore have fiduciary duties to the company and its shareholders.

In Japan, directors have a duty of care, but the judiciary has avoided detailing or enforcing regulations that restrict breaches of fiduciary duty. Directors must obey all laws and ordinances of the company's organizational documents and resolutions and must act in good faith. There are, however, no requirements that directors act in the interests of minority shareholders.

Controlling shareholders in Japan have neither duty of care nor duty of loyalty. Minority shareholders' only protection from undue pressure by a controlling shareholder comes from the board of directors. In practice, however, directors of subsidiary firms do not have much incentive to protect the interests of minority shareholders; many directors are former or current executives of the parent company. Regulators at the Tokyo Stock Exchange have expressed concern about this situation, remarking in a 2007 white paper that "relationships between parent companies and minority shareholders of the subsidiary entail potential conflicts of interest, and there is a risk that the subsidiary conducts its business for the benefit of the parent to the detriment of the interest of overall shareholders." (TSE-Listed Companies White Paper of Corporate Governance 2007).

The broad guidelines of the law have particularly significant implications for minority shareholders of subsidiaries with regard to three issues: (a) related party transactions; (b) usurped business opportunities; and (c) minority squeeze outs.

Related party transactions. In the U.S., all transactions between a controlling shareholder and the company are subject to court scrutiny. Courts define self-dealing as the circumstance in which the controlling shareholder enters into a transaction with the company and exercises influence over the terms of the transaction. In the U.S., the burden of proof rests on the controlling shareholder to show that the transactions occurred at a fair price and reflect fair

dealing. In Japan, no such duties or burden of proof exist. Related party transactions must be disclosed and are subject to audit, but parent and subsidiary companies often share auditors.

Usurped business opportunities. In many cases, a parent company may influence the subsidiary indirectly and in ways that are difficult to prove in court. A parent company may force the subsidiary company to continue in a particular business venture that provides benefits for the parent or may prohibit the subsidiary from competing with it in a particular area of business. Consider again the case of NEC Electronics. As a subsidiary of NEC, it produced semiconductors which it then sold to the parent company. For several years after listing, the subsidiary incurred significant excess research and development and capital expenditures to enhance the competitive position of parent products (Foley, Greenwood, and Quinn 2008).[5] In the U.S., the rules governing business opportunities are well defined. The controlling shareholders may not take a business opportunity for itself if the subsidiary is able to pursue it and the opportunity is in the subsidiary's interest and scope of competency. In the event of a breach, the company can recover all benefits from the controlling shareholder. In Japan, no such fiduciary responsibility exists.

Minority squeeze outs. Squeezing out a minority investor by means of a cash-out merger is a related party transaction that in the U.S. invites a high degree of court scrutiny. The majority shareholder bears the burden of proving that the squeeze-out is fair to all shareholders. As with other related party transactions, controlling shareholders have no fiduciary duty in Japan. A court can revoke a shareholder resolution approving a squeeze out only if it is clearly and grossly

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[5] In the specific case of NEC Electronics, it is also reasonable to argue that the excess investment was inefficient in that production at the subsidiary was done at an inefficient scale so that with perfect alignment of incentives between NEC Electronics and NEC it would have been cheaper to purchase semiconductors from another supplier.

unfair. Dissenting shareholders have appraisal rights, but these are of limited value given the ability of parents to take actions that affect valuations.

IV. Publicly listed subsidiaries in Japan 1980-2005

We collect a sample of subsidiary listings from the Toyo Keizai Japan Company Handbooks, which provide background information on all publicly listed Japanese companies. We identify subsidiary listings by scanning volumes from 1980, 1985, 1987, 1990, 1995, 2000, and 2005 for firms with corporate owners.[6] We define a newly listed firm to be a subsidiary if a publicly listed Japanese corporate parent owns at least 20% stake before and after listing. In the vast majority of cases we are able to determine pre-listing ownership stakes from the firm's first appearance in the handbooks. In a few cases, we really on handbook descriptions stating that firms are subsidiaries. In the cases for which we have ownership data for subsidiaries before and after listing, parent ownership typically falls by a substantial margin at the time of listing. From our initial list, we exclude firms with more than one blockholder that owns at least 20% of the equity at the time of listing, subsidiaries in regulated sectors (utilities and financials), and subsidiaries for which we do not have stock returns after listing.

As mentioned earlier, our tests require us to identify listings for which the potential for agency problems is especially high ex ante. We identify three types of such subsidiaries. First, we use the Japan Company Handbooks to determine whether the parent and subsidiary maintain

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[6] We use the 1987 handbook in addition to the other ones because it is the first handbook that provides information on firms listed on the second section of Tokyo Stock Exchange and on regional stock exchanges. One concern is that we may miss subsidiaries that are divested before we have the chance to observe a large blockholder. This does not appear to be much of a problem, however: parent ownership is stable over short time horizons. We have also cross checked our list with data from other sources: An analyst at Morgan Stanley and an analyst at a U.S. hedge fund independently provided us with lists of just over 300 firms that were still trading in late 2007 in which a parent controlled at least 50% of shares outstanding. Most of the extra firms on these lists were listed independently and later fell under the influence of a "parent" company and thus do not quality under our methodology. We also scan the SDC database for new issues in which the ultimate parent is different from the listed firm. In all, we add only 25 firms from these sources.

a sales relationship. In most cases the handbooks specifically state whether there is a sales relationship between the subsidiary and its parent firm. For example, NEC Fieldings' description reads "Ratio of sales to NEC group stands at around 70%." Jalux is a "JAL-affiliated trading company engaged in procurement of aircraft parts, sales of used aircraft and procurement of in-flight goods-for-sale for JAL group." And Lawson Tickets "has outlets at Lawson stores nationwide." In a few cases, we have had to make subjective judgments about the nature and scope of these relationships.[7] The ownership information we collect from the Japan Company Handbooks also allow us to select subsidiaries in which the parent maintains effective control yet owns a relatively small percentage of the cash flows. Specifically, we identify subsidiaries in which the parent's ownership stake after listing is between 20% and 50%.

To classify subsidiaries as being large relative to their parents, measured as having a market capitalization at listing that exceeds 20% of the parent market capitalization, we require information on market values at listing. These data and data on monthly stock returns are collected primarily from Datastream and augmented with data from the Japan Securities Research Institute (JSRI), the Pacific Basin Capital Markets (PACAP) Research Center and Bloomberg, which are useful for listings in the 1980s when Datastream coverage is sometimes sparse. For many of our tests, we calculate risk-adjusted returns using the standard Fama and French (1993) risk factors. SMB is the value-weighted return of small stocks on the first section of the Tokyo Stock Exchange minus the value-weighted return of large stocks. HML is the value-weighted return of large high book-to-market stocks minus the value-weighted return of

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[7] For example, Nippon Steel Chemical is a chemical firm described as "Nippon Steel's strategic subsidiary, with development work done jointly," suggesting that it supplies chemicals and carries out R&D for its parent. Tokyo Kohtetsu is a producer of angle steel products; its parent, Mitsui, is a general trading company, with metals as its largest segment.

large low book-to-market stocks; specifically, it is the Barra/Nikko Value return minus the Barra/Nikko Growth return.

