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The Value Information of Financing Decisions and Corporate Governance during and after the Japanese Deregulation*

Using Fama and French's (1998) framework, we investigate how financing decisions and corporate governance affect firm value, during and after the Japanese deregulation of 1974-97. We find that the value information is especially strong in the case of adverse *keiretsu* effects on bank financing in the 1980s, suggesting that *keiretsu* hands-on corporate governance and finance caused more costs than benefits. There is also strong evidence that Japan's deregulation changed the value information of corporate financing decisions and made it more compatible with a market-oriented financial system. This presaged the waning of traditional *keiretsu* corporate governance in Japan.

I. Introduction

The financial-policy-irrelevancy argument, or the MM theorem (Modigliani and Miller 1958; Miller and Modigliani 1961), asserts that, in a perfect market, the choice of corporate investments rather than the choice of corporate financing decisions is what matters to firm value. The MM theorem, however, implies that in reality corporate financing decisions interact with corporate investments, because of various market imperfections such as taxes, agent conflicts, and information asymmetries, and hence affect firm value. Consequently, nimble managers must be able to adjust corporate finance to mitigate such market imperfections to enhance firm value. In the imperfect real world, it is important to

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understand how corporate finance affects firm value. In this paper, we use Fama and French's (1998) regression methodology to examine how corporate financing decisions and corporate governance affect firm value during and after Japan's deregulation of 1974–97.

Fama and French's (1998; hereafter, FF) central theme is to test the tax effects of financing decisions.[1] FF suggest that the market value of a firm can be determined from: (1) the market value of an all-equity, no-dividends firm with the same pretax expected net cash flows (cash earnings before interest, dividends, and taxes, less investment outlays) plus (2) the value of the tax effects in the firm's expected debt and dividend decisions. Nontax factors such as agency costs and asymmetric information are also relevant. A vast body of literature offers a host of nontax factors that can play a role in the relationship between firm value and financing decisions (see the detailed literature review in section II.B). FF argue that all the factors that link value and financing decisions should operate through corporate profitability. Consequently, to isolate the tax effects, FF carefully control for the variables (not directly related to debt and dividends) that carry value information about part (1), which should also include the nontax effects.

The results from FF's regressions show that the slopes for interest payments are negative and those for dividends are positive. These results apparently contradict the predictions not only of Modigliani and Miller (1963) and Brennan (1970) but also of Miller (1977) and Miller and Scholes (1978, 1982). Despite their failure to detect the tax effects of financing decisions, FF conclude that the slopes for debt and dividends are most likely to convey the value information about the nontax effects missed by the control variables for profitability, such as earnings and investments.[2] The nontax effects apparently overwhelm the tax effects, if any, of financing decisions. Therefore, the FF approach may be more suitable to reveal value information from financing decisions when nontax effects dominate.

If the so-measured value information from financing decisions is reliable, it will be especially interesting to examine Japanese corporate finance. Many have argued that the main-bank-centered corporate governance and finance in Japan were essential to the success of Japan's economy during most of the postwar period.[3] In view of the

1. Some classic theories suggest that there are positive interest tax shields from high leverage (Modigliani and Miller 1963) and a negative taxes effect in the pricing of dividends (Brennan 1970). But others argue that there should be no value effects of both debt (Miller 1977) and dividends (Miller and Scholes 1978, 1982).

2. Note that the FF methodology is not without controversy, which, however, focuses mainly on whether the approach is appropriate in identifying the tax effects of debt (see Kemsley and Nissim 2002).

3. At the heart of the main-bank-centered system, Japanese banks played a much more active role in client firms' corporate governance and finance (see Aoki, Patrick, and Sheard

fact that corporate finance in Japan has been remarkably different from that in the United States (e.g., Hodder and Tschoegl 1985, 1993; Mayer 1988), the value information available from corporate financing decisions under these two distinct structures of corporate governance might be different as well.

This unique feature of the Japanese corporate sector actually offers an opportunity to investigate the value effects of different corporate governance structures, especially when a direct international comparison is likely to be confounded by a host of noisy international factors. It is recognized that there have been two distinct structures of corporate governance and financing within Japan (e.g., Berglöf and Perotti 1994; see also Wu, Sercu, and Chen 2000 for a literature review). The structure typically designated as the Japanese model refers to the (financial) *keiretsu* system in which reciprocal holdings (particularly between firms and main banks) enable financing and disciplining within a *keiretsu* group with a longer-run perspective than what is standard in a capital-market-driven system. Coexisting with the *keiretsu* system, there are many firms financed and disciplined (relatively) more at arm's length by the capital markets, in a way closer to the Anglo-American governance concept. Thus, the different value effects of financing decisions between *keiretsu* and non-*keiretsu* firms, if any, reflect the different value effects of the two distinct corporate governance structures.

Another advantage the Japanese data offer is a dynamic perspective about the value effects of corporate finance in response to Japan's financial deregulation. Japan's financial deregulation was aimed at moving its financial system toward a more market-oriented one. The deregulation changed the nature of market imperfections and the corporate contracting environment in Japan, where bank-centered corporate governance and finance had been dominant. This change, in turn, could alter the relationship between Japanese corporate financing decisions and firm value.

The Japanese corporate sector used to be highly leveraged with mostly bank debt, but the deregulation initiated in the mid-1970s started to change both the capital structure and debt mix in Japan (Campbell and Hamao 1994). The deregulation process had a slow start but speeded up in the mid-1980s. Many Japan's previously tough restrictions on corporate arms'-length financing, such as bond issues, were finally lifted in the early 1990s, allowing Japanese corporate financing to

1994 for a review of the Japanese main-bank system). However, the main-bank relationship is not simply the type of relationship banking. There are long-term implicit contractual relationships among several banks, one of which serves as the main bank. Aoki, Patrick, and Sheard (1994) point out that all Japanese firms virtually have a main bank. This is not surprising in light of relationship banking everywhere in the world. However, they argue that the Japanese main-bank system is special in that it is oriented more to corporate governance, which is beyond the usual activities of relationship banking one would expect.

become more market-oriented than ever before.[4] Theoretically, a close relationship between a firm and its inside bank is less sustainable if access to capital markets is easier (Rajan 1992). In response to this gradual disintermediation process, Japanese firms marginally preferred unmonitored debt (mostly bonds) to bank borrowing.[5] Therefore, the observed changes in Japanese corporate financing probably reflect the changes in the relationship between Japanese corporate financing and firm value.

Our findings are rich and interesting. We find that Japanese corporate finance conveys meaningful value information during the period 1974–97. The value information is especially strong in the case of adverse *keiretsu* effects on bank financing in the 1980s, when *keiretsu* banks remained powerful. This suggests that the *keiretsu* practices of hands-on corporate governance and finance brought about more costs (due to rent seeking on behalf of *keiretsu* banks) than the benefits from mitigating agency conflicts and asymmetric information. However, such adverse value effects tend to diminish in the 1990s, when strict restrictions on capital market financing were lifted. The empirical evidence presages the waning of traditional *keiretsu* practices, along with the main-bank-centered governance and finance structure.

We also find, among many important results, that the speeding up of financial deregulation caused the (formerly irrelevant) Japanese corporate dividend policy to have a significantly positive value. Since the knowledge of the detailed tests later in this paper facilitates the understanding of the results, we leave a detailed summary of the results to the conclusions. However, it is worth emphasizing here that our findings are consistent with major corporate finance theories that explain the roles of financing decisions in a more-competitive financial market.

The remainder of the paper is organized as follows. Section II reviews the literature. Section III explains the FF regression framework that we use to test our hypotheses. Section IV reports the data. Section V presents and discusses the regression results and deals with some

4. Our sample period ends just before the recent "Big Bang" deregulation of the Japanese financial markets, which started in 1998. This "Big Bang" deregulation was aimed at dismantling the remaining hard-shelled restrictions to make the Japanese financial markets more open to the world. See Gibson (1998) for a discussion on the impact of that deregulation on Japanese corporate governance and financing.

5. Hoshi, Kashyap, and Scharfstein (1993) contend that the tendency of Japanese firms to replace bank loans with public debt during the deregulation process implies that the costs associated with monitored or bank debt in the past exceeded the benefits. However, Anderson and Makhija (1999) show that the bank-financed high-growth firms remained bank financed, especially when strict bond issuance restrictions were explicitly lifted in 1990. They conclude that their evidence is inconsistent with the view of significant holdup costs of bank loans. In a recent study, Wu, Sercu, and Yao (2001) use a theoretically sound U-shaped relation between the loan-to-debt ratio and corporate growth to reconcile the seemingly contradictory views about the costs and benefits of the Japanese corporate debt mix choice (monitored debt versus public debt) in relation to firm growth.

issues on robustness of the results. Section VI summarizes and concludes the paper.

II. The Literature Review: Relevance and Hypotheses

In this section, we discuss the relevance of this paper to the existing literature on Japanese corporate governance and finance (section A). We also explain how the existing literature relates firm value with the major nontax effects of corporate financing decisions (section B). Taking into account Japan's corporate and institutional background, we propose some testable hypotheses about these valuation effects.

A. Relevance to the Literature

Our focus on the relationship between each major corporate financing decision and firm value in an integrated test makes this paper significantly different from previous studies on Japanese corporate governance and financing. For example, Weinstein and Yafeh (1998) highlight a negative aspect of the Japanese corporate governance and financing system in terms of higher cost of capital (largely due to higher interest payments) but lower profitability in *keiretsu* firms during 1974–86 (see also the early study by Nakatani 1984). Wu, Sercu, and Chen (2000) provide further evidence that, during 1974–95, the large *keiretsu* firms had no advantage in the cost of capital but significantly lower returns on investment, compared to large non-*keiretsu* firms. However, these studies are unable to show how each of the major corporate financing decisions is explicitly related to firm value. Dewenter and Warther (1998) recognize differences in agency conflicts and asymmetric information between the *keiretsu* and non-*keiretsu* (and U.S.) firms and attribute these differences to the underlying factors for the observed different dividend policies. However, a smaller equity price response to a *keiretsu* firm's dividend policy change may well reflect the *keiretsu* firm's smaller reliance on arms'-length financing, as they point out, but it gives no clue whether or not *keiretsu* practices enhance firm value.

Still other studies, again unlike this paper, concentrate mainly on a single aspect of the Japanese corporate governance and financing system. Hoshi, Kashyap, and Scharfstein (1993); Anderson and Makhija (1999); and Wu, Sercu, and Yao (2001) study the relations between the Japanese corporate debt mix choice and firm growth opportunities and find both benefits and costs to monitored debt. Morck, Nakamura, and Shivdasani (2000) investigate how the value of a Japanese firm is linked to bank holdings in the firm and find that more bank holdings (with a ceiling of 5% in each firm as of 1987) tend to erode firm value. Kang and Stulz (2000) examine how Japanese firms with more bank loans lost more equity value in the early 1990s and question the role of the main banks in the recent Japanese economic recession.

In the once-well-received traditional view, Japanese firms under the *keiretsu* governance and finance structure are less constrained by their internal cash positions and able to continue their investments and growth even when facing a shortage of cash (Hoshi, Kashyap, and Scharfstein 1990a, 1990b, 1991). It is also well documented that *keiretsu* banks play a positive role in helping member firms in financial difficulties (Kaplan and Minton 1994; Kang and Shivdasani 1997). But, in view of the unexpectedly slow recovery, if any at all, of the Japanese firms from the prolonged recession starting in the early 1990s, more recent studies have naturally become more critical towards Japan's governance system (see Allen, 1996, for a review on this reversal of opinions). Empirical evidence on the negative aspect of the Japanese main-bank-centered governance system, such as in Weinstein and Yafeh (1998) and Wu, Sercu, and Chen (2000), does emerge. On balance, it is recognized that *keiretsu* corporate financing and governance has brought about both benefits and costs in the evolution of the Japanese financial system (Hoshi and Kashyap 2001). This paper contributes to the literature by showing how Japanese corporate financing decisions are explicitly related to firm value, especially during a corporate contracting environment that is changing, and by providing a value-effect-based evaluation of every major aspect of corporate finance in Japan.

