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Abstract

This paper provides evidence that keiretsu group member firms are subject to lower effective tax rates than independent firms in Japan. As one explanation for this phenomenon, we develop a hypothesis that keiretsu firms strategically shift financially reported income among affiliates in order to reduce overall effective tax rates. Empirical evidence supports this income-shifting hypothesis since the positive relationship between pretax return on firm value and marginal tax rate status is significantly mitigated by keiretsu membership. Further, it appears that keiretsu income shifting activities intensify when Japanese firms face economic recession, contrasting conjecture of weakening strength of keiretsu affiliation during this period. We also find evidence supporting the view that benefactors of shifted income are compensated via increased dividends.

Taxes, Keiretsu Affiliation, and Income Shifting

1. Introduction

This paper examines the effects of taxes and keiretsu affiliation on income shifting among Japanese firms. Prior tax research has focused primarily on shifting income between jurisdictions rather than between differentially taxed entities within the same jurisdiction.[1] But advisory materials are replete with planning suggestions for shifting income between entities that face different tax rates within the same jurisdiction [Scholes et al. (2002)]. As in the United States, except for the limited availability of loss carryovers, profitable firms pay tax while unprofitable firms do not receive tax rebates. Thus, when two or more related companies act in concert they can mitigate their overall tax liability by shifting income from a profitable firm to a loss firm, presumably by using non-market-value transfer prices. In this paper, we investigate the extent that, relative to independent firms, keiretsu members capitalize on their affiliations by shifting both financial and taxable income among group members to lower overall effective tax rates.

Keiretsu or industrial groupings in Japan represent diversified groups of manufacturing and trading firms that share the same financial institutions and adopt homogenous business strategies, and they represent a significant portion of one of the world's major economies.[2] Viewed as a formidable barrier to entry into the Japanese market, keiretsu members benefit from distribution and production arrangements, dominant access to markets, and low-cost flexible financing.[3] In fiscal year 1997 (the final year of our 21-year study period), a total of 1,245 companies belong to six keiretsu groups under study, with the combined paid-in capital accounting for approximately 20 percent of the total amount for Japan. Keiretsu annual sales account for over 17 percent of total sales in Japan, while their combined profits are

[1] Examples of research concerning income shifting between jurisdictions include Beatty and Harris (2001), Collins et al. (1998), Harris (1993), Harris et al. (1993), Jacob (1996), Klassen et al. (1993), Mills and Newberry (2001), Newberry and Dhaliwal (2001), and Rego (1999 and 2001). Yetman (2001) provides an example of within-jurisdiction income shifting research in his study of nonprofit organizations' allocation of expenses between taxable and tax-exempt activities, as reported in tax returns. He considers income shifting between related nonprofit entities' tax returns, and, given the setting, does not examine the effect of tax motivation on shifting financially reported income among entities.

[2] For additional insights and descriptive statistics concerning the keiretsu form and its influence in the Japanese economy, see Miyashita and Russell (1994), Berglöf and Perotti (1994), Brown & Company (1999), Campbell and Hamao (1994), Gilson and Roe (1993), Prowse (1992) and Sheard (1989).

[3] Financial economists have documented a number of advantages of belonging to a keiretsu group. For instance, keiretsu membership has been shown to reduce the cost of financial distress [Suzuki and Wright (1985); Hoshi et al. (1990)], to diminish information asymmetry [Prowse (1990, 1992) and Hoshi et al. (1991)], and to provide effective monitoring over top management [Berglöf and Perotti (1994), Kaplan (1994), and Kaplan and Minton (1994)]. Keiretsu firms' investment decisions are less constrained by liquidity issues [Hoshi et. al. (1991)] and keiretsu membership has been observed to substantially reduce bankruptcy costs [Hoshi et al. (1990)]. Although the literature documents these keiretsu advantages, Beason (1998) concludes that the capital market behavior of keiretsu and independent firms' securities, as measured by equity price volatility, does not appear to systematically differ.

8.4 percent of the total profits of Japanese corporations.[4] A large number of empirical studies investigate the financial benefits of keiretsu group affiliation, though we believe this paper is the first to investigate the tax savings of keiretsu membership and, specifically, the possible shifting of income among affiliates to reduce overall effective tax rates.[5]

The existence of important keiretsu groups, with firms organizing around a main bank and related financial institutions, provides a unique setting for testing the effect of corporate group affiliation on the propensity to shift income between taxpayers for tax-mitigating purposes. In spite of the incentives and the perceived flexibility for keiretsu firms to reduce their combined tax liabilities through income-shifting techniques, restrictions and frictions might prevent this from happening on a widespread basis.[6] Income shifting involves a transfer of wealth (or at least the right to wealth) between two legal entities. To the extent that these firms are owned by different sets of shareholders, some of the different shareholders will benefit from the income shift while others will be harmed. Further, tax-induced income shifting complicates management performance evaluation and keiretsu affiliations may be forced to create costly logistical mechanisms, including special accounting and dividend systems.[7]

The evidence supports our hypothesis that Keiretsu members shift income to work towards a collective, lower tax rate, in spite of clear economic incentives not to undertake this shifting. Relative to independent firms, keiretsu firms' pretax return on firm value is less positively related to the marginal tax rate proxy.[8] The evidence is robust to alternative variable definitions, model specifications, and time

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[4] These figures pertain to the six major horizontal keiretsu that are the subjects of this study. They consist of Mitsui, Mitsubishi, Sumitomo, Fuji, Sanwa, and Dai-ichi Kangyo, most of which have their origins in the 1950s [Nakatani (1984)]. The Tokyo Stock Exchange (TSE) lists approximately 250 core members and 280 other related firms [Dodwell Marketing Consultants (1985, 1989, and 1995)]. Throughout the paper, the term “keiretsu” refers to these horizontal groups, leaving the study of income shifting within vertical keiretsu groups for future research.

[5] Recent examples of this research include Dewenter (2001), Jo et al. (2001), Guo et al. (2001), Anderson and Makhija (1999), Namiki (1999), Oliver (1999), Beason (1998), Dewenter and Warther (1998), and Kim and Limpaphayom (1998). More directly applicable research is described in the next section.

[6] Refer to Scholes et al. (2002) for an explanation of the conceptual terms “restrictions” and “frictions.” As an example of a restriction, in the U.S. a tax-induced income-shifting scheme based on transfer prices would be deemed improper by Internal Revenue Code Section 482, which requires that transactions between related taxpayers be recorded at arms’ length prices. Japan has a similar law but it only applies to transactions between Japanese companies and their overseas affiliates; transactions between domestic Japanese companies are specifically exempted from this aspect of the Special Taxation Measures Law that became effective on April 1, 1986 [Kuboi (1991, p. 86)]. Thus, the Japanese government has apparently not exerted substantial effort to restrict income-shifting schemes that reduce the overall tax burdens of cooperating firms.

[7] Later, in the sensitivity analysis portion of the empirical results, we examine evidence concerning the possibility that shifted income is returned to the transferor via dividend payments. In Japan, an 80-percent (100-percent) dividends received deduction is available to offset dividends received from domestic corporations for which the recipient owns 25 percent or less (more than 25 percent). For further information, see Japanese Ministry of Finance (1999) and Deloitte Touche Tohmatsu International (1996).

[8] For this purpose, firm value is the sum of the book value of outstanding liabilities and the market value of outstanding equity. This deflator is used to avoid the bias that would potentially be caused by deflating with total assets that are

periods. We also find evidence supporting the view that the recipients of shifted income pay extra dividends to compensate income shifters for the wealth effects of their shifts.

Our findings have strong policy implications. Most important, the evidence suggests that unbridled tax incentives for income shifting bias the publicly reported financial statements of Japanese keiretsu members. Relative to a control group of non-keiretsu firms, keiretsu firms facing positive marginal tax rates appear to shift income to keiretsu firms not facing positive marginal tax rates. Thus, financial statement users not fully considering a keiretsu firm's tax situation, and its capability and willingness to shift income, face increased difficulty in assessing its corporate performance. Both cross-sectional and cross-temporal comparisons are problematic. The challenge is particularly acute among the presidents' council members within each of keiretsu groups; they exhibit more income-shifting behavior than other keiretsu members. Interestingly, the evidence of income shifting increases in intensity through Japan's economic recession of the 1990s. This observation may seem counter-intuitive because the Japanese government has been tightening its regulatory grip over keiretsu firms through its Fair Trade Commission's anti-monopoly policies. Further, ad hoc evidence suggests that keiretsu affiliations have been weakening as the economic recession has deepened in the 1990s.[9] However, keiretsu firms may have capitalized on the recession's effects (i.e., corporate losses) by engaging in income-shifting activities to reduce overall keiretsu effective tax rates. We also conjecture that prior to the recession the Japanese government generously distributed special tax breaks to keiretsu-affiliated companies but these allowances began to disappear with the introduction of a broader-base, lower-rate corporate tax system in 1990 [Ishi (1993)]. With special tax breaks having disappeared and effective tax rates rising, keiretsu firms appear to have used their affiliations to capitalize on the recession's losses by shifting income among keiretsu members.

The remainder of the paper is organized as follows. We describe the sample in Section 2. In Section 3 we test the income-shifting hypothesis with a multiple regression approach that explains pretax return on firm value using keiretsu affiliation, a marginal tax rate proxy, and several control variables. Summary and conclusions are offered in the final section.

2. Data

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measured under extremely conservative accounting methods. In Section 4.4 we report, however, that the results are not sensitive to this choice of deflator.

