

## Taxes, Keiretsu Affiliation, and Income Shifting

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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.

# 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 [Beatty and Harris (2001), Mills and Newberry (2001), Newberry and Dhaliwal (2001), and Collins et al. (1998)].<sup>1</sup> 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)]. 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.

The keiretsu business form represents a significant portion of one of the world's major economies. 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. 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 8.4 percent of the total profits of Japanese corporations.<sup>2</sup> 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

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<sup>1</sup> A recent notable exception is Yetman's (2001) study of nonprofit organizations' allocation of expenses between taxable and tax-exempt activities, as reported in tax returns. Yetman's research 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.

<sup>2</sup> 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.

keiretsu membership and, specifically, the possible shifting of income among affiliates to reduce overall effective tax rates.<sup>3</sup>

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. Given that keiretsu firms are subject to lower effective tax rates than independent firms, we hypothesize that income-shifting is one reason for this observation. To provide evidence in support of our hypothesis, we examine the interactive effect of keiretsu membership and a marginal tax rate proxy on pretax return on firm value.<sup>4</sup> Compared with independent firms, keiretsu firms' pretax return on firm value is inversely related to the marginal tax rate proxy. The evidence is robust to alternative variable definitions, model specifications, and time periods.

Our empirical evidence has 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 final observation may seem counter-intuitive because the Japanese

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<sup>3</sup> 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.

<sup>4</sup> 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 measured under extremely conservative accounting methods. In Section 4.4 we report, however, that the results are not sensitive to this choice of deflator.

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.<sup>5</sup> 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 develop the income-shifting hypothesis within keiretsu groups in Section 2. In Section 3 we illustrate relative tax burdens of keiretsu group members and independent firms using an effective tax rate measure. We test the income-shifting hypothesis in Section 4 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. Income-Shifting within Keiretsu Groups**

Keiretsu or industrial groupings represent diversified groups of manufacturing and trading firms that share the same financial institutions and adopt homogenous business strategies. Keiretsu members usually come from a variety of industries, and they are linked through various relationships, including cross-ownership, mutual appointment of officers and directors, intra-group financing, and formation of presidential councils. Beyond extensive cross-shareholdings within the keiretsu group, the most distinctive institutional feature is the main bank relationship [Miyashita and Russell (1994)]. Serving as the central unit of each keiretsu group, the main bank acts as a

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<sup>5</sup> See Dvorak et al. (2001) and Abrahams and Tett (1999) for articles discussing the possible recent disintegration of the keiretsu system.

major lender as well as a major shareholder of its respective group members [Berglöf and Perotti (1994)]. At the end of fiscal year 1997, banks owned approximately 15 percent of listed non-financial companies while listed companies held over 40 percent of banking shares, which compares with 16.5 percent and 45 percent, respectively in 1990 [Brown & Company Ltd. (1999)]. This ownership structure also enables main banks to assign personnel to top managerial positions of member companies, which, in turn, allows the banks to exercise power as both lenders and shareholders.<sup>6</sup>

Financial economists have documented a number of advantages of belonging to a keiretsu group.<sup>7</sup> For instance, keiretsu membership reduces the cost of financial distress [Suzuki and Wright (1985); Hoshi et al. (1990)]. In addition, the keiretsu governance structure resolves agency problems by reducing information asymmetry [Prowse (1990, 1992) and Hoshi et al. (1991)], and provides effective monitoring over top management [Berglöf and Perotti (1994), Kaplan (1994), and Kaplan and Minton (1994)]. Consequently, keiretsu companies maintain higher financial leverage than independent firms [Hodder and Tschoegl (1985)] and firm diversification is more valuable to keiretsu firms than to independent firms [Guo et al. (2001)]. At the same time, 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)].<sup>8</sup> Kester (1991) argues that business/trading relationships among keiretsu companies are

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<sup>6</sup> A number of independent firms also maintain a primary bank relationship and borrow from one of six major city banks [Campbell and Hamao (1994) and Horiuchi and Okazaki (1992)]. However, the corporate governance systems of independent firms are completely different from, and much less complex than, those of keiretsu firms that have intense interactions among numerous constituents [Gilson and Roe (1993), Prowse (1992), and Sheard (1989)]. Therefore, it is only in keiretsu groups where main banks share the benefits of affiliation with their members.

<sup>7</sup> Some pessimistic views on this point, however, have been expressed in prior studies. For example, 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. The apparent lack of different capital market behavior implies that the distinction between the two groups may be operationally meaningless in terms of the fundamental behavior of Japanese firms.

<sup>8</sup> Alternative interpretations of the literature cast a more critical view of the keiretsu financial system. It has been suggested that Jensen's (1986, 1989) value-destroying hypothesis, in which managers who control free cash flow are predicted to manage it inefficiently, is consistent with this view. In addition, a number of studies suggest that close bank relationships lead to lower growth and profitability [Lincoln et al. (1993)]. Because of their primary interest in securing

as important as financial relationships between banks and keiretsu members. In fact, cross-shareholding among member firms fosters mutual monitoring and information sharing among corporate members [Gilson and Roe (1993)].

With a focus on overall keiretsu wealth rather than on each firm's bottom line, keiretsu members have incentives to mitigate the organization's overall tax liability. 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.<sup>9</sup> 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. We borrow a concept introduced by Harris et al. (1993) and Harris (1993) to suggest that keiretsu membership affords firms flexibility (i.e. less "frictions") in reducing their effective tax rates through income shifting.<sup>10</sup> These studies measure flexibility in terms of the level of expenses, relative to total assets or sales, that represents operations that are apparently easy to shift across jurisdictions (i.e., research and development, interest, advertising, and, in the Harris study, rent). The cooperative nature of Japanese keiretsu firms provides a comparative measure of income-shifting flexibility: whether the firm is a member of one of the six dominant keiretsu groups.<sup>11</sup>

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payment of principal and interest, banks may prevent firms from investing in risky but profitable projects. Keiretsu affiliation also allows banks to charge relatively higher interest rates in exchange for readily accessible bank loans [Weinstein and Yafeh (1998)].

<sup>9</sup> See Shevlin (1990) for further discussion of the asymmetric treatment of income and loss and the estimation of marginal tax rates considering loss carryovers. Japanese corporate taxpayers that maintain certain accounting records (i.e., file "blue form" tax returns) are allowed to carry back losses to one preceding year [Article 81 of the Corporation Tax Law] and carry forward income to five succeeding years [Article 57 of the Corporation Tax Law] [Kuboi (1991, p. 47)]. However, the one-year loss carryback rule was suspended between 1984 and 1988 and again between 1992 and 2000. Also, between 1986 and 1988 the loss carryforward rule required taxpayers to wait two years before offsetting current income with prior losses [Kuboi (1991, p. 34)]. Asymmetric taxation of gains and losses, combined with the limited availability of loss carryovers, explains some of the variation in effective tax rates across Japanese companies. Further variation in effective tax rates is due to the imposition of local income taxes that differ depending on prefecture and municipality [Kuboi (1991, pp. 44-45)] and to the varying availability of tax-free reserves across firm size, industry membership, and nature and amount of investment [Ishi (1993, pp. 201-203)].

<sup>10</sup> Refer to Scholes et al. (2002) for an explanation of the conceptual terms "frictions" and "restrictions."

<sup>11</sup> Gupta and Mills (2001) and Rego (2001) empirically determine that effective tax rates are statistically related to the number of states and countries, respectively, in which a firm operates. Gupta and Mills explain that up to a point (i.e., 24 states) corporate effective tax rates are positively related to the number of states that a firm operates within, but that this

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 legislation [Kuboi (1991, p. 86)].<sup>12</sup> Thus, the Japanese government has apparently not exerted substantial effort to restrict income-shifting schemes that reduce the overall tax burdens of cooperating firms.