B. Hypotheses on the Value Effects of Japanese Corporate Financing Decisions

In view of the findings of FF (1998), the nontax value effects of financing decisions can easily overshadow any tax effects. What are the major nontax effects? In this section, we concentrate on the arguments put forward by the extant literature on market imperfections, mainly in terms of agency conflicts (section 1) and asymmetric information (section 2) in influencing the value effects of financing decisions. Before we form our testable hypotheses, we also look at the relevant arguments related to *keiretsu* and the debt mix choice between bank loans and public debt (bonds) due to their close relevance to the Japanese context (section 3). As summarized in table 1, we detail these arguments next.

1. Agency Costs

In agency-costs models, listed as the first category in table 1, agency problems that damage firm value arise as conflicts between managers and outside shareholders or between shareholders and debt holders. Some argue that debt casts a positive light on firm value. To mitigate agency conflicts, higher leverage increases managers' incentive with their insider equity holdings in proportion to the total equity (Jensen and Meckling 1976). In addition, debt and dividends also play a disciplinary

TABLE 1 Major Theories Based on Market Imperfections to Predict Value Effects of Financial Decisions

	Theory	Higher Level of	Consequence	Effect on Value
Agency costs	Jensen and Meckling (1976)	Debt	Closer incentive alignment due to increased insider ownership	Positive
	Jensen (1986)	Debt	Free cash flows less likely	Positive
	Easterbrook (1984)	Dividend	Disciplined management more likely	Positive
	Fama and Miller (1972); Jensen and Meckling (1976)	Debt	Asset substitution problem more likely	Negative
	Myers (1977)	Debt	Underinvestment (debt overhang) more likely	Negative
Asymmetric information	Bhattacharya (1979)	Dividend	Signaling value	Positive
	Miller and Rock (1985)	Dividend	Conveying information on unobservable current true earnings	Positive
	Myers and Majluf (1984); Myers (1984)	Risky debt (like equity)	Underinvestment more likely due to higher adverse selection costs of external financing	Negative
Asymmetric information and agency costs	Stulz (1990)	Debt	Overinvestment less likely but underinvestment more likely due to asymmetric information about xxfinancial slack (or free cash flows)	Mixed
	Wu and Wang (in press)	Equity (outside)	Overinvestment more likely but underinvestment less likely due to insiders' private benefits of control from new investment	Mixed

TABLE 1 (*Continued*)

	Theory	Higher Level of	Consequence	Effect on Value
Debt mix choice between bank Loans and public debt (bonds)	Diamond (1984); Berlin and Loeys (1988)	Loan	More monitoring	Positive
	Detragiache (1994); Chemmanur and Fulghieri (1994)	Loan	Inefficient liquidation less likely	Positive
	Sharpe (1990)	Loan	Rent seeking by banks (holdup) more likely	Negative
	Rajan (1992)	Loan	Weakening incentive due to holdup	Negative
Keiretsu	Prowse (1990)	Loan	Asset-substitution problem less likely	Positive
	Morck and Nakamura (1999)	Loan	Rent seeking by banks more likely	Negative
	Kato, Loewenstein and Tsay (1997); Dewenter and Warther (1998)	Dividend	Increased intragroup reallocation of cash flows more likely (not meant for signaling value)	Weak at best

NOTE.—This table illustrates major theories or arguments that predict the value effects of financial decisions based mainly on market imperfections, such as agency costs and asymmetric information. We also highlight the relevant arguments related to *keiretsu* and the debt mix choice (between monitored and unmonitored debt, namely, bank loans versus bonds) because of the Japanese corporate context.

role in forcing managers to pay out free cash flows that would be otherwise wasted on bad investments (Jensen 1986; Easterbrook 1984).

But debt can have a negative side. Higher leverage may increase the incentives of managers and shareholders to take risky, suboptimal projects, the asset substitution problem (Fama and Miller 1972; Jensen and Meckling 1976). Too much debt can also lead to the problem of underinvestment due to debt overhang (Myers 1977).

2. Asymmetric information

In asymmetric information models, listed as the second category in table 1, higher dividends have a positive signaling effect on firm value (Bhattacharya 1979) or simply convey positive information about the unobserved current true earnings (Miller and Rock, 1985). However, the asymmetric information model of Myers and Majluf (1984) implies that external financing (risky debt like new equity) is more costly than internal financing. Thus, there is a pecking order in financing (Myers 1984). Following this logic, higher debt and dividends leave less financial slack for future investments and could sometimes force firms to forgo good projects. This is the underinvestment problem that causes ex ante loss in firm value.

But more financial slack does not always enhance firm value in an asymmetric information framework. In an extension of Myers and Majluf (1984) recognizing the private benefits of managers or controlling shareholders, Wu and Wang (in press) argue that there are both *ex ante* under-and overinvestment (see also Stulz, 1990, who considers the agency cost of the free-cash-flow type in addition to information asymmetry). Wu and Wang (in press) show that an increase in financial slack reduces firm value when investors' concern about overinvestment looms large. This means that less reliance on capital markets is not always cost saving or value enhancing. Theories that consider asymmetric information as well as agency problems are shown in the middle of table 1.

3. The Japanese context

What are the theories about such value effects in the context of the Japanese corporate finance? The rest of table 1 summarizes the relevant arguments. The Japanese model has been celebrated by many as having a long-term perspective in contrast to the short-term capital-market-driven Anglo-American practices (Porter 1992; Jacobs 1993). Berglöf and Perotti (1994) argue that the cross-holdings in the main-bank-centered *keiretsu* system make internal discipline more sustainable over time. The reciprocal holdings help fend off hostile takeovers, which would break up valuable (long-term) implicit contracts that Shleifer and Summer (1988) appreciate. In the *keiretsu* system, member firms used to be able to raise more debt than otherwise at arm's

length, and debt came largely in the form of bank loans (Hodder and Tschoegl 1985). Thus, Japanese corporate finance has been viewed as, at least, benefiting a great deal from bank financing.

Bank loans in general can have a positive relationship with firm value, because banks play a monitoring role (Diamond 1984; Berlin and Loeys 1988) and do not as easily as bondholders push firms into bankruptcy when firms become financially distressed (Detragiache 1994; Chemmanur and Fulghieri 1994). Therefore, a higher loan-to-debt ratio, given leverage, has a positive value effect. It follows that higher leverage in which bank loans predominate is less likely to cause agency problems between shareholders and debt holders. Prowse (1990) concludes that *keiretsu* practices mitigate the asset-substitution problem.

More use of bank loans can have an effect on dividend policy, too. The monitoring role of bank loans can to some extent substitute for the disciplinary role of dividends. Less reliance on arm's-length financing reduces the need for a market-oriented dividend policy to convey or signal positive information to the capital markets. In actuality, *keiretsu* dividends changed more frequently than non-*keiretsu* dividends (Kato, Loewenstein, and Tsay 1997) and were viewed largely as internal funds reallocated within the group (Dewenter and Warther 1998). By implication, if dividends in general contain positive information as found in FF (1998), the value information from *keiretsu* dividends should be weak.

However, bank loans can have a negative aspect. If inside banks have informational monopoly power, which is derived from a close bank-firm relationship, they can hold up client firms to capture rents (Sharpe 1990). This in turn may impair the incentive of these firms (Rajan 1992). True, bank ownership in firms can alleviate the holdup problem. Yet, if the *keiretsu* governance practices assign effective control rights to banks when the bank ownership is actually not so large as to align bank interests with those of outside shareholders, bank loans can have a significantly negative value effect, as pointed out by Morck and Nakamura (1999). More directly, bank borrowing can negatively interact with corporate investments. If the hands-on practices in *keiretsu* tilt toward rent seeking on behalf of *keiretsu* banks, the held-up member firms, when short of good investment opportunities, would be forced to overinvest to generate more interest income for the banks to the detriment of the firms' own profitability.

In sum, the extant theories with various focuses provide no consistent predictions on the value effects of financing decisions. As a result, the nontax effects, or simply value effects, of leverage, the loan-to-debt ratio and dividends, respectively, in general can be either positive or negative, depending on which theory's emphasis empirically dominates. Nevertheless, regardless of the positive or negative signs, a cross-sectional comparison of financing decisions under two distinct

corporate governance structures can demonstrate which produces stronger or weaker value information. This allows us to evaluate the relative merits of the two distinct governance structures. We hypothesize that there are significantly different value effects from financing decisions between *keiretsu* and non-*keiretsu* practices, on the ground that their corporate governance and finance are significantly different. We also hypothesize that the changing, unobservable corporate contracting environment leading to a more competitive financial market affects the value information of Japanese corporate financing decisions. In the next section, we describe how we test these hypotheses.

III. Methodology

To measure the value effects of Japanese corporate finance, we use FF's (1998) regression framework. In the regression, the dependent variable is the spread of value over cost, $V_t - A_t$, scaled by A_t (to control for heteroscedasticity), where V_t is the total market value of a firm (the sum of the market equity and the book debt) and A_t is the book value of the firm. The presumption is that good managers implement corporate investment and financing decisions to maximize the difference between total firm value and cost. In the spirit of FF, the specification of the regression we use is as follows:[6]

$$\begin{aligned}(V_t - A_t)/A_t = {} & a + a^g G + a^s S \\ & + \sum_{i=1}^{M} (b_i + b_i^g G + b_i^s S)\mathrm{EX}_i + \sum_{j=1}^{N} (c_j + c_j^g G + c_j^s S)\mathrm{INV}_j \\ & + \sum_{k=1}^{K} (d_k + d_k^g G + d_k^s S)\mathrm{FD}_k \\ & + (h + h^g G + h^s S) dV_{t+2}/A_t + e_t. \end{aligned} \tag{1}$$

In regression (1), the terms a, b, c, d and h are regression coefficients. G is the dummy variable for large *keiretsu* firms, which is equal to one if a firm is a *keiretsu* member and in the largest quintile of all firms; otherwise G takes a value of zero. S is the dummy variable for small- and medium-sized firms, which is equal to one if a firm is in the four smaller quintiles than the largest, and zero otherwise. The reason to single out the largest Japanese firms is that Wu, Sercu, and Chen (2000)

6. As FF(1998) argue, the version of FF regressions to explain the level of firm value, which we use here, can measure the anticipated effects of known financing strategies while the other version of FF regressions to explain changes in firm value, similar to event studies, can measure only the effects of unexpected changes in financing decisions. The version of FF regressions we use in this paper is especially suited for our purpose.

find that the adverse *keiretsu* differential effect in corporate performance is mainly limited to the top quintile. In addition, they find a strong size effect in the Japanese corporate cost of capital but no cost of capital difference between the large *keiretsu* and non-*keiretsu* firms.[7] Therefore, we control for the size effect by setting the slopes dependent on the size dummy as well. Note that the number of large *keiretsu* firms is likely to predominate in the top size quintile. This may cause a small sample problem for large non-*keiretsu* firms. In section V.C, for a robustness study, we show that, despite the smaller sample of large non-*keiretsu* firms we use due to the top size quintile restriction, our results are largely robust because increasing the number of large non-*keiretsu* firms to match the number of large *keiretsu* firms that are in the top quintile of all firms produce very similar results.

In the first summation of regression (1), EX is a compact symbol of M explanatory variables related to the profitability of assets. Following FF, these variables, scaled by A_t, include both the current level of earnings, E_t/A_t, and the future changes (up to $t + 2$) in earnings, dE_{t+2}/A_t, a proxy for the expected changes, as we explain shortly. If these variables were effective, they would absorb all value information in corporate investment and financing decisions, except the information on the tax effects of debt and dividends.

In the second summation of regression (1), INV is a compact symbol of N explanatory variables related to investments. These variables, scaled by A_t, include the current fixed investments, INV_t/A_t, the expected (up to $t + 2$) fixed investments, INV_{t+2}/A_t, and the current level of and expected changes in intangible investments (or R&D expenses), $\text{R\&D}_t/A_t$ and $d\text{R\&D}_{t+2}/A_t$.

