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Abstract

Taxes affect the size of a corporate takeover market in theory; the extant empirical studies from the US data offer limited such evidence. We consider Japan after 2001, which offers an alternative setting in which a tax system implicitly subsidizes mergers that follow a particular sequence of steps (“step transactions”). We construct a novel dataset on step transactions from a list of takeover deals from 1996 through 2013 and examine their utilization rates before and after Japan’s tax reform of 2001. We find a statistically and economically significant discontinuity across the two regimes. We also examine tax payments using a panel dataset of firms from 1997 through 2013 and find a strong association between unexplained falls in tax payments and step transactions. The Japanese tax system provided subsidies to marginal as well as infra-marginal mergers among domestic corporations: we estimate tax expenditure to be ¥172.3 billion.

JEL Classification: H25, H26, G34, H32

Keywords: *Tax Avoidance, M&A, Corporate Restructuring*

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1 Introduction

Corporate takeovers are an important means through which productive resources are reallocated (Andrade et al., 2001; Holmstrom and Kaplan, 2001; Martynova and Renneboog, 2008). The role of taxes in the takeover market are of long-standing interest (Butters and Lintner, 1951; Mandelker, 1974); takeover deals often involve considerable payout, and thus, the efficiency consequences can be enormous if taxes influence deal formations.¹ The seminal empirical studies by Auerbach and Reishus (1986, 1988b) find no effect of taxes on the size of a takeover market. While subsequent studies report significant influences (Ayers et al., 2007), the prevailing view in the literature is that taxes are probably of secondary importance in deal formation and constitute windfall gains or losses (Shackelford and Shevlin, 2001; Betton et al., 2008; Hanlon and Heitzman, 2010).²

The literature adopts this view from studies mainly on the US economy in which the tax law limits tax benefits from takeovers. If an acquirer could fully carry over the net operating loss (NOL) of a target and offset that NOL against its own profits, then the acquirer's valuation of target with a large NOL would be higher by the amount of tax saving compared to its valuation absent carryover. However, the US institution sets limits to the carryover of NOL upon ownership changes (Scholes and Wolfson, 1990), and Devos et al. (2009) find tax benefits to be a minor component of takeover premia. The lack of findings on the effects of NOL after the Tax Reform Act of 1986 (TRA1986) in the US could be due to the legal environment which restricts carryover of NOL. More generally, tax incentives in the US might have been too small for statistical analysis to detect.

We consider an alternative setting, Japan, where a Supreme Court ruling in 2016 found there has been large tax incentives favoring mergers.³ Japan differs from the US not just in terms of specific tax laws but also in terms of the legal tradition and attitude of the tax enforcement agency. We show that in Japan, acquirers can reduce after-tax costs of takeover premium substantially by applying takeover schemes developed in response to the tax reform of 2001: the net-of-tax cost of an additional dollar spent on an acquisition can be as low as a quarter by applying one of the schemes. The 2001 reform overhauled tax treatments

¹For example, a landmark deal between AOL and Time Warner in 2000 amounted to \$164 billion.

²Certainly, the literature has found influences on other aspects of takeover deals, providing evidence that tax considerations affect takeover premiums and forms of transactions.

³Appendix provides details of this case involving Yahoo! Japan.

of shareholders and acquiring firms by instituting explicit conditions that apply for tax-free transactions, including carryover of NOL. Tax avoidance schemes developed in response to the 2001 reform involve merging in two steps to fulfill the conditions necessary for preferable tax treatment: the acquirer first purchases shares in the target firm from the firm's shareholders, and then merges with the target firm.

The goal of this study is to provide evidence that is relevant in assessing the impacts of taxes in the market for corporate takeovers. Two-step mergers can reduce the effective prices of target companies. In theory, a reduction in price induces deals at the margin of realization to form, increasing merger activity. The option of a two-step merger however can induce infra-marginal deals, or parties that would have merged directly absent tax motives, to opt to merge in two steps if the latter has tax advantages. Distinguishing between these two responses is important, but since the utilization itself is not well understood beyond the aforementioned court case, our study takes a first step toward filling this gap in knowledge.

The key challenge is then to identify the frequency with which mergers are preceded by majority acquisitions of the target firm's shares. We employ a list of adopters of tax avoidance schemes constructed from a dataset on takeover deals by focusing on key observable features of the schemes, that is, that those schemes involve two steps. We employ a list of mergers and acquisitions (M&As) compiled by a private M&A consultant firm, RECOF, to obtain a subset of mergers that involve prior acquisitions. We find 507 cases completed from 2001 through 2010 in a sample of large domestic takeover deals. Durations between steps does not appear long enough for acquirers to make substantial operational adjustments in targets in many cases: one-quarter of the two-step mergers cases involve durations between steps of seven months or less.

We analyze two aspects of tax avoidance schemes: the utilization rate and tax payment. First, we examine the probability that a majority acquisition precedes a merger between independent domestic firms in a sample of third-party mergers, and test whether the probabilities differ before and after the 2001 reform. The sample period for the baseline analysis is 1997–2010. The RECOF list begins in 1996 and determines the beginning year of the sample period that is not affected by left-censoring. A tax change in 2010, which closed one of the schemes, determines the ending year. We apply regression discontinuity (RD) design and estimate lin-

ear probability models to examine if there is a discontinuity in 2001. We find a statistically and economically significant discontinuity, particularly for the information and communication technology (ICT) sector. The finding is robust to various specification checks: varying sample periods, specification of the running variables, and definition of two-step mergers.

Second, we check whether acquiring firms in two-step mergers pay “unusually” small amounts of corporate tax. Specifically, do firms that engage in two-step mergers exhibit an unexplained fall in tax payments during financial years when two-step mergers take place? We obtain financial information from NEEDS-Financial Quest to construct a panel dataset of 5,496 publicly traded firms spanning 1997–2013 and augment the dataset with the list of two-step mergers. We find a statistically and economically significant reduction in tax payments after two-step mergers. The total savings from 2001–2013 is ¥172.3 billion and the sample of publicly traded firms saved nine times as much taxes as that documented in the court case.

Our study contributes to investigations into the effects of tax attributes of target firms on takeover activities by providing evidence from a setting in which the legal environment differ markedly from that of the US (Auerbach and Reishus, 1988b,a; Hayn, 1989; Plummer and Robinson, 1990; Scholes and Wolfson, 1990; Erickson, 1998; Moore and Pruitt, 1987; Henning et al., 2000; Devos et al., 2009; Chiang et al., 2014; Steffens, 2015). While a Japanese legal scholar predicted an increase in tax-preferred forms of transaction soon after the 2001 reform (Kimura, 2002), we are not aware of any attempt to test that prediction; we provide documentation in support of this prediction.

The rest of the paper is organized as follows. Section 2 reviews the related literature with emphasis on studies dealing with NOLs. Section 3 describe the tax provisions on mergers in Japan and their changes over time, while relegating technical details to the appendix. Section 4 describes the data. Section 5 presents the analysis, which has two main parts. The first part considers the incidence of two-step mergers relative to direct mergers. The second part investigates tax payments of firms conducting two-step mergers, and considers the amount of tax expenditures in aggregate. The last section concludes.

2 Literature review

Main tax considerations in corporate takeovers are target companies' tax attributes, target shareholders' capital gains tax liabilities, and step-up in basis. Since our study primarily focuses on the role of target companies' tax attributes, particularly NOLs, this section first reviews studies related to NOLs and then briefly covers other tax considerations.

2.1 NOLs

Policy debates in the 1980s motivated researchers to examine the importance of targets' tax attributes in mergers beyond what anecdotes suggest.⁴ Evidence from early studies in the US is mixed. Auerbach and Reishus (1988b) estimate tax benefits in mergers from 1968 to 1983 and find that, in a significant minority of cases, tax benefits appear large enough. However, in the authors' subsequent study comparing pairs of merged firms with control pairs that did not merge, they find little difference in NOLs between merged and control pairs (Auerbach and Reishus, 1988a). Likewise, Plummer and Robinson (1990) find no difference in cumulative abnormal return (CAR) for taxable acquisitions with targets with and without NOLs for a sample of taxable acquisitions from 1970 to 1982 in the US. By contrast, Hayn (1989) examine a sample of taxable and tax-free mergers from 1970–1985 and conclude that targets' NOLs and tax credits are important in explaining CAR. Scholes and Wolfson (1990) consider the composite effects of tax changes under TRA1986, and argue that the reduced takeover activities are attributable to the reform. While the evidence is mixed, reviews assessing earlier studies suggest NOLs do not constitute a strong motive in takeovers (Shackelford and Shevlin, 2001; Betton et al., 2008), which is in line with the results from later studies (Henning et al., 2000; Erickson, 1998).

Despite the general consensus from the early studies, academic interest in the role of NOLs persist, perhaps prompted by the practical relevance.⁵ In a review article, Hanlon and Heitzman (2010) refer to the Wachovia takeover turmoil of 2008, when an unexpected lifting of the loss limitation rule seemingly increased the price offered to takeover a troubled financial institution by more than sevenfold. A theme emerging from a series of recent studies is the role of the loss

⁴For example, refer to “Penn central in talks on merger with Colt,” The New York Times, July 21, 1981.

⁵See, for example, an unequivocally titled newsletter by Bottomlee et al. (2009).

limitation rule in the US, known as the Section 382 Rule, as emphasized earlier by Moore and Pruitt (1987) and more recently by Steffens (2015).⁶ Consistent with this reasoning, Chiang et al. (2014) find in the main specification that NOLs do not increase acquisition prices in a sample for 1997–2006.⁷

Overall, the loss limitation rule, in conjunction with the judicial anti-avoidance doctrines, would have limited—although probably not eliminated—mergers motivated by NOLs in the US, rendering statistical detection difficult with US data. Under more “lenient” legal institutions, then, the influence of NOLs could be discernible.

2.2 Capital gains tax and international taxation

In a taxable transaction, target firm’s shareholders lose an option to defer their capital gains tax liability, and might demand compensation in the form of additional takeover premium, as conjectured by Mandelker (1974). In light of a broader literature on lock-in effects (e.g. Feldstein and Yitzhaki, 1978), the conjecture seems reasonable, particularly given recent studies that employ more accurate information on tax bases.⁸ Betton et al. (2008) interpret early evidence from corporate takeovers as mixed (Huang and Walkling, 1987; Franks et al., 1988; Hayn, 1989).⁹ While the measurement of capital gains tax liabilities in studies of takeovers is not as finely measured as in recent studies on lock-in effects, later evidence suggests that acquirers pay compensation to target firms’ shareholders (Erickson and Wang, 2000; Ayers et al., 2003).

M&As are a large component of foreign direct investment (FDI), representing 82% of inward FDI into OECD countries for the 1987–2001 period (Head and Ries, 2008). While FDI includes

⁶In estimating tax benefits, Devos et al. (2009) consider interest shields as the sole source of tax benefits and do not to consider NOLs in the first place, observing that the loss limitation restriction would have limited the value of NOLs to acquirers. Devos et al. (2009) estimate synergy gains in mergers by comparing the present value of cash-flow forecasts for firms before mergers with that for combined entities, and decompose their synergy estimates into operational, market, and tax components employing a sample of 264 large mergers during 1980–2004. They find interest shields contributed 1.64 percentage points in additional value, or about 16.4% of the overall synergy gains on average, and conclude that tax benefits are a minor component of overall gains.

⁷We take the main specification (Table 3) in their study as the most informative estimate, since another specification, which distinguishes NOLs by the length of time to expiry, produces an estimated NOL effect that is outside the plausible range. The value of 1 dollar of NOL to an acquirer with a marginal tax rate of 40% should be at most 40 cents absent any loss restriction.

⁸For example, Ivković et al. (2005) measure capital gains directly by employing monthly-positions of individual investors. By contrast, a common strategy has been to construct a proxy measure with a recent stock price before a takeover announcement and the lowest stock price within 5 years.

⁹See also Henning et al. (2000) and a discussion by Erickson (2000).

greenfield investments, the effects of taxes on FDI, particularly FDI into and out of developed countries, should provide insights into how taxes affect corporate takeovers. A large body of investigations, as reviewed by Gordon and Hines (2002), show that tax rates, home-country tax regimes (i.e., territorial and worldwide systems), and sub-national taxes affect the levels and locations of FDI. A growing body of recent literature focuses on M&As and provides direct supporting evidence, drawing on transaction-level data (e.g. Di Giovanni, 2005; Huizinga and Voget, 2009; Feld et al., 2016). The main emphasis of these studies has been on differentials in tax rates across locations. Our study differs by examining tax incentives generated within a country's tax system.

3 Japanese Institution

By the late 1990s, developed countries had specific rules for tax-free reorganization, viewing tax discouragement to reorganization as inefficient (Vanistendael, 1998). Typically, a taxable merger triggers capital gains tax for a target firm's shareholders and corporate tax on any gains realized by the target firm while an acquiring firm cannot carry over the target firm's NOL and credits, although the acquirer may benefit from increased depreciation deduction from stepping up asset basis. Tax-free mergers lessens these disincentives by allowing transacting parties to defer realization of gains and sometimes carryover credits with conditions. To prevent abuse, tax rules around the world place conditions requiring the continuity of interests and business activities. Vanistendael (1998) characterizes these broad approaches as placing specific eligibility conditions and requiring the existence of business purposes. Japan was comparably late in adopting explicit rules for tax-free reorganization, although in practice, even before the adoption of the Tax System for Corporate Reorganization (TSCR), companies could defer capital gains upon merger. This section describes how the Japanese rules governing tax deferral changed in 2001, and considers how the Japanese approach to the continuity requirement left room for abuse, drawing from a discussion by Kimura (2002).