In an early empirical study of tax-induced income shifting, Harris et al. (1993) obtain evidence to support their hypothesis that firms transfer income to (from) the United States when their foreign operations are located in countries with higher (lower) tax rates than in the United States. Harris (1993) reports that US multinational companies shifted income into the United States following the Tax Reform Act of 1986 when tax rates were cut substantially. Further, Harris finds that "flexible" firms, those with substantial rent, interest, research and development, and advertising expenses, react more quickly and completely than inflexible firms. Klassen et al. (1993) report evidence that US multinational firms shift income around the world in response to both domestic and foreign tax rate changes.

Jacob (1996) examines a sample of US firms to determine whether the magnitude of intra-company cross-jurisdictional business is positively related to the propensity to shift income among corporate affiliates. Jacob's evidence supports the view that these firms shifted income through transfer pricing. Collins et al. (1998) determine that income-shifting by US multinational firms critically depends on the firm's position with respect to the foreign tax credit limit. Designed to prevent double taxation but insure at least one level of taxation, the foreign tax credit allows US firms to receive a tax credit for foreign taxes paid on foreign income; the limitation prevents the credit from exceeding the US tax on the foreign income. Because of the foreign tax credit limit,

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relationship turns negative with further increases in states. Rego more generally finds that multinational firms face lower effective tax rates than domestic-only companies.

firms with foreign income subject to higher foreign tax rates have a strong incentive to shift income from high-tax jurisdictions to the United States. Collins et al. reveal evidence that US multinational companies shifted between \$34 and \$40 billion of income to the US between 1984 and 1992 in response to cross-jurisdictional tax rate differences. Mills and Newberry (2001) find similar evidence of tax-rate-sensitive income shifting behavior among foreign-controlled U.S. corporations. In an effort to explain how firms shift income across jurisdictions, Newberry and Dhaliwal (2001) show that tax incentives affect firms' location of debt issuances.

In spite of the incentives and the perceived flexibility for keiretsu firms to reduce their combined tax liabilities through income-shifting techniques, frictions might prevent this from happening on a widespread basis. 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, management performance evaluation is complicated by tax-induced income-shifting and keiretsu affiliations may be forced to create costly logistical mechanisms, including special accounting and dividend systems.<sup>13</sup>

In summary, keiretsu member firms have strong incentives to shift income for tax purposes and they possess the flexibility to shift income through intra-keiretsu trade involving transfer prices. Building on previous income-shifting research that pertains primarily to multinational American firms operating in different tax jurisdictions, this study provides evidence supporting the view that keiretsu member companies shift income among themselves to reduce the overall tax burden facing the keiretsu. In the next section we present effective tax rates and other descriptive statistics for the sample.

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<sup>12</sup> The Special Taxation Measures Law became effective on April 1, 1986.

<sup>13</sup> 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).

### 3. Relative Tax Burdens of Keiretsu and Independent Firms

The sample employed in this study contains all non-financial and non-utility firms listed on the Tokyo Stock Exchange for which data is available during the 21-year period from 1977-1997.<sup>14</sup> Financial statement data are retrieved from the PACAP database™ compiled by the Sandra Ann Morsilli Pacific-Basin Capital Markets (PACAP) Research Center at the University of Rhode Island, in collaboration with the Daiwa Institute of Research and Toyo Keizai Inc.

#### 3.1. 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 organize keiretsu firms into two subgroups, strong ties and weak 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, 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 and companies with one- and two-star ratings as indicating weak ties to the group.

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<sup>14</sup> 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.

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.<sup>15,16</sup> The year 1990 marks the beginning of a gradual weakening of keiretsu 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. 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. Gross profit measure is the ratio of gross profits to sales. Financial leverage is the ratio of total liabilities to firm value. The sample firms are grouped into keiretsu firms, either strong-tie or weak-tie, and independent firms.<sup>17</sup> Results of statistical tests of the differences between each of the keiretsu groups and the independent firms are presented. 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.

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<sup>15</sup> 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 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.

<sup>16</sup> 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)].

<sup>17</sup> These descriptive statistics represent a somewhat smaller sample than the total of 30,234 firms-years used in the regression results because data requirements for the effective tax rate measure are not necessary for the regression analysis.

[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 ( $p < .0001$ ). 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 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.<sup>18</sup> Financial leverage is consistently higher among keiretsu firms than independent firms across the whole period as well as each of the two subperiods.

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 more than twice as large as weak-tie keiretsu firms and nearly 42 percent larger than 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,

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<sup>18</sup> We use ¥120=\$1 as a rough estimate of the exchange rate across the entire sample period.

particularly those with strong ties, 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).

### 3.2. *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, firm size, and industry. 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.<sup>19</sup> 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), 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.<sup>20</sup>

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.<sup>21</sup> Effective tax rates for

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<sup>19</sup> See Rego (1999) for further discussion and an examination of this issue. Effective tax rates are employed in Tables 2, 3 and 4 for descriptive purposes only; subsequent empirical tests rely upon a binomial marginal tax rate proxy.

<sup>20</sup> 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)].

<sup>21</sup> For the descriptive analysis relying upon the tax rate on cash flows (i.e., Tables 1 through 4), 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.

keiretsu firms with strong and weak ties are also 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 ( $p < .0001$ ). During the pre-recession period, the difference between the two groups' median effective tax rates is 5.7 percent ( $p < .0001$ ) but this difference falls to 4.9 percent ( $p < .0001$ ) 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.<sup>22</sup>

[Insert Table 2]

As expected, keiretsu firms with strong ties exhibit much lower median effective tax rates than firms with weak ties [19.9 percent versus 28.1 percent] during the 21-year study period. Across both subperiods, strong-tie keiretsu firms face lower effective tax rates than independent firms. Not surprisingly, however, the differences between keiretsu firms with weak ties and independent firms are not as pronounced as those between strong tie keiretsu firms and independent firms.

### 3.3. *Firm Size and Industry Effects*

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.<sup>23</sup> 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. Panel A of Table 1 indicates that total assets and firm value of keiretsu firms are greater than those reported by independent firms whereas the market value of shareholders' equity is smaller for keiretsu firms than independent firms (not

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<sup>22</sup> 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.

<sup>23</sup> 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.

reported).<sup>24</sup> To examine the differences in effective tax rates between keiretsu and independent firms with the minimum possible confounding effect of firm size, all sample firms are ranked in ascending order by firm value and then grouped into ten deciles (1<sup>st</sup> decile = smallest; 10<sup>th</sup> 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.

Table 3 presents the results. Keiretsu firms exhibit 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<sup>th</sup> decile. Overall, 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.

[Insert Table 3]

Industry effects may also 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. Table 4 shows the average effective tax rates of keiretsu and independent firms within major industries classified by Tokyo Stock Exchange industry codes (similar to the four-digit standard industry classification). 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

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<sup>24</sup> The mean values of equity are ¥125.5 billion for keiretsu firms and ¥180.9 billion for independent firms.

firms is not supported by the results in Table 4. For example, keiretsu firms do not dominate the low-tax industries such as 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. Overall, it does not appear that the keiretsu tax advantage is explained by firm size or industry membership. The next section considers the possibility that keiretsu firms use income-shifting as a vehicle for lowering effective tax rates.

[Insert Table 4]

#### **4. Empirical Evidence on the Keiretsu Income-Shifting Hypothesis**

##### *4.1. Model*

The effective tax rates portrayed in Tables 1-4 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)]. Thus, 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. Although the evidence indicates that these simulation procedures generally perform well, Graham (1996b) and Plesko (2001) suggest that simple dummy variables reasonably capture much of the variation in corporate marginal tax rate status.<sup>25</sup>

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<sup>25</sup> 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.

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 dummy variable 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)].<sup>26</sup> 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 carryforward), 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

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<sup>26</sup> We also perform the empirical tests modeling only the carryback rules and obtain results very similar to those reported in Table 6.

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:

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

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  $\varepsilon$  is the residual term.