The variables related to earnings and investments are used in the FF regressions to control for the value information from the profitability of a firm's assets in place and expected investments and for the value information from the nontax effects of financing decisions that would fully operate through profitability. FF find that these control variables miss a great deal of the value information from the nontax effects of financing decisions and the slopes for the variables related to financing decisions themselves contain rich value information beyond that contained in the measured profitability. In addition, such rich value information empirically overwhelms the value information of any tax effects. This is the main reason that we can use the FF regression framework as one way to measure the value information from the nontax effects of financing decisions.

7. When we use firm size as a continuous variable instead of size dummies in regression (1), there is direct evidence of a size effect in the slope estimates (results are available on request). However, this linear specification would suppress the fact that the *keiretsu* effect is pronounced only in the top size quintile (or largest firms).

In the third summation of regression (1), FD is a compact symbol of K financial decision variables that include the current level of and expected changes (from t to $t+2$) in the book leverage, BD_t/A_t and $d(\mathrm{BD}_{t+2}/A_{t+2})$, the book loan-to-debt ratio, $\mathrm{Loan}_t/\mathrm{BD}_t$ and $d(\mathrm{Loan}_{t+2}/\mathrm{BD}_{t+2})$, and the dividend-to-book-equity ratio, $\mathrm{DIV}_t/\mathrm{BE}_t$ and $d(\mathrm{DIV}_{t+2}/\mathrm{BE}_{t+2})$. We set each slope dependent on the *keiretsu* dummy and the size dummy. This detailed specification allows us to focus our hypotheses on the slopes for the *keiretsu* dummy with each explanatory variable. If a slope for G is significant, we infer a significant *keiretsu* differential effect.[8]

The changes in earnings, investments, and financing decisions variables from t to $t+2$ as explanatory variables in the FF regression are not standard in the method of ordinary least square (OLS) because these variables alone contain future unexpected shocks, which should not influence the current dependent variable, $(V_t - A_t)/A_t$. To correct for this errors-in-variable problem, following Kothari and Shanken (1992), FF add a measurement error proxy, dV_{t+2}/A_t, which is deemed to capture unexpected shocks from t to $t+2$. Of course, measurement errors cannot completely go away, because dV_{t+2}/A_t is not perfectly correlated with any of the unexpected components in those future changes. Nevertheless, FF treat the slope estimates for realized future changes (from t to $t+2$), after offset by dV_{t+2}/A_t, as the ones for the expected changes. In the regression, we also let these slopes depend on *keiretsu* and size dummies to stay consistent with other slopes.

Following Fama and MacBeth (1973), FF take the time-series average of the annual cross-sectional regression coefficients for each explanatory variable as a point estimate. Since the regression involves biannual change variables but is run year by year, there is a 1-year data overlap in consecutive regressions. As a result, the standard deviation of the point estimate, assuming a typical serial correlation in the slope estimates to be at 0.5, is inflated by 40%. Accordingly, FF suggest that a significant t-value should be 2.8 or more.

An advantage of FF's (1998) regression framework is that the year-by-year cross-sectional estimation allows us to track the value effects of Japanese corporate financing that may vary through time meaningfully. Thus, based on the subperiod results or simply the plots of annual slope estimates, we can examine how the value effects of Japanese corporate financing change in response to the changing corporate contracting environment due to the deregulation in our sample period.

IV. Data and Sample Description

Our Japanese data are retrieved from the Pacific-Basin Capital Markets (PACAP) databases. The annual data on balance sheets and income

8. The choice of *keiretsu* membership is largely historically determined and hence exogenous. Thus, the FF regression to detect a *keiretsu* effect is least affected by a reverse

statements for nonfinancial and non-utility-and-telecom listed firms we use (all Japanese Industry Codes except 0501–0513, 0705, and 801) cover 24 fiscal years from 1974 to 1997. Since our aim is to highlight major corporate financing decisions, we ignore non-interest-bearing liabilities and include only debt that pays explicit interest in the calculation of the firm value. Thus, the book value of a firm, A_t, is the sum of its total end-of-year book value of long-term debt (PACAP data items BAL14 and BAL15), short-term debt (BAL11), and equity. Book equity is total assets (BAL9) minus total liabilities (BAL17). The market value of a firm, V_t, is the sum of the book debt in A_t and the market equity (MKTVAL, or share price, MKT3, times shares outstanding, MKT5, at the end of March, the typical fiscal year end.)

Following the existing literature, we define *keiretsu* firms as closely affiliated members of the six major Japanese horizontal (financial) groups: Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa, and Daiichi Kangyo (see e.g., Gerlach 1992 for a review of *keiretsu* industrial groups). *Keiretsu* membership is readily identifiable and stays rather stable over time: The switch-in and-out of membership (especially when a weak membership is not counted) is very rare. In our sample, *keiretsu* firms are the group firms from the classification by Nakatani (1984) or the closely affiliated members (with the degree of the two-, three-, and four-star inclinations) of the six *keiretsu* groups from the classification in the 1992/93 edition of *Industrial Groupings in Japan—the Anatomy of the Keiretsu*.[9] Other firms that do not fall in either of these classifications belong to non-*keiretsu* firms. We also form quintiles of all firms in the sample each year according to the year-end market value of that firm in the previous year. Firms in the top quintile are heavily weighted in the corporate sector. Every year, on average, they account for more than 50% of the total market or book value of all listed firms in our sample.

Table 2 reports the annual averages of the (cross-sectional) mean and standard deviations of the regression variables. The Japanese value-to-cost ratios (V/A) in our sample are similar to Anderson and

causality problem. In the literature, such as Rajan and Zingales (1995), about the determinants of capture structure, financing decisions are deemed to be determined by corporate performance along with firms' other characteristics. Nevertheless, the FF regression explicitly uses earnings and investments to control for corporate performance to gauge a "clean" value effect from financial decisions.

9. According to the 1992/93 handbook, there are 471 *keiretsu* firms and 198 (as we can find in the PACAP database) according to Nakatani's (1984) classification. There are 106 *keiretsu* firms common to both classifications. Therefore, the Nakatani classification adds 92 only *keiretsu* firms (e.g., Sony and Toshiba) that are not recognized by the handbook classification. This makes a total of 563 *keiretsu* firms. Admittedly, there is no unified classification of *keiretsu* firms in the literature (see the discussion in Weinstein and Yafeh 1995). Nevertheless, a misclassification bias would muffle a *keiretsu* effect that exists and make the tests more conservative.

TABLE 2 Descriptive Statistics of Regression Variables

	Large Non-*Keiretsu*			Large *Keiretsu*			Small–Medium Sized		
Dependent Var. (Y)	Mean	Std Dev	Corr. with Y	Mean	Std Dev	Corr. with Y	Mean	Std Dev	Corr. with Y
$(V_t - A_t)/A_t$	1.094	1.435	1.00	.827	.765	1.00	.954	1.091	1.00
Explanatory variable:									
E_t/A_t	.076	.034	.50	.076	.026	.36	.071	.079	.15
dE_{t+2}/A_t	.005	.033	.23	.004	.031	.13	.007	.093	.17
Inv_t/A_t	.136	.109	.25	.128	.096	.16	.132	.150	.10
Inv_{t+2}/A_t	.153	.129	.33	.147	.128	.25	.162	.185	.15
$\text{R\&D}_t/A_t$	.005	.009	.04	.004	.007	.03	.005	.012	.10
$d\text{R\&D}_{t+2}/A_t$	.001	.005	.06	.001	.004	.03	.001	.009	−.01
BD_t/A_t	.507	.283	−.45	.554	.262	−.52	.463	.347	−.04
$d(\text{BD}_{t+2}/A_{t+2})$	−.011	.079	.03	−.012	.065	.08	−.014	.295	−.11
$\text{Loan}_t/\text{BD}_t$	.661	.289	−.08	.660	0.276	−.34	.803	.273	.05
$d(\text{Loan}_{t+2}/\text{BD}_{t+2})$	−.016	.149	−.16	−.025	.136	−.16	−.025	.193	−.09
Div_t/BE_t	.027	.014	.17	.026	.014	.08	.021	.014	.06
$d(\text{Div}_{t+2}/\text{BE}_{t+2})$	−.002	.009	.02	−.002	.013	.04	−.002	.012	.01
dV_{t+2}/A_t	.268	1.000	.05	.238	.713	−.06	.367	1.539	−.04
Annual sample size	105			152			1083		

NOTE.—This table presents the simple statistics of regression variables for nonfinancial and non-utility-and-telecom Japanese listed firms (all Japanese Industry Codes except 0501–0513, 0705, and 801) for a period from 1976 to 1995. Mean is the average of annual means of a regression variable. Std Dev is the standard deviation of the annual means. Corr. with Y is the average of annual correlation coefficients between dependent variable (Y) and individual explanatory variables. A_t is a firm's book value of debt, BD_t, and equity, BE_t, or book capital at the end of fiscal year t, where book debt includes the short-term (BAL11) and long-term debt (BAL14 and BAL15) and book equity is total assets (BAL9) minus total liabilities (BAL17). V_t is the firm's market value at the end of March of each year (MKTVAL or share price, MKT3, times shares outstanding, MKT5, plus book debt.) E_t is earnings before interest and extraordinary items but after tax, or net income (INC9) minus extraordinary items (INC8) plus interest expense (JAF67). dE_{t+2}/A_t stands for the change in earnings from year t to $t+2$, scaled by A_t, $(E_{t+2} - E_t)/A_t$. Inv_t is the change in fixed assets (BAL7) from year $t-2$ to t plus the depreciation expenses over the 2 years (JAF74 in year $t-1$ and t). (Cumulated) R&D is intangible assets (JAF24). BD_t/A_t stands for leverage. $d(\text{BD}_{t+2}/A_{t+2})$ stands for the change in the leverage ratios from year t to $t+2$, $\text{BD}_{t+2}/A_{t+2} - \text{BD}_t/A_t$. Loan_t is the short-term (JAF33 and JAF34) and long-term loans (JAF48). Div_t is cash dividend paid out in fiscal year t, dividend per share (MKT1) times shares outstanding (MKT5). We sort firms into quintiles according to year-end market capital in year $t-1$. We further separate the non-*keiretsu* from the keiretsu firms in the top quintile (denoted as large non-*keiretsu* and large *keiretsu,* respectively). *Keiretsu* firms are closely affiliated members of the six major financial groups. The small-and medium-sized firms are Japanese firms in the smaller quintiles than the largest. Year t runs from 1976 to 1995 (but data range from 1974 to 1997 because regression variables in year t include data from year $t-2$ to $t+2$).

Makhija (1999), who report an average value-to-cost ratio (GROWTH or V/A) for Japanese firms of 1.91. In the first two groups of columns, with the value-cost spread metric as the regression dependent variable, $(V - A)/A$, the average is 1.094 for large non-*keiretsu* firms, higher than the average, 0.827, for their large *keiretsu* peers. The large *keiretsu* and non-*keiretsu* difference in this regard is consistent with the return-on-investment and value-added evidence in Wu, Sercu, and Chen (2000). From the viewpoint of security (in particular, equity) providers, such evidence of adverse *keiretsu* effects in corporate performance naturally casts doubt on the traditionally perceived merit of *keiretsu* corporate governance and finance.