3.1 Tax rules for reorganization: 1990–2000

The Japanese tax system before 2001 was relatively more permissive in allowing deferral of capital gains upon mergers than the TSCR was. In Japan, the main requirement was that the transacting parties exchange stock-for-stock and transfer a target's assets in book value (Mizuno, 1997). Under these conditions, the target firm's shareholders could defer capital gains tax.¹⁰ Although statistics are not available, practitioners from the 1990s observe that transacting parties in mergers typically choose to defer gains (e.g. Kawamoto, 1998). However, unlike under formal tax-free reorganization, an acquiring firm cannot carry over a target firm's NOL.¹¹

Tax deferral for the acquisition of shares became available in 1999. Like the tax-free reorganization for stock acquisition in the US, a target firm's shareholders can defer capital gains tax by exchanging their shares in the target for an acquirer's share.¹² While a target firm's NOL in the US is subject to the loss transfer restriction imposed on substantial changes in ownership interests, the Japanese law does not impose such a restriction.¹³

3.2 After the reform: 2001–2010

The Japanese economy had been stagnating at the turn of the century, and a series of measures had been implemented to facilitate restructuring of businesses, particularly banks. The TSCR, enacted in May 2000 and enforced from April 2001, was part of that effort to lesson tax disincentives for reorganization.¹⁴ Compared to the previous regime, the TSCR had narrower eligibility but provided more generous treatment of NOLs for qualifying mergers.

To qualify for a tax-free treatment since 2001, a merger must fulfill various conditions that are intended to ensure continuity, as summarized in Figure A1 in the appendix. The foremost condition is that the payment must be in shares. The new regime improves flexibility by allowing shares of a parent firm to be used in payment, but is more restrictive than the US

¹⁰Between 1989 and 2003, capital gains on shares were taxable at 26% or 1% of sales proceeds.

¹¹The rule permitted accounting for a target's NOL as goodwill, to be amortized over 5 years, but with some limitations (Kawamoto, 1998).

¹²This is called the Section 368(b) reorganization. See Scholes et al. (1992) for details.

¹³Scholes and Wolfson (1990) concisely summarize the Section 382 limitation in the appendix to their study. Japan introduced a transfer limitation upon acquisition in 2006, but this limitation only applies in cases in which target firms have been non-operational.

¹⁴Between 2003 and 2010, the capital gains tax rate on shares of publicly traded companies was 10%.

institution, which allows some cash payments.¹⁵ The TSCR requires additional restrictions. Mergers are tax-free almost automatically among related parties, particularly with wholly-owned subsidiaries, but an additional test applies between a pair with less than 50% ownership participation. This test (“joint-venture test”) includes five requirements, such as the similarity of business operations of two firms.

Tax-free mergers may or may not qualify for carryover of a target firm’s NOLs, as summarized in Figure A2 in the appendix. A qualifying merger between unrelated parties carries over a target’s NOL, but a qualifying merger between related parties must pass a test, similar but slightly different to the joint-venture test described above. This test (“deemed joint-venture test”) has similar individual requirements to the joint-venture test, but a merger needs only pass a subset of the requirements in order to carry over losses. Importantly, therefore, this test for NOL carryover is less restrictive than the test for tax-free treatment.¹⁶ For a merger that does not satisfy all the required elements of the joint-venture test, transacting parties have incentives to conduct a two-step merger as in the court case mentioned in the introduction involving Yahoo! Japan (YJ) summarized in the appendix (see also Hironaka et al., 2015). Note that firms may acquire the majority of shares in another firms prior to merging for non-tax reasons, such as to control risks of unobserved liabilities and to squeeze out shareholders who are unwilling to sell out.

To illustrate the impact of a two-step merger, Panel (a) in Figure 1 shows YJ’s income tax payments and before-tax accounting profits in billion yen from unconsolidated accounting statements since the company’s founding in January 1996 until financial year 2014. Earnings increased rapidly and steadily in the 2000s, reaching ¥190 billion in 2013. The tax payments exhibit a similar increase except when YJ conducted a two-step merger in financial year 2008 which exhibits an apparent dip; the tax payment falls by ¥25 billion or 50% of the payment made in financial year 2007. Panel (b) shows the ratio of the two variables, indicating a general decline with an apparent dip in financial year 2008.

Other types of step transactions can generate substantial tax incentives for merger. Appendix describes a scheme, involving a *taxable* merger, that was available from 2001 to 2010, demonstrating with a simple accounting model that, in effect, the government subsidizes cor-

¹⁵See Scholes et al. (1992) for details of Section 368 (a) and (c).

¹⁶For a discussion of fine differences between these two tests, see, for example, Adachi (2011).

porate mergers. In a baseline scenario without NOLs, an acquirer obtains tax benefits of 26 cents per 1 dollar spent on acquiring targets' stock. The implicit subsidy can be much larger; with a large NOLs, tax benefits are as much as 76 cents in a dollar under certain condition.

3.3 US-Japan Comparison

The YJ case highlights several characteristics of the Japanese tax system that are distinct from the US tax system. First, US judicial doctrines restrict the type of step transaction integral to the YJ scheme. The time span between YJ's acquisition and merger is only 34 days, a speed reminiscent of the landmark Gregory case of 1935, in which the transaction included the creation and closure of a company within 6 days (Likhovski, 2004). As a common law country, the judicial tradition in the US includes the step transaction doctrine whereby a series of transactions are deemed a single integrated event in assessing tax liability. Although precedents also influence judicial decisions in Japan, as a civil law country, codified statutes weigh heavily. Until the YJ case, tax practitioners had regarded the scheme as permissible in Japan.¹⁷ Therefore, codified statutes restrain the Japanese tax enforcement agency to a greater degree than in the US.

Second, the statute on NOLs carryforward in ownership changes is less restrictive in Japan than in the US (Kimura, 2002). Section 382 of the US Internal Revenue Code of 1986 limits carryforward in events of ownership changes, including stock acquisition. As an illustration, had the same limitation existed in Japan, it would have limited the amount of income YJ could offset with NOLs to at most ¥2.25 billion per year.¹⁸ Since Japanese corporate income tax (CIT) does not have an equivalent restriction, NOLs were passed on in full upon this acquisition. The lack of the Section 382 limitation in Japan may in part be explained by the early expiration of NOLs (7 years) compared to 20 years in the US.¹⁹

¹⁷Various pieces of qualitative evidence support this conjecture: while YJ adopted a complex tax avoidance scheme, its essence is the same as one that appears in a tax-saving guidebook (Adachi, 2009). The tax affairs division of YJ initiated the scheme. An executive director of an up-and-coming information technology firm commented that NOLs were an important consideration in a takeover he conducted, and that he made considerable tax savings (*Nihon Keizai Shimbun*, April 4, 2009, p. 17, morning edition).

¹⁸In general, the use of NOL is limited to the value of a company before the change multiplied by a long-term tax-exempt interest rate. We assume the value of the target firm to be ¥45 billion. We follow Bottomlee et al. (2009), whose discussion is based on the US case, and assume the long-term tax-exempt interest rate to be 5%.

¹⁹The expiration was 5 years until the tax reform of 2004, which extended expiration on losses generated at and after financial year starting on April 2001. Tax reforms extended expirations to 9 and 10 years in 2015 and 2016 respectively.

4 Data

The data source is the MARR Database published by RECOF Co., an M&A consulting firm. RECOF Co.'s subsidiary gathers information on deals from sources, such as the press, disclosure statements, and press releases, and as such, this data source mostly covers M&A deals involving large companies.²⁰ Studies on M&As in Japan employ this data source for its accessibility (Fukao et al., 2005; Arikawa and Miyajima, 2007).²¹ The MARR Database is not the universe of M&A deals in Japan but is a selected list that disproportionately samples deals that involve prominent companies. The strength of this data source is its coverage of economically significant deals. However, if smaller firms were tax aggressive, a sample drawn from this source would produce an underestimate. The dataset contains characteristics of transacting parties such as names, industry, and location. The records classify deals by the degree of prior ownership and the extent of change in ownership.²² Information on deals includes various dates, deal amounts, and levels of ownership before and after, but with some variation in coverage. The appendix describes the construction of a list of two-step mergers in detail.

Figure 2 presents the distribution of the number of months between acquisitions and mergers. The sample comprises two-step mergers in which merger transactions took effect from 2001 through 2010. We find 507 cases during this period. The distribution is skewed to the right; the 25th percentile is 7 month, with a median of 16 month, indicating that the majority of two-step transactions are completed within 2 years. Table 1 provides summary statistics on the cross-section of deals.

²⁰The proportion of companies that are publicly traded in all entries from January 1996 to September 2013 (N=45,701) are 45% and 17% for acquirers and targets, respectively.

²¹While mergers need to be reported to the Ministry of Justice (MoJ), stock acquisitions need not be, and MoJ does not make the information publicly available.

²²The types of deals include mergers, acquisitions (stock purchase that brings ownership in excess of 50%), division sales, stock participation (stock purchase in an unrelated-party transaction that does not exceed 50% ownership), and ownership increase (stock purchase in a related-party transaction that does not exceed 50% ownership).

5 Analysis

5.1 Theoretical prediction

In theory, for parties to reach an agreement in a takeover deal, the value of assets to a buyer must be higher than the reservation price of the target's shareholders. We expect that, for some pairs of companies, deals generate surpluses large enough so that those deals would take place regardless of tax considerations ("compatible match"). However, most matching between companies, particularly for pairs conducting distant activities, makes no business sense, so that deals would not be possible regardless of tax motives ("incompatible match"). In between this spectrum of matchings, there should be pairs that are on the margin of agreement ("marginal match").

The discussion in Section 3 shows that the institution after April 2001 in effect provide a subsidy when an acquirer obtains a target's shares prior to merger. Therefore, we expect that the incidence of two-step mergers to increase after the policy change along three channels. First, in compatible matches, parties would choose a two-step merger over a direct merger if doing so increases surplus from trade. Note that direct mergers should still be advantageous in various circumstances. For example, a direct merger between two similar-sized independent firms in the same industry may qualify for the deferral of capital gains and NOL carryover. In other words, we expect some, but not all, infra-marginal cases to take the form of two-step mergers after 2001. The extent to which transacting parties adopt two-step mergers is an empirical question. Second, agreement may be reached in some takeover deals only if two-step mergers generate sufficient surplus, leading to realization of marginal matches. Third, the tax avoidance motive may induce some firms in incompatible matches to merge. The last two channels, but not the first, increases the quantity traded in the market for corporate takeover.

5.2 Incidents of two-step mergers

5.2.1 Graphical analysis

To test this prediction, we examine the incidence of two-step mergers relative to mergers without prior acquisition of controlling stakes ("direct merger"). Non-tax factors primarily determine the pool of potential matches and realized mergers at a given point in time, since

tax motives likely affect incentives at the margin.²³ We pool direct and two-step mergers to control flexibly for those non-tax factors. Recall that, in direct mergers, NOLs survive in transactions that fulfill certain conditions before and after the 2001 reform. If anything, this is a conservative approach since the 2001 reform might have induced additional direct mergers.²⁴

Panel A in Figure 3 presents the share (solid line) and number (dashed line) of two-step mergers for 1997–2010. Our baseline analysis defines two-step mergers as deals in which the durations between stock and asset acquisitions are 12 months or less. The choice of the first year of this plot is to avoid a mechanical under-identification of two-step mergers that have durations between transactions shorter than 1 year. The first year which this left censoring does not affect identification is 1997, since the record begins on January 1996. We choose the last year to avoid the 2010 reform, that closed the scheme involving capital losses. The tax bureau’s lawsuit against YJ would have affected practitioners’ perceptions on the applicability of the general anti-avoidance clause. “Year” is the April–March fiscal year.

The share of two-step mergers is visibly different across the tax regimes. Between 1997 and 2001, 5% of the sample before 2001 involve two-step mergers; in and after 2001, the share is 23%. Fitted regression lines for corresponding periods highlight possible discontinuity across the two regimes. The numbers of cases per annum fluctuate from around 70 to 110; the higher numbers in 2005–2007 are in line with the world-wide expansion in liquidity while the decline from 2008 reflects the global financial crisis. Panel B widens the sample of two-step mergers; the duration between steps is 24 months or less. The gap before and after 2001 becomes less pronounced with the additional sample, suggesting that non-tax reasons dominate mergers that take a longer time to complete. Overall, the graphical analysis suggests that the 2001 reform increased adoptions of two-step mergers. The analysis also shows that direct mergers remain dominant, which is indicative of tax and non-tax reasons for merging directly.

²³Non-tax factors include macroeconomic condition and industry-specific growth as well as age-dependent preferences of the founder-owner and regulatory environment.

²⁴We pool observations based on the dates when mergers took place legally, assuming similar lead times for the two types of mergers. We restrict attention to two-step mergers of relatively short duration to ensure this assumption is reasonable. Switches from direct to two-step mergers do not overstate the impact by double counting, since one addition of a two-step merger from this channel leaves the denominator unchanged, unlike for the ratio of the number of two-step mergers to the number of direct mergers. Strictly speaking, of the three channels discussed in the previous section, the switches would have larger impacts since an addition due to the realization of marginal matching increases the denominator, but possible differences appear quantitatively minor: with $N=25$, a switch has only a 0.15 percentage point larger effects than an addition does.

5.2.2 Regression analysis

To analyze, we implement sharp RD design albeit with caution. The sharp RD design identifies local average treatment effects by utilizing a cut-off point at which observations on one side receive treatment but those on the other side do not, and a before–after analysis is a special case in which the running variable is time (Lee and Lemieux, 2010). In a standard RD design, in which a running variable, for example, is the geographical distance from a border, the outcome should differ sharply across the border. In our setting, responses may occur with some delay. While tax consultants understood the new policy within months of its passage, they would have faced uncertainty as to how the tax bureau would react to the scheme. Since a post-reform time trend captures some of those delayed responses, sharp RD under-identifies the full extent of behavioral response. We report the validity checks of the RD design, including the balance of covariates across the cut-off point and the manipulation of the running variable, in the appendix.

The following is the baseline linear probability model:

$$y_j = \alpha_l + \gamma AFTER_j + \sum_{p=1}^P [\beta_{lp}(TIME_j - TIME_0)^p + \beta_{rp}AFTER_j(TIME_j - TIME_0)^p] + \delta_1 PUBLICA_j + \delta_2 PUBLICT_j + \kappa_k + u_j. \quad (1)$$

Outcome variable y_j is a dummy variable indicating that deal j is a two-step merger with up to 12 months between transactions. $AFTER_j$ is a dummy variable indicating deal j was finalized at or after the second quarter of 2001. $TIME_j$ is the running variable in quarter. The order of polynomial (P) is 1 in the baseline model since the linear specification performed best in terms of the Akaike information criterion (AIC). The specifications allow for different time trends (β_{lp} and β_{rp}) across the cut-off point as recommended by Lee and Lemieux (2010).