#### 4.2. Descriptive Statistics of Key Variables

Table 5 presents descriptive statistics of key variables included in the regression model. Panel A summarizes measures of central tendency and Panel B offers correlation coefficients among the variables. In addition to  $PTAXROV$ , another profitability measure, the ratio of gross profits to sales ( $GPPCT$ ), is introduced in Table 5 because  $GPPCT$  is examined as an alternative dependent variable in the sensitivity analysis. In general, Table 5 descriptive statistics confirm the results reported in Table 1: independent firms are larger, more profitable, less financially levered, and more likely to be subject to positive marginal tax than keiretsu firms. As reported in Panel B, 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 ( $p < .0001$ )

and 0.34 ( $p < .0001$ ), 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. 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.<sup>27</sup>

[Insert Table 5]

#### 4.3. *Regression Results*

Panel A of Table 6 presents the regression results for the whole period (1977-1997), the pre-recession period (1977-1989), and the recession period (1990-1997). The first column presents the results for the whole period (1977-1997) and the last two columns summarize the results for the two subperiods. In each column, regression results are reported for the entire sample as well as separately for keiretsu firms with strong and weak ties.<sup>28</sup> With adjusted R-squares all exceeding .15 and highly significant F-statistics, the models provide strong explanations of the variation in PTAXROV. The coefficient of LEVERAGE is highly significant and negative in the whole period as well as in the two subperiods, indicating that high financial leverage implies low profitability. Although conventional wisdom dictates that high profitability should be associated with high risk (as well as high financial leverage as one of major determinants of systematic risk), the large negative relation between firm profitability and financial leverage is not surprising in view of the Japanese banking practices in the past.<sup>29</sup> Traditionally,

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<sup>27</sup> 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, which are much smaller in their magnitude than the counterpart figures estimated for our sample firms,  $-0.218$  and  $-0.361$  reported in Panel B. This preliminary evidence suggests that Japanese lenders are less concerned with (or less successful in predicting) the future profitability of their debtors.

<sup>28</sup> When regressions are run for strong-tie keiretsu firms, we made sure that weak-tie keiretsu firms are excluded. Thus, necessary contrast can be obtained between strong-tie firms and independent firms. Likewise, we excluded strong-tie keiretsu firms from regressions for weak-tie keiretsu firms.

<sup>29</sup> Refer to Mandelker and Rhee (1984) on the role of operating and financial leverage in determining a firm's systematic risk.

Japanese banks continue to lend to their corporate customers even if borrowing firms suffer from operating losses to avoid corporate bankruptcies.<sup>30</sup> Only recently with severe economic recession, Japanese banks attempt to minimize this type of relationship-based banking practices. The impact of firm size on firm profitability is significantly negative in the pre-recession period, while it becomes insignificant in the recession period.

[Insert Table 6]

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  $K_i * X_i$  ( $p < .0001$ ). 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.<sup>31</sup>

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 in the recession period ( $-0.0159$ ,  $p < .0001$ ), compared with the pre-recession period ( $-0.0078$ ,  $p < .0001$ ). Although the significant negative coefficient estimated for strong-tie firms decreases from  $-0.0114$  ( $p < .0001$ ) to  $-0.0186$  ( $p < .0001$ ) in the recession period (a 63% increase in absolute magnitude), the negative coefficient of weak-tie keiretsu firms decreases from  $-0.0042$  (insignificant) in the pre-recession period to  $-0.0128$  ( $p < .0001$ ) during the recession, an increase of more than 204%. These results

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<sup>30</sup> Horiuchi and Shimizu (1998) report that the issuance of a large amount of subordinated debt allowed the Japanese major banks to credit supply despite the severity of equity capital depletion in the 1980s and 1990s.

<sup>31</sup> 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 ( $K_i * X_i$ ).

indicate that income-shifting among keiretsu firms was formerly concentrated among those with strong ties, and that income-shifting expands into weak-tie keiretsu firms during the recession. 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 (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 does not imply moderation of income-shifting activities among keiretsu firms.<sup>32</sup> Rather, keiretsu firms engage in income-shifting more aggressively during the economic recession.<sup>33</sup>

In Panel B we report the results in which we narrow strong keiretsu firms to include only those companies that belong to the Presidents' Council of each keiretsu group. This 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

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<sup>32</sup> Except for a reduction in significance from  $P < .0001$  to  $P < .001$  for weak-tie firms during the recession period, none of the significance levels reported in Table 6 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.

<sup>33</sup> Table 4 indicates that the largest difference in effective tax rate occurs in the fishing, mining and forestry industry group. 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 6, 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.

of strong-tie keiretsu firms.<sup>34</sup> The following model is used for the test:

$$\begin{aligned}
 \text{PTAXROV}_{i,t} = & \beta_0 + \beta_1 \text{IPTAXROV}_{i,t} + \beta_2 X_{i,t} + \beta_3 G_i + \beta_4 (G_i * X_{i,t}) + \beta_5 \text{SIZE}_{i,t} + \beta_6 \text{LEVERAGE}_{i,t} + \\
 & \beta_7 \text{IND}_{i,1} + \dots + \beta_{34} \text{IND}_{i,28} + \beta_{35} \text{YEAR}_1 + \dots + \beta_{54} \text{YEAR}_{20} + \beta_{55} \text{GROUP}_1 \\
 & + \dots + \beta_{59} \text{GROUP}_5 + \varepsilon_{i,t}
 \end{aligned} \tag{2}$$

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 independent 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.<sup>35</sup>

As expected, the interaction for the Presidential Council subset is much stronger for strong-tie keiretsu firms, further mitigating the positive relation between firm profitability and marginal tax. For example, the estimated coefficient for  $G_i * X_{i,t}$  in the whole period is -0.0178 ( $p < .0001$ ), which compares with the estimated coefficient of -0.0159 ( $p < .0001$ ) 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 -0.0114 and -0.0186 estimated for strong-tie keiretsu firms. These results indicate stronger income-shifting activities among keiretsu Presidents' Council members.

Further analysis indicates that variation in Presidents' Council members' tax rates differs depending on keiretsu affiliation (see Table 7). Sumitomo and Fuij are apparently most effective at shifting income to mitigate income taxes while the Sanwa group appears least effective. For comparison, this table measures tax rates two ways: relative to cash flows and relative to firm value (i.e., the sum of equity market value and debt book value). When firm value is the tax rate

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<sup>34</sup> 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.

<sup>35</sup> Sanwa is the reference group when the group dummies are introduced.

deflator instead of cash flows, Fuji's apparent shifting effectiveness diminishes while Sumitomo's remains. The Sumitomo group's income shifting effectiveness is indicated by its member firms' low mean and median tax rates on both cash flows and firm value, and by the very small standard deviations of these tax rates.

[Insert Table 7]

#### 4.4. *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.<sup>36</sup> 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  $-0.0212$  ( $p < .0001$ ) 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 6, 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 6. 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

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<sup>36</sup> Detailed results of these tests are available upon request from the authors.

significance level observed for strong-tie keiretsu firms only, we conjecture that keiretsu firms rely on many other income-shifting methods over and beyond a narrowly defined transfer pricing mechanism.

Second, 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.

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

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.<sup>37</sup>

The last test is designed to investigate the existence of a compensatory dividend payment. The underlying assumption is as follows: If a keiretsu member firm shifts income to another

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<sup>37</sup> Estimated coefficients for the test variable, K, are -0.0174 (P<.001) and -0.0145 (P<.05) in the whole period and the recession period, respectively, for strong-tie keiretsu firms, while the coefficient is insignificant in the pre-recession period. In contrast, none of the coefficients (K) estimated for weak-tie keiretsu firms is significant in any of the periods.