Also largely consistent with the existing literature, in comparison with their non-*keiretsu* peers, the large *keiretsu* firms have lower current and future investments (0.128 and 0.147 versus 0.136 and 0.153) but higher leverage (0.554 versus 0.507) in proportion to total book capital. We measure current investment using the change in fixed assets (BAL7) from year $t - 2$ to t plus depreciation expenses (JAF74 at $t - 1$ and t) and leverage by book debt over book capital. A larger *keiretsu* debt to finance investments should lead to a lower *keiretsu* cost of capital. However, Wu, Sercu, and Chen (2000) find no evidence on the alleged *keiretsu* advantage in the cost of capital for a similar sample period. This may indicate, instead, the relative inefficiency in the use of *keiretsu* debt. Given that the numbers in the first two groups of columns of table 2 for earnings before interest but after taxes and for dividend payouts are similar between the two groups, the extra *keiretsu* (relative to non-*keiretsu*) leverage seems to be compatible with the alleged excessive compensation balance imposed traditionally by *keiretsu* banks on their member firms. Note that the earnings are measured by net income (INC9) minus extraordinary items (INC8) plus interest expense (JAF67), and dividend payout is measured by dividend per share (MKT1) times the number of shares outstanding (MKT5) over book equity. Not surprisingly, the subsequent decreases in loan-to-debt ratio, where loans include both short term (JAF33 and JAF34) and long term (JAF48), are markedly faster for *keiretsu* firms (-0.025) than for non-*keiretsu* firms (-0.016) during the process of the financial deregulation and disintermediation in Japan.

The lower *keiretsu* value-and-cost-spread must be explained by *keiretsu* earnings, investments, and even financing decisions in some way. It is interesting that the *keiretsu*'s financing decisions can convey the value information. The annual averages of the (cross-sectional) correlation estimates between $(V-A)/A$ and a single explanatory variable as shown in table 2 provide some preliminary evidence. For example, while both negatively related to $(V-A)/A$, the *keiretsu* leverage and, in particular, the loan-to-debt ratio have stronger value effects than their non-*keiretsu* peers (correlation estimates are –0.52

and –0.34 versus –0.45 and –0.08, respectively.) In the next section, we put the *keiretsu* differential effects under close scrutiny in our formal investigation of the value effects of Japanese corporate financing decisions by controlling for earnings and investments.

V. Regression Results

In this section, we report and discuss the value effects of Japanese corporate earnings and investments (section A) and financing decisions (section B) based on FF's regression framework. Additionally, we discuss some robustness issues (section C). The information about firm value in a regression variable is measured by the average of annual cross-sectional slope estimates in a sample period. The results are shown in table 3 for the whole sample period of 1976–95 and subperiod samples 1976–88 for the period in the process of financial deregulation and 1989–95 for the period with much liberalized financial markets. In the discussion that follows, we seek to highlight the *keiretsu* differential effects in large Japanese firms. We also show how the deregulation affects the value information in corporate financial decisions.

A. Information about Firm Value in Earnings and Investments

In columns of Table 3 for the whole period, the average slope estimates for current earnings and their expected changes are significantly positive for the large non-*keiretsu* firms (the baseline case) but not significant for the *keiretsu* dummies. For example, the slope estimate for current earnings is 8.35 with a *t*-value of 4.35, while for the corresponding *keiretsu* dummy, it is −1.85 with a *t*-value of −0.95. Reliably, current earnings of the large Japanese firms and their expected changes are positively related to firm value.

The slope estimates for various firms should be different if these firms differ significantly in the cost of capital (discount rate) or growth.[10] In a simple discounted cash flow framework (holding growth equal), the absence of a significant *keiretsu* differential value impact from earnings is consistent with the finding of equal cost of capital in the large *keiretsu* and non-*keiretsu* firms by Wu, Sercu, and Chen (2000). Interestingly, profitability in small-and medium-sized firms has a significantly smaller value impact. For example, the slope estimate for the expected changes in earnings is lower than the one for the baseline case by 5.32 and it is significant. This evidence may well reflect a

10. In a simplified framework, $V/A = \mathrm{ROA}/(r - g)$ plus some other value factors due to market imperfections, where V/A is firm value scaled by book assets, ROA is return on assets, or earnings over assets, r is cost of capital, and g is (earnings) growth. Thus, $1/(r - g)$ can be viewed as the slope for earnings in our regression.

TABLE 3 Main Results from Estimates of Regression to Explain Value-Cost Spread

		1976–95 (Total Period)			1976–88 Subperiod			1989–95 Subperiod		
		Const	G	S	Const	G	S	Const	G	S
Intercept	Mean	.10	.80	.47	.09	1.06	.65	.10	.32	.13
	t(Mean)	(.37)	(3.29)	(1.93)	(.23)	(2.96)	(1.77)	(1.37)	(3.12)	(1.14)
E_t/A_t	Mean	8.35	−1.85	−5.20	7.28	−1.44	−4.62	10.34	−2.61	−6.27
	t(Mean)	(4.35)	(−.95)	(−2.67)	(2.51)	(−.48)	(−1.60)	(7.35)	(−1.57)	(−3.11)
dE_{t+2}/A_t	Mean	7.92	−2.18	−5.32	6.58	−1.11	−4.72	10.39	−4.17	−6.43
	t(Mean)	(4.72)	(−1.23)	(−3.35)	(2.67)	(−.42)	(−1.94)	(7.35)	(−2.74)	(−5.86)
Inv_t/A_t	Mean	.03	−.37	−.29	−.19	−.25	.04	.45	−.59	−.90
	t(Mean)	(.08)	(−.93)	(−.71)	(−.32)	(−.41)	(.06)	(1.27)	(−1.84)	(−2.40)
Inv_{t+2}/A_t	Mean	1.44	−1.07	−.87	1.63	−1.29	−1.08	1.08	−.67	−.47
	t(Mean)	(3.50)	(−3.56)	(−2.34)	(2.65)	(−2.87)	(−1.99)	(2.93)	(−2.86)	(−1.23)
$\text{R\&D}_t/A_t$	Mean	.21	7.43	2.53	.67	8.95	2.82	−.64	4.60	2.01
	t(Mean)	(.08)	(2.24)	(.97)	(.18)	(1.81)	(.71)	(−0.28)	(1.52)	(.78)
$d\text{R\&D}_{t+2}/A_t$	Mean	1.38	−3.01	.92	3.64	−10.04	.02	−2.83	10.06	2.58
	t(Mean)	(.23)	(−.42)	(.14)	(.40)	(−1.07)	(.00)	(−.49)	(.97)	(.45)
BD_t/A_t	Mean	−.85	−.20	.29	−.87	−.27	.11	−.83	−.08	.62
	t(Mean)	(−5.09)	(−.89)	(1.59)	(−3.38)	(−.75)	(.41)	(−6.15)	(−.67)	(4.53)
$d(\text{BD}_{t+2})/A_{t+2}$	Mean	.50	−.27	−.37	.79	−.88	−.79	−.05	.87	.41
	t(Mean)	(1.51)	(−.80)	(−1.30)	(1.61)	(−2.16)	(−2.03)	(−.29)	(2.81)	(2.69)
$\text{Loan}_t/\text{BD}_t$	Mean	.26	−.45	−.07	.33	−.66	−.11	.14	−.08	−.01
	t(Mean)	(3.56)	(−2.98)	(−.67)	(3.26)	(−3.10)	(−.65)	(1.45)	(−.74)	(−.08)
$d(\text{Loan}_{t+2}/\text{BD}_{t+2})$	Mean	−.18	−.37	.11	−.29	−.52	.26	.01	−.08	−.18
	t(Mean)	(−.71)	(−1.32)	(.43)	(−.72)	(−1.23)	(.69)	(0.12)	(−.43)	(−1.73)
Div_t/BE_t	Mean	8.40	−3.15	−3.28	4.74	−2.33	−2.50	15.19	−.67	−4.72
	t(Mean)	(3.31)	(−1.82)	(−1.96)	(1.39)	(−1.01)	(−1.01)	(7.37)	(−1.67)	(−2.75)
$d(\text{Div}_{t+2}/\text{BE}_{t+2})$	Mean	3.78	−.78	−.08	2.82	−1.49	−.83	5.57	.54	1.31
	t(Mean)	(1.93)	(−.37)	(−.03)	(1.18)	(−.72)	(−.28)	(1.46)	(.11)	(.29)
dV_{t+2}/A_t	Mean	−.33	−.03	.07	−.21	.02	.14	−.56	−.12	−.05
	t(Mean)	(−3.22)	(−.46)	(.90)	(−1.58)	(.19)	(1.40)	(−3.86)	(−1.82)	(−.37)

NOTE.— This table presents the average coefficients and their t-statistics (in parentheses) from estimates of regression (1) for nonfinancial and non-utility-and-telecom Japanese listed firms (from the PACAP database) for the whole sample period, 1976–95 and two subperiods, 1976–88 and 1989–95. Each year t, the value-cost spread, $(V_t - A_t)/A_t$, is regressed on explanatory variables related to earnings, investments, and financing decisions as specified in regression (1). See the definition of regression variables in table 2. We sort firms into quintiles according to year-end market capital in year $t-1$. We further separate *keiretsu* and non-*keiretsu* firms in the top quintile. *Keiretsu* firms are closely affiliated members of the six major financial groups. We set intercept and each regression slope dependent on a constant, Const, the largest *keiretsu* dummy, G (=1 if a *keiretsu* member in the largest quintile, 0 otherwise), and the size dummy, S (=1 if a firm in smaller quintiles than the largest, 0 otherwise). Estimates under Const are for the largest non-*keiretsu* firms. Year t runs from 1976 to 1995 (but data range from 1974 to 1997 because regression variables in year t include data from year $t-2$ to $t+2$).

significantly higher cost of capital for small-and medium-sized firms. It seems that the size factor in the value effect of profitability falls in line with the size premium in the Japanese cost of capital documented by Wu, Sercu, and Chen (2000) for a similar sample period.

The results about earnings in the subperiod samples as shown in table 3 are otherwise qualitatively similar. The exception is that the value information in the expected changes in the earnings of the large non-*keiretsu* firms becomes much stronger from the period of 1976–88 to the much-deregulated period of 1989–95 (the slope estimates increase from 6.58 to 10.39). As a result, the value information in the expected changes in earnings in the 1989–95 subperiod becomes significantly less for large *keiretsu* firms than for their large non-*keiretsu* peers. Here, the large *keiretsu* firms look like the small-and medium-sized firms regarding their slope estimates. This may well indicate a relative increase in cost of capital or a relative decrease in growth at the large *keiretsu* firms during the years of an unfortunate mix of recession, a credit crunch, and growing troubles at the *keiretsu* banks.

For investments, while there is no statistically significant value effect of R&D, we find significant value effects of expected investments in fixed assets.[11] For the whole period, the slope estimate for expected investments of the large non-*keiretsu* firms is 1.44, which is significant with a *t*-value of 3.50. However, the *keiretsu* differential value effect is noticeably negative. The slope estimate for the *keiretsu* dummy with this variable is −1.07, which is significant with a *t*-value of −3.56, leaving insignificant the value information in expected investments of the large *keiretsu* firms (the direct estimate is available on request).

This *keiretsu* differential effect remains robust in both sub periods, as shown in table 3. It appears that expected investments contain value information about the *keiretsu* effect. The persistently lower present values from *keiretsu* investments are open to two possible explanations. One is the adverse *keiretsu* effect on expected cash flows (holding risk constant). The main implication of bad corporate governance is the unfair diversion of corporate cash flows to whomever controls the firm, namely, expropriation from the shareholders at large. The other is the effect on investment risks (holding cash flows equal) and hence cost of capital. In this line, an adverse *keiretsu* effect here should

11. The slope estimate for large *keiretsu* R&D during the whole sample period is 7.43 with a *t*-value of 2.24. Statistically, this positive slope estimate is not significant. As we mentioned in the methodology section, the threshold *t*-value for significance is 2.8 (as suggested by FF 1998), due to the time-series correlation in slope estimates from year-by-year regressions using variables spanning more than 1 year. However, there is reason to believe that the investment in R&D by *keiretsu* firms can be viewed as good news, especially if the market expects that *keiretsu* banks are reluctant to support risky investments. We thank the referee for pointing this out.

mean that *keiretsu* investments become riskier (than the baseline case). However, this contradicts the notion that *keiretsu* banks press their member firms to invest in less risky project to secure the banks' interest revenues. On the other hand, the small and medium-sized firms have apparently higher risks than large *keiretsu* firms, and at the same time, their slope estimates here (as a value effect) appear qualitatively similar to those of large *keiretsu* firms. Perhaps, the lower value effect of smaller firms' investments (than the baseline case) is due mainly to their higher investment risks. By contrast, the adverse *keiretsu* effect from large firms seems to be mostly related to more questionable corporate governance (a cash flow effect) at large *keiretsu* firms. The large *keiretsu* firms would have passed up less-profitable investments if they had been more disciplined by the market. This is consistent with the view that the large *keiretsu* firms overinvested (relative to their large non-*keiretsu* peers) to the benefits of *keiretsu* banks.