$PUBLICA_j$ and $PUBLICT_j$ are a dummy variable for publicly traded acquirers and targets, respectively. For a two-step merger, the status of the target is as at the time of acquisition. The specification includes industry dummies of acquirers (κ_k , 5 categories). The base industry is manufacturing.

Columns 1–4 in Table 3 presents results from a sample consisting of direct mergers and two-step mergers with duration between transactions at or less than 12 month. The coefficient on

AFTER is statistically significant at the 5 and 10 percent level for, respectively, the linear and quadratic specification. The linear specification performs better in terms of AIC. The coefficient from the quadratic specification implies that the probability of two-step merger increases by 8.3 percentage points; this coefficient implies that the probability more than doubles from 5 percent in the pre-2001 period.

The dummy for financial companies is negative and statistically significant at the 1% level, indicating that financial companies rarely employ two-step transactions. A regulatory factor drives this finding: the majority of financial companies in the estimation sample are credit unions and credit cooperatives, which cannot, as a general rule, hold more than 10% of voting shares in other corporations. Since a large fraction of the estimation sample are credit unions and credit cooperatives (11%), the aggregated response likely understate responses among firms not constrained by this ownership regulation. To allow for heterogeneity across sectors, Columns 3 and 4 present an extended model that replaces *AFTER* with interaction terms between each industry dummy and *AFTER*. The coefficients on these interaction terms indicate substantial heterogeneity. The impacts are statistically significant and large for the ICT and retail/wholesale industries (increases of 26 and 17 percentage points, respectively) but the coefficients are not statistically different from zero for the remaining categories.

The dummy for publicly traded acquirers is positive and statistically significant, whereas that for publicly traded targets is negative and statistically significant. Since publicly traded companies on average are larger, the set of variables likely capture the size effects. Columns 4–6 in Table 4 present results from the sample that extends two-step mergers to those completed within 24 months. The overall estimates are qualitatively similar.

5.2.3 Sensitivity analysis: RD design

The analysis thus far employs observations far from the cut-off point in identifying policy effects. Since we expect delayed impacts due to learning, inclusion of those distant observations has an advantage. The key disadvantage is that subsequent policy changes may confound the results. Table 2 provides a chronological list of institutional changes related to corporate restructuring. To examine the sensitivity of estimates, we focus on the extended model that allows for sectoral heterogeneity and estimate models on the sub-sample in the neighborhood

of the cut-off point. Table 4 presents key estimates from sub-samples ranging from ± 4 to 16 quarters from the second quarter of 2001. We present both linear and quadratic specifications for each sub-sample; the linear specification generally performs better in terms of the AIC. For the sub-sample of ± 16 quarters, the coefficient estimates for retail/wholesale and ICT are robust for both linear and quadratic specifications. For the ± 12 - and 8-quarter sub-samples, the linear specification produces qualitatively similar estimates, although with larger standard errors; the results are sensitive for quadratic specifications. For the ± 4 -quarter sub-sample, none of the coefficients in the table are statistically significant. The last result is consistent with the conjecture that transacting parties responded with a delay. The identification in any of these subsamples does not employ variation after the second quarter of 2005 and there do not seem to be policy changes that could favor two-step transactions in the meantime. Overall, other policy changes do not appear to confound the results.

5.3 Tax payment

To investigate further, we examine what happens to tax payments when firms conduct two-step mergers. If the tax consideration were relevant in adopting two-step transactions, as the court found in the YJ case, tax payments should have fallen, perhaps as sharply as in that case.

We obtain financial statement information for publicly traded companies from the NEEDS Financial Quest Database and merged the sample of two-step mergers using the numerical ticker symbols of acquirers. This procedure restricts the sample to publicly traded companies, but publicly traded acquirers are the majority of the two-step merger sample (79%).

We estimate the following two-way fixed-effects regression model. The idea is to examine whether we observe a dip in tax payment for the financial year in which a company completes a two-step merger.

$$cit/asset_{it} = \beta_0 + \beta_1 step_{it} + \beta_2 profit/asset_{it} + \beta_3 profit/asset_{it} \times step_{it} + v_i + w_t + u_{it} \quad (2)$$

cit_{it} is taxes currently owed, an income statement item that combines CIT and regional taxes owed by firm i for its taxable income from financial year t . A securities report discloses the stand-alone account of the parent company and the consolidated account which combines

the parent and its subsidiaries. We employ figures from stand-alone accounts in the estimation to capture the impacts of *gross* tax savings. In some two-step mergers, targets merge with subsidiaries of acquirers. Those subsidiaries are typically not listed companies and we cannot observe their tax payments. While a consolidated account should capture gross tax savings at a subsidiary, any taxes triggered at a target that becomes part of a consolidated group would render detection of *net* tax savings difficult. To proceed, we employ stand-alone data and focus on transactions in which acquirers of shares, rather than their subsidiaries, merge with their target firms. Since corporations vary in sizes, we normalize tax payments with gross assets and consider the ratio of the two, $cit/asset_{it}$.²⁵ We apply a winsorization of 5 basis points at each tail.

$step_{it}$ is a dummy variable indicating that, during financial year $t \in [2001, 2013]$, company i merged with a target acquired previously (“merger dummy”). First, in case another subsidiary of company i merged with a target acquired previously, $step_{it}$ is 0. Second, the contemporaneous specification captures the effects of NOLs or capital losses for years of mergers, and ignores future tax savings. We consider lagged impacts, which can arise through unused NOLs or goodwill amortization, in an extension. Third, the baseline specification employs a merger dummy that takes 1 for any duration between stock acquisition and merger. This specification can capture tax savings from cases in which an acquiring firm did not initially plan to merge (“unplanned”) as well as cases in which an acquisition was only an intermediate step before merger (“planned”). In an extension, we make a distinction by durations between transactions. Finally, $step_{it}$ takes the value 0 in cases in which the algorithm does not identify matching pairs in the data source but are in fact two-step mergers. Mergers that do not take place in two steps cannot be classified as two-step mergers in the algorithm. Since any misclassification would lead to $step_{it}$ being classified as 0, but not as 1, any measurement errors would lead to attenuation bias (Hausman, 2001).

$profit/asset_{it}$ is defined as follows:

$$profit/asset_{it} = \max\left(0, \frac{oprofit_{it} - \widehat{NOL}_{it}}{assets_{it}}\right), \quad (3)$$

²⁵We attempt to normalize tax payments with turnover ($tax/sale_{it}$); the variation of this variable is larger and the model fit is lower (R^2 is 0.28 for the baseline specification). The results are qualitatively identical.

where $opprofit_{it}$ is an operating profit of firm i at time t and \widehat{NOL}_{it} is an estimate of net loss carry over (NOL).²⁶ $profit/asset_{it}$ therefore captures variation in $cit/asset_{it}$ associated with variations in operating profits, allowing for i 's NOL, and leaves variation arising from non-operating expenses and NOL from targets. The coefficient on $profit/asset_{it}$ (β_2), should be the tax rate approximately.²⁷

The remaining variation includes the effects of two-step transactions: NOL inherited from targets, which is tax credit, and capital loss, which is a deductible expense accounted for among other non-operating expenses. The coefficient on the interaction term between $profit/asset_{it}$ and $step_{it}$ is the average difference in effective tax rates (ETR) between a subset of firm-year observations with $step_{it}$ equal to 1 and the rest of the sample, and captures those sources of variation. Under the tax-saving hypothesis, this coefficient should be negative.

v_i is the time-invariant characteristics of company i . w_t is the calendar-year fixed-effects. u_{it} is an error term. We cluster standard errors within panel units in the estimation. Table 5 provides summary statistics on the panel of 5,496 firms, omitting observations that have fiscal year lengths other than 12 month.

5.3.1 Estimation results

Column 1 in Table 6 presents estimates from the baseline specification excluding the merger dummy. With adjusted R^2 of 0.65, the model fit is reasonable. Positive operating profits explain much of the variation in tax payments, reflecting the accounting relationship. The coefficient is statistically significant at the 1% level, and its magnitude implies that ¥100 of additional operating profit increases tax payments by about ¥40. The model in Column 2 incorporates the merger dummy. The coefficient on the interaction term is statistically significant at the 1% level and is economically substantial: the ETR is lower by 9.8 percentage points.²⁸

Column 3 incorporates one merger dummy for shorter durations between transactions (within 12 months) and another for those that took longer. The coefficient on the shorter

²⁶To estimate NOL, we employed net accounting profit and assumed carry back of one year, carry forward of 5 years, and no stock of NOL for initial sample year.

²⁷The statutory rates, inclusive of regional taxes, have fallen from 50 percent in 1996 to 34.6 percent in 2014. We have tried a specification with interaction terms between $profit/asset_{it}$ and tax regime dummies in a preliminary analysis. This extended model produces similar results to the baseline model so we report a parsimonious specification.

²⁸A concurrent study by Steffens (2015) examines ETR at times of takeovers for international as well as domestic deals from around the world. He finds targets of tax-aggressive acquirers' ETR is eight percentage points lower on average.

duration is slightly larger than that on the longer duration but a test of equality of these two coefficients does not reject the null hypothesis of no difference. While the estimated coefficients suggest that, on average, step transactions with short duration between transactions reduce tax payments, mergers of subsidiaries are associated with lower tax payments.

5.3.2 Sensitivity analysis: panel regression

One concern with the analysis in the previous subsection is that relative to the number of observations, the number of two-step mergers is small: the sample contains 234 firm-year observations on two-step mergers, which is 0.31% of the sample size. If YJ was an outlier (after all, the YJ lawsuit was a prominent case), that observation may be driving the correlation. Another concern is that the interaction term may capture some pre-existing trends, causing a spurious correlation.

To check for influential observations, we obtain jackknife estimates of coefficients by leaving out each panel unit that engaged in two-step mergers (i.e. all observations on one firm). A large difference between the coefficient from the full sample and that from the sample excluding i^{th} firm flags an influential observation. To examine the second concern about the time-varying shocks, we added to the model leads of the merger dummy of up to 3 years, which should capture shocks that extend over a few years.

Panel A in Table 7 presents the coefficients on interaction terms from a specification with lead dummies of up to 3 years. The first column shows the estimated coefficients. The second and third columns present the ranges of coefficients obtained from the jackknife procedure. The coefficient on the contemporaneous interaction term is statistically significant at the 1% level and this test is not sensitive to influential observation, as the magnitudes of the estimations remain well above the standard error. The coefficient on the 1-year-lead term is statistically significant at the 10% level but this test is sensitive to removal of observations, which reduces its magnitude by 42% as shown in the second column. The rest of the lead terms are not significant statistically. This exercise shows that the main estimate is not sensitive to influential observations and we find no evidence of pre-existing trend.

As an extension, Panel B considers possible lagged impacts of step transactions that can arise from unused NOL or amortization of goodwill. The specification incorporates lag dummies

of up to 3 years into the baseline specification. The estimated coefficient on the contemporaneous interaction term is still statistically significant but falls to about three-quarters of that from the model without lags. Lagged terms are negative and 1- and 2-year lag terms are negative and significant at the 10% and 5% levels, respectively. While the test result for the 1-year lag term is sensitive to influential observation, the result for the 2-year-lag term is robust, indicating some evidence of delayed impacts.

Another concern involves some time-varying shocks that generate gaps between tax payments and operating profits during merger years unaccounted for by control variables in the basic specification. To address this concern, we estimate a specification with industry-specific and prefecture-specific time effects, and corporate age. The result is robust to the addition of these controls.²⁹

Finally, we consider the effects of mergers between independent parties that do not involve any step transactions, and provide a discussion in the appendix. Briefly, the main result is robust to the inclusion of a direct merger dummy and its interaction with positive operating profits. We find no robust evidence indicating unusual falls in tax payments upon direct mergers.

5.3.3 Tax expenditure

We consider an initial estimate of tax expenditure in a parsimonious model based on equation 2 but without the interaction term. By multiplying the coefficient on the merger dummy from this specification and the average assets of acquirers in the years of two-step mergers, an estimate of the average gross tax savings per two-step merger is ¥736.4 million. With 234 firm-year observations, total savings during 2001–2013 are ¥172.3 billion. The court found that YJ unlawfully avoided paying tax of ¥20 billion. Therefore, our estimate indicates that the sample of publicly traded firms saved 8.6 times the amount of taxes that YJ did. Thus, while the YJ case is not representative of other cases, it is the tip of the iceberg.

We also consider tax savings by length of duration between transactions. For short duration

²⁹Since a merger increases the gross assets of an acquirer (assuming a target own assets of positive value), the denominator of the dependent variable increases; there may be concern that this generates a mechanical correlation between the dependent variable and merger dummy. The baseline model includes a control variable scaled by assets (ratios of operational profits to assets), which should absorb some of the mechanical correlation, if any, but the non-linearity in the profit variable may leave some influence unaccounted. We attempted to use assets from previous period to scale tax payments and operating profits but the result is qualitatively similar.

(N=83), the average savings are ¥1066.0 million with total savings of ¥88.5 billion; roughly one-half of tax savings is attributable to shorter duration. For longer duration (N=152), the average is ¥563.9 million with total savings of ¥85.7 billion.

6 Conclusion

This study analyzes tax incentives in the corporate takeover market during the 2000s in Japan. We utilize a unique policy environment after 2001, which enables acquiring firms to reduce their corporate tax liabilities by acquiring large stakes in targets prior to merging. This setting allows us to consider the role of NOL and other tax motives in takeover deals. We find that merger transactions that involve prior acquisitions, or two-step mergers, are not rare events; our sample of domestic takeover deals involving large firms contains 507 cases completed from 2001 through 2010. Durations between steps do not appear long enough for acquirers to make substantial operational adjustments in targets in many cases; one-quarter of the cases of two-step mergers involve durations between steps of 7 months or less. Consistent with the tax incentives, we find that the probability of two-step mergers discontinuously increases after the policy change of 2001, particularly in the ICT sector. We also estimate an accounting model of tax payments on profitability and find strong correlation between unexplained reductions in tax payments and incidences of two-step mergers.