[9] See Dvorak et al. (2001) and Abrahams and Tett (1999) for articles discussing the possible recent disintegration of the keiretsu system.

The sample employed in this study contains all non-financial and non-utility firms listed on the Tokyo Stock Exchange for which financial statement data are available during the 21-year period from 1977-1997.[10] The data are retrieved from the PACAP database™ compiled jointly by the University of Hawai'i Asia-Pacific Financial Markets Research Center and the University of Rhode Island Pacific-Basin Capital Markets Research Center, in collaboration with the Daiwa Institute of Research and Toyo Keizai Inc.

2.1. Descriptive Statistics of Sample Firms

We classify sample firms into two categories, keiretsu member firms and independent firms, based on the information in *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, and 1995) and Brown & Company Ltd (1999). Independent firms are those not identified as members of one of the six largest horizontal keiretsu groups. We further identify a subgroup of keiretsu firms, those with strong ties, based on the degree of affiliation intensity reported in *Industrial Groupings in Japan*. Dodwell Marketing Consultants and Brown & Company, Ltd. use both qualitative and quantitative factors in measuring the degree of affiliation intensity. Those factors include: historical background; share ownership; sources and amounts of main bank loans; appointment of board directors; overall inter-company relations, etc. It appears, however, that the total number of shares held by the top ten shareholders is the most important variable considered. *Industrial Groupings in Japan* assigns a four-star rating to nucleus companies, a three-star rating to companies with group shareholding (by the ten largest shareholders) greater than 50 percent; a two-star rating to companies with group shareholding between 30 and 50 percent; and a one-star rating to companies with group shareholding of less than 30 percent. Based on this information, we classify keiretsu firms with three- and four-star ratings as having strong ties to the keiretsu group.

Descriptive statistics are computed for the 21-year study period (1977-1997) as well as two subperiods: 1977-1989 and 1990-1997. Beginning in 1990, Japan's economy experienced a decade-long economic recession. Relative to the recession period, the first subperiod is characterized by robust economic growth and expansion in Japan. Two important developments occurred toward the end of the first subperiod: the amendment to the Anti-Monopoly Act became effective in 1987 and the Tax Reform Law of 1988 was enacted.[11] The year 1990 marks the beginning of a gradual weakening of keiretsu

[10] Banks, insurance companies, and securities firms are excluded, but a small portion of the sample relates to certain financial companies that do not fall into one of these three categories.

[11] The first set of amendments to the Anti-Monopoly Act passed the Japanese Diet in 1977. The amendments were intended to strengthen the original Act and to empower the FTC. Based on the amendments, for example, the FTC has the

group affiliations as the Anti-Monopoly Act became a driving force for changes in Japanese industrial organization and as other reform measures were enforced in the Japanese banking and corporate sectors.

Table 1 summarizes cross-sectional mean and median statistics for gross profit measure, pre-tax return, after-tax operating return, tax expense, financial leverage, firm value, and total assets. Gross profit measure is the ratio of gross profit to sales. Pre-tax return, after-tax operating return, and tax expense are shown relative to firm value, which is defined as the sum of the market value of outstanding equity plus the book value of total liabilities for all sample firms. Financial leverage is the ratio of total liabilities to firm value. The sample firms are grouped into keiretsu firms and independent firms.[12] Keiretsu firms are further classified as "strong ties" and presidents' council members to highlight the impact of the intensity of keiretsu affiliation. The presidents' council is an institutionalized forum for communication among selected chief executives of keiretsu members [Gerlach (1992)]. Because only inner group members are invited to participate in the council, we expect more intensive income-shifting activities among these firms than across the broader group of strong-tie keiretsu firms.[13] The last three columns of Table 1 present the results of statistical tests comparing each of the keiretsu groups with the independent firms. Panel A conveys this information for the whole 21-year period encompassing the years 1977 through 1997, Panel B shows the 1977 to 1989 pre-recession period, and Panel C reports the recession period between 1990 and 1997.

[Insert Table 1]

Gross profit measure, pre-tax return on firm value and after-tax operating return on firm value are all significantly lower among keiretsu firms than independent firms, and this difference persists across both the pre-recession and recession periods ($p<.01$). Strong-tie keiretsu firms report lower profit measures than weak-tie keiretsu members, across the entire period as well as each subperiod. Possible reasons for lower profitability among keiretsu firms include, among others, market penetration objectives that dominate profit objectives, or a lack of financial discipline on managers to provide the same return on

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authority to impose a surcharge on a company involved in an illegal cartel and to order such corporations to divest themselves of parts of their business. Most importantly, the amendments reduce the proportion of a company that can be owned by a financial institution from 10 percent to 5 percent and impose new limits on cross-shareholding. Most of the provisions of the amendments became effective in 1987. The Tax Reform Law of 1988 became fully effective in 1989, reducing the corporate tax rate and, more importantly, eliminating many special tax breaks previously available to corporations [Ishi (1993)].

[12] These descriptive statistics represent a somewhat smaller sample than the total of 30,234 firm-years used in the regression results because data requirements for the effective tax rate measure are not necessary for the regression analysis.

investment required by managers of independent firms. Consistent with lower profitability among keiretsu firms, tax expense relative to firm value is lower for all keiretsu firms and the least for strong-tie keiretsu firms. From a macro-economic point of view, both investors and the government reap smaller returns, per yen invested, from keiretsu firms than from independent firms. One way to estimate the average keiretsu tax advantage is to subtract the mean keiretsu tax rate on firm value, 0.012, from the independent firm rate, 0.0157, and multiply the difference by the mean firm value of keiretsu firms, ¥300.3 billion. This produces an estimated mean keiretsu annual tax savings of ¥1.11 billion or roughly $9.25 million.[14] Financial leverage is higher among keiretsu firms than independent firms across the whole period as well as each of the two subperiods, consistent with prior research (Hodder and Tschoegl 1985).

Keiretsu firms' mean firm value is nearly ¥21 billion larger (about 7 percent) than the mean firm value of independent firms. Strong-tie keiretsu firms, with firm value averaging ¥395 billion (approximately $3.3 billion) are nearly 42 percent larger than independent firms, whereas presidents' council members are three times the size of independent firms (see Panel A). Overall keiretsu mean pre- and after-tax returns on firm value are 2.18 percent and 0.99 percent, respectively, compared with 2.75 percent and 1.28 percent for independent firms across the whole period (Panel A). Keiretsu firms, particularly those with strong ties or presidents' council members, are larger and less profitable than independent firms, though these differences dissipate sharply when the recession arrives.

Comparing the overall mean firm value, ¥285.9 billion, to the mean book value of total assets, ¥196.2 billion, reveals that the ratio of the estimated market value of firm assets to the balance sheet value of assets is 1.46. As expected, this ratio declined from 1.53 before the Japanese stock market "bubble" burst in 1990 to 1.39 afterward (see Panels B and C).

2.2. Corporate Effective Tax Rates

Our initial objective is to understand the relative tax burdens facing keiretsu and independent firms, and to see how these burdens differ across time, industry, and firm size. For this purpose only, we examine effective tax rates on cash flows to avoid possible taint arising from using income-shifted earnings in the denominator.[15] The effective tax rate on cash flows is defined as income tax divided by operating cash flow, where income tax is the sum of national tax (levied by central government),

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[13] Dewenter (2001) reports that the total number of core group members in the presidents' councils for five keiretsu groups (with the data available in 1989 and 1998) changed from 145 to 144. At the individual keiretsu level, the changes were more frequent, but these changes largely reflect mergers and consolidations within each group.

[14] We use ¥120=$1 as a rough estimate of the exchange rate across the entire sample period.

enterprise tax (levied by the prefecture), and inhabitant tax (levied by both prefectures and municipalities), and operating cash flow is the sum of net operating income, other revenue/expense items, depreciation, prior-year current assets and current-year current liabilities, minus the sum of current-year current assets and prior-year current liabilities. We retrieve tax data from the PACAP-Japan Financial Statement file.[16]

Table 2 presents cross-sectional mean and median effective tax rates for keiretsu and independent firms for the whole period as well as for the two subperiods.[17] Effective tax rates for keiretsu firms with strong ties and presidents' council members are also separately reported. Overall, there is strong evidence that keiretsu firms have lower effective tax rates than independent firms. During the study period, the median effective tax rate is 23.8 percent for keiretsu firms and 29.1 percent for independent firms ($p<.01$), while strong tie keiretsu firms and presidents' council members exhibit median effective tax rates of 19.9 percent and 19.7 percent, respectively. During the pre-recession period, the difference between the two groups' median effective tax rates is 5.7 percent ($p<.01$) but this difference falls to 4.9 percent ($p<.01$) in the recession period. This implies erosion of the special tax breaks garnered by keiretsu firms in the latter period following the complete introduction of tax reform measures in 1990.[18]

[Insert Table 2]

2.3. Firm Industry and Size Effects[19]

Industry effects may explain differences in effective tax rates between keiretsu and independent firms. Kern and Morris (1992) observe a strong association between effective tax rates and industry classification using U.S. data. Thus, it may be plausible that keiretsu companies are more clustered in certain industries where government tax subsidies and different forms of tax breaks are readily available, which, in turn, could influence our results. We examine mean and median effective tax rates of keiretsu

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[15] See Rego (1999) for further discussion and an examination of this issue. Effective tax rates are employed in Table 2 for descriptive purposes only; the empirical tests rely upon a binomial marginal tax rate proxy.