We follow FF (1998) in interpreting the "future-shocks-purged" slope estimates for future changes in earnings and future investments as value information from expected changes in earnings and expected investment. As introduced in the methodology section, we believe that the measurement error proxy, dV_{t+2}/A_t, as suggested by FF (1998), largely purges future unexpected shocks and should not influence the current value and cost spread (the independent variable of the regression). Indeed, all average slope estimates on dV_{t+2}/A_t for the baseline case in table 3 (in the bottom row) are negative, and significantly so for the whole sample period and the deregulated period of the 1990s. Thus, this offsetting variable seems to fulfill what it is expected to do in our regression.[12]

If *keiretsu* overinvestment is largely perceived ex ante, we have an a priori reason to believe that the *keiretsu* financing decisions may somehow be involved. But we cannot be certain that the *keiretsu* financing decisions are still able to show strong value information, given that expected investments have already done a good job in reflecting the *keiretsu* adverse differential effect. Nevertheless, in the next section, we turn to the value information from corporate financing decisions.

B. Information about Firm Value in Financing Decisions

Our main purpose is not to investigate the value information in corporate earnings and investments, although the part of the regression results we discussed in the previous section already shows a strong *keiretsu* differential value effect (to the disadvantage of the *keiretsu*,

12. In effect, exclusion of these future changes in the regression does not qualitatively change our main results (available on request). We keep them in the regression because it is part of the FF methodology.

though). Instead, we are more interested in value information from financing decisions. In view of the FF's findings, earnings and investments as control variables for current and expected profitability fail to a large extent to absorb value information from the nontax effects of financing decisions. Therefore, if the value information from financing decisions is robust, we can evaluate directly the merit of financing decisions in terms of, for example, leverage, the loan-to-debt ratio, and dividend payout.

1. Leverage

As shown in table 3, after controlling for measured profitability in assets in place and expected investments, we find significant value information in corporate financial policies here, as FF (1998) do using the U.S. data. Given that the slope estimates for the *keiretsu* dummies with current leverage are not significant at all (in all sample periods), the slope estimates for current leverage are on average significantly negative, regardless of being a large *keiretsu* or non-*keiretsu* firm, or the sample period. For example, the average slope estimate in total period for the baseline case is -0.85 with a t-value of -5.09. It seems that, in the trade-off framework for an optimal capital structure, large Japanese firms in practice tend to borrow too much. It is worth mentioning that the evidence on a negative value effect of debt is also found for U.S. firms by FF (1998).

Do the value effects of debt evolve with Japan's deregulation? The value effects of debt, indeed, do not remain static but change in strong response to the gradual financial deregulation in Japan in a meaningful way. As plotted in figure 1, the annual (cross-sectional) slope estimates for the current leverage of all Japanese firms, while remaining largely negative, are on the rise for improvement until the end of the sample period after a notable drop around 1983, when the deregulation started to speed up. It seems that the traditional way of debt financing became disadvantageous when the improved access to arm's-length capital markets turned out to be real.

2. Bank financing

Given that bank loans play an important role in Japanese corporate finance, there may be rich information from bank loans as well. As shown for the total period in table 3, with a control for leverage, the current loan-to-debt ratio of the large non-*keiretsu* firms (the baseline case) is significantly positively related to firm value. But the *keiretsu* differential effect is highly negative, so that the loan ratio of the large *keiretsu* firms is negatively related to firm value. The marked results for the whole period sample are actually driven by the first subperiod sample in the 1980s, when *keiretsu* banks were largely influential. The slope estimate for the baseline case, the non-*keiretsu* bank loan ratio in

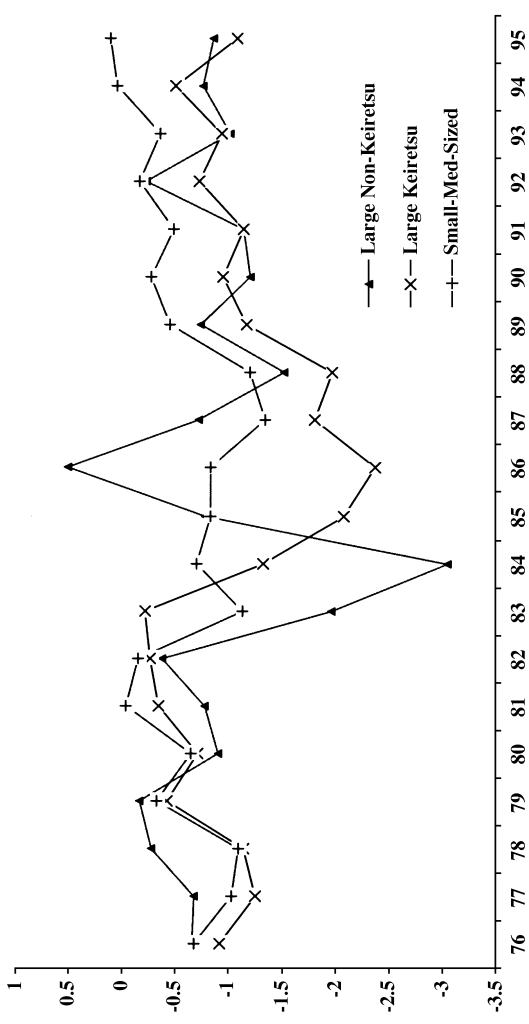

FIG. 1.—Evolution of annual slope coefficients for Japanese corporate leverage. This figure shows the evolution of annual slope coefficients for leverage, BD_t/A_t, from estimates of regression (1) to explain the value and cost spread, $(V_t - A_t)/A_t$, for the nonfinancial and non-utility-and-telecom Japanese firms (from PACAP) over a period from 1976 to 1995. The same regression estimates produce the average estimates in table 3. The slope coefficient is conditional on a constant, Const, the large *keiretsu* dummy, G (=1 if a *keiretsu* member in the largest quintile, 0 otherwise), and the size dummy, S (=1 if a firm in smaller quintiles than the largest, 0 otherwise). *Keiretsu* firms are closely affiliated members of the six major financial groups. Large Non-*Keiretsu,* Large *Keiretsu,* and Small-Med-Sized, respectively, stand for the coefficient for Const, the sum of coefficients for Const and *G*, and the sum of coefficients for Const and *S*.

the first subperiod, is 0.33 with a *t*-value of 3.26, but the incremental slope estimate for the large *keiretsu* firms is a bigger negative number, −0.66 with a *t*-value of −3.10. More revealing, we find, on average, negative slope estimates in expected changes in the loan ratio for large *keiretsu* firms. In particular, as indirectly shown in this subperiod, the average slope estimate is equal to −0.81 (=−0.29 − 0.52) with a *t*-value of −2.85 (the direct slope estimate is available on request). This significantly negative relation means that the smaller is the expected decrease in the weight of bank loans in the debt mix of a large *keiretsu*, the more firm value is eroded.

This finding is consistent with the view that the *keiretsu* practices of hands-on corporate governance and finance used to give rise to rent-seeking behavior on behalf of *keiretsu* banks. This resulted in a negative value effect that outweighed any positive value effect of *keiretsu* bank loans in mitigating agency problems and asymmetric information. Our evidence is also consistent with the finding by Morck, Nakamura, and Shivdasani (2000) about the negative value effect of Japanese bank ownership in business firms.

One expected consequence of the Japanese financial deregulation and disintermediation is that corporate finance became more at arm's length. The evidence of a constant decrease in leverage and loan ratios, as shown in table 2, indicates that Japanese corporate finance more and more favored capital markets. Interestingly, to reflect this trend, any significant value effects of bank loans tend to diminish in the 1990s, where apparently none of the estimates are significant, as shown in the second subperiod of table 3.

Largely circumstantial, this phenomenon is detailed in figure 2: The value information for all Japanese firms tends to converge to zero from the early 1990s (end of the fiscal year of 1989) on. With the gradual opening up of capital markets, the positive value information in bank loans of large non-*keiretsu* firms diminished, indicating that there once had existed benefits from monitoring by using bank loans in Japan. At the same time, the value information in bank loans of the large *keiretsu* firms shows a different path of evolution. This value information is mainly negative in the 1980s, reflecting perhaps the holdup behavior on behalf of *keiretsu* banks. Yet, the negative value information in keiretsu bank loans has become largely alleviated or diminished since around 1989. Recall that banks had to reduce their equity holdings in each business firm from 10% to 5% by 1987. Not only did *keiretsu* banks lose much of their grip on member firms but a more competitive capital market also took hold in Japan in the 1990s.

It should be mentioned that bank loans, in general, are based more or less on bank relationships. If not for the costs of loan financing imposed by banks on firms, non-*keiretsu* firms would have enjoyed less positive

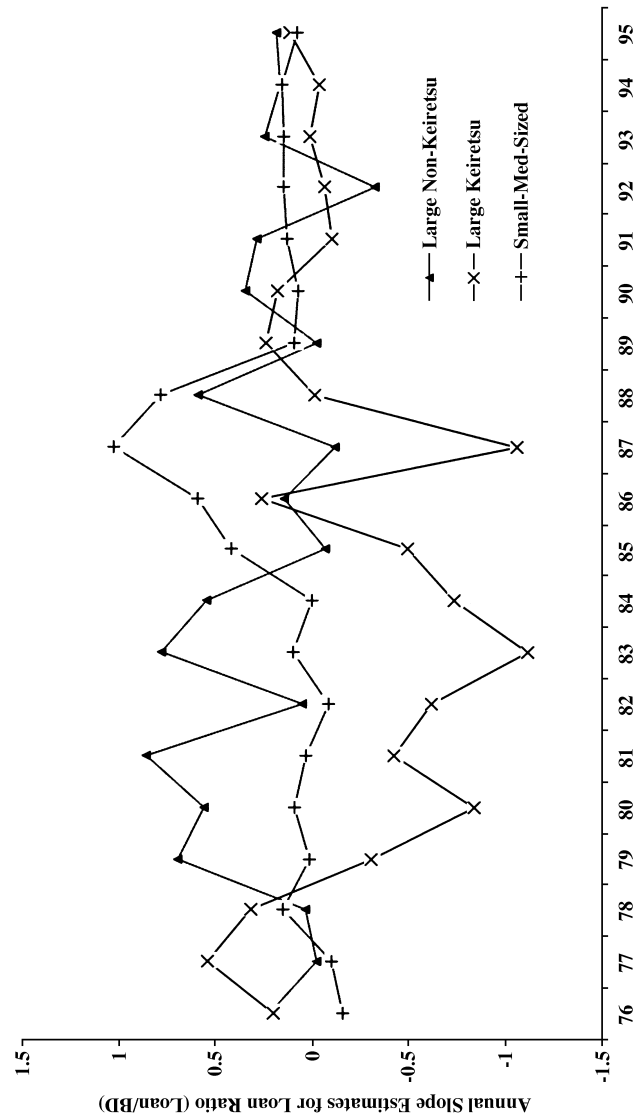

FIG. 2.—Evolution of annual slope coefficients for Japanese corporate loan-to-debt ratio. This figure shows the evolution of annual slope coefficients for loan-to-debt ratio, $\text{Loan}_t/\text{BD}_t$, from estimates of regression (1) to explain the value over cost spread, $(V_t - A_t)/A_t$, for the nonfinancial and non-utility-and-telecom Japanese firms (from PACAP) over a period from 1976 to 1995. The same regression estimates produce the average estimates in table 3. For more details, see the notes in figure 1.

value effects than *keiretsu* firms, as traditionally perceived, because large non-*keiretsu* firms by definition are less relationship based. The fact that there was even negative value information in *keiretsu* loans implies that the costs of *keiretsu* loans overwhelmed the benefits. It is likely that such a cost-benefit trade-off of bank borrowing changes with market imperfections. In particular, the financial deregulation that gradually opened the public debt market, so as to downplay the role of bank loans, is likely to diminish the positive as well as negative effects of bank loans. As a result, Japanese firms seem to have a debt mix with a good balance in the wake of the financial deregulation. Our findings suggest that the Japanese financial regulatory reform does significantly change the value information from bank loans.