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Table 1: Summary statistics: Cross section data of deals

Sub-sample	1 year or less			2 year or less		
	before	after	diff.	before	after	diff.
Two-step transaction=1	0.047 (0.211)	0.231 (0.422)	0.184** [7.91]	0.062 (0.241)	0.308 (0.462)	0.246** [9.71]
Acquirer public= 1	0.323 (0.468)	0.379 (0.485)	0.056 [1.83]	0.321 (0.467)	0.389 (0.488)	0.068+ [2.28]
Target public= 1	0.123 (0.329)	0.163 (0.369)	0.040 [1.75]	0.121 (0.327)	0.147 (0.354)	0.025 [1.18]
Manufacturing= 1	0.148 (0.356)	0.145 (0.353)	-0.003 [-0.12]	0.148 (0.356)	0.150 (0.357)	0.002 [0.08]
Finance= 1	0.244 (0.430)	0.197 (0.398)	-0.047 [-1.81]	0.240 (0.428)	0.182 (0.386)	-0.058* [-2.35]
Retail Wholesale= 1	0.348 (0.477)	0.271 (0.445)	-0.076* [-2.66]	0.345 (0.476)	0.274 (0.446)	-0.071+ [-2.52]
Info. & Comm.= 1	0.085 (0.279)	0.140 (0.347)	0.055* [2.67]	0.089 (0.285)	0.145 (0.353)	0.057* [2.73]
Other industry= 1	0.175 (0.381)	0.246 (0.431)	0.071* [2.69]	0.178 (0.383)	0.249 (0.433)	0.071* [2.74]
Observations	365	792	1,157	371	880	1,251

Notes: This table shows the summary statistics of the cross-section of merger deals. Standard deviations in parentheses. t -statistic in brackets. The sample period is 1997Q1–2010Q1. “1 year or less” and “2 year or less” sub-samples include two-step transactions with up to 12 and 24 months between transactions, respectively. “before” and “after” indicates the sample period before and after April 2001, respectively. The third and sixth columns (“diff.”) show differences between the two periods. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 2: A chronological list of major institutional changes

Effective	Enacted	Description	Area of law
06/1997	05/1997	Relaxed restrictions on share repurchase	Commercial
06/1997	06/1997	Removed a ban on holding companies	Antitrust
10/1997	06/1997	Simplified merger procedures	Commercial
10/1999	03,08/1999	Introduced the stock swap and stock transfer system that defer capital gains realization	Commercial, Tax
01/2001		Relaxed restrictions on repurchase further	Commercial
04/2001	05/2000	Introduced the Tax System for Corporate Restructuring	Tax
07/2002	04/2002	Introduced an option for consolidated filing of corporate income tax. Applicable from tax year ending 03/2003	CIT
04/2003	03/2003	Reduced dividend tax for small individual shareholders (less than 5% ownership)	PIT
04/2002	03/2002	Increased taxable dividend received by corporations from unrelated parties (owns less than 25%). Applicable for financial years ending after 03/2003	CIT
01/2003	03/2001	Reduced, in effect, the capital gains tax rate on individuals for gains less than 11%	PIT
04/2004	03/2003	Introduced the size-based enterprise tax, applicable for fiscal year starting after 04/2004	CIT (Regional)
10/2006	04/2006	Unified stock transfer and stock swap into the Tax System for Corporate Restructuring	CIT, PIT
05/2007	07/2005	Permitted an acquirer to use its parent company's stocks as payment to target shareholders	Commercial
10/2010	03/2010	Introduced a new taxation of corporate groups	CIT

Note: PIT and CIT refer to personal income tax (*shotokuzei*) and corporate income tax (*hōjinzei*), respectively.

Table 3: Baseline regression: probability of two-step transactions

Dep. var.: Indicator for two-step merger								
two-step sample:	1 year or less				2 year or less			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After 2001Q2	0.083*	0.089+			0.079*	0.072		
	(0.034)	(0.050)			(0.038)	(0.057)		
Acquirer public = 1	0.243**	0.243**	0.237**	0.237**	0.260**	0.260**	0.254**	0.254**
	(0.033)	(0.033)	(0.033)	(0.033)	(0.031)	(0.031)	(0.031)	(0.031)
Target public = 1	-0.413**	-0.413**	-0.410**	-0.410**	-0.492**	-0.492**	-0.488**	-0.487**
	(0.031)	(0.031)	(0.031)	(0.031)	(0.029)	(0.029)	(0.029)	(0.029)
Finance = 1	-0.127**	-0.126**	-0.102*	-0.102*	-0.176**	-0.175**	-0.131**	-0.131**
	(0.033)	(0.033)	(0.046)	(0.046)	(0.035)	(0.035)	(0.048)	(0.048)
Retail Wholesale = 1	-0.031	-0.031	-0.125**	-0.127**	-0.052	-0.052	-0.142**	-0.143**
	(0.035)	(0.035)	(0.044)	(0.045)	(0.036)	(0.036)	(0.047)	(0.047)
Info. & Comm. = 1	0.038	0.038	-0.125**	-0.123**	0.034	0.033	-0.087	-0.086
	(0.043)	(0.043)	(0.047)	(0.046)	(0.043)	(0.043)	(0.064)	(0.064)
Other industry = 1	0.001	0.001	-0.056	-0.056	-0.013	-0.013	-0.057	-0.056
	(0.038)	(0.038)	(0.054)	(0.054)	(0.039)	(0.039)	(0.058)	(0.058)
Manufac. x after = 1			0.023	0.037			0.041	0.045
			(0.060)	(0.069)			(0.063)	(0.075)
Finance x after = 1			-0.021	-0.007			-0.036	-0.032
			(0.036)	(0.049)			(0.040)	(0.056)
Ret.&Whole. x after = 1			0.166**	0.182**			0.174**	0.179**
			(0.043)	(0.056)			(0.045)	(0.062)
Info.& Comm. x after = 1			0.241**	0.254**			0.199**	0.202*
			(0.054)	(0.064)			(0.071)	(0.081)
Other industry x after = 1			0.105+	0.119+			0.103	0.106
			(0.059)	(0.070)			(0.064)	(0.078)
	(0.039)	(0.048)	(0.045)	(0.050)	(0.043)	(0.055)	(0.049)	(0.058)
Observations	1,157	1,157	1,157	1,157	1,251	1,251	1,251	1,251
Adjusted R-squared	0.195	0.194	0.204	0.202	0.241	0.240	0.247	0.246
Polynomial order (P)	1	2	1	2	1	2	1	2
AIC	793.0	796.8	784.6	788.4	1069	1073	1063	1067

Notes: This table presents estimates of linear regressions. The dependent variable is the indicator for mergers in which acquirers obtained controlling shares prior to merging targets. Columns 1–4 employ a sub-sample with up to 12 months between acquisitions and mergers. Columns 5–8 employ a sub-sample with up to 24 months between acquisitions and mergers. The estimated models include a P th order polynomial in quarter. The base industry category is manufacturing. Robust standard errors in parentheses. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: Sensitivity analysis: Sample periods around 2001Q2

Dep. var.: Indicator for two-step merger								
Specification:	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Quarters to/since '01Q2:	16	16	12	12	8	8	4	4
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Manufacturing x after = 1	0.014 (0.076)	-0.023 (0.089)	0.063 (0.086)	0.042 (0.104)	0.114 (0.103)	0.084 (0.129)	-0.040 (0.142)	-0.128 (0.211)
Finance x after = 1	-0.022 (0.040)	-0.064 (0.059)	-0.026 (0.046)	-0.050 (0.071)	-0.026 (0.053)	-0.059 (0.089)	-0.113 (0.083)	-0.197 (0.190)
Retail Wholesale x after = 1	0.191** (0.055)	0.150* (0.072)	0.157* (0.063)	0.131 (0.086)	0.212** (0.075)	0.173 (0.107)	0.161 (0.107)	0.083 (0.198)
Info. & Comm. x after = 1	0.284** (0.075)	0.254** (0.080)	0.245** (0.088)	0.218* (0.097)	0.243* (0.095)	0.203+ (0.113)	0.127 (0.105)	0.045 (0.200)
Other industry x after = 1	0.081 (0.075)	0.043 (0.085)	0.085 (0.087)	0.065 (0.092)	0.047 (0.101)	0.007 (0.111)	-0.009 (0.121)	-0.083 (0.197)
Observations	684	684	537	537	389	389	242	242
Adjusted R-squared	0.173	0.173	0.146	0.147	0.185	0.189	0.160	0.159
AIC	329.4	331.4	250.9	252.2	159.5	159.5	121.9	123.9

Notes: This table presents estimates of linear regressions by different sample lengths (quarters around April 2001). The base specification corresponds to Columns 3 and 4 in Table 3. The dependent variable is the indicator for mergers in which acquirers obtained controlling shares prior to merging targets, and two-step mergers are those with 12 months between acquisitions and mergers. The estimated models include controls for trend, public dummies, industry dummies, and a constant. Robust standard errors in parentheses. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Summary statistics: Panel of firms

	(1)	(2)	(3)	
Sample ($step_{it}$)	Others (= 0)	2 step (= 1)	Diff.	Std. Err.
Tax payment/asset (cit_a)	0.0184 (0.0258)	0.0200 (0.0232)	-0.002	[0.002]
Positive operating profit/assest ($profit_pos$)	0.0430 (0.0544)	0.0568 (0.0580)	-0.014**	[0.004]
Year	2003.9 (4.769)	2007.1 (3.164)	-3.198**	[0.312]
Total assets ($totassets$, billion)	122.6 (502.0)	160.1 (465.0)	-37.5	[32.9]
Operating profit (op_prof)	-0.0575 (0.432)	-0.0186 (0.382)	-0.039	[0.028]
(Fraction)				
Mining agriculture construction	0.056	0.026	0.031+	[0.015]
Light manufacturing	0.053	0.017	0.036+	[0.015]
Heavy manufacturing	0.340	0.184	0.156**	[0.031]
Finance	0.047	0.077	-0.030*	[0.014]
Services	0.212	0.175	0.037	[0.027]
Retail and wholesale	0.177	0.312	-0.135**	[0.025]
Info. and comm.	0.077	0.184	-0.107**	[0.017]
Utility and transportation	0.038	0.026	0.012	[0.012]
Observations	75,146	234		75,380

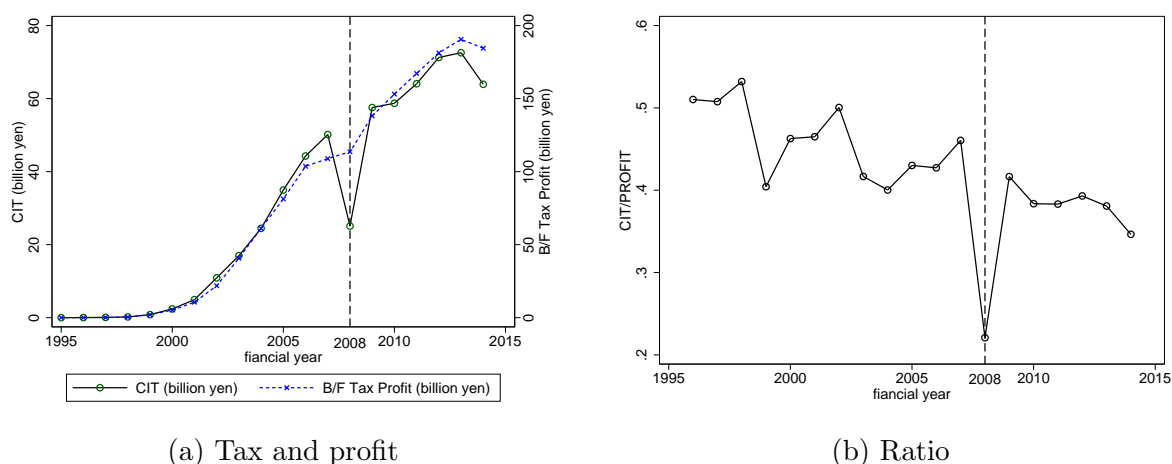
Notes: This table presents summary statistics of the panel of firms. The time period is the fiscal year ending January 1997 to December 2013. Column 1 is for firm-year observations in which firms did not conduct two-step mergers ($step_{it} = 0$). Column 2 is for firm-year observation in which firms engaged in two-step mergers ($step_{it} = 1$). Standard deviations in parentheses. Standard errors in brackets. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Tax payments and two-step mergers

Dep. var.: Ratio of tax payments to assets (<i>cit_a</i>)	(1)	(2)	(3)
Positive operating profit/asset (<i>profit_pos</i>)	0.3920** (0.0041)	0.3923** (0.0041)	0.3923** (0.0041)
Merged after acquisition = 1 (<i>step</i>)		0.0009 (0.0011)	
<i>step</i> x <i>profit_pos</i>		-0.0979** (0.0258)	
<i>step</i> = 1 & duration \leq 12 (<i>short</i>)			0.0015 (0.0019)
<i>short</i> x <i>profit_pos</i>			-0.1030** (0.0373)
<i>step</i> = 1 & duration $>$ 12 (<i>longer</i>)			0.0006 (0.0014)
<i>longer</i> x <i>profit_pos</i>			-0.0936** (0.0351)
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES
Observations	75,380	75,380	75,380
Number of id	5,496	5,496	5,496
Adjusted R-squared	0.6548	0.6553	0.6553

Notes: This table presents estimates of panel regressions of tax payments. The dependent variable is the tax payment divided by asset. The model includes constant terms. Standard errors are clustered at firm level and are shown in parentheses. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 1: Notes: Yahoo! Japan's tax payments and before-tax accounting profits



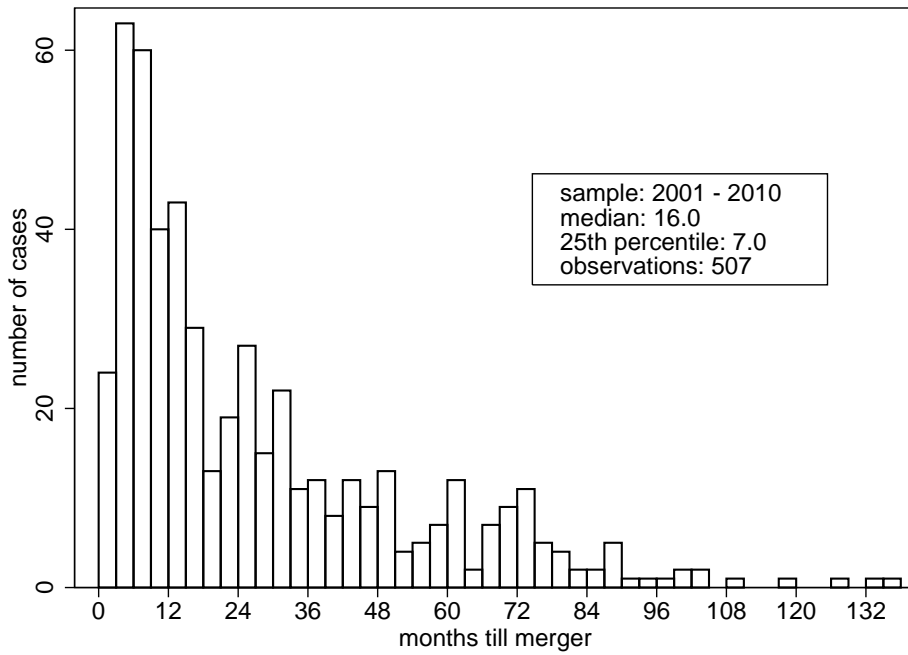
Panel (a) shows YJ's tax payments and before-tax accounting profits (billion yen). Panel (b) shows the ratio of these two variables. The dashed vertical line indicates the financial year during which YJ acquired and merged with Softbank IDC Solutions.