[16] Unlike the United States where public companies report two different versions of profits, one for investors and one for tax authorities, in Japan during the study period, income for tax purposes is generally calculated based on the information included in published financial statements [Cooke and Kikuya (1992)].

[17] For the descriptive analysis relying upon the tax rate on cash flows (i.e., Tables 1 and 2), we exclude firms reporting negative tax rates on cash flows. Negative tax rates indicate that either tax expense or cash flows is negative (but not both). When pre-tax cash flows are small, effective tax rates may become large. We decided to retain those rates even if they become large: (i) to avoid imposing a subjective and arbitrary cut-off point; and (ii) to illustrate a realistic picture of tax burdens of sample firms. For this reason, comparisons of median effective tax rates are more appropriate than means. Since we use a binomial marginal tax rate proxy in our empirical tests of the income-shifting hypothesis, the use of effective tax rates for descriptive purposes does not bias our test results.

[18] As a precursor to later empirical evidence based on a marginal tax rate proxy, we note that the behavior of effective tax rates may differ significantly from that of marginal tax rates. See Shevlin (1990) and Graham (1996a, 1996b) for further discussion of this issue.

[19] Detailed results of the analyses of possible industry and size effects are available from the authors upon request.

and independent firms within major industries classified by Tokyo Stock Exchange industry codes (similar to the four-digit standard industry classification). The data indicate that effective tax rates vary across industries, with food, wholesale and retail, construction, and service industries exhibiting higher tax rates than others. Within each industry, however, keiretsu firms exhibit lower effective tax rates than independent firms. Some exceptions are observed as indicated by positive differences for some industries (e.g. real estate & financial and transportation, communications, & utilities), but these differences are not statistically significant. In addition, the notion that keiretsu companies may be concentrated more in low-tax industries than independent firms is not supported. For example, keiretsu firms do not dominate the low-tax real estate/financial, transportation, communications, utilities, and textile industries. These findings indicate that industry effects alone cannot explain lower effective tax rates observed for keiretsu firms.

Zimmerman (1983) provides evidence that, relative to small firms, large U.S. firms incur higher effective tax rates, and hypothesizes that this is due to higher political costs that large companies may incur.[20] Specifically, if keiretsu firms are, on average, smaller than independent firms, it is possible that keiretsu firms' lower effective tax rates may be attributed to a difference in firm size between keiretsu and independent firms. Although Panel A of Table 1 indicates that total assets and firm value of keiretsu firms are greater than those reported by independent firms, the market value of shareholders' equity is smaller for keiretsu firms than independent firms (not reported). To examine the differences in effective tax rates between keiretsu and independent firms with the minimum possible confounding effect of firm size, we ranked all sample firms in ascending order by firm value and then grouped them into ten deciles (1^{st} decile = smallest; 10^{th} decile = largest). We compute the mean and median effective tax rate, as well as the mean firm value, for keiretsu and independent firms within each of the ten deciles. The results (not reported here) indicate that keiretsu firms have lower mean and median effective tax rates than independent firms throughout the whole period as well as during both subperiods, Firm size differentials between keiretsu and independent firms are statistically insignificant in each of the 10 decile columns with the exception of the 10^{th} decile, in which keiretsu firms are considerably larger than independent firms. Median effective tax rates are significantly lower for keiretsu firms across most size levels and, generally speaking, keiretsu and independent firms are both fairly well dispersed across most of the size categories.

[20] Using US data, Omer et al. (1993) confirm Zimmerman's finding that effective tax rates are generally greater for large firms than for small firms. In contrast, Gupta and Newberry (1997) are unable to verify the positive statistical relation between firm size and effective tax rates.

Overall, it does not appear that the keiretsu tax advantage is explained by industry membership or firm size. The next section considers the possibility that keiretsu firms use income shifting as a vehicle for lowering effective tax rates.

3. Empirical Evidence on the Keiretsu Income-Shifting Hypothesis

3.1. Model

The effective tax rates portrayed in Tables 1 and 2 identify the overall tax burdens incurred by different groups, but effective tax rates are not likely to be useful for estimating the tax cost of earning *additional* income. For this the marginal tax rate is appropriate as it is generally defined as the change in the present value of cash paid to tax authorities as a result of earning one additional currency unit [Scholes et al. (2002)]. In corporations, the primary issue in estimating marginal tax rates is the valuation of the net operating loss (NOL) deduction [Shevlin (1999)]. The value of the NOL depends on its magnitude, the amounts of current and future taxable income, the number and timing of the years for which carryover is statutorily permitted, the tax rate in the year in which the NOL deduction is used, and the cost of capital. Shevlin (1990) and Graham (1996a) simulate future earnings streams in order to estimate corporate marginal tax rates. The evidence indicates that these simulation procedures generally perform well, but Graham (1996b) and Plesko (2001) suggest that simple dummy variables reasonably capture much of the variation in corporate marginal tax rate status.[21]

In place of the simulation procedure, Graham suggests employing a trichotomous variable that differs depending on the value of the Compustat NOL variable that indicates whether the firm possesses NOL carryforwards for tax purposes. Given the absence of the NOL carryforward data item on the PACAP database, we use a binomial approach in an attempt to model the basic Japanese tax laws concerning loss carrybacks and carryforwards. Generally, Japanese corporations can carry losses back one year and forward five to offset positive pretax income in these other years [Ishi (1993 p. 179) and Kuboi (1991 p. 34)].[22] Thus, firms are assumed to face positive marginal tax rates in two cases: (1) if current pretax income is both greater than 0 and exceeds the sum of net losses for the two preceding years (i.e., loss

[21] Graham (1996b) finds that simulation results provide 87.6 percent correlation with tax rates based on perfect foresight. The correlation coefficient for the trichotomous variable is 69.1 percent and the correlation with a taxable income dummy variable is 65.3 percent. Using tax return data, Plesko (2001) reports similar, though slightly lower, correlation coefficients for binary marginal tax rate indicator variables.

[22] We also perform the empirical tests modeling only the carryback rules and obtain results very similar to those reported in Table 4.

carryforward),[23] and (2) if a pretax loss is smaller than the prior year's pretax income (i.e., loss carryback). However, between 1984 and 1988, and again between 1992 and 2000, loss carrybacks were not permitted in Japan [Ishi (1993 p. 179) and Japanese Ministry of Finance (1999)]; during these years firms are assumed to face positive marginal tax rates when pretax income exceeds zero. Regarding carryforwards, in 1986 and 1987 losses from the immediate preceding years could not be used to offset taxable income (i.e., corporate taxpayers were required to wait one year before utilizing an NOL carryforward) [Kuboi (1991, p. 34)]. Thus, we assume that firms face positive marginal tax rates in 1986 (1987) if positive pretax income exceeds the sum of net losses for 1983 and 1984 (1984 and 1985).

An OLS multiple regression model is employed to examine the differential relation between firm profitability and our marginal tax rate proxy given that firms are either independent or affiliated with a keiretsu. This model is motivated by Collins et al. (1998) but adapted to capture the possible differential behavior of keiretsu and independent firms. The underlying concept of the model is straightforward: the relation between firm profitability and corporate marginal tax rate should be positive. If keiretsu firms respond to taxes by shifting substantial income, we should be able to capture this reaction with a dummy variable (signifying either keiretsu or independent firms) interacting with the marginal tax rate proxy. We hypothesize that the coefficient estimated for the interaction of tax rate and keiretsu membership in the regression will be negative, controlling for the separate main effects of each of these variables. We employ the following model:

$$PTAXROV_{i,t} = \beta_0 + \beta_1 IPTAXROV_{i,t} + \beta_2 X_{i,t} + \beta_3 K_i + \beta_4 (K_i * X_{i,t}) + \beta_5 SIZE_{i,t} + \beta_6 LEVERAGE_{i,t} + \beta_7 IND_{i,1} + \ldots + \beta_{34} IND_{i,28} + \beta_{35} YEAR_1 + \ldots + \beta_{54} YEAR_{20} + \varepsilon_{i,t} \quad (1)$$

for each firm i and year t. The dependent variable, PTAXROV, is the ratio of pretax income to firm value (i.e., the sum of equity market value and debt book value); X is the binomial marginal tax rate proxy (1 for firms facing positive marginal tax rates based on the assumptions described above; 0 otherwise); K is a dummy variable (1 for keiretsu firms; 0 for independent firms); SIZE is the natural logarithm of the total market value of equity; LEVERAGE is the ratio of total liabilities to firm value; IND is a vector of dummy variables for each of 28 industries (1 if the firm operates primarily in the industry; 0 otherwise); YEAR is a vector of dummy variables signifying each of the 20 years between 1978 and 1997 (1 if the observation occurs within the year; 0 otherwise); and ε is the residual term.

3.2. Descriptive Statistics of Key Variables

[23] We abbreviate the five-year carryforward period to two years in order to maximize the number of useful observations.

Table 3 presents descriptive statistics of key variables included in the regression models. Panel A summarizes measures of central tendency, Panel B offers correlation coefficients among the variables, and Panel C shows the distributions of the continuous regression variables across the key binomial variables, X and K. In addition to PTAXROV, another profitability measure, the ratio of gross profits to sales (GPPCT), is shown in Table 3 because GPPCT is examined as an alternative dependent variable in the sensitivity analysis. NETDIV, the ratio of dividend income to dividends paid, is introduced in the regression analysis to examine the existence of compensatory dividends, so its summary statistics are also reported. In general, Table 3 descriptive statistics confirm the results reported in Table 1: independent firms are more profitable and less financially levered, and more likely to be subject to positive marginal tax than keiretsu firms. The mean value of X, 0.8552 (0.8855), indicates that approximately 85.5 (88.6) percent of keiretsu (independent) firm-years exhibit positive marginal tax rates while only about 14.5 percent (11.4 percent) indicate X=0.[24] Thus, one concern is the extent that the relatively small group of firms that do not indicate a positive marginal tax rate drives the results. This concern is alleviated by a relatively large sample size and by other test specifications that yield corresponding answers.