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 especially among keiretsu firms.<sup>38</sup> 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).<sup>39</sup> The following model is used to test the hypothesis that keiretsu affiliation will directly impact the dividend policies of its member firms:

$$\begin{aligned} \text{NETDIV}_{i,t} = & \beta_0 + \beta_1 \text{SIZE}_{i,t} + \beta_2 \text{K}_{i,t} + \beta_3 \text{X}_i + \beta_4 (\text{K}_i \times \text{X}_{i,t}) + \beta_5 \text{IND}_{i,1} + \dots + \beta_{32} \text{IND}_{i,28} \\ & + \beta_{33} \text{YEAR}_1 + \dots + \beta_{52} \text{YEAR}_{20} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

The estimated coefficient for the interaction,  $\text{K}_i \times \text{X}_i$ , between the keiretsu dummy (K) and marginal tax status (X) is our major focus in this model. NETDIV is the ratio of dividend income to dividends paid and all other independent variables have been defined in previous regression models. A positive and significant coefficient of  $\text{K}_i \times \text{X}_i$  would indicate greater net compensatory dividend income among keiretsu firms with positive marginal tax rates. In fact, the results confirm this. Across the whole period for all keiretsu firms, we observe a positive and significant coefficient on  $\text{K}_i \times \text{X}_i$  of 0.1051 ( $p < .001$ ). The results of this model are stronger for strong-tie keiretsu firms and non-existent for weak-tie keiretsu firms, indicating that compensatory dividends is a mechanism predominantly used by strong-tie keiretsu firms.

## 5. Conclusion

Many empirical papers have documented a variety of benefits to 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 that has not been previously been

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<sup>38</sup> 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.

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. Thus, 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 keiretsu firms during the recession.

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<sup>39</sup> 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.

## References

- Abrahams, P. and G. Tett, 1999, The circle is broken, *Financial Times* (November 19).
- Anderson, C. W. and A. K. Makhija, 1999, Deregulation, disintermediation, and agency costs of debt: Evidence from Japan, *Journal of Financial Economics* 51, 309-339.
- Beason, D., 1998, Keiretsu affiliation and share price volatility in Japan, *Pacific-Basin Finance Journal* 6, 27-43.
- Beatty, A., and D. G. Harris, 2001, Intra-group, interstate strategic income management for tax, financial reporting, and regulatory purposes, *The Accounting Review* 76, 515-536.
- Berglöf, E. and E. Perotti, 1994, The governance structure of the Japanese financial keiretsu, *Journal of Financial Economics* 36, 259-284.
- Brown & Company Ltd., 1999, *Industrial groupings in Japan: The changing face of 'keiretsu,'* 13<sup>th</sup> edition.
- Campbell, J. Y. and Y. Hamao, 1994, Changing patterns of corporate financing and the main bank system in Japan, in: M. Aoki and H. Patrick, eds., *The Japanese Main Bank System: Its Relevance for Developing and Transforming Economies* (Oxford University Press, New York) 325-349.
- Collins, J., D. Kemsley, and M. Lang, 1998, Cross-jurisdictional income shifting and earnings valuation, *Journal of Accounting Research* 36, 209-229.
- Cooke, T. E. and M. Kikuya, 1992, *Financial reporting in Japan: Regulation, practice and environment* (Blackwell Publishers Ltd., Oxford, United Kingdom).
- Deloitte Touche Tohmatsu International, 1996, *Taxation in the Asia-Pacific Region* (New York, NY).
- Dewenter, K. L., 2001, Japanese Keiretsu restructuring in the early 1990s: Was there a master plan?, University of Washington working paper.
- Dewenter, K. L. and V. A. Warther, 1998, Dividends, asymmetric information, and agency conflicts: Evidence from a comparison of the dividend policies of Japanese and U.S. firms, *Journal of Finance* 53, 879-904.
- Dodwell Marketing Consultants, 1985, 1989, 1995, *Industrial Groupings in Japan* (Dodwell Marketing Consultants, Tokyo, Japan).
- Dvorak, P., R. A. Guth, J. Singer, and T. Zaun, 2001, Loose ends: Frayed by recession, Japan's corporate ties are coming unraveled—Sales of interlocking holdings fuel Nikkei's tumble, boost foreign ownership—A chair and a crystal ashtray, *Wall Street Journal* (March 2, A1).
- Gerlach, Michael, 1992, *Alliance Capitalism: The Social Organization of Japanese Business* (Berkeley, CA: University of California Press).
- Gilson, R. J. and M. J. Roe, 1993, Understanding the Japanese keiretsu: Overlaps between corporate governance and industrial organization, *Yale Law Journal* 102, 870-906.

- Graham, J. R., 1996a, Debt and the marginal tax rate, *Journal of Financial Economics* 41, 41-73.
- Graham, J. R., 1996b, Proxies for the corporate marginal tax rate, *Journal of Financial Economics* 42, 187-221.
- Guo, E., A. J. Keown, and N. Sen, 2001, The impact of firm diversification and focus: The Japanese experience, *Pacific-Basin Finance Journal* 9, 165-193.
- Gupta, S. and L. F. Mills, 2001, Corporate multistate tax planning: Benefits of multiple jurisdictions, forthcoming in *Journal of Accounting and Economics*.
- Gupta, S. and K. Newberry, 1997, Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data, *Journal of Accounting and Public Policy* 16, 1-34.
- Harris, D. G., 1993, The impact of US tax law revision on multinational corporations' capital location and income-shifting decisions, *Journal of Accounting Research* 31, 111-140.
- Harris, D., R. Morck, J. Slemrod, and B. Yeung, 1993, Income shifting in US multinational corporations, in *Studies in International Taxation*, edited by A. Giovannini, R. G. Hubbard, and J. Slemrod (University of Chicago Press, Chicago, IL).
- Hodder, J. E. and A. E. Tschoegl, 1985, Some aspects of Japanese corporate finance, *Journal of Financial and Quantitative Analysis* 20, 261-272.
- Hojo, H., 1995, The legacy of the bubble economy in Japan: Declining cross shareholding and capital formation, Japan Securities Dealers Association Working Paper.
- Horiuchi, A. and K. Shimizu, 1998, The deterioration of bank balance sheets in Japan: Risk-taking and recapitalization, *Pacific-Basin Finance Journal* 6, 1-26.
- Horiuchi, A. and R. Okazaki, 1992, Capital markets and the banking sector: The efficiency of Japanese banks in reducing agency costs, University of Tokyo working paper.
- Hoshi, T., A. Kashyap, and D. Scharfstein, 1990, The role of banks in reducing the costs of financial distress in Japan, *Journal of Financial Economics* 27, 67-88.
- Hoshi, T., A. Kashyap, and D. Scharfstein, 1991, Corporate structure, liquidity, and investment: Evidence from Japanese industrial groups, *Quarterly Journal of Economics* 106, 33-60.
- Ishi, H., 1993, *The Japanese tax system*, second edition (Oxford University Press, UK).
- Jacob, J., 1996, Taxes and transfer pricing: Income shifting and the volume of intrafirm transfers, *Journal of Accounting Research* 34, 301-312.
- Japanese Ministry of Finance, 1999, *An Outline of Japanese Taxes*.
- Jensen, M. C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-339.
- Jensen, M. C., 1989, Eclipse of the public corporation, *Harvard Business Review* 5, 61-74.