Last, our tests in section VI require daily returns around periods in which subsidiaries are repurchased. For these repurchases, we identify repurchase announcement dates from Bloomberg and Factiva and collect daily returns for both parent and subsidiary firms around this time from the sources used to obtain monthly return data.

Our final database includes 431 listed subsidiaries, listed by 243 unique parent companies. Out of these, 164 list just one subsidiary, 39 list two subsidiaries, and 19 list three subsidiaries. One firm, Aeon, lists a total of thirteen subsidiaries.

Table 1 provides some descriptive statistics on subsidiary listings in our sample. Subsidiaries are quite a bit smaller than their parents -- the median subsidiary's market equity at listing is about 7% that of its parent. For the typical listed subsidiary, parent company retains just over 50% of subsidiary equity after listing. 42% of subsidiaries have a sales relationship with the parent firm. In 39% of subsidiary listings, parent retains effective control but has low cash flow stake. And 21% of subsidiaries have market equity at listing that exceeds 20% of parent market equity.

V.   Valuations and stock market performance of listed subsidiaries

Industry valuations

Table 2 presents mean industry market-to-book ratios for subsidiaries and other firms in the listing year, following Datastream industry definitions and using market and book equity data from Datastream. The market-to-book ratio has been used by a variety of corporate finance studies as an ex ante valuation measure because of its well-known cross-sectional correlation

with subsequent stock returns.[8] Because these valuation measures are necessarily contaminated by growth opportunities, we leave it to return-based tests to draw firm conclusions about mispricing. Notwithstanding, they provide a useful starting point for understanding whether parent firms attempt to exploit ex ante mispricing.

For the full sample of subsidiary and non-subsidiary listings, the mean industry market-to-book ratio is 2.47 in the year of listing. However, subsidiary listings' average industry market-to-book ratio of 2.73 is significantly higher than non subsidiary listings' industry market-to-book ratio of 2.41. Thus, subsidiaries tend to list at times when industry valuations are high, even relative to non subsidiary listings. We can further separate subsidiaries into groups based on the scope for agency problems at the time of listing: valuations tend to be higher for those firms for which there scope for agency problems is higher.

The underperformance of subsidiaries

Figure 2 and Table 3 summarize cumulative monthly returns earned by subsidiary and non-subsidiary listings over the first thirty-six months following the IPO. We track monthly returns starting at the end of the listing month.

The dashed line in Figure 2 shows returns for non-subsidiary listings. Their returns hover around zero and thirty-six months after listing attain a value of just over three percent. By comparison, cumulative returns of subsidiaries are strongly negative.

Table 3 summarizes the returns shown in Figure 2. The first two panels show results for the full sample, with Panel A showing raw returns and Panel B showing industry-adjusted

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[8] Baker and Wurgler (2002) and Rhodes-Kropf, Robinson, and Viswanathan (2005) use this measure as an ex ante measure of valuation measure, and Fama and French (1992) and Daniel and Titman (1997) show that it predicts future returns.

returns. Both raw and industry-adjusted returns earned by subsidiaries are negative, with industry-adjusted returns of -6.33%, -13.91%, and -13.36% over the one, two, and three year horizon after listing respectively.

The table also shows parent returns, both raw and adjusted for the return on the parent's stake in subsidiary. If investors do not fully anticipate the potential costs of expropriation from the subsidiary's perspective, they may simultaneously ignore the benefits of expropriation from the parent's perspective. Thus it may be reasonable to expect that subsidiary underperformance in the stock market is accompanied by parent outperformance. In studying parent returns, however, we are careful to remove the mechanical effect of parent's stake in subsidiary. Specifically, if parent owns share 1-α of subsidiary, we can isolate the returns to investing in parent assets excluding its stake in subsidiary's equity by computing the returns that one would earn by buying parent equity and hedging out the implied subsidiary position:

$$r_{it}^{PA} = r_{it}^{Parent} - (1-\alpha)\left(\frac{MV^{Sub}}{MV^{Parent}}\right)r_{it}^{Sub}$$

(9)

The third column of Panel B shows that adjusted parent returns, net of parent industry returns, are positive but quite small, providing weak evidence in support of our hypothesis.

Because expropriation of minority shareholders constitutes a transfer of resources from subsidiary to parent, we have the most power to detect it by looking at the difference between parent and subsidiary returns. These are reported in the last two columns of Table 3 and are quite large. When measured using adjusted parent returns, they are around 7-8% over the first year and around 15-17% over the first three years after listing.

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We next isolate subsamples of subsidiaries in which the ex-ante scope for expropriation by the parent company is high. Recall that, according to our predictions, these subsidiaries should exhibit the worst underperformance. Figure 2 and Panels C, D and E of Table 3 are consistent with this prediction: subsidiaries with high ex-ante agency costs perform much worse than the full sample of subsidiaries and other new listings. For example, Panel C reports that over the first three years after listing, subsidiaries that have a sales relationship with their parent earn raw returns cumulative monthly returns of -19.24%. Cumulative monthly returns of their parents, adjusted for the mechanical effect of parent's stake in subsidiary, are 6.48%. Panels D and E indicate that subsidiaries that are between 20% and 50% owned by parents at listing and subsidiaries that are large relative to their parents perform equally badly.

Finally we note that both Figure 2 and Table 3 indicate that subsidiary stock market underperformance occurs primarily over the first two years following listing, with cumulative returns over the three-year horizon only slightly lower than over the two-year horizon. This pattern suggests that agency problems come to light and are incorporated into stock prices over this horizon.

Risk adjustment

Although the event-time cumulative returns summarized in Figure 2 and Table 3 show that subsidiaries perform poorly after listing, especially those with high ex-ante agency costs, they are subject to a number of concerns. First, most of the returns that we report in Figure 2 and Table 3 are not risk adjusted. Newly listed subsidiaries have high market-to-book ratios, and their underperformance could reflect poor returns earned by high market-to-book firms more generally. Second, it is difficult to determine the statistical significance of cumulative returns. As

emphasized by Mitchell and Stafford (2000), a key issue in long-horizon inference is that the conventional event-time approach assumes independence of multi-year abnormal returns for event firms, thereby producing test statistics that are too large.[9] Third, Ritter (1991), Loughran and Ritter (1995) and others document underperformance of initial public offerings in the U.S., and the poor performance of newly listed subsidiaries could be symptomatic of a more general new listing effect.