Panel B reports that marginal tax status is positively related to both profitability measures, GPPCT and PTAXROV. Not surprisingly, strong positive correlations are observed between two profitability measures, PTAXROV and GPPCT as indicated by the Pearson and Spearman coefficients of 0.29 ($p<.01$) and 0.34 ($p<.01$), respectively. Financial leverage is negatively correlated with marginal tax status, firm size, and two profit measures. The relation between firm size and financial leverage has not been clearly established by the past literature. For example, Titman and Wessels (1988) report a positive relation between size and debt-to-book value of equity but no significant relation between size and debt-to-market value of equity. The negative correlation between financial leverage and profitability measures is not surprising, but its magnitude is unexpectedly large.[25]

[24] We examine other sub-samples to determine the extent of variation in the proportion of firms that face positive marginal tax rates (i.e., X=1). The percentages range from a high of 90.7% in the presidents' council keiretsu sub-sample to a low of 84.3% in the pre-recession keiretsu sub-sample. Interestingly, a greater proportion of keiretsu firms report tax losses (i.e., X=0) in the pre-recession period (15.7%) than during the recession period (12.4%). As expected, more independent firms (12.1%) do not face positive marginal tax rates during the recession than in pre-recession years (11.0%).

[25] We compute the correlations between financial leverage and PTAXROV for the population of U.S. Compustat active industrial companies for the years 1977 through 1997. Pearson and Spearman correlations are –0.063 and –0.064, respectively, much smaller than the counterpart figures estimated for our sample firms in Table 3 Panel B, -0.218 and -0.361. Thus, this preliminary evidence suggests that Japanese lenders are less concerned with (or less successful in predicting) the future profitability of their debtors.

A few interesting observations emerge from the summary statistics presented in Table 3 Panel C. First, when not subject to taxation (i.e., X=0), keiretsu firms tend to report smaller losses than independent firms, as suggested by the narrower distributions of PTAXROV and GPPCT among keiretsu firms. Second, relatively speaking, PTAXROV hovers close to zero for taxpaying keiretsu firms and neither profits nor losses among keiretsu firms are generally as extreme as they are among independent firms. Both of these observations indicate more active income shifting among keiretsu firms than independent firms.

[Insert Table 3]

3.3. Regression Results

Table 4 presents the regression results for the whole period (1977-1997), the pre-recession period (1977-1989), and the recession period (1990-1997). In each column, regression results are reported for the entire sample as well as separately for keiretsu firms with strong ties and those keiretsu firms that are members of the keiretsu presidents' council. Adjusted R-squares of all the models exceed 0.15 and highly significant F-statistics are indicated; thus, the models provide reasonably strong explanations of the variation in PTAXROV. Controlling for industry median pre-tax return on firm value, industry, year, and size and financial leverage effects, keiretsu firms exhibit tax-mitigating income-shifting behavior as indicated by the whole-period negative coefficient of –0.0123 associated with the interaction term K_i*X_t ($p<.01$). This negative coefficient reveals evidence that keiretsu membership obscures the positive relation between firm profitability and marginal tax status; it appears that keiretsu firms facing positive marginal tax rates shift income to those facing non-positive marginal tax rates. Keiretsu firms with strong ties and those with weak ties offer an interesting contrast. Apparent income shifting indicated by the estimated coefficient for the interaction term is more conspicuous for keiretsu firms with strong ties.[26]

Table 4 also reports the results in which we narrow strong keiretsu firms to include only those companies that belong to the presidents' council of each keiretsu group.[27] As expected, the interaction

[26] As a sensitivity test, we run equation (1) without including the industry dummy variables since the industry effect is also captured by the industry median value of PTAXROV. The results are even stronger than with the industry dummy variables as indicated by significant and negative coefficients estimated for the interaction variable (K_i*X_t).

[27] The following model is used for the test:

$$PTAXROV_{i,t} = \beta_0 + \beta_1 IPTAXROV_{i,t} + \beta_2 X_{i,t} + \beta_3 G_i + \beta_4 (G_i*X_{i,t}) + \beta_5 SIZE_{i,t} + \beta_6 LEVERAGE_{i,t} + \beta_7 IND_{i,1} + \ldots + \beta_{34} IND_{i,28} + \beta_{35} YEAR_1 + \ldots + \beta_{54} YEAR_{20} + \beta_{55} GROUP_1 + \ldots + \beta_{59} GROUP_5 + \varepsilon_{i,t}$$

The primary difference between the above model and regression model (1) is the introduction of a new dummy variable G (1 for presidents' council members and 0 for non-presidents' council firms). Heretofore, data limitations have prevented controlling for the likelihood that the observations within each of the keiretsu groups are not independent from one another. However, in this model we control for this possibility by including five keiretsu-specific dummy variables, GROUP1-GROUP5, that equal 1 if the firm belongs to the keiretsu and 0 if not. Sanwa is the reference group when the group

for the presidents' council subset is stronger than for strong-tie keiretsu firms, further mitigating the positive relation between firm profitability and marginal tax. For example, the estimated coefficient for G_i*X_t in the whole period is -0.0178 (p<.01), which compares with the estimated coefficient of -0.0161 (p<.01) estimated for keiretsu firms with strong ties (Panel A). Likewise, the estimated coefficients are –0.0126 and –0.0238 in the pre-recession and recession periods, respectively, for the members of the presidents' council, which compare with -0.0113 and –0.0189 estimated for strong-tie keiretsu firms.

[Insert Table 4]

The results obtained for the two subperiod models are even more interesting. Overall, the coefficient of the interaction term more than doubles in absolute magnitude during the recession period (-0.0159, p<.01), compared with the pre-recession period (-0.0078, p<.01). The significant negative coefficient estimated for strong-tie firms decreases from –0.0113 (p<.01) to –0.0189 (p<.01) in the recession period (a 65 percent increase in absolute magnitude), the negative coefficient of presidents' council member firms decreases from –0.0123 (p<.01) in the pre-recession period to –0.0238 (p<.01) during the recession, an increase of more than 90 percent. These results indicate that income shifting among keiretsu firms is concentrated among those with strong ties and much more so among presidents' council member firms. Overall shifting becomes more intensive during the recession period than the pre-recession period. The latter observation may appear counter-intuitive considering the overall trend of weakening affiliation of keiretsu groups. However, when more keiretsu firms suffered from operating losses in the recession period, keiretsu groups apparently organized to take advantage of their group affiliation to engage in aggressive income shifting. The recession period also coincides with the tightening of the fiscal purse by the Japanese government and the conclusion of government subsidies that had previously been available to keiretsu firms. In contrast, during the pre-bubble period, no strong incentive existed among keiretsu firms for income shifting. As Jensen (1986, 1989) points out, before the recession Japanese firms enjoyed readily available positive free cash flow and bank financing, and senior management engaged in excessive expansion and growth of their firms rather than cost-cutting and profit-maximization. From our evidence, it appears clear that possible weakening of keiretsu affiliation

dummies are introduced. Although the model appearing on Table 4 does not exactly reflect these variables, the table description explains the variation employed with the above model.

does not imply moderation of income-shifting activities among keiretsu firms.[28] Rather, keiretsu firms engage in income shifting more aggressively during the economic recession.[29]

Table 5 presents a 2x2 matrix to illustrate the profitability of our sample firms based on their keiretsu affiliation (K) and marginal tax status (X).[30] The first row of the matrix indicates that the mean PTAXROV among firms facing positive marginal tax rates is 0.0345 for independent firms and only 0.0301 for all keiretsu firms. As the intensity of keiretsu affiliation increases, profitability further declines to 0.0283 for strong tie firms and to 0.0269 for presidents' council member firms. However, when firms are not subject to taxation (i.e., X=0), the results are different. Based on the estimated coefficient for K, we observe that PTAXROV is 0.0079 higher for keiretsu firms than for independent firms. This difference increases to 0.0094 for strong-tie keiretsu firms and 0.0135 for presidents' council members. Thus, consistent with tax-motivated income shifting, keiretsu firms on average report relatively smaller losses than independent firms when they do not face positive marginal tax rates but indicate lower profits than independent firms when they are subject to taxation.

What is the approximate magnitude of tax-motivated income shifting? A maintained assumption in the Table 4 regressions is that the lower profitability of keiretsu firms is similar among loss firms (X=0) and profitable firms (X=1) and that the control variables capture any other differences. Given this assumption, the amount of tax-motivated shifting can be estimated separately for profit and loss firms by first determining the total difference in profitability between keiretsu and independent firms and then subtracting the uncontrolled exogenous difference. Table 3 Panel A indicates that the difference in PTAXROV between keiretsu and independent firms is -0.0057 and that the SIZE and LEVERAGE differentials are -0.0848 and 0.0575, respectively. Application of the Table 4 estimated coefficients for SIZE and LEVERAGE (-0.0005 and –0.0609, respectively) explains -0.0035 of the difference in PTAXROV, and similar application of the (unreported) coefficients for IPTAXROV, IND and YEAR to the IPTAXROV, IND and YEAR differentials explains 0.0013. Subtracting the income effects of these control variables from the difference in PTAXROV leaves -0.0035 remaining as the unexplained exogenous profit

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[28] None of the significance levels reported in Table 4 for the test variable, K_i*X_t, changes when SIZE is alternatively defined as the natural log of the sum of equity market value and debt book value.