Table 7: Leads, lags, and jackknife estimates

	Coefficient	Jackknife	
		max	min
Panel A			
<i>step</i> x <i>profit_pos</i>	-0.1194** (0.0345)	-0.0981	-0.1302
<i>lead</i> x <i>profit_pos</i>	-0.0428+ (0.0223)	-0.0246	-0.0488
<i>lead2</i> x <i>profit_pos</i>	-0.0168 (0.0123)	-0.0122	-0.0196
<i>lead3</i> x <i>profit_pos</i>	0.0077 (0.0143)	0.0133	0.0014
Panel B			
<i>step</i> x <i>profit_pos</i>	-0.0870** (0.0257)	-0.0683	-0.0947
<i>lag</i> x <i>profit_pos</i>	-0.0334+ (0.0193)	-0.0224	-0.0423
<i>lag2</i> x <i>profit_pos</i>	-0.0517* (0.0201)	-0.0404	-0.0599
<i>lag3</i> x <i>profit_pos</i>	-0.0115 (0.0221)	0.0066	-0.0231

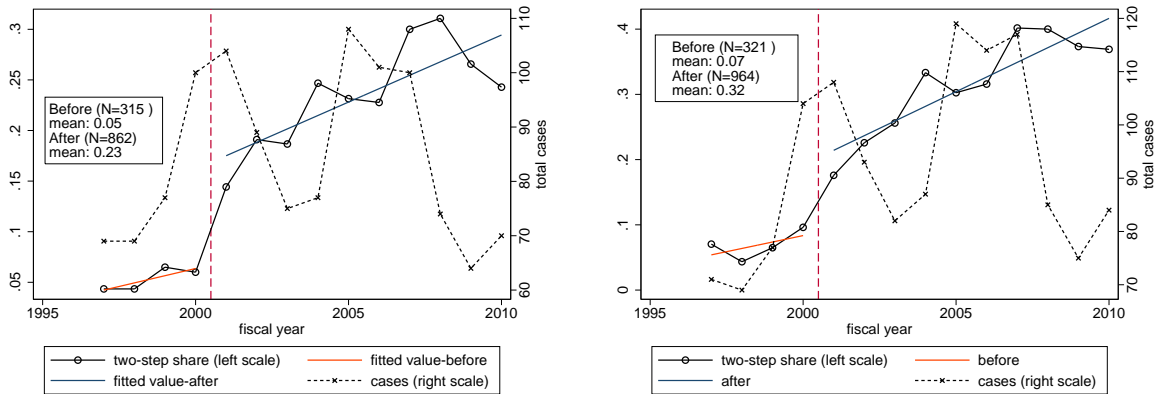
Notes: This table presents selected coefficients from equation 2 augmented with leads and lags. The dependent variable is tax payment divided by asset. Panel A incorporates leads of up to 3 years and their interaction term with *profit_pos*. Panel B incorporates lags of up to three years and their interaction term with *profit_pos*. Columns 2 and 3 show the range obtained from the jackknife procedure described in the text. Standard errors are clustered at firm level and are shown in parentheses. **, *, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 2: Time between stock and asset acquisition: Domestic companies, in months



Notes: This figure presents the distribution of the number of months between acquisition and merger. The sample comprises two-step mergers in which the merger transaction took effect from 2001 to 2010. The bin size is 3 months.

Figure 3: Share of two-step mergers in mergers



(a) Duration of 12 month or less

(b) Duration of 24 month or less

Notes: This figure presents the share of two-step mergers in all mergers in the sample, along with fitted lines for before and after the policy change of 2001 (left scale, solid line). Data are aggregated over a fiscal year, which spans April–March. The dashed vertical line indicates the timing of the TSCR. The figure also presents the total number of mergers including direct and two-step mergers (right axis, dashed line). In panel (a), the sub-sample of two-step mergers is restricted to deals in which the durations between stock and asset acquisitions are 12 months or less. The sub-sample for panel (b) is for duration of 24 months or less.

Online appendix for “Taxes, takeovers, and step transactions”

Kazuki Onji and Roger H. Gordon

A Case studies

A.1 Yahoo! Japan

A Supreme Court case involving Yahoo! Japan (YJ) highlights the relevance of net operating losses (NOLs) as a motivating factor in mergers in Japan.¹ YJ is a profitable joint venture of Yahoo! (US) and SoftBank, a large telecommunications company.

The case involves two separate litigations, but for brevity, we focus on the main one. On February 24, 2009, YJ acquired 100% of SoftBank IDC Solutions (IDCS), a 100% subsidiary of SoftBank, for ¥45 billion. On March 30, a month later, YJ merged with IDCS in a merger that qualified as a tax-free transaction. This merger also fulfilled the requirements to carry over the target’s NOLs; YJ obtained ¥54.2 billion in NOLs and saved ¥20 billion in taxes in the fiscal year ending March 31, 2009. Table A1 shows the timeline of the case.

Note first that a merger between a parent and a 100% subsidiary qualifies as a tax-free merger, provided the payments do not include cash, and the merger on March 30 qualifies for tax-free treatment (see Figure A1). However, since the parent became a majority owner of the target within 5 years of the merger, additional requirements must be met for the target’s NOLs to survive. YJ satisfied the *deemed* joint-venture test by assigning its executive director as an executive vice-director of IDCS on December 24, 2008 (see Figure A2 for the requirements for this test).

Note also that a direct merger can qualify for tax-free treatment and for NOL carryover if the transaction satisfies requirements under the joint-venture test. However, the joint-venture test has more requirements than the deemed joint-venture test does. For example, YJ would have had to retain 80% of IDCS’s employees to meet the joint-venture test.

After the Tokyo Regional Taxation Bureau (TRTB) received YJ’s tax return, which was due by June 1, the bureau engaged with YJ to revise the tax return.² On June 30, 2010,

¹Hironaka et al. (2015) provide an English-language summary of this court case.

²The transaction involving these prominent corporations was covered by a major financial newspaper, *Nihon*

YJ received a formal letter of reassessment from the TRTB, which invoked the general anti-avoidance clause in the Tax System for Corporate Reorganization (TSCR) for the first time and denied carryover of NOLs. The case eventually went to the Supreme Court, which ruled in favor of the government in February 2016.

A.2 HOYA

The takeover of Pentax, a precision instrument producer popularly known for its single-lens reflex cameras, by HOYA, another precision instrument producer, is a case in which tax savings might have played a pivotal role in tipping the balance in favor of a takeover. This section outlines the HOYA-Pentax merger, and section G describe the technical details of the transaction scheme.

According to a press report, as early as 2004, the then CEOs of the two companies had discussed possible business cooperation (Matsuzaki, 2008). Pentax had competitive advantage in medical equipment, particularly endoscopes, and HOYA had interest in Pentax's technology to complement its own medical instrument production. In late 2006, the two companies publicized their merger agreement. The direct merger involved a merger ratio of 1 Pentax share for 0.158 HOYA shares. Given HOYA's stock price in late 2006, the valuation of one Pentax share was about ¥720 per share. HOYA's stock price fell by more than 10% by March 2007, and the then second largest shareholder of Pentax, a foreign-based investment trust, warned that it would cast a dissenting vote at an upcoming shareholders' meeting. Apparently, Pentax's executives were not unanimously in favor of the merger, and after a boardroom coup, Pentax's new CEO canceled the merger agreement. However, the then largest shareholder of Pentax, a domestic investment trust, disagreed with the cancelation, submitting an agenda for the upcoming shareholders' meeting to reinstate the former CEO, who was in favor of the merger. Eventually, Pentax's CEO agreed to a "friendly" takeover bid (TOB), which was a stock acquisition unlike the asset acquisition in the previous deal. In summary, the merger negotiation between the two companies went through twists and turns.

HOYA's disclosure statement suggests that the company was able to offer a higher price without a substantial cost hike by switching from a direct merger to a step transaction. HOYA

Keizai Shimbun, as early as April 4.

initiated its TOB on July 3, 2007, offering ¥770 per share or about ¥50 per share more than the initial offer. HOYA completed its TOB on August 6, obtaining 90.5% of Pentax. Shareholders who accepted the TOB realized capital gains. The tax rate on capital gains under personal income tax was 10% for publicly traded stocks around the time. The two companies merged on March 31, 2008, the last day of financial year 2007, paying ¥770 per share in cash for the remaining shares. The merger was a taxable transaction. In its financial year 2007 Securities Report, HOYA reported writing off ¥18.1 billion in capital loss as a result of the merger with Pentax; total tax savings would have been ¥7.3 billion assuming an effective corporate tax rate of 40%, implying tax savings of ¥59.3 per share.³ Under the 2006 merger agreement, this capital loss would not have arisen, since the transaction was a direct merger. This estimate of tax savings per share is similar in magnitude to the difference in the offer price; more than 80% of tax savings would have accrued to the target's shareholders, which is in line with previous studies that reported that most of the tax benefits are captured in the premium. Although HOYA offered higher compensation to Pentax's shareholders, its own net-of-tax cost of stock would not have changed much from the initial offer. Thus, the tax benefit of ¥59.3 per share would have facilitated the formation of this agreement.

B Current value of net assets imputed for tax purposes

This section provides details on how firms impute current values of assets for tax purposes. The TSCR does not specify an exact procedure to compute the current value of net assets, and practitioners generally refer to a circular notice (*tūtatu*), issued by the National Tax Agency (NTA) for another purpose (Adachi, 2009).⁴ The circular, by design, does not specify all details, and leaves room for discretion within the bounds of acceptable corporate accounting practices.⁵ The primary adjustment to book value stipulated by the circular is a revaluation of

³The denominator is the number of outstanding common stocks (12,792.5 million) minus Pentax's own holding (13.8 million) plus common stocks that would have been granted upon maturation of convertible bonds (768.45 million).

⁴The Corporation Tax Basic Circular Notice 12: 3-2-1 was issued in February 2003. This circular notice explains how a firm should assess current values of assets upon electing to file a consolidated tax return. Formally, the Corporation Tax Basic Circular Notice is a set of guidelines issued by the NTA commissioner to regional commissioners at regional tax bureau on how to implement Japan's Corporation Tax Act.

⁵A circular notice need not be comprehensive: the preface of the circular notice published in 1964 after an overhaul states that its purpose is to guide flexible implementation of the Corporation Tax Law that respects appropriate accounting practices and individual situations and therefore, avoids overregulation (<https://www.nta.go.jp/shiraberu/zeiho-kaishaku/tsutatsu/kihon/hojin/zenbun/01.htm>, accessed March

tangible assets, especially land, and of securities. This corporate income tax circular provides the following guidelines by types of assets.

B.1 Tangible depreciable asset

The current value of a depreciable tangible asset is its estimated replacement value depreciated for the number of years since the initial purchase, employing the declining balance method.

Intangible depreciable asset

The current value of a depreciable intangible asset is its purchase price depreciated for the number of years since the initial purchase using the straight line method. The circular does not specify how to treat intangibles generated in-house; this omission leaves room for discretion.

Land

Transaction prices of nearby land, if available, provide the basis to assess land values. If such transactions are unavailable, government-published figures on land values (*kōji kakaku*) provide the basis.⁶

Securities

Stocks of publicly traded companies are valued at the market price. Otherwise, the value of a security is imputed from, for example, traded prices of the same security from within 6 months, and traded prices of corporate stocks issued by companies similar to the issuer of the security in question. Guidelines for the purpose of inheritance and gift tax detail methods for valuing stocks of non-traded companies and provide another basis that practitioners can follow.

Accounts and notes receivable

The computation of the bad debt allowance under the accounting rule is different from that under the tax rule. For the purpose of assessing the market value of outstanding credits, the

31, 2016).

⁶The Land, Infrastructure and Transportation Ministry provides assessments on selected addresses (23,380 points across Japan in 2015), revised annually on January 1.

circular requires computation based on the tax rule, which generally results in a higher value than that based on the accounting rule (i.e., the tax rule is more stringent than the accounting rule in allowing deductions for bad debts).

Deferred assets

A deferred asset is expenditure undertaken in advance and provides a flow of service beyond 1 year. The tax law specifies that expenditure can be counted as deferred assets for tax purposes; examples include expenditure for paving public roads, down payments for consultation, and the costs of producing a signboard for display at a (third-party) car dealer. The circular specifies the current values to be the book values (or remaining values after applying statutory depreciation).

C Sample construction

This section describes the construction of the sample of corporate mergers preceded by stock acquisitions (“two-step mergers”). The procedure consists of two main components. The first is a selection of a pool of observations on transactions from the data source. The second is an algorithm for pairing observations from the pool.