The results summarized in Table 4 are based on panel analysis of monthly subsidiary and adjusted parent returns

$$r_{it} = \alpha + \beta_1 \cdot RMRF_t + \beta_2 \cdot SMB_t + \beta_3 \cdot HML_t + \varepsilon_{it} \tag{10}$$

where r_{it} is subsidiary or adjusted parent return net of the risk free rate, or alternately, is the adjusted parent return minus subsidiary return. The specifications include the standard Fama and French (1993) risk factors: the market excess return $RMRF_t$, the value-weighted return of small stocks minus the value-weighted return of large stocks, SMB_t, and the value-weighted return of high book-to-market stocks minus the value-weighted return of low book-to-market stocks, HML_t. The constant term in equation (10) denotes the risk-adjusted abnormal performance.

Our panel specification in equation (10) is different from the calendar-time approach that collapses events into a single time series of average returns in each period. This approach weights each time period equally, and if firms respond to time-varying mispricing, it produces biased test statistics that have low power (Loughran and Ritter (2000)). To obtain unbiased test statistics Loughran and Ritter (2000) advocate weighting each period by the number of

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[9] See also Brav and Gompers (1997), Lyon, Barber, and Tsai (1999), Brav (2000) and Hanson (2008) for discussions of statistical inference in long-horizon event studies.

observations in that period. It is straightforward to show that our panel specification is equivalent to the weighting scheme suggested by Loughran and Ritter (2000), yet more flexible. In particular the panel specification in equation (10) allows for arbitrary correlation structure and can be generalized to compare the returns of subsidiaries and other listings, which we do in Table 5.

Panel A of Table 4 reports results for the full sample of subsidiaries. Over the two-year horizon following subsidiary listing, subsidiary abnormal returns are -33 basis points per month, and adjusted parent abnormal returns are 14 per month. A portfolio that is long adjusted parent returns and short subsidiary returns earns 47 basis points per month. Although economically large, these returns are not statistically distinguishable from zero. Similar results are obtained over one and three year horizons, although the portfolio described above earns slightly higher average returns over a one year horizon and slightly lower average returns over a three year horizon. Not surprisingly, in these specifications, subsidiary returns have a strong negative loading on HML and a strong positive factor loading on SMB, reflecting their small size and high market-to-book ratios at the time of listing. Adjusted parent returns have a smaller exposure to SMB and higher exposure to the market than subsidiary returns and an insignificant loading on HML.

Panels B, C, and D analyze subsamples of subsidiaries that are especially prone to agency problems. Panel B focuses on subsidiaries that maintain a sales relationship with the parent company. Over the two-year horizon after listing, these subsidiaries earn statistically significant abnormal returns of -71 basis points per month. Adjusted parent returns exceed subsidiary returns by 86 basis points per month over this horizon. We obtain similar results when analyzing one- and three-year horizons. We also find similar effects in the two other subsamples of

subsidiaries with high ex-ante agency costs. Panels C and D present results of analysis of subsidiaries in which the parent owns between 20% and 50% of equity after listing and large subsidiaries. In each case, subsidiaries earn negative abnormal returns, and there are positive abnormal returns to the portfolio that buys adjusted parent returns and goes short subsidiary returns.

Overall, results in Tables 3 and 4 support our hypothesis that subsidiaries underperform in the stock market after listing and that subsidiaries with high ex-ante agency costs perform particularly poorly. In particular our two year horizon estimates in Panel B of Table 4 of the monthly risk-adjusted performance of subsidiaries that maintain a sales relationship with their parent suggest that such subsidiaries are at least $24 \times 0.71 \approx 17\%$ overvalued at the time of listing.

We have not yet ruled out the possibility that poor subsidiary performance reflects a more general new listing effect, although the extreme underperformance of subsidiaries that are especially prone to agency problems is difficult to reconcile with this alternative. Moreover, the returns for non-subsidiary listings in Figure 2 suggest that such listings have not performed too poorly. To test this more formally, we can pool our subsidiary listings with non subsidiaries into a single panel and estimate whether subsidiaries have statistically distinguishable underperformance relative to this control group. We estimate:

$$
\begin{aligned}
r_{it} - r_t^f = \alpha &+ \alpha_{Sub} \cdot Subsidiary + \beta_1 \cdot RMRF_t + \beta_2 \cdot Subsidiary \cdot RMRF_t + \beta_3 \cdot HML_t \\
&+ \beta_4 \cdot Subsidiary \cdot HML_t + \beta_5 \cdot SMB_t + \beta_4 \cdot Subsidiary \cdot SMB_t + \varepsilon_{it}
\end{aligned}
\tag{11}
$$

where the dependent variable is the excess return on new listings, *Subsidiary* is a dummy variable indicating subsidiary listings, and where we allow subsidiary and non-subsidiary listings to have different factor loadings.[10]

These results are shown in Table 5. The constant term coefficient α is the realized average abnormal return of non-subsidiary listings, and the coefficient on the *Subsidiary* dummy, α_{Sub}, measures the underperformance of subsidiaries relative to the other listings control group. Panel A shows results for the full sample, which now includes subsidiary and other listings. Non-subsidiary listings earn small and statistically insignificant abnormal returns over one-, two-, and three-year horizons. These types of listings, therefore, do not exhibit inferior performance in Japan.[11] The coefficient on the subsidiary dummy implies that subsidiaries underperform other listings by 19-28 basis points per month over the first three years after listing, but these coefficients are not statistically significant.

Panel B reports results for subsidiaries that have a sales relationship with their parent and all other new listings. These subsidiaries underperform other new listings by 54-87 basis points per month (depending on the horizon), with the differences in returns being statistically significant at conventional levels. Subsidiaries in which parent firms retain effective control but do not have significant cash flow rights and large subsidiaries also exhibit poor performance when compared to other listings.

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[10] With the exception of large subsidiaries' loading on SMB, subsidiary and other listings have very similar factor loadings, which we do not report to preserve space. We get similar results when we assume that subsidiary and non-subsidiary listings have the same factor loadings.

[11] In contrast, new lists in the U.S. are generally known to have poor post-IPO returns (Ritter (1991)).