- Jo, H., S. G. Rhee, and M. H. Song, 2001, The role of security analysts in Japan, University of Hawaii working paper.
- Kaplan, S. N., 1994, Top executive rewards and firm performance: A comparison of Japan and the United States, *Journal of Political Economy* 102, 510-546.
- Kaplan, S. N., and B. A. Minton, 1994, Appointment of outsiders to Japanese boards: Determinants and implication for managers, *Journal of Financial Economics* 36, 225-258.
- Kern, B. B. and M. H. Morris, 1992, Taxes and firm size: The effect of tax legislation during the 1980s, *Journal of the American Taxation Association* 14, 80-96.
- Kester, W. C., 1991, *Japanese Takeovers: The Global Contest for Corporate Control* (Harvard Business School Press, Boston, MA).
- Kigyo Keiretsu Souran*, 1992 and 1993 (Toyo Keizai, Tokyo, Japan).
- Kim, K. A. and P. Limpaphayom, 1998, A test of the two-tier corporate governance structure: The case of Japanese keiretsu, *Journal of Financial Research* 21, 37-51.
- Klassen, K., M. Lang, and M. Wolfson, 1993, Geographic income shifting by multinational corporations in response to tax rate changes, *Journal of Accounting Research* 31 (Supplement), 140-173.
- Kuboi, T., 1991, *Business practices and taxation in Japan* (The Japan Times, Tokyo, Japan).
- Lincoln, J. R., M. Gerlach, and C. Ahmadjian, 1993, Keiretsu networks and corporate performance in Japan, University of California at Berkeley working paper.
- Mandelker, G. N. and S. G. Rhee, 1984, The impact of the degrees of financial and operating leverage on systematic risk of common stock, *Journal of Financial and Quantitative Analysis* 19, 45-57.
- Mills, L.F., and K.J. Newberry, 2001, Do worldwide tax incentives affect the income reporting and debt policy of foreign-controlled U.S. corporations? University of Arizona working paper.
- Miyashita, K. and D. W. Russell, 1994, *Keiretsu: Inside the hidden Japanese conglomerates* (McGraw-Hill, Inc., New York, NY).
- Nakatani, I., 1984, The economic role of corporate financial grouping, in M. Aoki, ed., *Economic Analysis of the Japanese Firm* (Elsevier, New York, NY).
- Namiki, N., 1999, Parent-subsidiary relationships in Japan: Some observations from financial statement data, *SAM Advanced Management Journal*, Summer, 15-16.
- Newberry, K., and D. Dhaliwal, 2001, Cross-Jurisdictional Income Shifting by U.S. Multinationals: Evidence from international bond offerings, forthcoming in *Journal of Accounting Research*, December 2001, 629-48.
- Oliver, R. W., 1999, Killer keiretsu, *Management Review*, September, 10-11.

- Omer, T. C., K. H. Molloy, and D. A. Ziebart, 1993, An investigation of the firm size—effective tax rate relation in the 1980s, *Journal of Accounting, Auditing & Finance* 8, 167-182.
- Plesko, G. A., 2001, An evaluation of alternative measures of corporate tax rates, Massachusetts Institute of Technology working paper.
- Prowse, S. D., 1990, Institutional investment patterns and corporate financial behavior in the U.S. and Japan, *Journal of Financial Economics* 27, 43-66.
- Prowse, S. D., 1992, The structure of corporate ownership in Japan, *Journal of Finance* 47, 1121-1140.
- Rego, S. O., 1999, Multinational income shifting and the endogenous relationship between firm profitability and effective tax rates, University of Iowa working paper.
- Rego, S. O., 2001, Tax avoidance activities of US multinational corporations, University of Iowa working paper.
- Scholes, M. S., M. A. Wolfson, M. Erickson, E. L. Maydew, and T. Shevlin, 2002, *Taxes and business strategy: A planning approach*, 2<sup>nd</sup> edition (Prentice Hall, Upper Saddle River, NJ).
- Sheard, P., 1989, The main bank system and corporate monitoring and control in Japan, *Journal of Economic Behavior and Organization* 11, 399-422.
- Shevlin, T., 1990, Estimating corporate marginal tax rates with asymmetric tax treatment of gains and losses, *Journal of the American Taxation Association* 11, 51-67.
- Shevlin, T., 1999, A critique of Plesko's An evaluation of alternative measures of corporate tax rates, University of Washington working paper.
- Suzuki, S. and R. Wright, 1985, Financial structure and bankruptcy risk in Japanese companies, *Journal of International Business Studies*, 97-110.
- Titman, S. and R. Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1-19.
- Weinstein, D. E. and Y. Yafeh, 1998, On the cost of a bank centered financial system: Evidence from the changing main bank relations in Japan, *Journal of Finance* 53, 635-672.
- Yetman, R. J., 2001, Tax-Motivated Expense Allocations by Nonprofit Organizations, *The Accounting Review* 76, 297-311.
- Zimmerman, J. L., 1983, Taxes and firm size, *Journal of Accounting and Economics* 5, 119-149.

**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). Gross profit measure is the ratio of gross profits to sales. Firm value 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). Keiretsu firms are classified into two subgroups, strong ties and weak ties, based on the degree of affiliation intensity as defined by Dodwell Marketing Consultants and Brown & Company, Ltd. \*, \*\*, \*\*\*, and \*\*\*\* indicate two-sided significance levels of .05, .01, .001, and .0001, respectively, in comparisons of means using t-tests and medians using Wilcoxon rank sum tests.

	All Firms	Keiretsu Firms			Independent Firms (4)	Differences		
		(1) All Keiretsu firms	(2) Strong Ties	(3) Weak Ties		(1) - (4)	(2) - (4)	(3) - (4)
<b>Panel A: Whole Period (1977- 1997)</b>								
Gross profit measure / 100	0.2090 [0.1806]	0.1856 [0.1670]	0.1717 [0.1589]	0.1994 [0.1762]	0.2186 [0.1868]	-0.0330**** -0.0198****	-0.0469**** -0.0279****	-0.0192**** -0.0106****
Pretax return on firm value	0.0257 [0.0237]	0.0218 [0.0196]	0.0186 [0.0165]	0.0250 [0.0236]	0.0275 [0.0256]	-0.0057**** -0.0060****	-0.0089**** -0.0091****	-0.0025**** -0.0020****
After-tax operating return on firm value	0.0119 [0.0126]	0.0099 [0.0107]	0.0085 [0.0095]	0.0113 [0.0121]	0.0128 [0.0136]	-0.0029**** -0.0029****	-0.0043**** -0.0041****	-0.0014**** -0.0015****
Tax expense/firm value	0.0145 [0.0118]	0.0120 [0.0094]	0.0100 [0.0076]	0.0140 [0.0120]	0.0157 [0.0129]	-0.0036**** -0.0035****	-0.0056**** -0.0053****	-0.0016**** -0.0009****
Leverage	0.5024 [0.4986]	0.5421 [0.5419]	0.5683 [0.5678]	0.5159 [0.5121]	0.4846 [0.4802]	0.0570**** 0.0617****	0.0840**** 0.0876****	0.0320**** 0.0319****
Firm value (¥ billions)	285.948 [71.787]	300.329 [84.377]	395.029 [91.968]	205.888 [79.426]	279.480 [67.725]	20.849* 16.652****	115.549**** 24.243****	-73.592**** 11.701****
Total assets (¥ billions)	196.207 [46.992]	221.483 [58.398]	303.313 [63.951]	140.665 [55.012]	185.908 [43.842]	35.575**** 14.556****	17.405**** 20.109****	-45.243**** 11.170****
<b>Panel B: Pre-Recession Period (1978 – 1989)</b>								
Gross profit measure / 100	0.2022 [0.1761]	0.1817 [0.1614]	0.1682 [0.1547]	0.1951 [0.1713]	0.2113 [0.1832]	-0.0296**** -0.0218****	-0.0431**** -0.0285****	-0.0162**** -0.0119****
Pretax return on firm value	0.0316 [0.0271]	0.0258 [0.0221]	0.0218 [0.0182]	0.0299 [0.0262]	0.0344 [0.0300]	-0.0086**** -0.0079****	-0.0126**** -0.0118****	-0.0045**** -0.0038****