[29] The largest difference in effective tax rate between keiretsu and independent firms occurs within the fishing, mining and forestry industry group. (See the analysis of industry-by-industry effective tax rates in Section 2.3.) To examine the robustness of our results, we ran the primary regression analysis without including firms in these industries. The results are very similar to those reported in Table 4, with strong significance across all years for strong-tie firms and highly significant results in the recession period for strong-tie firms and overall. Note that there is no logical underpinning for excluding these firms from the sample as they clearly represent keiretsu firms.

[30] We are grateful to the referee for suggesting this 2x2 matrix as a basis for refining our interpretation of the results.

difference between keiretsu and independent firms. Hence, the shifting among unprofitable keiretsu firms (i.e., X=0) would therefore be approximately 0.0115 of firm value (0.0079 keiretsu main effect minus -0.0036). Among profitable keiretsu firms (i.e., X=1), the second row of the matrix suggests that keiretsu members are 0.0044 less profitable than independent firms (0.0345 versus 0.0301). However, considering the uncontrolled exogenous difference between keiretsu and independent firms, -0.0036, the net amount of income shifting for profitable keiretsu firms is estimated as -0.0008 of firm value. Thus, profitable keiretsu firms apparently shift, on average, 0.08 percent of their value to loss members, to allow them to increase their profit by 1.15 percent of their value. Applying the same analysis to the regression results for strong tie (presidents' council) keiretsu firms, we estimate that, on average, profitable strong tie (presidents' council) firms shift 0.17 (0.18) percent of their firm value to loss firms to allow them to increase their profit by 1.44 (1.6) percent of firm value.[31] These analyses demonstrate that loss firms' income is impacted to a substantially greater degree by the shifting techniques than profitable firms' income.

[Insert Table 5]

3.4 Compensatory Dividends

We conduct a test to detect the possible settling up of income-shifting activities. The underlying assumption is as follows: If a keiretsu member firm shifts income to another member firm, there must be some way the former should be compensated for the shifted income. One variable we investigate is dividend payments in view of cross-shareholding practices among keiretsu firms.[32] In Japan, a firm owning more than (no more than) 25 percent of the outstanding shares of another company is entitled to a 100 percent (80 percent) dividends-received deduction for dividends received from the company (Japanese Ministry of Finance 1999). Thus, if the institutional setting permits, the recipient of shifted income could compensate the benefactor by paying a "special" dividend (i.e., one that is paid with respect to shifted income and not with respect to share ownership).[33] The following model is used to test the hypothesis that keiretsu affiliation will directly impact the dividend policies of its member firms:

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[31] Not shown in Table 3, the differences in means between presidents' council member firms keiretsu and independent firms for PTAXROV, SIZE and LEVERAGE are –0.0047, 1.841, and 0.0770, respectively.

[32] Hojo (1995) reports that the average percentage of cross-shareholding among keiretsu group members amount to 20 to 25 percent without counting the main banks' holding. For recent statistics on cross-shareholding between listed firms and financial institutions, see Hiraki et al. (2002).

[33] Ad hoc evidence from a conversation with a Japanese accounting professor suggests that special dividends to certain shareholders are possible within keiretsu groups and that such dividends may result from the use of artificial transfer prices designed to mitigate income tax.

$$NETDIV_{i,t} = \beta_0 + \beta_1 SIZE_{i,t} + \beta_2 K_{i,t} + \beta_3 X_i + \beta_4 (K_i * X_{i,t}) + \beta_5 IND_{i,1} + \ldots + \beta_{32} IND_{i,28} + \beta_{33} YEAR_1 + \ldots + \beta_{52} YEAR_{20} + \varepsilon_{i,t} \quad (4)$$

NETDIV is the ratio of dividend income to dividends paid and all other independent variables have been defined in previous regression models. Again the estimated coefficient for the interaction, $K_i * X_i$, between the keiretsu dummy (K) and marginal tax status (X) is our major focus. A positive and significant coefficient of $K_i * X_i$ would indicate greater net compensatory dividend income among keiretsu firms with positive marginal tax rates. However, a caveat is in order. There are some external factors that may work against our hypothesis that keiretsu affiliation will affect the dividend payment behavior of keiretsu firms when compared with independent firms, especially during the recession period, 1990-1997. The first factor is the government policy of discouraging cross-shareholding among Japanese firms. The second factor is that Japanese firms are required to meet the legal and accounting requirements that shareholdings must be reported at actual market value. Although this requirement finally became effective in September 2001, a large number of Japanese firms began much earlier the process of unloading cross-shareholdings to avoid large write-offs.

Table 6 reports the results. Across the whole period for all keiretsu firms, we observe a positive and significant coefficient on $K_i * X_i$ of 0.1003 ($p<.01$). The results of this model are stronger for strong-tie keiretsu firms and even stronger for presidents' council keiretsu firms. Clearly, more evidence of compensatory dividends appears in the pre-recession period than during the recession. Although this finding is not consistent with our overall finding about intense income shifting in the recession period, we believe that the external factors discussed above may cause this result. The issue of compensatory dividend payment is a topic that must be corroborated by further research, but our initial results indicate its existence. Hence, income shifting is not a free good among keiretsu members, which is not surprising strictly from an economic viewpoint.

[Insert Table 6]

3.5 Sensitivity Analyses

In the absence of proprietary information regarding their operational decisions, it is almost impossible to identify the vehicles that keiretsu member firms utilize for their income-shifting activities. Therefore, we conduct a set of admittedly broad-based tests that are likely to be refined by future corroborative studies.[34]

[34] Detailed results of these tests are available upon request from the authors.

Initially, we examine alternative dependent variables and find supporting results. First, we deflate earnings by book total assets rather than the market value of the firm. With this specification, the coefficient of K_i*X_t is -0.0212 ($p<.01$) across the whole period. Second, we introduce an alternative definition of firm profitability, GPPCT: the ratio of gross profits to sales. The GPPCT variable only considers transfer prices of primary products and services within the manufacturing and distribution chain, whereas PTAXROV is a broader measure that captures all possible transfer prices, including, for examples, interest, rent, and advertising. The underlying motivation for using GPPCT as the alternative dependent variable is to determine whether keiretsu group members rely on a wide variety of mechanisms beyond simple transfer pricing of products. If qualitative results of the regression with GPPCT differ from those reported in Table 4, we may conclude that keiretsu firms utilize a broader set of transactions to facilitate income shifting. The overall regression results with GPPCT as the dependent variable differ from those summarized in Table 4. For example, only strong-tie keiretsu firms exhibit income-shifting activities in the pre-recession period ($p<.05$) and recession period ($p<.05$), while weak-tie keiretsu firms do not show any activities at all during the two subperiods. In the presence of much lower significance level observed for strong-tie keiretsu firms only, we conjecture that keiretsu firms rely on many income-shifting methods over and beyond a narrowly defined transfer pricing mechanism.

Third, we adopt a model to investigate the possibility that intra-keiretsu income-shifting activities remain unsettled by cash transfers at year-end. If income shifting among keiretsu firms is not settled up in cash by year-end, tax-induced income shifting will reduce the variation in tax expense relative to pretax cash flows. In other words, keiretsu firms' income-shifting activities will have a negative impact on the ratio of the time-series variation in income tax expense to the time-series variation in pre-tax cash flows. The following model tests this possibility.

$$VTXCF_{i,t} = \beta_0 + \beta_1 SIZE_{i,t} + \beta_2 K_{i,t} + \beta_3 IND_{i,1} + \ldots\ldots + \beta_{30} IND_{i,28} + \beta_{31} YEAR_1 + \ldots\ldots + \beta_{51} YEAR_{21} + \varepsilon_{i,t} \quad (3)$$

where VTXCF is the firm-specific ratio of the time-series variation in income tax expense to the time-series variation of pre-tax cash flows; and K is a dummy variable that differs in definition depending on whether the model examines all keiretsu firms, strong-tie keiretsu firms, or weak-tie keiretsu firms. A negative and significant coefficient of dummy variable K is an indication of intra-keiretsu income shifting activities. The regression coefficients on the keiretsu dummy variable estimated for strong-tie keiretsu firms are significant and negative in the whole period and the recession period, but not during the pre-recession period, indicating the existence of intra-keiretsu income-shifting activities. The same coefficients are not significant for weak-tie keiretsu firms, which implies that this type of income shifting

may be limited to only strong keiretsu members. Although one cannot isolate specific income-shifting mechanisms, the results provide some evidence of tax-lowering maneuvers among strong-tie keiretsu firms.[35]

4. Conclusion

Empirical research has documented a variety of benefits for firms affiliated with keiretsu groups in Japan. In the finance arena, membership in the keiretsu system has been shown to reduce bankruptcy and agency costs, alleviate liquidity constraints, and control monitoring costs. This paper examines a tax-savings benefit not previously examined: the keiretsu system enables member companies to shift income within the affiliated group to pay lower overall taxes than independent companies.