VI. Subsidiaries ownership changes after listing

Figure 2 and Table 3 suggest that the mispricing of subsidiaries with the most severe agency problems corrects within two or three years after listing. As argued earlier, when valuations return to fundamentals, or even overshoot, parent firms have an incentive to repurchase their subsidiaries. If a parent repurchases all of the equity of a subsidiary, it is likely to terminate or reduce activities that generate deadweight costs. For example, the incentive to engage in potentially costly practices to disguise diversion through transfer pricing is eliminated. Thus, parent should be able to negotiate a repurchase price that allows them to capture some of gains caused by reduced deadweight costs, especially because minority shareholders have few powers to object to the terms of a repurchase or to avoid a delisting. In addition, squeeze out laws and delisting rules yield considerable negotiating power to the parent firm, ensuring that they capture some of the gains associated with repurchases. Specifically, if a top shareholder owns more than 75% of shares for a year or if she holds more than 90% of shares at any time, the firm is subject to delisting. Minority shareholders fear delisting because of the illiquidity of unlisted equity. Thus, repurchases of subsidiaries should be common and to the extent that such acquisitions are not fully anticipated, they should be associated with positive announcement returns to the parent firm.

We use Japan Company Handbooks through 2007 to track the ownership of each subsidiary after listing. These outcomes are summarized in Table 6. The most common occurrence is that parents maintain an ownership stake that is within 5% of the stake they held right after the subsidiary was listed. Thus, for many subsidiaries, ownership is stable.

The next most common occurrence, however, is that the parent repurchases its subsidiary in a take-private transaction. This happens in 109 of 431 cases, or in 25% of cases. Such

repurchases are difficult to reconcile with many motivations for listing subsidiaries, including the need for the parent firm to raise external capital in order to finance investment.

The number of subsidiaries that are repurchased is considerably higher than the number of subsidiaries that are divested by the parent. In only 64 cases does the parent firm sell its entire ownership stake. Parents decrease their ownership stakes by 5% or more in 85 cases, but in 63 of these they maintain a controlling stake, and in 36 cases they maintain a majority stake.

If parents list subsidiaries when subsidiaries are overpriced, then once mispricing is corrected repurchase subsidiaries in order to eliminate the deadweight agency costs, repurchases should occur at discounts to the listing price. Although the evidence in tables 3-5 indicates that subsidiaries perform poorly over the first three years after listing, the timing of repurchases often exceeds these horizons. Therefore, figure 3 plots the histogram of the buy-and-hold return of repurchased subsidiaries from the end of the listing month until the time of their repurchase. In 78 out of 109 cases, the returns are negative. Although there are 14 cases in which returns exceed 100%, median buy-and-hold returns are -41.5%. Thus, in the typical case, parents repurchase their subsidiaries at a considerable discount to the listing price.

Table 7 summarizes reacquisition announcement returns for parents and subsidiaries. In contrast to the usually negative announcement returns for acquirers, parent announcement returns are positive and statistically significant. Market-adjusted returns during the five-day window around announcement are 1.72%. The average reacquired subsidiary has a market capitalization approximately 10 percent that of its parent at the time of reacquisition, so parent announcement return represents about 18% of subsidiary's stock market value. Panel B shows that subsidiaries also experience positive announcement returns, with market-adjusted returns during the five-day

window around announcement of 9.49%, reflecting modest takeover premia. Thus, consistent with our intuition, parent firms are able to capture some of the gains from take-private transactions.

VII.   Conclusion

In perfectly efficient markets, minority shareholders require a substantial discount to buy equity when a controlling shareholder sells a stake because they anticipate future agency problems. Controlling shareholders, therefore, sell shares only when there are some substantial benefits. The existing literature focuses on considerations related to financial constraints in identifying benefits. Our findings suggest at least one other possible explanation: that these ownership structures are setup at times when equity is overpriced, allowing majority owners to raise capital without having to internalize the full costs associated with future expropriation.

In this paper, we propose and test this alternative explanation for the emergence of ownership structures that are prone to agency problems. We argue that stock market mispricing can sustain the formation of such structures. Our analysis focuses on the common practice of large Japanese firms listing their subsidiaries on the stock market while maintaining effective control. The listing of these subsidiaries provides a good setting to test our hypotheses because the development of capital markets in Japan makes financing constraints less salient than they are in other countries, but the law offers minority shareholders little protection against several forms of expropriation by parent firms.

We find that such listings are common when valuations are high, and that the stock market performance of subsidiaries is poor in the years following their listing. Poor performance is particularly pronounced among subsidiaries that are prone to agency problems. Subsidiaries

that have a sales relationship with their parent exhibit risk-adjusted returns of -71 basis points per month in the two-year period post-listing; this is 63 basis points per month less than the risk-adjusted returns earned by investing in other new listings over the same horizon. Large subsidiaries and those in which the parent maintains effective control but has a cash flow stake below 50% exhibit similar poor performance.

We also show that a quarter of subsidiaries that were listed during our sample period are eventually repurchased by their parents. When such repurchases are announced, shareholders in parent firms and subsidiaries experience positive abnormal announcement returns. In the vast majority of these repurchases, the parent takes the subsidiary private at a discount to the original IPO price.

The underperformance of listed subsidiaries has not escaped the recent attention of regulators. Partially in response to pressure from investors, in 2007 the TSE clarified its position on subsidiary listings, which it characterized as "not necessarily a desirable capital policy for various market players including investors" (TSE Listing Examination 235, October 29, 2007). In 2008, the TSE released guidelines enhancing disclosure requirements for companies with a controlling shareholder, particularly around related party transactions. In a survey of 380 such listed companies, released at the same time, the TSE found that 32.4% of listed subsidiaries had essentially no policy ensuring fair treatment of minority shareholders in related-party transactions, and urged "listed companies with controlling shareholders to make further efforts" (TSE-Listed Companies White Paper on Corporate Governance 2009, p. 13). Disclosure requirements by themselves, however, may not be enough – as Cain, Lowenstein, and Moore (2005) show, decision makers tend to ignore conflicts of interest, even when such conflicts are prominently disclosed.