C.1 Sub-sample of takeover deals

The data source is RECOF’s MARR Database for the period January 1996 to July 2013. RECOF gathers information on transactions through published information, such as news releases by acquirer companies and the press. The database does not comprise administrative data and does not contain the universe of transactions. Since the database records YJ’s merger IDCS in a note to an entry on YJ’s acquisition of IDCS, rather in a separate entry, we make an adjustment by creating a separate entry.⁷ We make few corrections to date variables in cases of large inconsistencies in these variables (published dates and effective dates of transactions). The original sample consists of 457,001 entries.

⁷This should not affect the two analyses in the main text. First, the analysis employing the regression discontinuity identifies the policy effects around April 2001, and YJ’s case occurred in financial year 2008. Second, the analysis of tax payments includes a sensitivity analysis, which leaves out a panel of firm one at a time.

Our goal is to identify pairs of entries in which mergers were preceded by acquisitions of controlling interest. Recall that YJ and HOYA obtained 100% and 90.5% of targets’ stocks prior to the mergers, respectively. To identify step transactions that possibly were influenced by tax considerations, ideally, we should pinpoint acquisition-merger pairs in which acquirers held a large fraction of control prior to the mergers. Unfortunately, the database does not contain complete information on acquirers’ ownership of targets. However, the database does classify as “acquisition” stock purchases that increases ownership above 50%.⁸ Other classifications include “equity participation” and “expansion in equity participation.”⁹ Given the data limitation on post-acquisition ownership levels, we employ entries classified as “acquisition” as a counterpart to merger entries. Retaining transactions classified as “merger” and “acquisition” leads to elimination of 21,811 entries (Table A2).

We further drop 445 entries that mostly are cases in which negotiations did not lead to final agreement, but we include a few cases in which RECOF made corrections. Since the research focus is on Japanese laws and to abstract from international tax issues, we drop international transactions. We keep transactions with RECOF codes as “IN-IN,” which are transactions among “Japanese” companies, and delete 3,639 entries. Since companies registered outside Japan but financed by Japanese-owned capital are classified as Japanese companies in the M&A database, we further delete 799 entries of this type. This selection leads to a base sample of 430,307 transactions.

C.2 Algorithm for identifying two-step mergers

The aim of the algorithm is to pair an acquisition entry in time t_1 with a merger entry in $t_2 > t_1$ based on the identities of a target and acquirer.

The M&A database does not contain company identifiers that allow us to match companies unambiguously across entries. The algorithm instead employs company name and headquarter location (prefecture) for identification. Mismatch is possible in theory. Until May 2006, the Commercial Code restricted new corporations from choosing the same company name of an

⁸Even if ownership is less than 50%, if an acquirer effectively controls a target after the transaction, including a case in which parties related to the acquirer hold the target’s shares, RECOF classifies the transaction as an “acquisition”

⁹“Equity participation” refers to purchases—by acquirers with no ownership stakes in targets—of stocks that lead to less than 50% ownership. “Expansion in equity participation” refers to additional stock purchases by companies that already hold less than 50% stakes, and excludes additional purchases beyond 50%.

existing corporation from the same municipality. The Company Code, in effect from May 2006, removed that restriction. A close inspection of the result suggests that the matches are genuine. Since selecting an existing name risks triggering anti-competitive lawsuits and the original source draws from the press reports, which disproportionably cover cases involving large companies, the two variables are sufficient identifiers in the current context. If anything, the algorithm under-identifies cases owing to name changes and headquarter relocations.

In searching for matches, the algorithm employs target-based information on name and location. Not conditioning on acquirer name enables the identification of mergers by subsidiaries of acquirers, and not just by acquiring companies themselves. We use acquirer name to distinguish between mergers as companies that acquired stocks and those whose subsidiaries did so. To ensure that we do not treat the case of a target that merges into a third party as a two-step merger, the algorithm requires that a merger be conducted within a corporate group; an indicator variable provides such information.

In a minority of cases, target names appear more than twice. One type involves a sequence of transactions, ordered by time, $\{A_1, A_2, M\}$, where A and M denote acquisition and merger, respectively. This type occurs when a target changes hands before being merged. The algorithm takes (A_2, M) as a pair for this type. Another type is $\{A_1, M_1, M_2\}$. This type occurs when an acquirer spins off a target after a merger and calls the new company by its previous name. (A_1, M_1) is a pair for this type.

RECOF records transactions that each involve multiple targets in one entry. This occurs, for example, in the case of a merger of multiple auto distributors in nearby regions. To illustrate how the algorithm deals entries with multiple targets, consider the example of Table A3. Row 0 indicates that an acquirer obtained controlling stakes in three companies X, Y, and Z. Rows 1–7 shows possible subsequent entries on mergers. In Row 1, for example, the acquirer merged the three companies. If only one of Rows 1–7 appears in the subsequent sample, that merger is treated as one pair, regardless of the number of companies involved. If mergers are in separate entries (e.g., the acquirer merged X and Y on different dates), the algorithm augments Row 0 so that Rows 2 and 3 each have a counterpart.

D Validity checks for the regression discontinuity design

We examine the balance of the covariates across 2001 to check the validity of applying the regression discontinuity (RD) design. Figures A3 and A4 present time-series plots of control variables for the samples with short and long step transactions, respectively. No break is visible in most covariates, although the fractions of the retail and wholesale industry and the publicly traded acquirers appear to exhibit discontinuities. We estimate a seemingly unrelated regression in which each equation represents a different covariate and conduct a joint test of discontinuity gaps, as recommended by Lee and Lemieux (2010). The test results do not reject the null hypothesis, suggesting RD design is valid.

One of the key identifying assumption in the RD design is that subjects do not manipulate running variables. Otherwise, any discontinuities in outcomes confound the effects of sample selection. In the present context, there may be concern that transacting parties could have adjusted the timing of takeover deals, particularly since the TSCR was passed in May 2000, but enforced only about 1 year later. We inspect for evidence of timing adjustments by plotting the number of observations by quarter, but find no such evidence. Since takeovers tend to occur during the second and fourth quarters, Appendix Figure A5 shows a seasonally adjusted number of cases from 1997 to 2009, indicating no pattern of withholding prior to the second quarter of 2001. This lends support to the assumption that non-tax factors largely determine the broad timing of takeover deals.

E Influential observation

We examine the sensitivity of the effective tax rate (ETR) estimate in a parsimonious model, which omits the interaction term from the main specification but allows for difference in the length of time between transactions.

$$cit/asset_{it} = \beta_0 + \beta_1 short_{it} + \beta_2 longer_{it} + \beta_3 profit/asset_{it} + v_i + w_t + u_{it} \quad (1)$$

Figure A6a presents the differences in coefficients, or DFBETA, as a proportion of the

coefficient estimate from the full sample. The x-axis is the industry code on the Tokyo Stock Exchange. The figure excludes panel units with deviations of less than 0.5% for visibility. Panel (a) is for the coefficient on $short_{it}$. The most influential company is, perhaps as expected, YJ (ID: 30102); the company increases the magnitude of coefficient by 13.4 percentage points. YJ is not the only influential observation, however; several others from the information and communication technology (ICT) industry have high values of DFBETA. Panel (b) is for the coefficient on $longer_{it}$. The industry classification for the most influential observation is real estate, but the acquirer is originally from the ICT industry.

F Direct mergers

On average, should we expect a lower effective tax rate (ETR) among firms that merge directly? The theoretical prediction is ambiguous. On one hand, some direct mergers generate tax benefits, manifesting in low ETR for some acquirers, both before and after the 2001 reform.¹⁰ On the other hand, if non-tax considerations primarily drive majority of direct mergers, ETR would not be systematically lower for the group.

The empirical finding reflects this ambiguity. We identify 245 firm-year observations that completed a direct merger during the sample period, and create a dummy variable ($dirmer_{it}$), which takes the value 1 in the case of a firm that has completed one or more direct mergers during year t . For two cases in which a firm has completed a direct merger and a two-step merger in the same year, we set the variable to 0. Column 1 in Table A4 shows the coefficient estimates from a model augmenting equation (8) from the main text with $dirmer_{it}$ and its interaction term with $profit/asset_{it}$. The coefficient on the interaction term is as large as that for the two-step merger, and is statistically significant at the 1% level. Since the direct mergers pre- and post-2001 can result in different tax consequences, Column 2 distinguishes direct mergers from the two periods. The coefficient for the pre-period is about half the magnitude of that from the post-period, although they are not statistically distinguishable. Column 3 shows the results for a model that incorporates lead terms of up to three periods. The coefficient on the interaction term is statistically significant at the 5% level. The coefficient on the lead

¹⁰After 2001, qualified acquirers could carry over targets' NOLs in tax-free mergers. Before 2001, although to a limited extent, acquirers could do so likewise through the informal institution, as discussed in the main text.

term, which is statistically significant at the 5% level, may be capturing costs of raising capital for takeovers or some pre-existing trend. These results appear to suggest that direct mergers resulted in lower tax payments, particularly after 2001.

However, this result is sensitive to influential observations. The last two columns report the maximum and minimum of coefficients obtained from the jackknife procedure, this time excluding, one at a time, firms engaged in two-step mergers or direct mergers. At one extreme, the magnitude of the coefficient on the interaction term with $dirmer_{it}$ falls by more than 40% and becomes close to the size of the standard error. Therefore, few observations on direct mergers carry significant weight in the estimation of the coefficient on $dirmer_{it}$. This suggests that tax savings are large in few cases but not so in the majority of direct mergers. Importantly for our purpose, the coefficients on step transactions are not sensitive to inclusion of the direct merger dummy.

G Step transaction with a taxable merger

A step transaction need not involve a tax-free merger to generate tax benefits. Parties may adopt other transaction structure, as in the case study of Hoya, which involved a taxable merger. This section examines a step transaction scheme involving a taxable merger discussed in a tax guidebook by Adachi (2009) based on the 2001 institutional environment.¹¹ We employ a simple accounting model to show that, in effect, the government subsidizes corporate mergers; in the baseline scenario, the tax system reduces merger cost by 20–30%.

Suppose first that an acquirer first obtained $a\%$ (where $a > 50\%$) of a target company's shares in a takeover bid (TOB), and then merged that target company in a taxable merger by paying cash after 6 months. For simplicity, assume that the target's shareholders were all individuals, were identical and faced dividend tax (τ^d) and capital gains tax (g). The acquirer paid p yen per share in the TOB and taxable merger. The target had no NOLs or built-in gains or losses on tangible assets. The acquirer was profitable and generated sufficiently large profits during the financial year at and after the merger.

The following concepts are based on tax law, rather than accounting. C is the target's total capital stock, which is a component of shareholders' equity paid in by shareholders and

¹¹A later edition of the book, published after the 2010 amendment, removes this strategy (Adachi, 2011).

does not include retained earnings.¹² $c(= C/n)$ is capital stock per share, where n is the total number of outstanding shares issued by the target. b is the average basis for each shareholders (average price paid when purchasing shares in the target firm). t is the corporate tax rate.

G.1 Target shareholder

At the shareholder level, both transactions (TOB and merger) trigger the realization of capital gains on *shares* since they involve cash payments. In taxing capital gains $(p - b)$, which are taxed lightly compared to dividends, the Japanese tax law classifies capital gains into two components.¹³ One component is a portion attributable to deferred dividend payments, referred to as “deemed dividend.” Deemed dividend is the difference between the share price (p) and capital stock per share (c) . Since capital stock does not include retained earnings, $(p - c)$ captures deferred distribution of profits. The capital gains tax applies to the remainder $(c - b)$.

The sum of shareholders’ tax liability from the sales of $a\%$ of shares at the time of acquisition and the sales of the remaining $(1-a)\%$ of shares at the time of merger is

$$[g(c - b) + \tau^d(p - c)]n. \quad (2)$$

G.2 Target company

In addition to the shareholder-level tax, the merger triggers the realization of capital gains on *assets* at the target-company level. Capital gains are a part of gross revenue under the CIT, and NOLs can offset those capital gains. Since the target in this example does not have NOLs, upon asset sales to the acquirer, the target is liable to pay the difference between the receipt $(P = pn)$ and book value of net assets (A^{bv}) based on the tax rule.

$$(P - A^{bv})t. \quad (3)$$

¹²In other words, C equals the book total assets minus total liabilities under the tax rule, minus retained earnings.

¹³Currently, the tax rates on dividends and capital gains are both 20.315% so that the tax advantage of capital gains is mainly the deferral of tax payments. Historically, capital gains were not taxable in principle for 1953–1989, while dividends could be taxed at the top personal rate during this period.

The tax definition of the book value of net assets is similar to the accounting concept of a book net asset, or shareholders' equity; book-tax differences arise from, for example, the treatment of depreciation and inventories.

G.3 Acquirer

A taxable merger may create various sources of tax savings for the combined firms in addition to any possible step-up in the basis for depreciable assets.¹⁴

The acquirer books an intangible asset that can be amortized over 5 years. The present value of goodwill amortization is

$$\sum_{j=1}^5 (1 - \delta)^{j-1} \frac{P - A^{cv}}{5} t = zt(P - A^{cv}), \quad (4)$$

where A^{cv} is the current value of net assets imputed for tax purposes.¹⁵ δ is the discount rate and z is the present value of amortization deductions per yen.

At the time of merger, the acquirer owns shares in the target. The tax law in 2001 treated the acquirer as both a buyer and seller of the target's share; as a buyer of the target share, the acquirer obtained $a\%$ of the shares in the target and was deemed to have made a payment of p per share on shares worth c per share. Since the amendment in 2010, however, acquirers cannot realize losses on this type of transaction and instead adjust balance sheet items under shareholders' equity. The total amount of tax saving from this deduction is

$$a(P - C)t. \quad (5)$$

As a seller, the acquirer is deemed to have realized a gain of $a(P - C)$, which is treated as a dividend. As long as the acquirer has held the target's shares for more than 6 months (the period needed for the target to be a related company for the tax purpose), the dividend is excluded from the acquirer's taxable income.

¹⁴We follow the treatment of Adachi (2009) and ignore the step-up of tangible assets.

¹⁵Net assets are assets minus liabilities, where assets include depreciable assets as well as non-depreciable assets and intangible assets.