3. Dividend

When firms more rely on the arm's-length capital markets, corporate dividend policy is elevated to play a role in valuation signaling or enhancement (Bhattacharya 1979; Easterbrook 1984). If so, we would observe positive value effects of Japanese corporate dividend policy following the liberalization of the Japanese capital markets. As shown in the subperiod columns of table 3, the average slope estimate for dividend payout of the large non-*keiretsu* firms is not significant in the first period, when the financial reform remained much in flux. But the average slope estimate is significantly positive at 15.19 with a *t*-value of 7.37 thereafter (the second subperiod). The *keiretsu* differential effect, however, is insignificant here.

Figure 3 shows that the value information in dividends in all firms jumped from nil to significantly positive since the mid-1980s, when the financial reform started to speed up. Thus, the Japanese financial deregulation has clearly increased the information content of Japanese dividend policy. Our evidence lends clear support to the arguments for the role of dividends in valuation signaling or enhancement in the arm's-length capital markets.

Dewenter and Warther (1998) find that the *keiretsu* stock prices are less responsive to *keiretsu* dividend policy changes and suggest that market imperfections, such as agency conflicts and information asymmetries, which *keiretsu* firms faced less, had little effect on dividend policy, as predicted by the existing theories. Our study sheds further light on the impact of market imperfections on dividend policy by showing that firm value becomes positively related to dividend policy in Japan when a new contracting environment, which has an arm's-length perspective on corporate financing, emerges.

Why, before the mid-1980s, did Japanese corporate dividends have no value information, even in Miller and Modigliani's (1961) sense of the argument that dividends simply have information about expected profitability beyond that contained in measured earnings? The

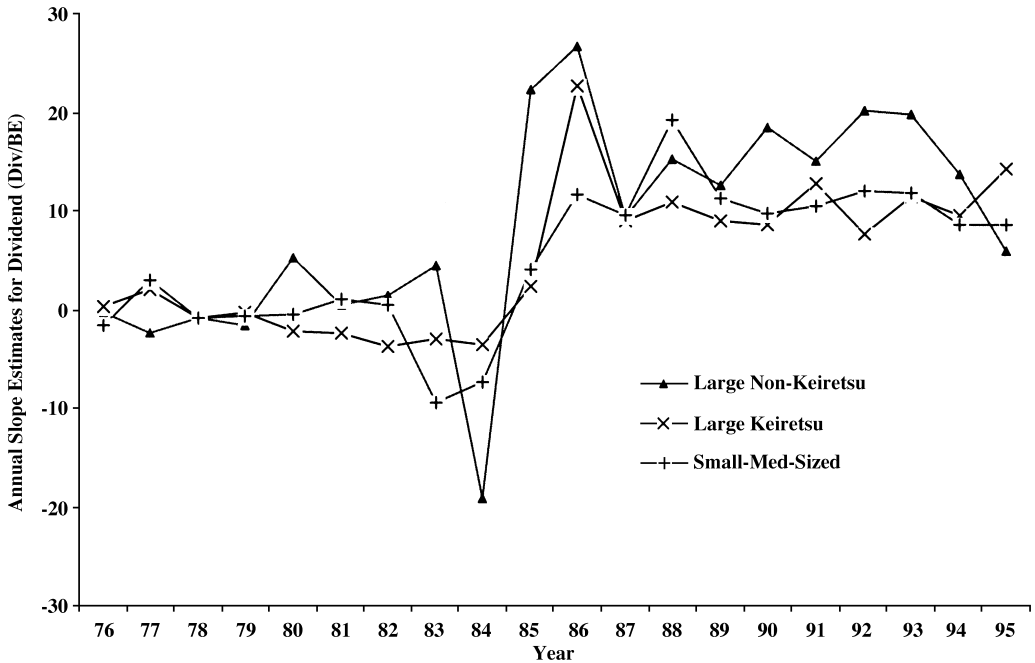

FIG. 3.—Evolution of annual slope coefficients for Japanese corporate dividend payout. This figure shows the evolution of annual slope estimates for dividend payout, $\mathrm{Div}_t/\mathrm{BE}_t$, from estimates of regression (1) to explain the value over cost spread, $(\mathrm{V}_t - A_t)/A_t$, for the nonfinancial and non-utility-and-telecom Japanese firms (from PACAP) over a period from 1976 to 1995. The same regression estimates produce the average estimates in table 3. For more details, see the notes in figure 1.

explanation lies in the traditional practice due to listing regulations that dividends were set based on par value (usually 10%) but not on corporate performance. In addition, Japanese firms used to issue new equity at par value but not at the market value and very often through rights offerings. Thus, Japanese dividends and new equity issues could be hardly viewed as coordinated financial policies to enhance capital market financing, as in a typical U.S. firm, as Easterbrook (1984) suggests. But, during the deregulation process, Japanese firms gradually abandoned their traditional practices, which had become unattractive if they intended to tap into the more competitive arm's-length capital markets. Figure 3 simply indicates that, in the mid-1980s when the Japanese deregulation speeded up to give rise to a more market-oriented contracting environment, Japanese dividend policy began to play the role of valuation signaling or enhancement.

In sum, our regression results show that Japanese corporate finance conveys rich information beyond that contained in the measured profitability in explaining the value over cost spread. There is evidence not only about adverse *keiretsu* differential effects but also about the value information from Japanese financing decisions, which changes in strong response to the opening up of Japanese capital markets in meaningful ways.

It is worth mentioning that our analysis focuses on large Japanese firms, which account for more than 50% of the total assets of all listed firms included in our whole sample. If we did not control for size, our findings, in particular, of an adverse *keiretsu* differential effect would be confounded.[13] On the other hand, when we try to separate *keiretsu* and non-*keiretsu* in small and medium-sized firms in tests similar to the ones reported in table 3, we can find no *keiretsu* effect among the small and medium-sized firms. Yet, the results about the large firms remain unchanged (results are available on request). Also, the results about large firms are the same if we drop the sample of small and medium-size firms. This is not surprising because we use dummies in all regression parameters to control for size.

If *keiretsu* banks can hold up their member firms, smaller *keiretsu* firms should fall captive more easily. However, our evidence shows a lack of more-pronounced adverse effects of bank loans on small *keiretsu* firms than on large *keiretsu* firms. To address this concern, we have to understand how main banks hold up member firms (to impose significant costs to firms). One likely form of expropriation by the main banks is to force member firms to overinvest. Main banks can get more interest

13. Note that, in view of the findings in Wu, Sercu, and Chen (2000), the Japanese corporate governance effect is nonlinearly related to firm size; that is, only large firms have a significant *keiretsu* effect. The current treatment using group and size dummies allows such nonlinear specification.

revenues through extending excessive loans even at "normal" interest rates. Consistent with this holdup/overinestment story, Wu, Sercu, and Chen (2000) show that, although a significant cost-of-capital differential is absent, large *keiretsu* firms have significantly lower expected return on investment compared to large non-*keiretsu* peers. In contrast, this investment inefficiency does not show up in small *keiretsu* firms in their study.

Perhaps, main banks may have little incentive to take such a holdup strategy because the scale of investment in small *keiretsu* firms naturally limits the monopoly rent. In addition, main banks may be less able to do so because bank equity holdings are usually much lower in small firms than in large firms. As a result, if the adverse effects in large *keiretsu* firms come from banks' holdup of such a kind, the effects are likely to be muted in small *keiretsu* firms. Of course, this does not mean the small firms, *keiretsu* or non-*keiretsu*, are not subject to the monopoly power of banks in the general sense. Our evidence is muted in this regard due to, perhaps, other positive effects of bank loans at work.

The small and medium-sized firms, on the whole, behave differently from the large firms, as shown in table 3. This is also an interesting result, although we focus on large firms. Nevertheless, using all firms in the regressions makes our tests more complete and robust. In the next section, we address more issues on the robustness of our regression results.

C. Robustness Check

In this section, we address the relevant issues as follows. How robust are our results to the potential outliers in the data we use? How do we explain the phenomenon that the slope estimates for large non-*keiretsu* firms appear to be abnormal around mid-1980s, especially in figures 1 and 3 (section 1)? Some explanatory variables can have alternative proxies, such as earnings before instead of after taxes and, as leverage, interest payment over book capital, which FF (1998) also use, instead of just debt over book capital, which we have used so far. Are our main regression results sensitive to the use of these alternative proxy variables for earnings and leverage (section 2)? Finally, how about the use of explanatory variables of future changes for a horizon longer than 2 years (section 3)?

1. Outliers

Our loan-to-debt ratio reaches unity at the maximum. However, other regression variables are scaled either by total book assets, A, or book equity, BE, and may become outliers if book assets or equity is an extremely small number (note that firms with book assets or equity that are negative or missing in the original data never enter our samples).

TABLE 4 Results from Estimates of Regression with Trimmed Data

		1976–95 (Total Period)			1976–88 Subperiod			1989–95 Subperiod		
		Const	G	S	Const	G	S	Const	G	S
Intercept	Mean	.10	.79	.45	.08	1.06	.65	.13	.30	.08
	t(Mean)	(.38)	(3.22)	(1.84)	(.21)	(2.92)	(1.76)	(1.67)	(3.10)	(.69)
E_t/A_t	Mean	8.40	−1.84	−4.61	7.44	−1.50	−4.38	10.19	−2.47	−5.03
	t(Mean)	(4.33)	(−.94)	(−2.34)	(2.52)	(−.50)	(−1.49)	(7.18)	(−1.56)	(−2.40)
dE_t/A_{t+2}	Mean	8.02	−2.18	−5.13	6.85	−1.20	−4.87	10.20	−3.98	−5.63
	t(Mean)	(4.71)	(−1.23)	(−3.29)	(2.69)	(−.45)	(−2.02)	(7.87)	(−2.77)	(−5.43)
Inv_t/A_t	Mean	.06	−.39	−.28	−.12	−.31	.00	.41	−.55	−.81
	t(Mean)	(.16)	(−.97)	(−.68)	(−.20)	(−.50)	(.00)	(1.14)	(−1.75)	(−1.94)
Inv_{t+2}/A_t	Mean	1.42	−1.09	−.92	1.60	−1.31	−1.12	1.08	−.68	−.54
	t(Mean)	(3.36)	(−3.59)	(−2.38)	(2.51)	(−2.89)	(−1.98)	(3.00)	(−2.88)	(−1.36)
$\text{R\&D}_t/A_t$	Mean	.07	7.06	2.65	.52	8.33	2.91	−.78	4.70	2.15
	t(Mean)	(.03)	(2.16)	(1.02)	(.14)	(1.70)	(.74)	(−.35)	(1.58)	(.85)
$d\text{R\&D}_{t+2}/A_t$	Mean	1.42	−2.49	1.40	3.27	−8.88	1.05	−2.02	9.39	2.07
	t(Mean)	(.24)	(−.35)	(.22)	(.36)	(−.92)	(.11)	(−.41)	(1.01)	(.42)
BD_t/A_t	Mean	−.84	−.22	.26	−.86	−.28	.09	−.81	−.10	.57
	t(Mean)	(−4.99)	(−.94)	(1.46)	(−3.30)	(−.79)	(.36)	(−6.48)	(−.82)	(4.26)
$d(\text{BD}_{t+2}/A_{t+2})$	Mean	.49	−.26	−.26	.80	−.87	−.78	−.08	.89	.70
	t(Mean)	(1.44)	(−.75)	(−.83)	(1.58)	(−2.10)	(−1.91)	(−.44)	(2.73)	(3.28)
Loan_t/BD_t	Mean	.25	−.44	−.08	.32	−.64	−.13	.11	−.05	.00
	t(Mean)	(3.29)	(−2.82)	(−.78)	(3.09)	(−2.99)	(−.81)	(1.25)	(−.49)	(.03)
$d(\text{Loan}_{t+2}/BD_{t+2})$	Mean	−.19	−.35	.12	−.29	−.51	.25	−.01	−.06	−.12
	t(Mean)	(−.74)	(−1.28)	(.51)	(−.73)	(−1.21)	(.68)	(−.06)	(−.33)	(−1.09)
Div_t/BE_t	Mean	8.28	−2.93	−2.99	4.66	−2.09	−2.27	15.01	−4.48	−4.33
	t(Mean)	(3.26)	(−1.67)	(−1.67)	(1.37)	(−.90)	(−.86)	(6.77)	(−1.53)	(−2.20)
$d(\text{Div}_{t+2}/\text{BE}_{t+2})$	Mean	3.77	−.66	−.19	2.76	−1.26	−.57	5.66	.47	.53
	t(Mean)	(1.95)	(−.32)	(−.08)	(1.18)	(−.66)	(−.19)	(1.49)	(.09)	(.12)
dV_{t+2}/A_t	Mean	−.33	−.03	.06	−.21	.01	.12	−.56	−.12	−.06
	t(Mean)	(−3.24)	(−.50)	(.75)	(−1.59)	(.15)	(1.29)	(−3.95)	(−1.73)	(−.43)