**Table 1 Continued**

	All Firms	Keiretsu Firms			Independent Firms (4)	Differences		
		(1) All Keiretsu firms	(2) Strong Ties	(3) Weak Ties		(1) - (4)	(2) - (4)	(3) - (4)
<b>Panel B continued</b>								
After-tax operating return on firm value	0.0131 [0.0133]	0.0105 [0.0110]	0.0085 [0.0096]	0.0125 [0.0128]	0.0144 [0.0145]	-0.0039**** -0.0035****	-0.0058**** -0.0049****	-0.0019**** -0.0017****
Tax expense/firm value	0.0166 [0.0135]	0.0135 [0.0108]	0.0110 [0.0083]	0.0160 [0.0137]	0.0182 [0.0151]	-0.0047**** -0.0043****	-0.0072**** -0.0068****	-0.0022**** -0.0014****
Leverage	0.5225 [0.5317]	0.5665 [0.5861]	0.5957 [0.6190]	0.5374 [0.5538]	0.5011 [0.5041]	0.0650**** 0.0820****	0.0960**** 0.1149****	0.0380**** 0.0497****
Firm value (¥ billions)	236.764 [59.172]	250.716 [70.738]	334.880 [79.370]	166.581 [65.135]	229.950 [54.069]	20.766 16.669****	104.933**** 25.301****	-63.369**** 11.066****
Total assets (¥ billions)	154.716 [36.801]	177.784 [45.909]	249.371 [51.585]	107.172 [42.747]	144.454 [33.426]	33.329**** 12.483****	104.917**** 18.159****	-37.282**** 9.321****
<b><u>Panel C: Recession Period (1990 – 1997)</u></b>								
Gross profit measure / 100	0.2192 [0.1879]	0.1925 [0.1774]	0.1779 [0.1717]	0.2068 [0.1848]	0.2287 [0.1923]	-0.0362**** -0.0149****	-0.0508**** -0.0206****	-0.0219**** -0.0075****
Pretax return on firm value	0.0171 [0.0190]	0.0150 [0.0158]	0.0132 [0.0137]	0.0168 [0.0187]	0.0180 [0.0204]	-0.0030** -0.0046****	-0.0048*** -0.0067****	-0.0012 -0.0017**
After-tax operating return on firm value	0.0101 [0.0117]	0.0089 [0.0102]	0.0085 [0.0093]	0.0094 [0.0111]	0.0106 [0.0125]	-0.0016**** -0.0023****	-0.0021**** -0.0032****	-0.0012* -0.0014****
Tax expense/firm value	0.0114 [0.0096]	0.0095 [0.0077]	0.0084 [0.0066]	0.0107 [0.0093]	0.0122 [0.0105]	-0.0026**** -0.0028****	-0.0038**** -0.0039****	-0.0015**** -0.0012****
Leverage	0.4726 [0.4660]	0.5003 [0.4902]	0.5213 [0.5084]	0.4794 [0.4669]	0.4617 [0.4503]	0.0390**** 0.0399****	0.0590**** 0.0581****	0.0170*** 0.0166***
Firm value (¥ billions)	358.644 [93.523]	385.152 [113.383]	498.200 [122.853]	272.873 [108.173]	348.146 [87.385]	37.006 25.998****	149.754**** 35.468****	-75.273**** 20.788****
Total assets (¥ billions)	257.729 [64.583]	297.554 [82.724]	397.052 [90.735]	199.069 [80.204]	243.572 [60.624]	53.982*** 22.100****	153.480**** 30.111****	-44.503**** 19.580****

**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). 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). Keiretsu firms are classified into two subgroups, strong ties and weak ties, based on the degree of affiliation intensity as defined by Dodwell Marketing Consultants and Brown & Company, Ltd. \*, \*\*, \*\*\*, and \*\*\*\* indicate two-sided significance levels of .05, .01, .001, and .0001, respectively, in comparisons of means using t-tests and medians using Wilcoxon rank sum tests.

	All Firm-Years	Keiretsu Firm-Years			Independent Firm-Years	Differences		
		(1) All Keiretsu Firms	(2) Strong Ties	(3) Weak Ties		(4)	(1) - (4)	(2) - (4)
<b><u>Panel A: Whole Period (1977-1997)</u></b>								
Mean effective tax rate on pretax cash flow (standard deviation)	0.651 (7.269)	0.499 (2.695)	0.454 (2.697)	0.543 (2.692)	0.713 (8.444)	-0.214**	-0.259***	-0.170*
Median effective tax rate on pretax cash flow	0.276	0.238	0.199	0.281	0.291	-0.053****	-0.092****	-0.010****
<b><u>Panel B: Pre-Recession Period (1978 – 1989)</u></b>								
Pre-Recession Period (1977-1989)								
Mean effective tax rate on pretax cash flow (standard deviation)	0.691 (8.729)	0.511 (3.046)	0.456 (3.054)	0.563 (3.037)	0.771 (10.283)	-0.260*	-0.315**	-0.208
Median effective tax rate on pretax cash flow	0.298	0.258	0.214	0.309	0.315	-0.057****	-0.101****	-0.006***
<b><u>Panel C: Recession Period (1990 – 1997)</u></b>								
Mean effective tax rate on pretax cash flow (standard deviation)	0.586 (3.853)	0.476 (1.843)	0.449 (1.843)	0.503 (1.844)	0.624 (4.342)	-0.148*	-0.175*	-0.121
Median effective tax rate on pretax cash flow	0.236	0.199	0.169	0.232	0.248	-0.049****	-0.079****	-0.016****

**Table 3**  
**Effective Tax Rates by Size Deciles**

This table presents mean and median effective tax rates by deciles of firm value for keiretsu group firms (KRS) and independent firms (INP). Panels A, B and C report tax rates for the whole sample period (1977-1997), the pre-recession period (1977-1989), and the recession period (1990-1997), respectively. 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). Firm value is defined as the sum of the market value of outstanding equity plus the book value of total liabilities. The effective tax rate is defined as 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. \*, \*\*, \*\*\*, and \*\*\*\* indicate two-sided significance levels of .05, .01, .001, and .0001, respectively, for t-tests and Wilcoxon rank sum tests of within-quintile differences ( $\Delta_{K-I}$ ) in means and medians between keiretsu and independent firms.

	First Decile (smallest)			Second Decile			Third Decile			Fourth Decile			Fifth Decile		
	KRS	INP	$\Delta_{K-I}$	KRS	INP	$\Delta_{K-I}$	KRS	INP	$\Delta_{K-I}$	KRS	INP	$\Delta_{K-I}$	KRS	INP	$\Delta_{K-I}$
<b>Panel A: Whole Period (1977-1997)</b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.292 (0.622)	0.410 (2.643)	-0.118	0.332 (0.817)	0.561 (3.930)	-0.229*	0.524 (1.960)	1.229 (23.375)	-0.704	0.617 (5.489)	0.759 (5.462)	-0.142	0.522 (1.446)	0.709 (4.767)	-0.187
Median effective tax rate on pretax cash flows	0.171	0.215	-0.044****	0.207	0.265	-0.058****	0.235	0.276	-0.041****	0.227	0.297	-0.07****	0.252	0.305	-0.053****
Mean firm value	9.144	9.063	0.081	18.770	18.839	-0.069	29.695	29.638	0.057	43.478	43.359	0.499	61.663	61.608	0.054
N	672	1,907	-1,235	791	1,789	-998	719	1,859	-1,140	719	1,861	-1,142	717	1,862	-1,145
<b>Panel B: Pre-Recession Period (1978 – 1989)</b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.271 (0.504)	0.461 (3.213)	-0.190*	0.322 (0.656)	0.495 (3.440)	-0.173	0.441 (1.680)	0.485 (1.491)	-0.044	0.822 (6.831)	1.709 (29.926)	-0.887	0.461 (1.018)	0.926 (6.836)	-0.466*
Median effective tax rate on pretax cash flows	0.149	0.228	-0.079****	0.211	0.253	-0.042****	0.246	0.306	-0.06****	0.259	0.305	-0.046**	0.262	0.347	-0.085****
Mean firm value	7.711	7.473	0.238	15.420	15.206	0.215	23.835	23.831	0.004	35.027	35.317	-0.290	50.110	49.956	0.154
N	417	1,180	-763	488	1,109	-621	476	1,121	-645	466	1,131	-665	503	1,094	-591
<b>Panel C: Recession Period (1990 – 1997)</b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.330 (0.685)	0.561 (4.633)	-0.231	0.414 (1.564)	0.504 (1.819)	-0.090	0.441 (1.760)	0.568 (2.513)	-0.127	0.566 (2.113)	0.745 (6.959)	-0.178	0.584 (1.889)	0.683 (5.929)	-0.010
Median effective tax rate on pretax cash flows	0.180	0.182	-0.002	0.175	0.207	-0.032*	0.188	0.259	-0.071****	0.167	0.244	-0.077***	0.256	0.263	-0.007
Mean firm value	14.772	14.448	0.324	27.864	28.151	-0.287	42.673	42.837	-0.164	60.710	60.169	0.541	81.810	82.029	-0.219
N	266	716	-450	238	744	-506	244	738	-494	241	742	-501	233	749	-516