G.4 Accounting model

The discussion so far highlights benefits and costs to different parties. Positive total gains increase the (private) surplus from a takeover and would facilitate deal making. Consider the total tax gain (S):

$$S = a(P - C)t + (P - A^{cv})zt - (P - A^{bv})t - [g(c - b) + \tau^d(p - c)]n \quad (6)$$

The first two terms represent acquirer-level deductions and are the capital loss and goodwill amortization, respectively. These tax benefits arise only when the acquirer has taxable income. The third term is the target-level realization of capital gains. This tax cost arises if the target has positive net income and is zero if the target has NOLs as large as this term. The last item is the shareholder-level tax. The capital gains tax rate (g) and dividend tax rate (τ^d) depend on the identity of shareholders.

To understand the scheme better, let $s = S/n$ and differentiate s with respect to p to obtain

$$\frac{ds}{dp} = t(z + a - 1) - \tau^d. \quad (7)$$

Since p is the payment to target shareholders, $1 - ds/dp$ represents an after-tax cost of an additional takeover premium.

Table A5 summarizes after-tax premium costs by identities of shareholders. The first row shows the case for dispersed shareholders who face a 10% dividend tax rate, as in the baseline scenario. In this case, the scheme generates tax benefits of 26 cents per 1 dollar spent on acquisition so that the effective cost of an additional 1 dollar of premium is 74 cents. The second row shows the case involving large individual blockholders. An individual must combine dividend income with other income if s/he holds more than 5% of shares,¹⁶ and we assume such individuals face the top marginal personal income tax rate of 43%. An additional premium increases tax payment by 7 cents so that the effective cost is greater than a dollar; parties would likely prefer a tax-free transaction to defer shareholder-level tax in such cases. Founder-owners often create proxy corporations known as asset-management companies, which hold shares and receive dividends on their behalf. If a corporate owner holds more than 25% of the stake, the

¹⁶The threshold was reduced to 3% in 2011.

dividend received is not taxed in order to mitigate double taxation of corporate income.¹⁷ The third row shows that the marginal cost is the lowest (0.64) in that case. If a corporate owner holds less than a 25% stake, half of the dividend is excluded from the tax base and the rest is taxed along with other income.¹⁸ The marginal cost is still less than a dollar (0.84) in this case.

The second column in Table A5 shows a similar computation, assuming that the target had NOLs greater than the target-level capital gains. As the third (negative) term in equation (6) drops out, the marginal costs are lower and all less than 1, with a minimum of 0.24 in the case of related corporate shareholders. This finding highlights that NOLs in targets are valuable even when parties do not qualify for tax-free mergers.

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¹⁷There is provision for a debt-financed avoidance scheme.

¹⁸This has applied since 2002, and from 1991 to 2001, 80% was excluded.

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http://www.nikkeibp.co.jp/style/biz/feature/news/070828_hoya/index1.html, accessed May 23, 2016, (in Japanese).

Table A1: Timeline of Yahoo! Japan Corp.'s tax-avoidance case

Date	Event
2008 Dec 26	Executive Director of YJ was appointed as Executive Vice-Director of IDCS
2009 Feb 2	IDCS spun off IDCF
Feb 20	IDCS sold all of IDCF to YJ at ¥11.5bn
Feb 24	YJ acquired 100% of IDCS from SoftBank at ¥45bn
Mar 30	YJ merged IDCS and carried over NOLs worth ¥54.2bn
2010 June 30	TRTB challenged YJ
2014 Mar, Nov	The District and High Courts ruled against YJ
2016 Feb 29	The Supreme Court supported the earlier decisions

Notes: Authors' compilation from Kakihara (2015) and other sources. Yahoo! Japan (YJ), SoftBank IDC Solutions (IDCS), SoftBank IDC Frontier (IDCF), Tokyo Regional Tax Bureau (TRTB).

Table A2: Sample selection

Number of observations	deletions	Notes
457,001		Original sample with corrections
	21,811	Drop transaction types other than merger and acquisition
	445	Drop dissolved and corrected entries
	3,639	Drop market type other than IN-IN
	799	Drop if parties located overseas
430,307		Base sample for identification

Table A3: An example to illustrate the algorithm

row	type	target
0	acquisition	X,Y,Z
1	merger	X,Y,Z
2	merger	X
3	merger	Y
4	merger	Z
5	merger	X,Y
6	merger	X,Z
7	merger	Y,Z

Table A4: Tax payments and direct mergers

Dep. Var.: Ratio of tax payments to assets (<i>cit_a</i>)	(1)	(2)	(3)	Jackknife	
				max	min
step x profit_pos	-0.0985** (0.0260)	-0.0984** (0.0260)	-0.1205** (0.0352)	-0.0981	-0.1315
step_lead x profit_pos			-0.0435+ (0.0225)	-0.0253	-0.0495
step_lead2 x profit_pos			-0.0175 (0.0126)	-0.0128	-0.0204
step_lead3 x profit_pos			0.0070 (0.0141)	0.0126	0.0007
dirmer x profit_pos	-0.0990** (0.0328)		-0.0973* (0.0454)	-0.0565	-0.1195
dirmer_lead x profit_pos			-0.0410* (0.0195)	-0.0295	-0.0474
dirmer_lead2 x profit_pos			-0.0369 (0.0267)	-0.0158	-0.0447
dirmer_lead3 x profit_pos			-0.0087 (0.0280)	0.0077	-0.0299
dirmer_after x profit_pos		-0.1123** (0.0405)			
dirmer_before x profit_pos		-0.0501* (0.0244)			
Observations	75,380	75,380	59,040		
Number of id	5,496	5,496	5,362		
Adjusted R-squared	0.6555	0.6555	0.6497		
Firm fixed effects	YES	YES	YES		
Year fixed effects	YES	YES	YES		

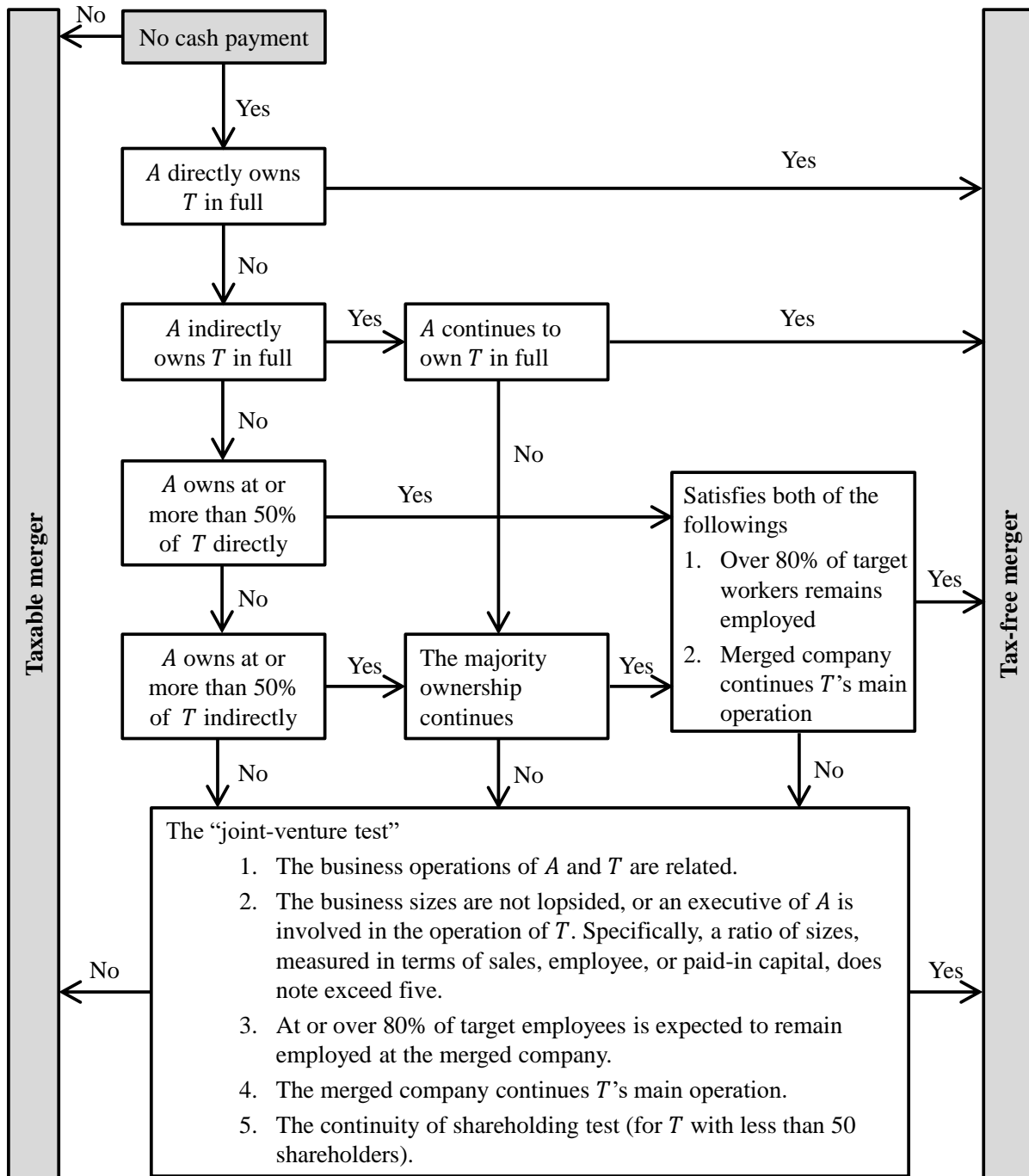
Notes: This table presents selected coefficients from equation 1 augmented with the dummy for direct mergers (*dirmer*) and a set of interaction terms. The dependent variable is the tax payment divided by asset. The last two columns show the range obtained from the jackknife procedure for the model in Column 3. Standard errors are clustered at firm level and are shown in parentheses. ***, **, and + denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A5: After-tax marginal costs of an additional premium

Shareholder type	τ^d	Baseline	Target has NOLs
Dispersed individuals	0.1	0.74	0.34
Individual blockholders	0.43	1.07	0.67
Related companies	0	0.64	0.24
Unrelated companies	0.2	0.84	0.44

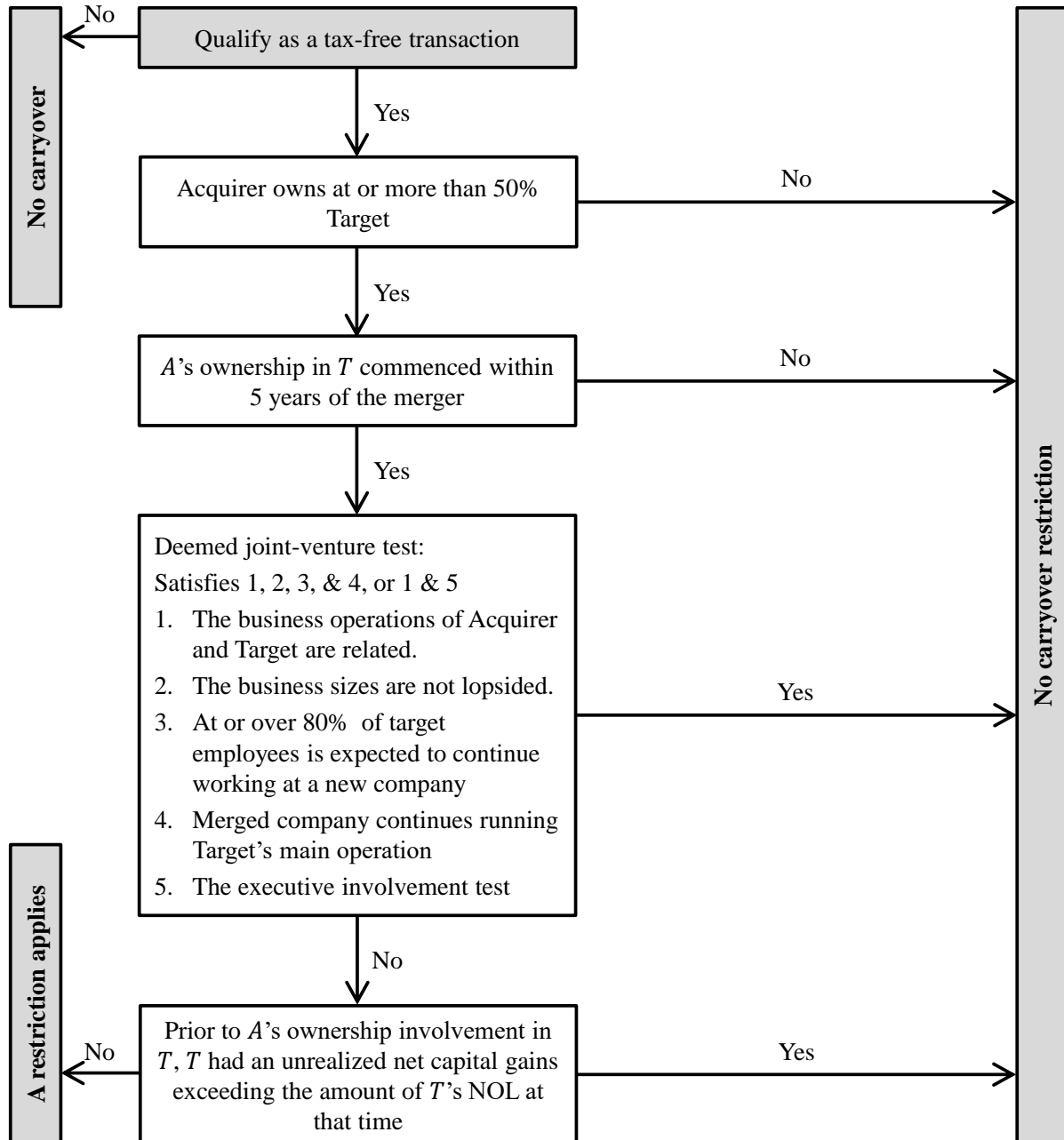
Notes: Figures are based on equation (7). τ^d is the tax rate on dividend income for each shareholder type under the assumptions described in the text. We assume z is approximately 1, a is 0.9, and t is 0.4 in this computation.