NOTE.— This table shows the average coefficients and their t-statistics (in parentheses) from estimates of regression (1), using trimmed data, for nonfinancial, and non-utility-and-telecom Japanese listed firms (from the PACAP database) for the whole sample period, 1976–95 and two subperiods, 1976–88 and 1989–95. Each year t, the value-cost spread, $(V_t - A_t)/A_t$, is regressed on explanatory variables related to earnings, investments, and financing decisions, as specified in regression (1), where we drop 0.5% of the observations from the lower tail of A_t and BE_t, respectively. Otherwise, the regression is run in the same way as for table 3. See the definition of regression variables and dummies for *keiretsu* membership and small-and medium-sized firms in table 2. Year t runs from 1976 to 1995.

To check the influence of the potential outliers on our main results in table 3, for each year we drop 0.5% of the observations from the lower tail of the book assets, *A*, or book equity, BE. The regression results with the trimmed data are reported in table 4 These estimates, as shown in table 4, to skip the details, are qualitatively the same as the main results reported in table 3.

If the potential outliers in the data are no problem, what causes the seemingly "anomaly" slope estimates, as evidently shown in figure 1and figure 3, especially for the large non-*keiretsu* debt and dividend decisions around the mid-1980s? We could find no major reason other than the speeding-up of deregulation around that time. However, why this drastically affects only the cross-sectional estimates for non-*keiretsu* firms was not clear to us until we suspected the smaller sample size of large non-*keiretsu* firms due to our size sorts by quintile. So we increased the (annual) sample of large non-*keiretsu* firms from some 100 to 150 (to match the sample of the largest quintile *keiretsu* firms) to reproduce the results as in table 3. The new slope estimates remain qualitatively the same as in table 3 but the previously observed "anomaly" estimates in the plots of figures 1 and 3 disappear (the results are available on request). Thus, the smaller sample for the large non-*keiretsu* firms is to blame for the less smooth plots for their slope estimates in figure 1 and figure 3.

On the other hand, when we exclude these anomaly estimates around the mid-1980s, the new average estimates, comparable to the main results in table 3, become even more significant. For example, the average slope estimates for the large non-*keiretsu* leverage (figure 1) become −0.67 (*t*-value = −6.58) and −0.57 (−4.04) for the whole period and the first sample period, respectively. Likewise, the average slope estimates for the large non-*keiretsu* dividend payout (figure 3) become 9.85 (4.79) and 6.73 (2.48), respectively. Therefore, these anomaly estimates shown in figure 1 and 3 do not influence our conclusions.

2. Alternative proxy variables for earnings and leverage

FF's (1998) main theme is to test the tax effects of debt and dividend policies. They use interest payments scaled by total assets as a regression variable to highlight any tax effects of debt policy. Since the main purpose of this paper is not to test the tax effects of debt and dividend policies, we simply employed the commonly used book debt over total assets, BD/*A*, as our regression variable for debt policy. Nevertheless, we can use, instead, interest payments as the regression variable to evaluate the tax effects, as FF do, and check whether or not our previous regression results are sensitive to using this alternative proxy for debt policy.

Table 5 shows the regression results from using interest payments over total assets, Int/*A*, instead of BD/*A*, which we previously used.

TABLE 5 Results from Estimates of Regression with Alternative Explanatory Variables

		1976–95 (Total Period)			1976–88 Subperiod			1989–95 Subperiod		
		Const	G	S	Const	G	S	Const	G	S
A. Results from Regression Using Interest Expense over Book Assets, Int_t/A_t, to Measure Leverage										
Intercept	Mean	−.13	.83	.57	−.17	1.13	.72	−.06	.27	.27
	t(Mean)	(−.56)	(3.47)	(2.52)	(−.45)	(3.29)	(2.12)	(−1.18)	(2.94)	(2.64)
E_t/A_t	Mean	10.90	−1.69	−7.23	10.39	−1.31	−6.90	11.86	−2.41	−7.86
	t(Mean)	(5.72)	(−.83)	(−3.81)	(3.52)	(−.42)	(−2.43)	(10.27)	(−1.67)	(−4.00)
dE_{t+2}/A_t	Mean	8.75	−1.96	−6.03	7.62	−.60	−5.48	10.86	−4.48	−7.03
	t(Mean)	(4.43)	(−.97)	(−3.13)	(2.53)	(−.20)	(−1.83)	(8.89)	(−2.36)	(−7.51)
Inv_t/A_t	Mean	.11	−.40	−.26	−.05	−.39	−.01	.39	−.41	−.73
	t(Mean)	(.29)	(−1.06)	(−.69)	(−.09)	(−.69)	(−.02)	(.93)	(−1.10)	(−1.67)
Inv_{t+2}/A_t	Mean	1.32	−.95	−.74	1.44	−1.16	−.88	1.11	−.56	−.50
	t(Mean)	(3.28)	(−3.38)	(−2.02)	(2.38)	(−2.80)	(−1.63)	(2.81)	(−2.32)	(−1.16)
$\text{R\&D}_t/A_t$	Mean	−.41	7.45	2.94	−.34	8.85	3.47	−.54	4.87	1.96
	t(Mean)	(−.17)	(2.55)	(1.13)	(−.09)	(2.04)	(.89)	(−.23)	(1.64)	(.78)
$d\text{R\&D}_{t+2}/A_t$	Mean	.82	−2.82	1.34	4.13	−11.76	−.85	−5.33	13.78	5.41
	t(Mean)	(.15)	(−.40)	(.24)	(.53)	(−1.35)	(−.10)	(−.94)	(1.29)	(.94)
Int_t/A_t	Mean	−13.54	−1.80	9.59	−13.22	−2.24	8.84	−14.13	−1.00	11.00
	t(Mean)	(−7.64)	(−.88)	(5.83)	(−5.13)	(−.73)	(3.84)	(−6.42)	(−.46)	(4.73)
$d(\text{Int}_{t+2}/A_{t+2})$	Mean	−4.08	−4.53	−1.14	−3.88	−4.50	.62	−4.46	−4.60	−4.40
	t(Mean)	(−1.53)	(−1.91)	(−.38)	(−1.14)	(−1.78)	(.18)	(−.88)	(−.82)	(−.70)
$\text{Loan}_t/\text{BD}_t$	Mean	.33	−.53	−.22	.38	−.71	−.26	.24	−.19	−.14
	t(Mean)	(3.82)	(−4.09)	(−2.52)	(3.06)	(−4.08)	(−2.09)	(2.26)	(−1.77)	(−1.33)
$d(\text{Loan}_{t+2}/\text{BD}_{t+2})$	Mean	−.23	−.23	.09	−.37	−.29	.26	.01	−.12	−.23
	t(Mean)	(−.82)	(−.87)	(.31)	(−.82)	(−.72)	(.59)	(.11)	(−.56)	(−1.93)
Div_t/BE_t	Mean	8.44	−5.37	−3.94	5.51	−5.74	−3.80	13.88	−4.70	−4.20
	t(Mean)	(3.48)	(−3.21)	(−2.52)	(1.61)	(−2.51)	(−1.62)	(7.90)	(−1.76)	(−2.65)
$\text{Div}_{t+2}/\text{BE}_{t+2}$	Mean	4.52	−2.66	−1.46	4.90	−4.88	−3.49	3.83	1.46	2.30
	t(Mean)	(2.37)	(−1.30)	(−.66)	(2.08)	(−2.55)	(−1.36)	(1.01)	(.31)	(.54)
dV_{t+2}/A_t	Mean	−.35	−.02	.08	−.22	.01	.15	−.57	−.09	−.04
	t(Mean)	(−3.23)	(−.33)	(1.01)	(−1.62)	(.12)	(1.44)	(−3.78)	(−1.29)	(−.32)

TABLE 5 (*Continued*)

		1976–95 (Total Period)			1976–88 Subperiod			1989–95 Subperiod		
		Const	G	S	Const	G	S	Const	G	S
B. Results from Regression Using Int_t/A_t for Leverage and Earnings before Taxes, ET_t										
Intercept	Mean	.03	.48	.28	.09	.63	.33	−.07	.21	.18
	t(Mean)	(.24)	(2.58)	(1.95)	(.39)	(2.19)	(1.51)	(−1.22)	(4.53)	(1.87)
ET_t/A_t	Mean	4.90	.75	−1.60	4.25	1.38	−1.20	6.12	−.42	−2.34
	t(Mean)	(6.60)	(1.73)	(−2.19)	(3.91)	(2.48)	(−1.16)	(10.22)	(−.88)	(−2.48)
dET_{t+2}/A_t	Mean	5.41	−1.19	−3.18	4.85	−.79	−3.40	6.45	−1.93	−2.77
	t(Mean)	(4.67)	(−1.13)	(−2.87)	(2.73)	(−.50)	(−2.01)	(8.79)	(−2.02)	(−3.20)
Inv_t/A_t	Mean	.05	−.38	−.22	−.21	−.31	.14	.54	−.51	−.88
	t(Mean)	(.12)	(−1.01)	(−.52)	(−.35)	(−.55)	(.23)	(1.44)	(−1.55)	(−2.31)
Inv_{t+2}/A_t	Mean	1.74	−1.26	−1.21	2.03	−1.58	−1.52	1.19	−.67	−.65
	t(Mean)	(3.82)	(−4.01)	(−2.84)	(3.02)	(−3.50)	(−2.46)	(2.82)	(−2.48)	(−1.44)
$\text{R\&D}_t/A_t$	Mean	−.65	7.71	3.49	−.91	9.37	4.63	−.16	4.64	1.38
	t(Mean)	(−.29)	(2.88)	(1.41)	(−.27)	(2.39)	(1.23)	(−.09)	(1.66)	(.72)
$d\text{R\&D}_{t+2}/A_t$	Mean	.49	−1.59	1.38	2.62	−8.95	.22	−3.47	12.08	3.54
	t(Mean)	(.11)	(−.29)	(.29)	(0.39)	(−1.35)	(.03)	(−.93)	(1.39)	(.90)
Int_t/A_t	Mean	−7.29	−1.31	5.62	−6.84	−2.04	4.19	−8.15	.04	8.28
	t(Mean)	(−5.07)	(−.58)	(4.05)	(−3.35)	(−.58)	(2.30)	(−4.17)	(.03)	(4.17)
$d(\text{Int}_{t+2}/A_{t+2})$	Mean	−2.30	−1.87	−.75	−1.98	−2.27	.10	−2.90	−1.13	−2.34
	t(Mean)	(−1.33)	(−.80)	(−.37)	(−1.50)	(−1.12)	(.07)	(−.61)	(−.18)	(−.42)
$d(\text{Loan}_t/\text{BD}_t)$	Mean	.30	−.49	−.18	.34	−.64	−.20	.22	−.21	−.13
	t(Mean)	(3.14)	(−3.62)	(−1.87)	(2.46)	(−3.26)	(−1.44)	(2.04)	(−2.42)	(−1.25)
$\text{Loan}_{t+2}/\text{BD}_{t+2}$	Mean	−.20	−.23	.10	−.23	−.37	.17	−.14	.03	−.04
	t(Mean)	(−.65)	(−.80)	(.33)	(−.48)	(−.84)	(.37)	(−1.35)	(.18)	(−.29)
Div_t/BE_t	Mean	6.20	−2.68	−3.66	3.31	−2.82	−3.20	11.58	−2.43	−4.52
	t(Mean)	(2.91)	(−1.70)	(−2.45)	(1.12)	(−1.23)	(−1.41)	(8.78)	(−1.21)	(−3.59)
$d\text{Div}_{t+2}/\text{BE}_{t+2}$	Mean	2.35	−.15	−.48	2.84	−2.27	−1.97	1.45	3.80	2.29
	t(Mean)	(1.68)	(−.10)	(−.26)	(1.42)	(−1.24)	(−.77)	(.80)	(1.74)	(.98)
dV_{t+2}/A_t	Mean	−.37	−.02	.09	−.26	.03	.16	−.58	−.11	−.05
	t(Mean)	(−3.44)	(−.22)	(1.03)	(−1.84)	(.35)	(1.51)	(−3.69)	(−1.51)	(−.29)