**Table 3-Continued**  
**Effective Tax Rates by Size Deciles**

	Sixth Decile			Seventh Decile			Eighth Decile			Ninth Decile			Tenth Decile (Largest)		
	KRS	INP	$\Delta_{K-1}$	KRS	INP	$\Delta_{K-1}$	KRS	INP	$\Delta_{K-1}$	KRS	INP	$\Delta_{K-1}$	KRS	INP	$\Delta_{K-1}$
<b><u>Panel A: Whole Period (1977-1997)</u></b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.737 (5.326)	1.035 (9.783)	-0.298	0.509 (1.289)	0.626 (3.156)	-0.117	0.549 (1.757)	0.596 (2.229)	-0.047	0.412 (1.061)	0.458 (0.864)	-0.046	0.519 (2.139)	0.561 (3.119)	-0.042
Median effective tax rate on pretax cash flows	0.273	0.307	-0.034***	0.268	0.304	-0.036*	0.280	0.309	-0.029**	0.229	0.266	-0.037****	0.227	0.221	0.006
Mean firm value	87.949	87.231	0.718	128.941	129.403	-0.463	212.931	209.726	3.205*	400.513	401.912	-1.399	1546.980	2117.053	-570.073****
N	784	1,795	-1011	745	1,835	-1,090	801	1,778	-977	1032	1,547	-515	925	1,654	-729
<b><u>Panel B: Pre-Recession Period (1978 – 1989)</u></b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.865 (6.658)	1.006 (9.594)	-0.141	0.508 (1.003)	0.803 (4.207)	-0.295*	0.477 (0.855)	0.525 (0.914)	-0.048	0.513 (1.629)	0.608 (1.649)	-0.094	0.451 (1.057)	0.512 (3.121)	-0.062
Median effective tax rate on pretax cash flows	0.301	0.344	-0.043****	0.288	0.354	-0.066****	0.313	0.344	-0.031**	0.258	0.318	-0.060****	0.251	0.253	-0.002
Mean firm value	72.751	72.254	0.497	106.081	108.068	-1.987**	173.517	174.115	-0.598	339.131	335.519	3.612	1353.400	1747.657	-394.257****
N	484	1,113	-629	540	1,057	-517	530	1,067	-537	654	943	-289	611	986	-375
<b><u>Panel C: Recession Period (1990 – 1997)</u></b>															
Mean effective tax rate on pretax cash flows (standard deviation)	0.395 (0.875)	0.896 (8.026)	-0.502	0.544 (1.795)	0.569 (2.840)	-0.025	0.433 (1.497)	0.471 (1.075)	-0.038	0.461 (1.514)	0.448 (0.933)	0.013	0.601 (3.191)	0.611 (3.139)	-0.010
Median effective tax rate on pretax cash flows	0.187	0.247	-0.060***	0.233	0.245	-0.012	0.226	0.253	-0.027	0.199	0.226	-0.027	0.201	0.182	0.019
Mean firm value	115.220	115.625	-0.405	169.662	170.288	-0.626	273.969	271.502	2.467	511.571	531.196	-19.625*	1769.209	2709.873	-940.663****
N	267	715	-448	226	757	-501	317	665	-348	362	620	-258	342	640	-298

**Table 4**  
**Effective Tax Rates on Pretax Cash Flows Distributed by Industry Classification**

This table presents mean effective tax rates on pretax cash flows for keiretsu group firms (KRS) and independent firms (INP) by industry classification and time period. The sample of firm-years is first grouped into 12 industry classifications, then categorized by whether affiliated with a keiretsu and arranged according to time period as occurring prior to 1990 or after 1989. 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). The effective tax rate is defined as 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. Numbers of firm-year observations are shown in parentheses. \*\*, \* and ^ denote two-tail statistical significance at the 1, 5 and 10 percent levels, respectively, for t-tests and Wilcoxon rank sum tests of within-industry differences ( $\Delta_{K-I}$ ) in means and medians between keiretsu and independent firms.

Industry	Whole period (1977-1997)				Pre-Recession period (1977-1989)				Recession period (1990-1997)			
	Total	KRS	IND	$\Delta_{K-I}$	Total	KRS	IND	$\Delta_{K-I}$	Total	KRS	IND	$\Delta_{K-I}$
Fishing, Mining and Forestry	0.465 (286)	0.265 (104)	0.580 (182)	0.316*	0.534 (186)	0.286 (68)	0.677 (118)	-0.391^	0.338 (100)	0.225 (36)	0.402 (64)	-0.177*
Construction	0.891 (2,386)	0.856 (709)	0.906 (1,677)	-0.050	0.958 (1,471)	0.840 (468)	1.013 (1,003)	-0.174	0.783 (915)	0.888 (241)	0.745 (674)	0.142
Food	1.129 (1,623)	0.427 (591)	1.532 (1,032)	-1.105	1.541 (1,009)	0.402 (383)	2.238 (626)	-1.836	0.453 (614)	0.473 (208)	0.443 (406)	0.030
Textiles	0.544 (1,193)	0.486 (366)	0.569 (827)	-0.083	0.641 (785)	0.540 (236)	0.684 (549)	-0.144	0.357 (408)	0.388 (130)	0.343 (278)	0.044
Chemical and Petroleum	0.561 (3,230)	0.470 (1,454)	0.635 (1,776)	-0.165^	0.544 (2,032)	0.399 (957)	0.673 (1,075)	-0.275*	0.590 (1,198)	0.607 (497)	0.577 (701)	0.030
Pulp, Paper, Rubber and Glass	0.410 (1,685)	0.339 (855)	0.483 (830)	-0.144	0.436 (1,123)	0.334 (572)	0.542 (551)	0.208	0.356 (562)	0.347 (283)	0.365 (279)	-0.018
Metal and Machinery Manufacturing	0.634 (7,536)	0.565 (1,884)	0.657 (5,652)	-0.093	0.678 (4,785)	0.678 (1,234)	0.679 (3,551)	-0.001	0.557 (2,751)	0.349 (650)	0.621 (2,101)	-0.272*
Equipment and Other Manufacturing	0.558 (3,479)	0.409 (606)	0.590 (2,873)	-0.181*	0.445 (2,219)	0.401 (400)	0.455 (1,729)	-0.055	0.737 (1,350)	0.425 (206)	0.793 (1,144)	-0.368^
Wholesale and Retail	0.907 (2,893)	0.553 (636)	1.006 (2,257)	-0.453*	1.050 (1,650)	0.561 (425)	1.220 (1,225)	-0.659*	0.716 (1,243)	0.538 (211)	0.753 (1,032)	0.215
Real Estate and Financial (excluding banks, insurance companies and securities firms)	0.452 (544)	0.462 (114)	0.450 (430)	0.012	0.525 (287)	0.462 (74)	0.547 (213)	-0.085	0.371 (257)	0.462 (40)	0.355 (217)	0.107
Transportation, Communication, and Utilities	0.343 (2001)	0.360 (590)	0.336 (1,411)	0.024	0.286 (1,258)	0.342 (390)	0.261 (868)	0.081	0.440 (743)	0.396 (200)	0.456 (543)	-0.061
Services	0.610 (909)	0.305 (100)	0.648 (809)	0.342**	0.598 (476)	0.354 (59)	0.633 (417)	-0.278**	0.623 (433)	0.235 (41)	0.663 (392)	-0.428**

**Table 5**  
**Descriptive Statistics for Key Regression Variables**

Panel A presents means and medians of key 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. 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; and LEVERAGE is the ratio of total liabilities to firm value.