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Figure 1

Mispricing and the Subsidiary Listing Decision
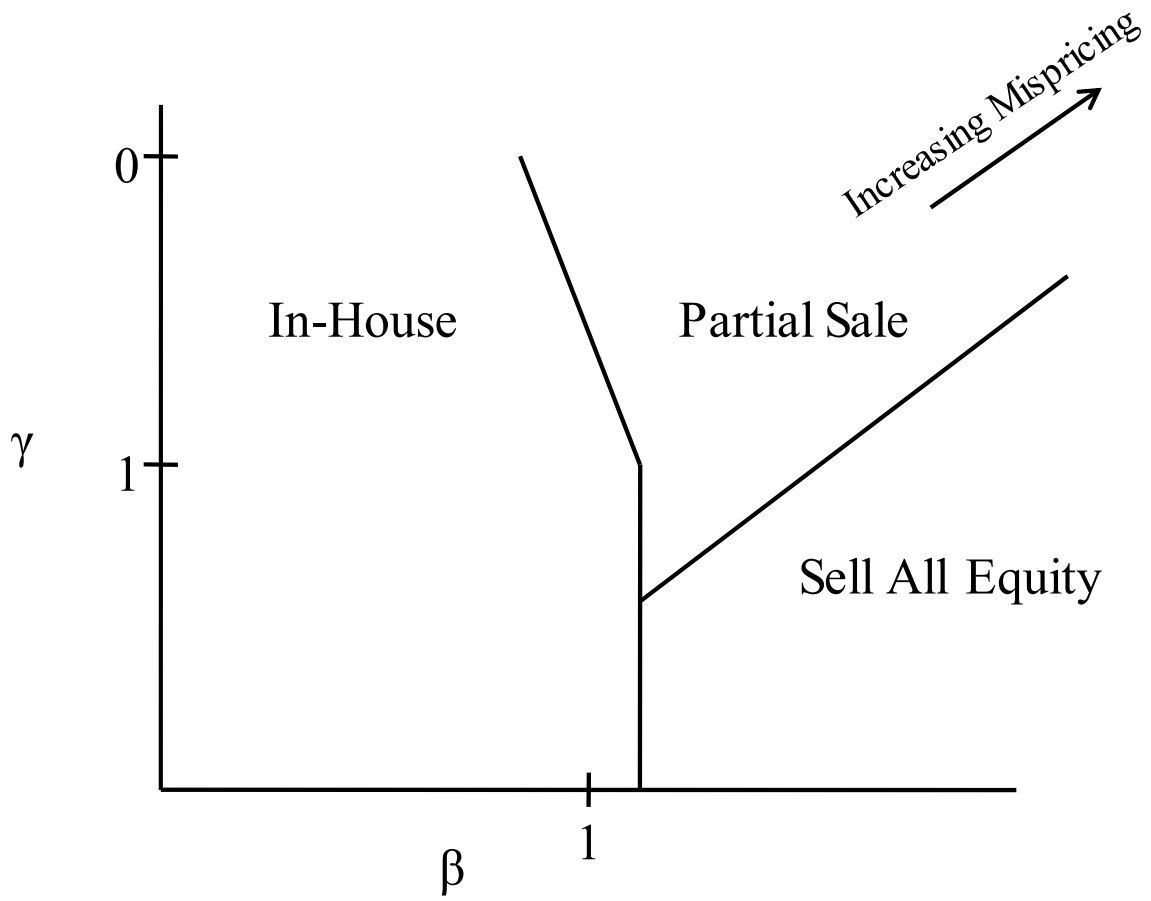
Figure 2

Cumulative monthly returns to public offerings of subsidiaries and other listings

Subsidiary listings are based on the full sample of listings starting in 1980. Sales relationship refers to an existing sales relationship between the parent and subsidiary, or an indication in company filings of a potential sales relationship. Minority owned describes subsidiaries in which the parent owns less than 50% of common shares. Large subsidiaries have a market capitalization at listing greater than 20% of the parent firms' capitalization.
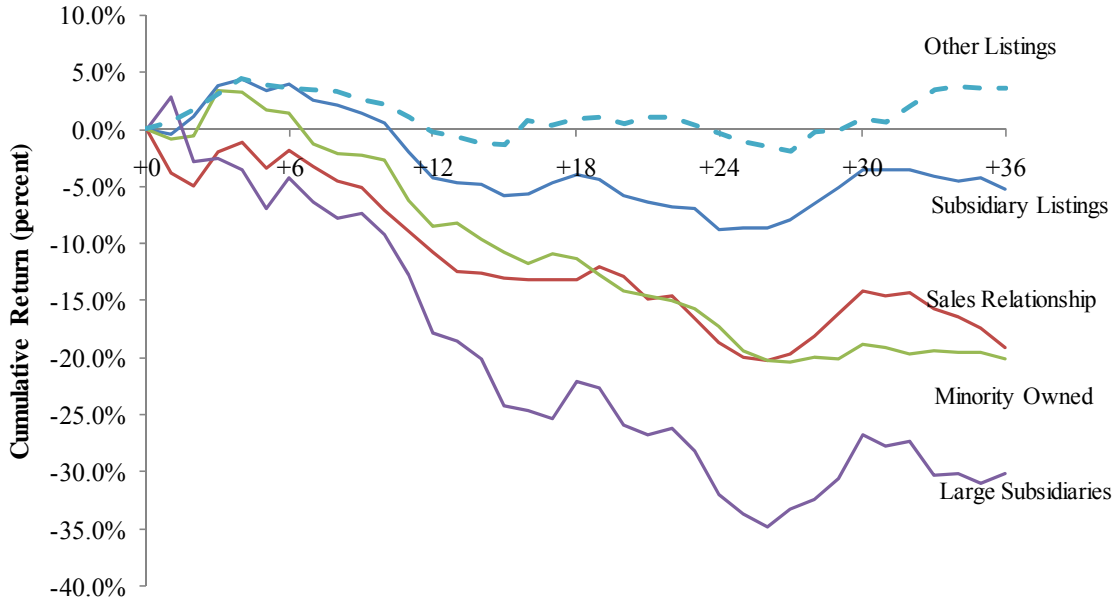
Figure 3