Given our evidence that keiretsu firms are subject to lower effective tax rates than independent firms, we examine the relation between firm profitability and marginal tax status and find that this relation is negatively affected by the keiretsu membership. This supports the view that, relative to independent firms, keiretsu affiliates with relatively high tax rates shift income to affiliates with relatively low tax rates. The negative relation we find is strong especially during the second subperiod (1990-1997) characterized by economic recession, and it withstands alternative measures of both the key independent and dependent variables. Therefore, the evidence strongly suggests that one benefit of keiretsu membership is the ability to shift income among group member companies. Contradicting conventional wisdom, we find that weakening of keiretsu affiliation during the recent economic recession does not imply less income shifting among keiretsu firms. Rather, empirical evidence indicates that income shifting emerges in full among strong-tie and presidents' council keiretsu firms during the recession.

Our evidence suggests that keiretsu ties are sufficiently strong to make common ownership control of the entities unnecessary in order to implement income shifting as a tax planning strategy. But the shifting of income also involves the shifting of wealth and, to the extent that the companies involved have different sets of shareholders, some owners are harmed by the shift while others benefit. Since inter-company dividends escape most taxation, we hypothesize that income shifted between entities for tax planning purposes is settled up with special dividends. We find support for this hypothesis.

[35] Estimated coefficients for the test variable, K, are –0.0174 (P<.01) and –0.0145 (P<.05) in the whole period and the recession period, respectively, for strong-tie keiretsu firms.

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Table 1
Summary Statistics for Sample Firms

This table presents mean [median] values of descriptive variables for the whole period (1977-1997) (Panel A) for the entire sample of firms, for keiretsu group firms, and for independent firms; the same statistics are presented for the pre-recession period between 1977 and 1989 (Panel B) and for the recession period between 1990 and 1997 (Panel C). We also report the results for keiretsu firms that are classified as "strong ties" and presidents' council members to highlight the impact of the intensity of keiretsu affiliation. Gross profit measure is the ratio of gross profits to sales. Pre-tax return, after-tax operating return, and tax expense are shown relative to firm value, which is defined as the sum of the market value of outstanding equity plus the book value of total liabilities. Leverage is defined as the ratio of total liabilities to firm value. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999). * and ** indicate two-sided significance levels of .05 and .01, respectively, in comparisons of means using t-tests and medians using Wilcoxon rank sum tests.

	All Firms	Keiretsu Firms			Independent Firms	Differences		
		(1) All Keiretsu Firms	(2) Strong Ties	(3) Presidents' Council	(4)	(1) - (4)	(2) - (4)	(3) - (4)
Panel A: Whole Period (1977- 1997)								
Gross profit measure	0.2090 [0.1806]	0.1856 [0.1670]	0.1717 [0.1589]	0.1761 [0.1594]	0.2186 [0.1868]	-0.0330** -0.0198**	-0.0469** -0.0279**	-0.0425** -0.0274**
Pretax return on firm value	0.0257 [0.0237]	0.0218 [0.0196]	0.0186 [0.0165]	0.0177 [0.0151]	0.0275 [0.0256]	-0.0057** -0.0060**	-0.0089** -0.0091**	-0.0098** -0.0105**
After-tax operating return on firm value	0.0119 [0.0126]	0.0099 [0.0107]	0.0085 [0.0095]	0.0102 [0.0099]	0.0128 [0.0136]	-0.0029** -0.0029**	-0.0043** -0.0041**	-0.0026** -0.0037**
Tax expense/firm value	0.0145 [0.0118]	0.0120 [0.0094]	0.0100 [0.0076]	0.0095 [0.0070]	0.0157 [0.0129]	-0.0036** -0.0035**	-0.0056** -0.0053**	-0.0062** -0.0059**
Leverage	0.5024 [0.4986]	0.5421 [0.5419]	0.5683 [0.5678]	0.5852 [0.5845]	0.4846 [0.4802]	0.0570** 0.0617**	0.0840** 0.0876**	0.1006** 0.1043**
Firm value (¥ billions)	285.948 [71.787]	300.329 [84.377]	395.029 [91.968]	852.788 [421.658]	279.480 [67.725]	20.849* 16.652**	115.549** 24.243**	573.308* 353.933**
Total assets (¥ billions)	196.207 [46.992]	221.483 [58.398]	303.313 [63.951]	657.070 [310.680]	185.908 [43.842]	35.575** 14.556**	17.405** 20.109**	471.162** 266.838**
Panel B: Pre-Recession Period (1978 – 1989)								
Gross profit measure	0.2022 [0.1761]	0.1817 [0.1614]	0.1682 [0.1547]	0.1717 [0.1546]	0.2113 [0.1832]	-0.0296** -0.0218**	-0.0431** -0.0285**	-0.0396** -0.0286**
Pretax return on firm value	0.0316 [0.0271]	0.0258 [0.0221]	0.0218 [0.0182]	0.0208 [0.0173]	0.0344 [0.0300]	-0.0086** -0.0079**	-0.0126** -0.0118**	-0.0136** -0.0127**

Table 1 Continued

	All Firms	Keiretsu Firms			Independent Firms	Differences		
		(1) All Keiretsu Firms	(2) Strong Ties	(3) Presidents' Council	(4)	(1) - (4)	(2) - (4)	(3) - (4)
Panel B continued								
After-tax operating return on firm value	0.0131 [0.0133]	0.0105 [0.0110]	0.0085 [0.0096]	0.0108 [0.0105]	0.0144 [0.0145]	-0.0039** -0.0035**	-0.0059** -0.0049**	-0.0036** -0.0040**
Tax expense/firm value	0.0166 [0.0135]	0.0135 [0.0108]	0.0110 [0.0083]	0.0108 [0.0080]	0.0182 [0.0151]	-0.0047** -0.0043**	-0.0072** -0.0068**	-0.0074** -0.0071**
Leverage	0.5225 [0.5317]	0.5665 [0.5861]	0.5957 [0.6190]	0.6064 [0.6395]	0.5011 [0.5041]	0.0650** 0.0820**	0.0960** 0.1149**	0.1053** 0.1354**
Firm value (¥ billions)	236.764 [59.172]	250.716 [70.738]	334.880 [79.370]	714.752 [346.098]	229.950 [54.069]	20.766 16.669**	104.933** 25.301**	484.802 292.029**
Total assets (¥ billions)	154.716 [36.801]	177.784 [45.909]	249.371 [51.585]	538.234 [263.326]	144.454 [33.426]	33.329** 12.483**	104.917** 18.159**	275.908** 229.900**
Panel C: Recession Period (1990 - 1997)								
Gross profit measure	0.2192 [0.1879]	0.1925 [0.1774]	0.1779 [0.1717]	0.1838 [0.1749]	0.2287 [0.1923]	-0.0362** -0.0149**	-0.0508** -0.0206**	-0.0449** -0.0174**
Pretax return on firm value	0.0171 [0.0190]	0.0150 [0.0158]	0.0132 [0.0137]	0.0124 [0.0119]	0.0180 [0.0204]	-0.0030** -0.0046**	-0.0048** -0.0067**	-0.0056** -0.0085**
After-tax operating return on firm value	0.0101 [0.0117]	0.0089 [0.0102]	0.0085 [0.0093]	0.0092 [0.0091]	0.0106 [0.0125]	-0.0016** -0.0023**	-0.0021** -0.0032**	-0.0014** -0.0034**
Tax expense/firm value	0.0114 [0.0096]	0.0095 [0.0077]	0.0084 [0.0066]	0.0072 [0.0055]	0.0122 [0.0105]	-0.0026** -0.0028**	-0.0038** -0.0039**	-0.0050** -0.0050**
Leverage	0.4726 [0.4660]	0.5003 [0.4902]	0.5213 [0.5084]	0.5481 [0.5350]	0.4617 [0.4503]	0.0390** 0.0399**	0.0590** 0.0581**	0.0864** 0.0847**
Firm value (¥ billions)	358.644 [93.523]	385.152 [113.383]	498.200 [122.853]	1,093.349 [575.330]	348.146 [87.385]	37.006 25.998**	149.754** 35.468**	745.203* 487.945**
Total assets (¥ billions)	257.729 [64.583]	297.554 [82.724]	397.052 [90.735]	864.289 [436.004]	243.572 [60.624]	53.982** 22.100**	153.480** 30.111**	620.717** 375.380**

Table 2
Comparison of Effective Tax Rates on Pretax Cash Flows Between Keiretsu and Independent Firms

This table presents mean [median] effective tax rates on pretax cash flows for the whole period (1977-1997) (Panel A) for the entire sample of firms, for keiretsu firms and for independent firms; the same statistics are presented for the pre-recession period between 1977 and 1989 (Panel B) and for the recession period between 1990 and 1997 (Panel C). We also report the results for keiretsu firms that are classified as "strong ties" and presidents' council members to highlight the impact of the intensity of keiretsu affiliation. The effective tax rate on pretax cash flow is income tax expense divided by cash flow, where cash flow is the sum of income from operations and other revenues and expenses, adjusted by adding depreciation expense, prior-year current assets and current-year current liabilities, and subtracting current-year current assets and prior-year current liabilities. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999). * and ** indicate two-sided significance levels of .05 and .01, respectively, in comparisons of means using t-tests and medians using Wilcoxon rank sum tests.