**Panel A: Measures of central tendency**

	Keiretsu Firms Mean [Median] (standard deviation)	Independent Firms Mean [Median] (standard deviation)	T-statistic (two-tail p-value)	Wilcoxon two-sample test Approximate Z (two-tail p-value)
X <sub>t</sub>	0.8552 [1.0000] (0.3519)	0.8855 [1.0000] (0.3184)	-7.24 (0.0001)	-7.53 (0.0001)
SIZE	10.5413 [10.4870] (1.5694)	10.6261 [10.5681] (1.6006)	-4.44 (0.0001)	-3.57 (0.0004)
LEVERAGE	0.5421 [0.5419] (0.2071)	0.4846 [0.4802] (0.2197)	-22.06 (0.0001)	-20.94 (0.0001)
PTAXROV	0.0218 [0.0196] (0.0391)	0.0275 [0.0256] (0.0499)	-10.78 (0.0001)	-19.15 (0.0001)
GPPCT	0.1856 [0.1670] (0.1163)	0.2186 [0.1868] (0.1434)	-21.86 (0.0001)	-18.57 (0.0001)

**Panel B - Correlation coefficients (p-values)**

Variable	X <sub>t</sub>	SIZE	LEVERAGE	PTAXROV	GPPCT
X <sub>t</sub>		0.282 (0.0001)	-0.222 (0.0001)	0.282 (0.0001)	0.199 (0.0001)
SIZE	0.280 (0.0001)		-0.382 (0.0001)	0.052 (0.0001)	0.243 (0.0001)
LEVERAGE	-0.221 (0.0001)	-0.388 (0.0001)		-0.218 (0.0001)	-0.416 (0.0001)
PTAXROV	0.368 (0.0001)	0.063 (0.0001)	-0.361 (0.0001)		0.285 (0.0001)
GPPCT	0.224 (0.0001)	0.254 (0.0001)	-0.457 (0.0001)	0.341 (0.0001)	

**Table 6**  
**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); GROUP is a dummy variable for each of six keiretsu groups (1 if the firm is a member of the keiretsu group; 0 otherwise); and  $\epsilon$  is the residual term. Descriptive statistics for the key variables and their definitions are presented in Table 5. 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). Keiretsu firms are classified into two subgroups, strong ties and weak ties, based on the degree of affiliation intensity as defined by Dodwell Marketing Consultants and Brown & Company, Ltd. Figures in parentheses are t-statistics. Estimated coefficients for the IND and YEAR variables are not reported. \*, \*\*, \*\*\*, and \*\*\*\* indicate two-tail significance levels of .05, .01, .001, and .0001, respectively.

**Panel A: Pretax Return on Firm Value (PTAXROV) as Dependent Variable**

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

Variables	Whole period (1978-1997)			Pre-Recession Period (1978-1989)			Recession period (1990-1997)		
	All Firm-years	Strong Ties	Weak Ties	All Firm-years	Strong Ties	Weak Ties	All Firm-years	Strong Ties	Weak Ties
Intercept	0.0231 (7.64)****	0.0168 (4.95)****	0.0199 (5.77)****	0.0379 (10.63)****	0.0310 (7.81)****	0.0381 (9.69)****	-0.0157 (-2.81)**	-0.0211 (-3.34)***	-0.0261 (-3.97)****
IPTAXROV <sub>i,t</sub>	0.6219 (14.80)****	0.6496 (13.82)****	0.6180 (13.07)****	0.6133 (12.64)****	0.6485 (12.10)****	0.5813 (10.97)****	0.5803 (5.40)****	0.5927 (4.82)****	0.6715 (5.40)****
X <sub>i,t</sub>	0.0345 (36.14)****	0.0346 (34.44)****	0.0341 (34.08)****	0.0256 (22.18)****	0.0263 (21.63)****	0.0253 (21.40)****	0.0458 (28.49)****	0.0453 (26.61)****	0.0452 (26.25)****
K <sub>i</sub>	0.0079 (5.50)****	0.0095 (5.02)****	0.0055 (2.84)***	0.0031 (1.88)	0.0041 (1.97)*	0.0012 (0.54)	0.0124 (4.63)****	0.0143 (3.68)***	0.0109 (3.10)****
K <sub>i</sub> * X <sub>i,t</sub>	-0.0123 (-8.05)****	-0.0159 (-7.89)****	-0.0081 (-3.95)****	-0.0078 (-4.46)****	-0.0114 (-5.16)****	-0.0042 (-1.79)	-0.0159 (-5.56)****	-0.0186 (-4.51)****	-0.0128 (-3.38)****
SIZE <sub>i,t</sub>	-0.0005 (-2.44)**	-0.0004 (-1.61)	-0.0002 (-0.73)	-0.0009 (-3.81)****	-0.0008 (-2.97)**	-0.0007 (-2.59)**	0.0001 (0.19)	0.0002 (0.57)	0.0005 (1.27)
LEVERAGE	-0.0609 (-40.36)****	-0.0585 (-41.13)****	-0.0605 (-35.45)****	-0.0680 (-37.47)****	-0.0645 (-31.34)****	-0.0691 (-34.71)****	-0.0530 (-20.43)****	-0.0512 (-17.31)****	-0.0504 (-16.63)****
Adjusted R <sup>2</sup>	0.1902	0.1886	0.1973	0.1960	0.1909	0.2043	0.1579	0.1548	0.1562
F-statistic for overall model	132.51	108.33	114.47	95.84	77.13	83.72	57.40	46.10	46.66
Sample size	30,234	24,940	24,937	17,899	14,839	14,824	12,335	10,101	10,113

**Table 6 Continued**

**Panel B: Presidents' Council Members Only**

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

Variables	Whole period (1978-1997)	Pre-Recession Period (1978-1989)	Recession period (1990-1997)
Intercept	0.0232 (7.29)****	0.0383 (10.20)****	-0.0171 (-2.89)**
IPTAXROV <sub>i,t</sub>	0.6271 (14.92)****	0.6107 (12.58)****	0.5903 (5.49)****
X <sub>i,t</sub>	0.0312 (38.52)****	0.0238 (24.55)****	0.0427 (29.88)****
G <sub>i</sub>	0.0135 (4.51)****	0.0091 (2.75)**	0.0190 (3.24)**
G <sub>i</sub> *X <sub>i,t</sub>	-0.0178 (-6.49)****	-0.0123 (-4.15)****	-0.0238 (-4.41)****
SIZE <sub>i,t</sub>	-0.0002 (-0.93)	-0.0007 (-2.71)**	0.0004 (1.08)
LEVERAGE <sub>i,t</sub>	-0.0608 (-39.50)****	0.0684 (-36.94)****	-0.0526 (-19.85)****
Adjusted R <sup>2</sup>	0.1893	0.1947	0.1571
F-statistic for overall model	120.64	85.86	50.97
Sample size	30,234	17,899	12,334

**Table 7**  
**Tax Rate Variation Within Keiretsu Presidents' Councils**

This table presents the mean, standard deviation, and median of tax rates within each of the six large Japanese keiretsu Presidents' Council groups. Tax rates are measured as tax expense reported on the income statement divided by pretax cash flows and alternatively by firm value.

Keiretsu Group	Effective tax rates on cash flows and firm value					
	Mean		Median		Standard deviation	
	Cash flow Tax rate	Cash flow Tax rate	Cash flow Tax rate	Firm value Tax rate	Cash flow Tax rate	Firm value Tax rate
Mitsubishi	0.4644	0.2071	0.2071	0.0071	1.9582	0.0083
Mitsui	0.4789	0.2150	0.2150	0.0073	1.6654	0.0136
Sumitomo	0.3260	0.1708	0.1708	0.0065	0.6132	0.0063
Fuji	0.3560	0.2050	0.2050	0.0086	0.6870	0.0109
Dai-Ichi Kangyo	0.4819	0.2073	0.2073	0.0062	3.6380	0.0105
Sanwa	0.5184	0.2266	0.2266	0.0099	2.1842	0.0111