NOTE.—This table shows the average coefficients and t-statistics (in parentheses) from estimates of a different version of regression (1) for nonfinancial and non-utility-and-telecom Japanese listed firms (from the PACAP database). In this version of regression (1), we use interest expense, Int_t, scaled by book assets, A_t, Int_t/A_t, as a measure for leverage policy and consider earnings either after taxes, E_t, as we previously used (panel A) and before taxes, ET_t (panel B), along with other variables defined in table 2. Otherwise, the regression is run in the same way as for table 3. See the definition of regression variables and dummies for *keiretsu* membership and small-and medium-sized firms in table 2. Year T runs from 1976 to 1995.

Following FF (1998), we also report two versions of earnings as a control variable for profitability, earnings after taxes, E (panel A) and before taxes, ET (panel B). In both Panels A and B of table 5, one of the consistent findings, which is not unexpected, is that the slope estimates on interest payments for the large Japanese firms, on average, are significantly negative, regardless of sample period. Thus, our results from the Japanese data are consistent with the main finding in FF (1998) that any positive value information of the tax effects of debt is overwhelmed by the much stronger, negative value information of nontax effects. Taken together, compared with the main results in table 3, there is a striking similarity in signs and significance about the value information from Japanese corporate financing decisions as shown in both panels A and B of table 5. Therefore, our results are robust to the use of alternative proxy variables for earnings and leverage.

Explanatory variables of future changes for a longer horizon. We follow FF (1998) to use explanatory variables of future changes from t to $t + 2$. FF (1998) argue that 2 years is about as far ahead as the U.S. market can predict, in line with the evidence in Fama (1990). We are not aware of any study on Japan similar to Fama's (1990) study on the United States.

Nevertheless, to address the concern about the predictable horizon that may fundamentally influence our estimates, we use instead the explanatory variables of future changes from t to $t + 4$, a horizon increased by 2 more years, to reproduce the results as in table 3. To avoid a potential small sample bias to confound the horizon robustness tests, we take here the enlarged sample for the large non-*keiretsu* firms (to match the sample of large *keiretsu* firms) as we described in section 1. As shown in table 6, the new results are qualitatively in line with the main results in table 3. In short, our main results are not qualitatively influenced by the use of variables of future changes for a longer horizon.

VI. Summary and Conclusions

This paper investigates the relationship between Japanese corporate finance and firm value during and after the Japanese deregulation of its financial markets for the period 1974–97. The deregulation led to a corporate contracting environment with an arm's-length perspective on corporate financing and thus changed the nature of market imperfections in Japan. It is not surprising that the value information from financing decisions under distinct structures of corporate governance in Japan also has changed in response. Thanks to FF's (1998) approach, we find that there is rich information about Japanese corporate finance in relation to firm value beyond that contained in control variables for profitability.

In particular, while the value information from expected investments in large non-*keiretsu* firms is significantly positive, it is largely muted

TABLE 6 Results from Estimates of Regression with Variables of Future Changes from t to $t + 4$

		1978–93 (Total Period)			1978–88 Subperiod			1989–93 Subperiod		
		Const	G	S	Const	G	S	Const	G	S
Intercept	Mean	.09	.84	.45	.17	.97	.50	−.08	.56	.34
	t(Mean)	(.50)	(5.11)	(2.62)	(.63)	(4.20)	(2.03)	(−.90)	(9.03)	(2.62)
E_t/A_t	Mean	8.53	−1.37	−4.23	6.51	.18	−3.01	12.97	−4.76	−6.91
	t(Mean)	(4.57)	(−.70)	(−2.31)	(2.64)	(.07)	(−1.21)	(12.22)	(−2.56)	(−3.54)
dE_{t+4}/A_t	Mean	7.20	−2.14	−4.63	5.93	−1.08	3.85	9.99	−4.46	−9.36
	t(Mean)	(5.44)	(−1.82)	(−4.36)	(3.27)	(−.72)	(−2.61)	(25.67)	(−2.95)	(−9.16)
Inv_t/A_t	Mean	.52	−.74	−.81	.42	−.74	−.63	.75	−.72	−1.22
	t(Mean)	(2.29)	(−2.38)	(−3.84)	(1.27)	(−1.66)	(−2.23)	(6.58)	(−3.80)	(−6.23)
Inv_{t+4}/A_t	Mean	1.18	−.72	−.74	1.18	−.8	−.86	1.18	−.54	−.45
	t(Mean)	(4.15)	(−3.31)	(−3.14)	(2.90)	(−2.93)	(−2.65)	(5.00)	(−1.42)	(−2.11)
$\text{R\&D}_t/A_t$	Mean	3.27	.44	.18	4.08	.25	0.14	1.48	.87	.29
	t(Mean)	(2.31)	(.27)	(.13)	(2.04)	(.11)	(.07)	(1.68)	(.47)	(.35)
$d\text{R\&D}_{t+4}/A_t$	Mean	−1.19	4.50	1.83	−1.50	2.05	2.76	−.50	9.90	−.23
	t(Mean)	(−.93)	(1.91)	(1.23)	(−.86)	(.92)	(1.39)	(−.31)	(1.86)	(−.13)
BD_t/A_t	Mean	−.69	−.32	.15	−.66	−.41	−.05	−.75	−.14	.57
	t(Mean)	(−8.61)	(−1.59)	(1.18)	(−6.01)	(−1.40)	(−.32)	(−7.99)	(−1.05)	(5.92)
$d(\text{BD}_{t+4}/A_{t+4})$	Mean	.51	.06	−.38	.64	−.22	−.65	.22	.68	.21
	t(Mean)	(1.63)	(.23)	(−1.18)	(1.43)	(−.64)	(−1.47)	(1.28)	(4.21)	(.92)
$\text{Loan}_t/\text{BD}_t$	Mean	.21	−.47	.00	.26	−.60	−.02	.10	−.17	.03
	t(Mean)	(2.52)	(−3.41)	(−.05)	(2.32)	(−3.22)	(−.14)	(1.02)	(−3.79)	(042)
$D(\text{Loan}_{t+4}/\text{BD}_{t+4})$	Mean	.02	−.48	−.11	.00	−.57	−.04	.07	−.30	−.26
	t(Mean)	(.19)	(−3.66)	(−1.01)	(−.02)	(−3.07)	(−.24)	(.46)	(−2.87)	(−2.87)
Div_t/BE_t	Mean	7.81	−3.74	−5.13	4.01	−3.00	−3.89	16.15	−5.37	−7.85
	t(Mean)	(2.85)	(−1.51)	(−1.83)	(1.42)	(−.98)	(−1.29)	(3.58)	(−1.17)	(−1.22)
$d(\text{Div}_{t+4}/\text{BE}_{t+4})$	Mean	3.22	−1.46	−1.18	2.53	−2.00	−1.72	4.74	−.28	.01
	t(Mean)	(2.15)	(−.75)	(−.68)	(1.19)	(−.73)	(−.73)	(4.71)	(−.16)	(.01)
dV_{t+4}/A_t	Mean	−.40	−.03	.14	−.29	−.02	.20	−.65	−.03	.02
	t(Mean)	(−3.75)	(−.82)	(2.17)	(−2.22)	(−.67)	(2.40)	(−4.33)	(−.43)	(.23)

NOTE.—This table shows the average coefficients and t-statistics (in parentheses) from estimates of a different version of regression (1) for nonfinancial and non-utility-and-telecom Japanese listed firms (from the PACAP database). In this version of regression (1), we use variables of future changes from t to $t + 4$ (instead of t to $t + 2$). To avoid the potential small-sample bias that may confound the horizon robustness check, we increase the annual sample of large non-*keiretsu* firms from some 100 to 150 (to match the sample of the large *keiretsu* firms, see table 2). Otherwise, the regression is run in the same way as for table 3. See the definition of regression variables and dummies for *keiretsu* membership and small-and medium-sized firms in table 2. Year t runs from 1976 to 1993.

in large *keiretsu* firms. This evidence is consistent with the view of *keiretsu* overinvestment relative to non-*keiretsu* investment. Interestingly, an adverse *keiretsu* differential effect can also be traced to bank financing. We find that bank loans, given leverage, had benefits for the large non-*keiretsu* firms but costs for the *keiretsu* peers when *keiretsu* banks were still influential, before the much-deregulated capital markets took hold in 1990s. This adverse *keiretsu* effect in using bank loans suggests that the hands-on practices in *keiretsu* corporate governance and finance used to give rise to rent-seeking behavior on behalf of *keiretsu* main banks. This resulted in a negative value effect that overwhelmed any positive value effect of bank loans in mitigating agency conflicts and asymmetric information. It seems that *keiretsu* banks were able to hold up and prod their member firms to take even bad projects to generate interest income for the banks to the detriment of the firms' own profitability.

Our results also show how the value information in Japanese corporate financing decisions changed in response to the changes in the nature of market imperfections. Significantly positive or negative, depending on previous corporate governance practices, the value information from bank loans has converged to zero since 1990 when the capital markets became much deregulated. This suggests that corporate choices of debt mix reached a good balance in a more-competitive financial environment. Moreover, the impact on the value information in Japanese corporate debt and dividends took place even earlier, in the mid-1980s. The speeding up of the financial reform in the mid-1980s suddenly aggravated the negative value information in Japanese corporate debt. This suggests that when arm's-length capital markets were expected to become more easily accessible, the old capital structure became more disadvantageous, and subsequent changes in corporate financing were inevitable. Note that we find that debt in large Japanese firms has strong negative information about firm value, similar to the findings by FF (1998) on U.S. firms. With the changes in debt policy in response to changes in the corporate contracting environment, the value information from leverage began to improve. In addition and even more clear-cut, the speeding up of the financial reform transformed the formerly irrelevant Japanese corporate dividend policy to significant positive value, consistent with major corporate finance theories.

In sum, this paper provides important insights into the relationship between corporate financing decisions and firm value. It also shows that this relationship changes in response to a changing corporate contracting environment. Our evidence suggests that the traditional *keiretsu* practices under the bank-centered governance and finance structure that used to work with few alternative corporate financing means other than bank loans waned when a more competitive capital market emerged.

Thus, a transition economy that intends to follow the Japanese model, which has been the envy of many, has to take into account the negative aspect of bank-centered corporate governance and finance and its lack of compatibility with a more market-oriented corporate contracting environment.

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