	All Firm-Years	Kieiretsu Firm-Years			Independent Firm-Years	Differences		
		(1) All Keiretsu Firms	(2) Strong Ties	(3) Presidents' Council	(4)	(1) - (4)	(2) - (4)	(3) - (4)
Panel A: Whole Period (1977-1997)								
Mean effective tax rate on pretax cash flow	0.651	0.499	0.454	0.446	0.713	-0.214**	-0.259**	-0.267**
(standard deviation)	(7.269)	(2.695)	(2.697)	(1.745)	(8.444)			
Median effective tax rate on pretax cash flow	0.276	0.238	0.199	0.197	0.291	-0.053**	-0.092**	-0.094**
Panel B: Pre-Recession Period (1978 – 1989)								
Pre-Recession Period (1977-1989)								
Mean effective tax rate on pretax cash flow	0.691	0.511	0.456	0.422	0.771	-0.260*	-0.315**	-0.349**
(standard deviation)	(8.729)	(3.046)	(3.054)	(1.164)	(10.283)			
Median effective tax rate on pretax cash flow	0.298	0.258	0.214	0.221	0.315	-0.057**	-0.101**	-0.094**
Panel C: Recession Period (1990 – 1997)								
Mean effective tax rate on pretax cash flow	0.586	0.476	0.449	0.493	0.624	-0.148*	-0.175*	-0.131
(standard deviation)	(3.853)	(1.843)	(1.843)	(2.527)	(4.342)			
Median effective tax rate on pretax cash flow	0.236	0.199	0.169	0.154	0.248	-0.049**	-0.079**	-0.094**

Table 3
Descriptive Statistics for Key Regression Variables

Panel A presents means and medians of variables used in the regression analysis. T-tests and Wilcoxon rank sum tests are performed to determine whether the variables differ according to the presence or absence of keiretsu affiliation. Panel B reports Pearson and Spearman correlation coefficients among these key variables. Pearson coefficients are reported in the upper right section and Spearman coefficients are reported in the lower left section. Panel C shows the 1st, 10th, 25th, 50th (median), 75th, 90th and 99th percentiles of the continuous regression variables by tax and keiretsu affiliation status. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999), and *Kigyo Keiretsu Souran* (1992, 1993). X is a dummy variable indicating 1 if the firm faces a positive marginal tax rate and 0 otherwise; SIZE is the natural logarithm of the total market value of equity; PTAXROV is pretax income divided by the sum of equity market value and debt book value; GPPCT is sales minus cost of sales, divided by sales; LEVERAGE is the ratio of total liabilities to firm value, NETDIV is the ratio of dividend income to dividends paid, and K is a dummy variable (1 for keiretsu firms; 0 for independent firms).

Panel A: Measures of central tendency

	Keiretsu Firms *Mean [Median] (standard deviation)*	Independent Firms *Mean [Median] (standard deviation)*	Difference In Means [Medians]	T-statistic *(two-tail p-value)*	Wilcoxon two-sample test Approximate Z (*two-tail p-value)*
X_t	0.8552 [1.000] (0.3519)	0.8855 [1.000] (0.3184)	-0.0303 0.0000	-7.24 (<0.01)	-7.53 (<0.01)
SIZE	10.5413 [10.4870] (1.5694)	10.6261 [10.5681] (1.6006)	-0.0848 [[-0.0811]	-4.44 (<0.01)	-3.57 (<0.01)
LEVERAGE	0.5421 [0.5419] (0.2071)	0.4846 [0.4802] (0.2197)	0.0575 [0.0617]	-22.06 (<0.01)	-20.94 (<0.01)
PTAXROV	0.0218 [0.0196] (0.0391)	0.0275 [0.0256] (0.0499)	-0.0057 [-0.0060]	-10.78 (<0.01)	-19.15 (<0.01)
GPPCT	0.1856 [0.1670] (0.1163)	0.2186 [0.1868] (0.1434)	-0.0330 [-0.0198]	-21.86 (<0.01)	-18.57 (<0.01)
NETDIV	0.2349 [0.0000] (0.5464)	0.1539 [0.0000] (0.3658)	0.0810 [0.0000]	11.36 (<0.01)	8.37 (<0.01)

Panel B - Correlation coefficients (p-values)

Variable	X_t	SIZE	LEVERAGE	PTAXROV	GPPCT	NETDIV
X_t		0.282 (<0.01)	-0.222 (<0.01)	0.282 (<0.01)	0.199 (<0.01)	-0.011 (0.10)
SIZE	0.280 (<0.01)		-0.382 (<0.01)	0.052 (<0.01)	0.243 (<0.01)	0.024 (<0.01)
LEVERAGE	-0.221 (<0.01)	-0.388 (<0.01)		-0.218 (<0.01)	-0.416 (<0.01)	0.220 (<0.01)
PTAXROV	0.368 (<0.01)	0.063 (<0.01)	-0.361 (<0.01)		0.285 (<0.01)	-0.073 (<0.01)
GPPCT	0.224 (<0.01)	0.254 (<0.01)	-0.457 (<0.01)	0.341 (<0.01)		-0.154 (<0.01)
NETDIV	-0.001 (0.83)	-0.158 (<0.01)	0.280 (<0.01)	0.043 (<0.01)	-0.103 (<0.01)	

Panel C - Distributional Characteristics of Continuous Variables by Values of $X_{i,t}$ and K_i

			Percentile						
Variable	$X_{i,t}$	K_i	1st	10th	25th	Median	75th	90th	99th
SIZE	0	0	6.787	7.611	8.357	9.280	10.176	11.028	12.817
		1	6.892	7.677	8.407	9.360	10.381	11.340	13.132
	1	0	7.541	8.727	9.593	10.574	11.565	12.593	14.495
		1	7.568	8.760	9.661	10.680	11.819	12.766	14.197
LEVERAGE	0	0	0.110	0.324	0.487	0.645	0.780	0.966	0.994
		1	0.077	0.349	0.513	0.683	0.807	0.871	0.939
	1	0	0.063	0.184	0.299	0.456	0.628	0.762	0.932
		1	0.117	0.256	0.367	0.518	0.682	0.806	0.929
PTAXROV	0	0	-0.283	-0.072	-0.029	-0.002	0.012	0.036	0.224
		1	-0.204	-0.059	-0.023	-0.001	0.013	0.041	0.223
	1	0	-0.028	0.006	0.015	0.028	0.046	0.067	0.121
		1	-0.029	0.003	0.011	0.022	0.037	0.056	0.108
GPPCT	0	0	-0.080	0.040	0.081	0.131	0.193	0.246	0.484
		1	-0.092	0.031	0.072	0.116	0.163	0.226	0.467
	1	0	0.033	0.086	0.128	0.193	0.282	0.398	0.739
		1	0.015	0.077	0.115	0.179	0.244	0.331	0.634
NETDIV	0	0	0.000	0.000	0.000	0.000	0.283	0.615	2.295
		1	0.000	0.000	0.000	0.000	0.282	0.547	1.217
	1	0	0.000	0.000	0.000	0.000	0.178	0.440	1.576
		1	0.000	0.000	0.000	0.000	0.277	0.594	2.570

Table 4
Regression Results Examining Tax-Motivated Income Shifting by Keiretsu Firms

This table presents results of an OLS regression that examines the effect of the interaction of a marginal tax proxy and keiretsu affiliation on gross profit measure. Results are presented for data from the entire 21-year period and for two subperiods corresponding to pre-recession period (1977 - 1989) and recession period (1990 - 1997). PTAXROV is the ratio of pretax income to the sum of equity market value and debt book value; SIZE is the natural logarithm of the total market value of equity; IPTAXROV is the industry's median PTAXROV; X is the binomial marginal tax rate proxy (1 for firms facing positive marginal tax rates; 0 otherwise); K is a dummy variable (1 for keiretsu firms; 0 for independent firms); SIZE is the natural logarithm of the total market value of equity; LEVERAGE is the ratio of total liabilities to total assets; IND is a vector of dummy variables for each of 28 industries (1 if the firm operates primarily in the industry; 0 otherwise); YEAR is a vector of dummy variables for each of the 20 years between 1978 and 1997 (1 if the observation occurs within the year; 0 otherwise); and ε is the residual term. Descriptive statistics for the key variables and their definitions are presented in Table 4. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999). Strong-tie keiretsu firms are a subset of keiretsu firms with close keiretsu affiliation as indicated by either a three- or four-star rating by Dodwell Marketing Consultants and Brown & Company, Ltd. Results reported under the column heading "presidents' council" (1) compare members of presidents' councils (K=1) with all firms not represented on a keiretsu presidents' council and (2) include dummy control variables for the major keiretsu groups. Figures in parentheses are t-statistics. Estimated coefficients for the IND, YEAR and GROUP variables are not reported. * and ** indicate two-tail significance levels of .05 and .01, respectively.