Buy-and-hold returns to subsidiaries repurchased by the parent firm

Returns are for the full lifespan of the subsidiary firm. Thus, for firms that do not pay dividends, this represents one minus the ratio of the price to the initial listing price.
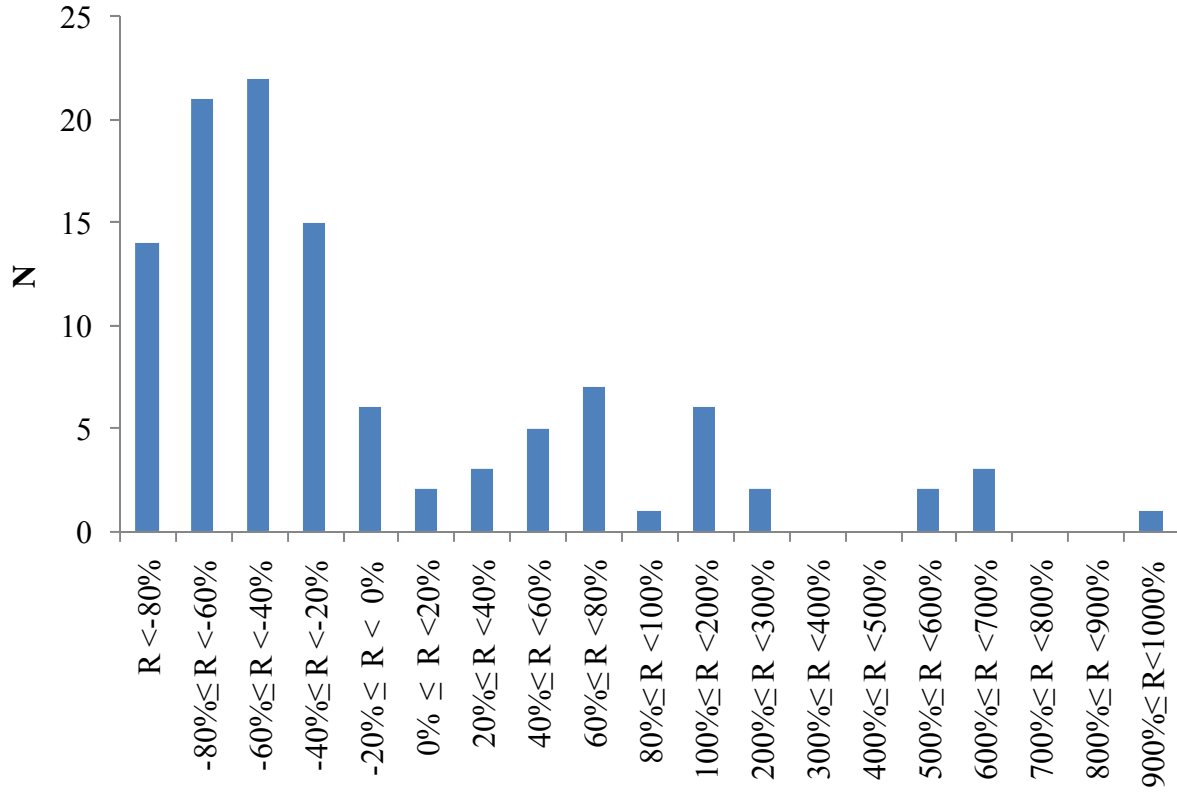
Table 1
Characteristics of Subsidiary Listings

The sample is 431 subsidiaries listed in Japan between 1980 and 2005. Listing information is from Toyo Keizai Japan Company Handbooks. A newly listed firm is considered to be a subsidiary if a publicly listed Japanese corporate parent owns at least a 20% stake before and after listing. The sample excludes a) firms with multiple 20% blockholders at the time of listing, b) firms in regulated sectors (utilities and financials), and c) firms with missing monthly stock returns after listing. Market equity at listing is measured in billions of yen at the end of the listing month. Same industry indicates that parent and subsidiary operate in the same Datastream industry. Sales relationship indicates the existence of a consumer-supplier relationship between parent and subsidiary and is based on the authors' subjective judgement about the nature and scope of these relationships as described in Japan Company Handbooks. Large subsidiary is a dummy variable equal to one whenever subsidiary market equity at listing exceeds 20% of parent market equity.

|	Mean	Median	SD
Subsidiary market equity at listing	66	17	447
Parent market equity at listing	757	294	1370
Parent stake after listing	0.50	0.52	0.16
Subsidiary ME / Parent ME	0.20	0.07	0.41
Parent stake * Subsidiary ME / Parent ME	0.09	0.04	0.19
Same industry	0.37	0.00	0.48
Sales relationship	0.42	0.00	0.49
Parent stake < 50%	0.39	0.00	0.49
Large subsidiary	0.21	0.00	0.41

Table 2
Industry Market-to-Book of New Listings

The sample consists of 431 subsidiary and 1,825 other listings during the 1980-2005 period. First, annual values of industry market-to-book ratios are calculated as equal-weighted averages of market-to-book ratios of all publicly traded firms in a given industry. Then, equal-weighted averages of industry market-to-book ratios of subsidiary and non-subsidiary listings are reported. Market and book equity values are from Datastream.

All Listings	2.47
Non-Subsidiary Listings	2.41
Subsidiary Listings	2.73
Sales Relationship	2.78
Minority Owned	2.74
Large Subsidiary	2.82

<div align="center">

Table 3
Cumulative Returns Following Subsidiary Listing

</div>

Cumulative monthly returns over 1-, 2-, and 3-year horizons following subsidiary listing. Monthly returns are primarily from Datastream, augmented with data from the Japan Securities Research Institute (JSRI), the Pacific Basin Capital Markets (PACAP) Research Center, and Bloomberg. Adjusted parent returns are

$$r^{adjusted\ parent} = r^{parent} - (1-\alpha)\left(\frac{MV^{sub}}{MV^{parent}}\right)r^{sub}$$

the returns on parent company equity adjusted for the returns on parent's stake in subsidiary. Industry-adjusted returns are net of matched industry returns. Sales relationship indicates the existence of a consumer-supplier relationship between parent and subsidiary and is based on the authors' subjective judgement about the nature and scope of these relationships as described in Japan Company Handbooks. Large subsidiary is a dummy variable equal to one whenever subsidiary market equity at listing exceeds 20% of parent market equity. Standard errors are reported in parentheses.

	Subsidiary	Parent	Adjusted Parent	Parent - Subsidiary	Adjusted Parent - Subsidiary
Panel A: Full Sample ($N = 431$)					
1 year	−4.30	1.47	3.16	5.77**	7.46**
				(2.71)	(2.99)
2 years	−8.74	2.64	5.61	11.38***	14.35***
				(3.40)	(3.83)
3 years	−5.18	7.47	10.23	12.65***	15.42***
				(3.95)	(4.42)
Panel B: Full Sample Industry-Adjusted ($N = 431$)					
1 year	−6.33	−0.13	1.55	6.20**	7.89**
				(2.83)	(3.09)
2 years	−13.36	−1.15	1.82	12.21***	15.18***
				(3.47)	(3.87)
3 years	−13.91	0.07	2.84	13.99***	16.75***
				(4.00)	(4.45)
Panel C: Sales Relationship ($N = 179$)					
1 year	−10.77	−1.07	1.86	9.70**	12.64***
				(3.73)	(4.16)
2 years	−18.78	0.90	5.20	19.68***	23.98***
				(4.90)	(5.64)
3 years	−19.24	1.77	6.48	21.01***	25.72***
				(5.92)	(6.90)
Panel D: Parent Stake after Listing $< 50\%$ ($N = 168$)					
1 year	−8.51	2.75	5.00	11.26**	13.51***
				(4.46)	(4.86)
2 years	−17.36	−1.99	2.17	15.37***	19.52***
				(5.16)	(5.82)
3 years	−20.19	3.36	7.49	23.55***	27.68***
				(5.63)	(6.39)
Panel E: Large Subsidiaries ($N = 91$)					
1 year	−17.89	−0.67	6.52	17.22***	24.41***
				(6.07)	(7.85)
2 years	−31.91	−4.17	9.10	27.74***	41.01***
				(7.86)	(10.72)
3 years	−30.10	1.78	14.94	31.89***	45.04***
				(8.95)	(12.18)