Model: $PTAXROV_{i,t} = \beta_0 + \beta_1 IPTAXROV_{i,t} + \beta_2 X_{i,t} + \beta_3 K_i + \beta_4 (K_i * X_{i,t}) + \beta_5 SIZE_{i,t} + \beta_6 LEVERAGE_{i,t} + \beta_7 IND_{i,1} + \ldots.. + \beta_{34} IND_{i,28} + \beta_{35} YEAR_1 + \ldots.. + \beta_{54} YEAR_{20} + \varepsilon_{i,t}$

	Whole period (1978-1997)			Pre-Recession Period (1978-1989)			Recession period (1990-1997)		
Variables	All Firm-years	Strong Ties	Presidents' Council	All Firm-years	Strong Ties	Presidents' Council	All Firm-years	Strong Ties	Presidents' Council
Intercept	0.0231 (7.64)**	0.0201 (6.02)**	0.0232 (7.29)**	0.0379 (10.63)**	0.0318 (8.04)**	0.0383 (10.20)**	-0.0157 (-2.81)**	-0.0139 (-2.29)*	-0.0171 (-2.89)**
$IPTAXROV_{i,t}$	0.6219 (14.80)**	0.6222 (13.45)**	0.6271 (14.92)**	0.6133 (12.64)**	0.6369 (11.94)**	0.6107 (12.58)**	0.5803 (5.40)**	0.5179 (4.42)**	0.5903 (5.49)**
$X_{i,t}$	0.0345 (36.14)**	0.0350 (35.24)**	0.0312 (38.52)**	0.0256 (22.18)**	0.0262 (21.78)**	0.0238 (24.55)**	0.0458 (28.49)**	0.0462 (27.74)**	0.0427 (29.88)**
K_i	0.0079 (5.50**)	0.0094 (5.03)**	0.0135 (4.51)**	0.0031 (1.88)	0.0040 (1.94)	0.0091 (2.75)**	0.0124 (4.63)**	0.0141 (3.68)**	0.0190 (3.24)**
$K_i * X_{i,t}$	-0.0123 (-8.05**)	-0.0161 (-8.01)**	-0.0178 (-6.49)**	-0.0078 (-4.46)**	-0.0113 (-5.11)**	-0.0126 (-4.15)**	-0.0159 (-5.56)**	-0.0189 (-4.66)**	-0.0238 (-4.41)**
$SIZE_{i,t}$	-0.0005 (-2.44)**	-0.0004 (-2.07)	-0.0002 (-0.93)	-0.0009 (-3.81)**	-0.0008 (-2.98)**	-0.0007 (-2.71)**	0.0001 (0.19)	0.0000 (-0.04)	0.0004 (1.08)
$LEVERAGE_{i,t}$	-0.0609 (-40.36)**	-0.0581 (-34.69)**	-0.0608 (-39.50)**	-0.0680 (-37.47)**	-0.0640 (-31.32)**	0.0684 (-36.94)**	-0.0530 (-20.43)**	-0.0517 (-18.36)**	-0.0526 (-19.85)**
Adjusted R^2	0.1902	0.1861	0.1893	0.1960	0.1906	0.1947	0.1579	0.1561	0.1571
F-statistic for overall model	132.51	109.08	120.64	95.84	77.56	85.86	57.40	48.71	50.97
Sample size	30,234	25,530	30,234	17,899	14,956	17,899	12,335	10,574	12,335

Table 5
Profitability of Sample Firms Classified by Marginal Tax Status

A 2x2 matrix illustrates the profitability of sample firms according to the two sets of dummy variables, keiretsu affiliation (K) and marginal tax status (X), by representing the coefficients from the regression results in Table 4 for the parameters β_2, β_3, and β_4. In the model, PTAXROV is the ratio of pretax income to the sum of equity market value and debt book value; SIZE is the natural logarithm of the total market value of equity; IPTAXROV is the industry's median PTAXROV; X is the binomial marginal tax rate proxy (1 for firms facing positive marginal tax rates; 0 otherwise); K is a dummy variable (1 for keiretsu firms; 0 for independent firms); SIZE is the natural logarithm of the total market value of equity; LEVERAGE is the ratio of total liabilities to total assets; IND is a vector of dummy variables for each of 28 industries (1 if the firm operates primarily in the industry; 0 otherwise); YEAR is a vector of dummy variables for each of the 20 years between 1978 and 1997 (1 if the observation occurs within the year; 0 otherwise); and ε is the residual term. Descriptive statistics for the key variables and their definitions are presented in Table 4. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999). Strong-tie keiretsu firms are a subset of keiretsu firms with close keiretsu affiliation as indicated by either a three- or four-star rating by Dodwell Marketing Consultants and Brown & Company, Ltd. "Presidents' council" firms (K=1) are those firms represented on a keiretsu presidents' council, compared with those firms not represented on a keiretsu presidents' council (K=0).

Model: $PTAXROV_{i,t} = \beta_0 + \beta_1 IPTAXROV_{i,t} + \beta_2 X_{i,t} + \beta_3 K_i + \beta_4 (K_i * X_{i,t}) + \beta_5 SIZE_{i,t} + \beta_6 LEVERAGE_{i,t} + \beta_7 IND_{i,1} + \ldots.. + \beta_{34} IND_{i,28} + \beta_{35} YEAR_1 + \ldots.. + \beta_{54} YEAR_{20} + \varepsilon_{i,t}$

	Independent Firms (K=0)	Keiretsu Firms (K=1)
Taxable (X=1)	$B_2 = 0.0345$	$\beta_2+\beta_3+\beta_4$ = 0.0301 for All Keiretsu Firms = 0.0283 for Strong Tie Firms = 0.0269 for Presidents' Council Members
Non Taxable (X=0)	0	β_3 = 0.0079 for All Keiretsu Firms = 0.0094 for Strong Tie Firms = 0.0135 for Presidents' Council Members

Table 6
Regression Results Examining Compensatory Dividends

This table presents results of OLS regression analyses that test whether dividends are paid by loss keiretsu firms to taxpaying keiretsu firms to compensate unique shareholders of the taxpaying firm for the wealth transfer effect of income to loss firms. We examine whether keiretsu affiliation affects the relation between marginal tax status and net dividend income. Results are presented for data from the entire 21-year period and for two subperiods corresponding to the pre-recession period (1977 - 1989) and the recession period (1990 - 1997). NETDIV is the ratio of dividend income to dividends paid; SIZE is the firm-specific mean of the natural logarithm of total market value of equity across years included in the time-series; K is a dummy variable (1 for keiretsu firms; 0 for independent firms); X is the binomial marginal tax rate proxy (1 for firm-years facing positive marginal tax rates; 0 otherwise); IND is a vector of dummy variables for each of 28 industries (1 if the firm operates primarily in the industry; 0 otherwise); YEAR is a vector of dummy variables for each of the 20 years between 1978 and 1997 (1 if the observation occurs within the year; 0 otherwise); and ε is the residual term. Descriptive statistics for the key variables and their definitions are presented in Table 4. Keiretsu and independent firm classification information is obtained from *Industrial Groupings in Japan* published by Dodwell Marketing Consultants (1985, 1989, 1995) and Brown & Company, Ltd. (1999). Strong-tie keiretsu firms are a subset of keiretsu firms with close keiretsu affiliation as indicated by either a three- or four-star rating by Dodwell Marketing Consultants and Brown & Company, Ltd. Results reported under the column heading "presidents' council" (1) compare members of presidents' councils (K=1) with all firms not represented on a keiretsu presidents' council and (2) include dummy control variables for the major keiretsu groups. Figures in parentheses are t-statistics. Estimated coefficients for the IND, YEAR and GROUP variables are not reported. * and ** indicate two-tail significance levels of .05 and .01, respectively.

Model: $NETDIV_i = \beta_0 + \beta_1 K_i + \beta_2 X_i + \beta_3 (K_i * X_i) + \beta_4 LEVERAGE_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 IND_{i,1} + \ldots.. + \beta_{34} IND_{i,28} + \beta_{35} YEAR_1 + \ldots.. + \beta_{55} YEAR_{21} + \varepsilon_{i,t}$

	Whole period (1978-1997)			Pre-Recession Period (1978-1989)			Recession period (1990-1997)		
Variables	All Firm-years	Strong Ties	Presidents' Council	All Firm-years	Strong Ties	Presidents' Council	All Firm-years	Strong Ties	Presidents' Council
Intercept	-0.4689 (-13.47)**	-0.4722 (-12.31)**	-0.3671 (10.40)**	-0.5010 (-11.34)**	-0.5059 (-10.42)**	-0.4082 (-9.21)**	-0.6091 (-10.71)**	-0.6190 (-9.85)**	-0.4769 (-8.05)**
K_i	-0.0807 (-2.28)**	-0.0814 (-1.65)	-0.0920 (-1.67)	-0.1070 (-2.32)*	-0.1012 (-1.61)	-0.1351 (-2.05)*	-0.0645 (-1.17)	-0.0881 (-1.09)	-0.0868 (-0.83)
$X_{i,t}$	-0.0604 (-2.99)**	-0.0643 (-3.03)**	-0.0464 (-2.63)**	-0.1178 (-4.22)**	-0.1237 (-4.23)**	-0.1001 (-4.14)**	0.0164 (0.57)	0.0140 (0.46)	0.0261 (1.02)
$K_i * X_{i,t}$	0.1003 (2.80)**	0.1652 (3.31)**	0.1955 (3.52)**	0.1322 (2.83)**	0.1896 (2.99)**	0.2378 (3.59)**	0.0742 (1.33)	0.1607 (1.96)*	0.1931 (1.84)
$SIZE_{i,t}$	0.0563 (27.48)**	0.0579 (25.08)**	0.0457 (19.88)**	0.0634 (24.52)**	0.0653 (22.57)**	0.0531 (18.30)**	0.0439 (13.06)**	0.0447 (11.78)**	0.0326 (8.63)**
$LEVERAGE_{i,t}$	0.3794 (23.59)**	0.3599 (19.89)**	0.3443 (21.05)**	0.4534 (22.21)**	0.4337 (18.75)**	0.4204 (20.25)**	0.2512 (9.54)**	0.2397 (8.17)**	0.2107 (7.86)**
Adjusted R^2	0.1894	0.1991	0.1930	0.2133	0.2236	0.2167	0.1232	0.1373	0.1276
F-statistic for overall model	101.23	91.18	103.65	87.92	78.43	89.70	30.18	29.35	31.38
Sample size	22,743	19,226	22,743	14,431	12,103	14,431	8,312	7,124	8,312