Table 4
Risk-adjusted Returns

Monthly risk-adjusted returns for the full sample of subsidiaries and for subsamples with high ex-ante agency costs are calculated by running the following panel regression

$$r_{it} = \alpha + \beta_1 \cdot RMRF_t + \beta_2 \cdot HML_t + \beta_3 \cdot SMB_t + \varepsilon_{it}$$

where r_{it} is subsidiary or adjusted parent return net of the risk free rate or the difference between adjusted parent and subsidiary returns. Adjusted parent returns are

$$r_{it}^{adjusted\ parent} = r_{it}^{parent} - (1 - \alpha_{i,t-1})\left(\frac{MV_{i,t-1}^{sub}}{MV_{i,t-1}^{parent}}\right) r_{it}^{sub}$$

the returns on parent company equity adjusted for the returns on parent's stake in subsidiary. Monthly returns are primarily from Datastream, augmented with data from the Japan Securities Research Institute (JSRI), the Pacific Basin Capital Markets (PACAP) Research Center, and Bloomberg. $RMRF$ is the Topix return net of the risk-free rate. HML is the Barra/Nikko Value return minus the Barra/Nikko Growth return. SMB is the value-weighted return of small stocks on the first section of the Tokyo Stock Exchange minus the value-weighted return of large stocks. N is the average number of subsidiaries in each monthly cross section. Sales relationship indicates the existence of a consumer-supplier relationship between parent and subsidiary and is based on the authors' subjective judgement about the nature and scope of these relationships as described in Japan Company Handbooks. Large subsidiary is a dummy variable equal to one whenever subsidiary market equity at listing exceeds 20% of parent market equity. Standard errors, shown in parentheses below the coefficients, are clustered by month. *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Holding Period	Return	Alpha	$RMRF$	HML	SMB	N	Adjusted R^2
		Panel A: Full Sample					
	Subsidiary - Risk Free	−0.40	0.77***	−0.56***	0.81***	426	0.12
		(0.45)	(0.08)	(0.19)	(0.10)		
1 year	Adjusted Parent - Risk Free	0.14	1.04***	−0.10	0.41***	426	0.28
		(0.19)	(0.04)	(0.09)	(0.06)		
	Adjusted Parent - Subsidiary	0.54	0.28***	0.47**	−0.40***	426	0.01
		(0.47)	(0.08)	(0.20)	(0.11)		
	Subsidiary - Risk Free	−0.33	0.82***	−0.44***	0.78***	423	0.13
		(0.35)	(0.06)	(0.15)	(0.09)		
2 years	Adjusted Parent - Risk Free	0.14	1.04***	0.03	0.33***	423	0.24
		(0.17)	(0.03)	(0.08)	(0.05)		
	Adjusted Parent - Subsidiary	0.47	0.22***	0.47***	−0.44***	423	0.01
		(0.34)	(0.06)	(0.15)	(0.09)		
	Subsidiary - Risk Free	−0.15	0.82***	−0.39***	0.77***	416	0.14
		(0.31)	(0.06)	(0.12)	(0.08)		
3 years	Adjusted Parent - Risk Free	0.17	1.02***	0.05	0.37***	416	0.24
		(0.15)	(0.03)	(0.07)	(0.05)		
	Adjusted Parent - Subsidiary	0.32	0.20***	0.44***	−0.40***	416	0.01
		(0.32)	(0.06)	(0.13)	(0.09)		

(continued)

Table 4 - Continued

		Alpha	$RMRF$	HML	SMB	N	Adjusted R^2
		Panel B: Sales Relationship					
	Subsidiary - Risk Free	-0.98^{**}	0.80^{***}	-0.49^{***}	0.87^{***}	177	0.16
		(0.46)	(0.10)	(0.18)	(0.12)		
1 year	Adjusted Parent - Risk Free	0.03	1.05^{***}	-0.26^{**}	0.36^{***}	177	0.30
		(0.25)	(0.05)	(0.11)	(0.08)		
	Adjusted Parent - Subsidiary	1.01^{**}	0.26^{***}	0.23	-0.51^{***}	177	0.02
		(0.46)	(0.08)	(0.18)	(0.12)		
	Subsidiary - Risk Free	-0.71^{**}	0.81^{***}	-0.43^{***}	0.83^{***}	176	0.16
		(0.36)	(0.08)	(0.15)	(0.09)		
2 years	Adjusted Parent - Risk Free	0.14	1.03^{***}	-0.08	0.25^{***}	176	0.23
		(0.22)	(0.04)	(0.09)	(0.07)		
	Adjusted Parent - Subsidiary	0.86^{**}	0.22^{***}	0.35^{**}	-0.58^{***}	176	0.02
		(0.37)	(0.07)	(0.15)	(0.10)		
	Subsidiary - Risk Free	-0.50	0.81^{***}	-0.32^{**}	0.81^{***}	174	0.16
		(0.31)	(0.07)	(0.13)	(0.08)		
3 years	Adjusted Parent - Risk Free	0.17	1.01^{***}	-0.05	0.28^{***}	174	0.23
		(0.19)	(0.03)	(0.07)	(0.06)		
	Adjusted Parent - Subsidiary	0.67^{**}	0.20^{***}	0.27^{**}	-0.52^{***}	174	0.02
		(0.33)	(0.07)	(0.13)	(0.10)		
		Panel C: Parent Stake after Listing less than 50%					
	Subsidiary - Risk Free	-0.73	0.68^{***}	-0.62^{***}	0.76^{***}	166	0.12
		(0.47)	(0.07)	(0.24)	(0.11)		
1 year	Adjusted Parent - Risk Free	0.32	0.97^{***}	-0.17	0.53^{***}	166	0.30
		(0.23)	(0.04)	(0.11)	(0.07)		
	Adjusted Parent - Subsidiary	1.06^{**}	0.30^{***}	0.46^{*}	-0.23^{**}	166	0.01
		(0.51)	(0.08)	(0.25)	(0.12)		
	Subsidiary - Risk Free	-0.60^{*}	0.74^{***}	-0.40^{**}	0.71^{***}	165	0.13
		(0.36)	(0.07)	(0.18)	(0.09)		
2 years	Adjusted Parent - Risk Free	0.05	0.97^{***}	0.07	0.44^{***}	165	0.25
		(0.19)	(0.04)	(0.08)	(0.06)		
	Adjusted Parent - Subsidiary	0.65^{*}	0.23^{***}	0.47^{***}	-0.28^{***}	165	0.01
		(0.38)	(0.07)	(0.18)	(0.10)		
	Subsidiary - Risk Free	-0.51^{*}	0.73^{***}	-0.34^{**}	0.69^{***}	164	0.12
		(0.30)	(0.05)	(0.14)	(0.07)		
3 years	Adjusted Parent - Risk Free	0.14	0.96^{***}	0.13^{*}	0.46^{***}	164	0.25
		(0.17)	(0.03)	(0.07)	(0.05)		
	Adjusted Parent - Subsidiary	0.65^{*}	0.24^{***}	0.47^{***}	-0.23^{***}	164	0.01
		(0.33)	(0.06)	(0.16)	(0.09)		
		Panel D: Large Subsidiaries					
	Subsidiary - Risk Free	-1.97^{**}	0.73^{***}	-0.37	1.00^{***}	86	0.11
		(0.77)	(0.12)	(0.28)	(0.22)		
1 year	Adjusted Parent - Risk Free	-0.00	0.76^{***}	-0.29^{*}	0.66^{***}	86	0.19
		(0.34)	(0.06)	(0.15)	(0.10)		
	Adjusted Parent - Subsidiary	1.97^{**}	0.04	0.08	-0.34	86	0.00
		(0.88)	(0.12)	(0.35)	(0.24)		
	Subsidiary - Risk Free	-1.36^{**}	0.77^{***}	-0.44^{**}	1.03^{***}	86	0.13
		(0.55)	(0.09)	(0.21)	(0.16)		
2 years	Adjusted Parent - Risk Free	0.10	0.75^{***}	-0.13	0.68^{***}	86	0.13
		(0.33)	(0.04)	(0.12)	(0.09)		
	Adjusted Parent - Subsidiary	1.46^{**}	-0.02	0.31	-0.35^{**}	86	0.00
		(0.60)	(0.09)	(0.23)	(0.18)		
	Subsidiary - Risk Free	-0.88^{*}	0.86^{***}	-0.47^{***}	1.01^{***}	83	0.14
		(0.45)	(0.07)	(0.17)	(0.13)		
3 years	Adjusted Parent - Risk Free	0.22	0.77^{***}	-0.10	0.64^{***}	83	0.14
		(0.26)	(0.04)	(0.10)	(0.07)		
	Adjusted Parent - Subsidiary	1.10^{**}	-0.08	0.36^{*}	-0.37^{***}	83	0.00
		(0.47)	(0.08)	(0.19)	(0.14)		

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Table 5

Risk-adjusted Returns on Subsidiaries versus Other Listings

Monthly risk-adjusted returns are calculated by running the following panel regression

</div>

$$r_{it} - r_{it}^f = \alpha + \alpha_{sub} \cdot Subsidiary + \beta_1 \cdot RMRF_t + \beta_2 \cdot Subsidiary \cdot RMRF_t +$$

$$\beta_3 \cdot HML_t + \beta_4 \cdot Subsidiary \cdot HML_t + \beta_5 \cdot SMB_t + \beta_6 \cdot Subsidiary \cdot SMB_t + \varepsilon_{it}$$

where *Subsidiary* is a dummy variable indicating subsidiary listing. The full sample consists of all listings during the 1980-2005 period. The samples in panels B, C, and D consist of all non-subsidiary listings and subsamples of subsidiary listings with high ex-ante agency costs. Monthly returns are primarily from Datastream, augmented with data from the Japan Securities Research Institute (JSRI), the Pacific Basin Capital Markets (PACAP) Research Center, and Bloomberg. *RMRF* is the Topix return net of the risk-free rate. *HML* is the Barra/Nikko Value return minus the Barra/Nikko Growth return. *SMB* is the value-weighted return of small stocks on the first section of the Tokyo Stock Exchange minus the value-weighted return of large stocks. *N* is the average number of firms in each monthly cross section. Standard errors, shown in parentheses below the coefficients, are clustered by month. *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

Holding Period	Relative Alpha: α_{sub}	Other IPO Alpha: α	N	Adjusted R^2
Panel A: Full Sample				
1 year	−0.28	−0.11	1865	0.09
	(0.28)	(0.51)		
2 years	−0.25	−0.08	1883	0.09
	(0.23)	(0.44)		
3 years	−0.19	0.04	1871	0.10
	(0.19)	(0.40)		
Panel B: Sales Relationship				
1 year	−0.87**	−0.11	1616	0.09
	(0.40)	(0.51)		
2 years	−0.63**	−0.08	1637	0.09
	(0.32)	(0.44)		
3 years	−0.54**	0.04	1629	0.10
	(0.27)	(0.40)		
Panel C: Stake after Listing less than 50%				
1 year	−0.62	−0.11	1605	0.08
	(0.41)	(0.51)		
2 years	−0.52*	−0.08	1626	0.09
	(0.31)	(0.44)		
3 years	−0.55**	0.04	1619	0.10
	(0.27)	(0.40)		
Panel D: Large Subsidiaries				
1 year	−1.86***	−0.11	1525	0.08
	(0.65)	(0.51)		
2 years	−1.28***	−0.08	1546	0.09
	(0.44)	(0.44)		
3 years	−0.92***	0.04	1539	0.10
	(0.35)	(0.40)		

Table 6
Subsidiary Outcomes

At the time of subsidiary's last appearance as a public company, we check whether the parent stake is essentially unchanged (within 5% of listing stake), whether the parent increases its stake but does not buy back the subsidiary, whether the parent or an affiliate of the parent repurchases the subsidiary, and whether the parent sells all or some of its holdings.

Total number of subsidiaries observed	431
Parent stake within 5% of listing stake	147
Parent increases stake by at least 5%	
but does not buy back subsidiary	26
Parent buys back subsidiary	109
Parent decreases stake by at least 5%	
but does not sell entire stake	85
of which maintain 20%	63
of which maintain 50%	36
Parent sells entire stake	64

Table 7
Reacquisition Announcement Returns

Buyer and target announcement returns for subsidiaries reacquired by the parent company or by another entity affiliated with the parent. There are 109 such reacquisitions in the sample. In 18 cases the buyer announces multiple acquisitions on the same day. In calculating buyer announcement returns, only one observation per announcement is included. We lose 7 observations of buyer returns and 5 observations of target returns due to missing price data. Standard errors are in parentheses. *, **, and *** denote significance at 10%, 5%, and 1%, respectively.

[0,0]	[-1,0]	[-1,1]	[-2,2]
	Panel A: Buyer		
0.836**	0.584	1.750***	1.718**
(0.322)	(0.362)	(0.621)	(0.782)
	Panel B: Target		
1.611*	2.492**	8.561***	9.486***
(0.869)	(0.956)	(1.830)	(2.052)