Figure A1: Eligibility for tax-free merger under the TSCR



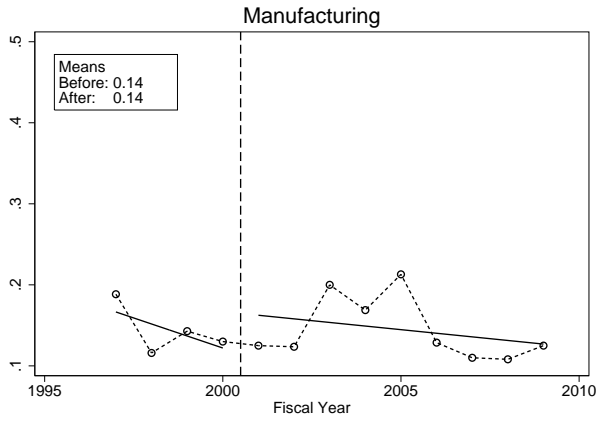
Note: This flowchart summarizes the eligibility for tax-free merger under the TSCR. This flowchart is based on the authors' translation of (Adachi, 2009, p.32).

Figure A2: Eligibility for NOL carryover under the TSCR

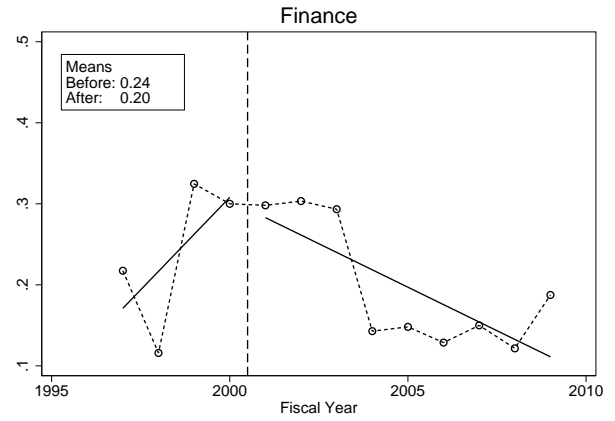


Note: This flowchart summarizes the eligibility for a carryover of targets' NOLs under the TSCR. This flowchart is based on the authors' translation of (Adachi, 2009, p.55).

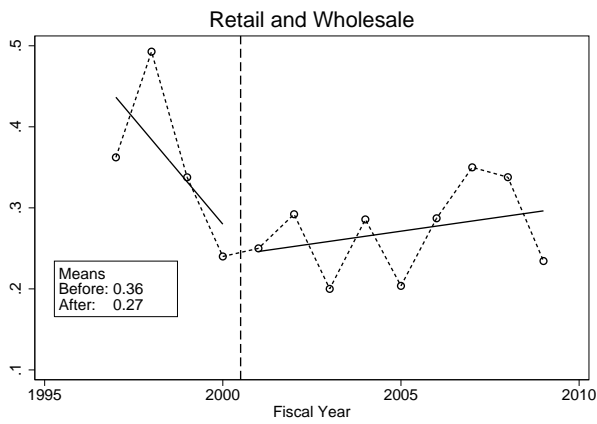
Figure A3: Discontinuity in covariates: A sample with short step transactions



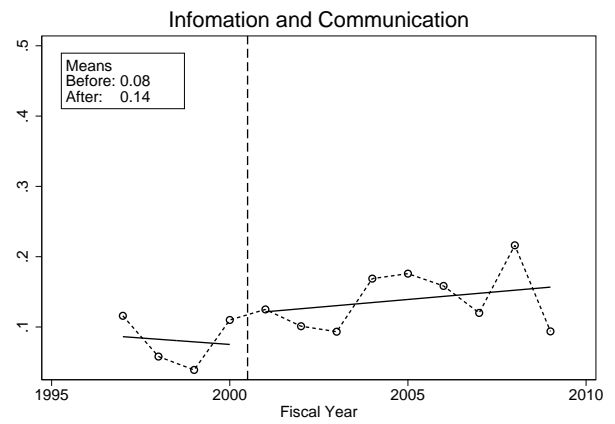
(a) Manufacturing



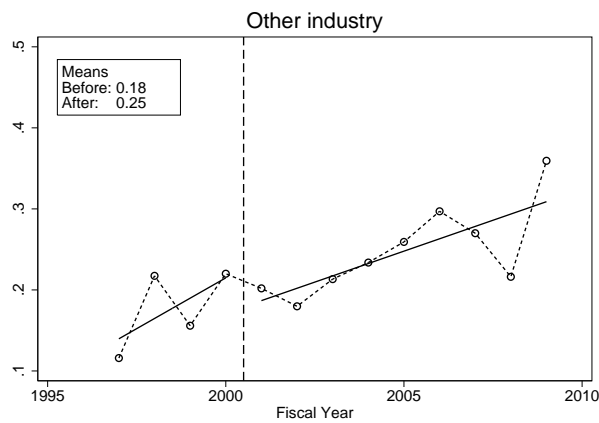
(b) Finance



(c) Retail and wholesale

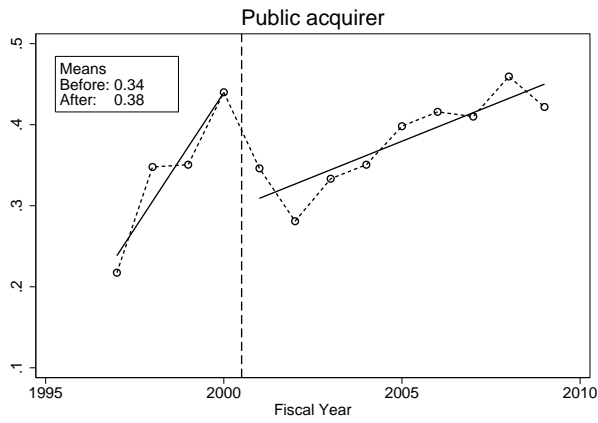


(d) Information and communication

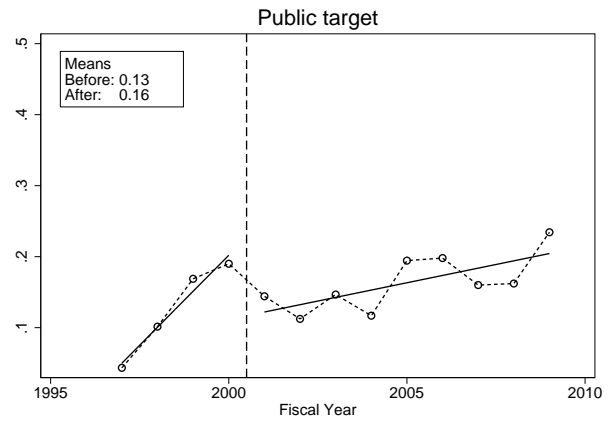


(e) Other industry

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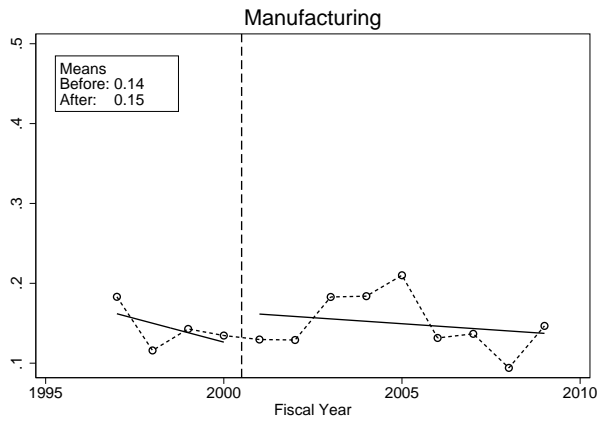
(f) Acquirer is a public company



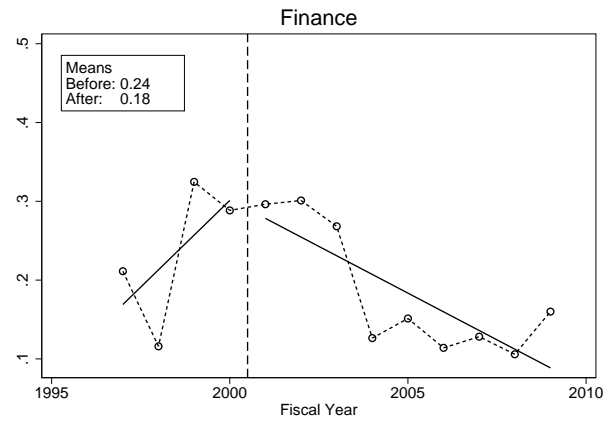
(g) Target is a public company

Note: This figure presents time-series plots of control variables employed in the regression discontinuity analysis on the sample restricted to step transactions with intervals of up to 12 months. All these control variables are dummies, and the vertical axis measures the proportions with a value of 1. The bin size is 1 year, which spans April to March.

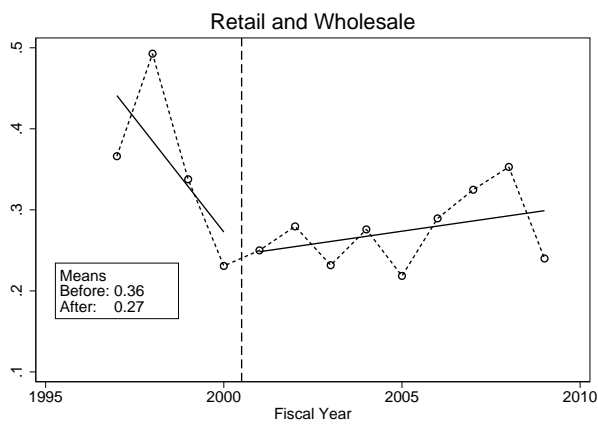
Figure A4: Discontinuity in covariates: A sample with longer step transactions



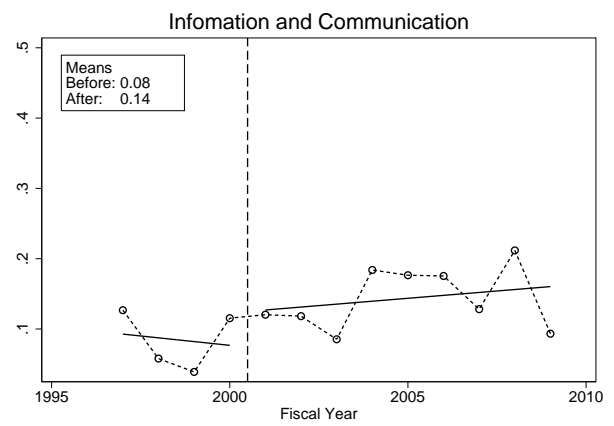
(a) Manufacturing



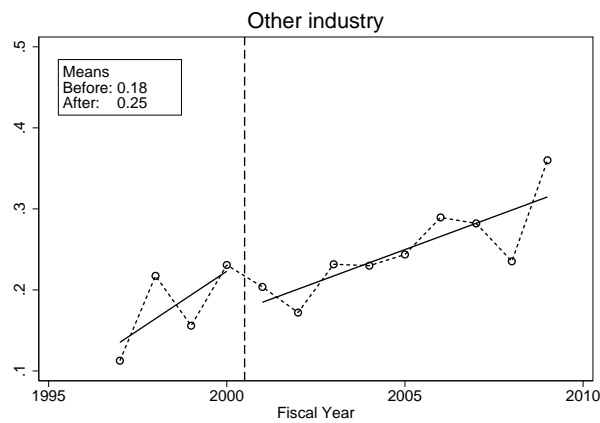
(b) Finance



(c) Retail and wholesale

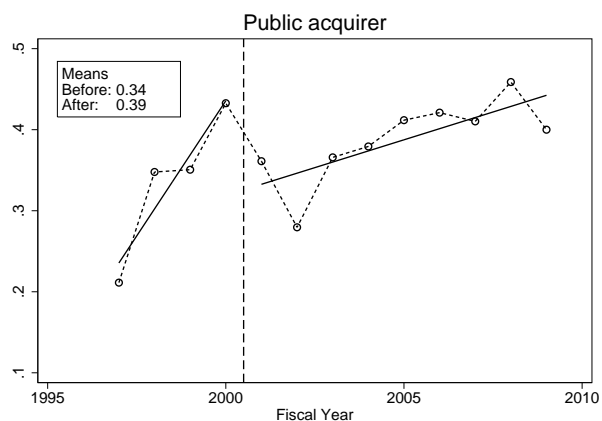


(d) Information and communication

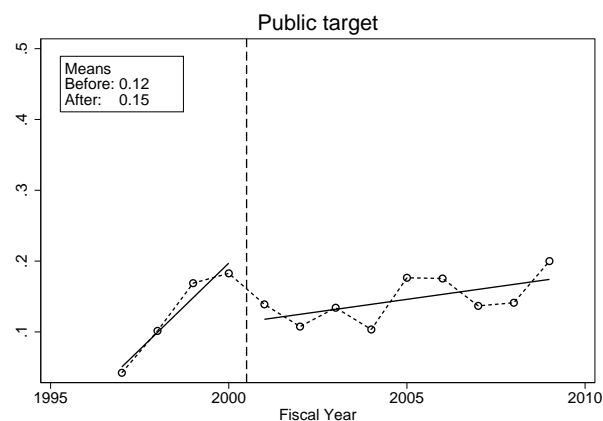


(e) Other industry

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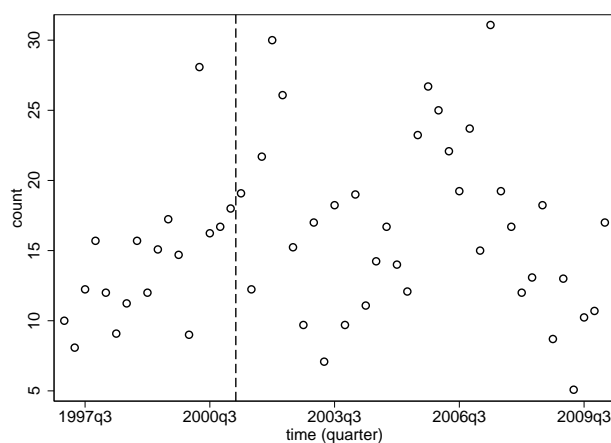
(f) Acquirer is a public company



(g) Target is a public company

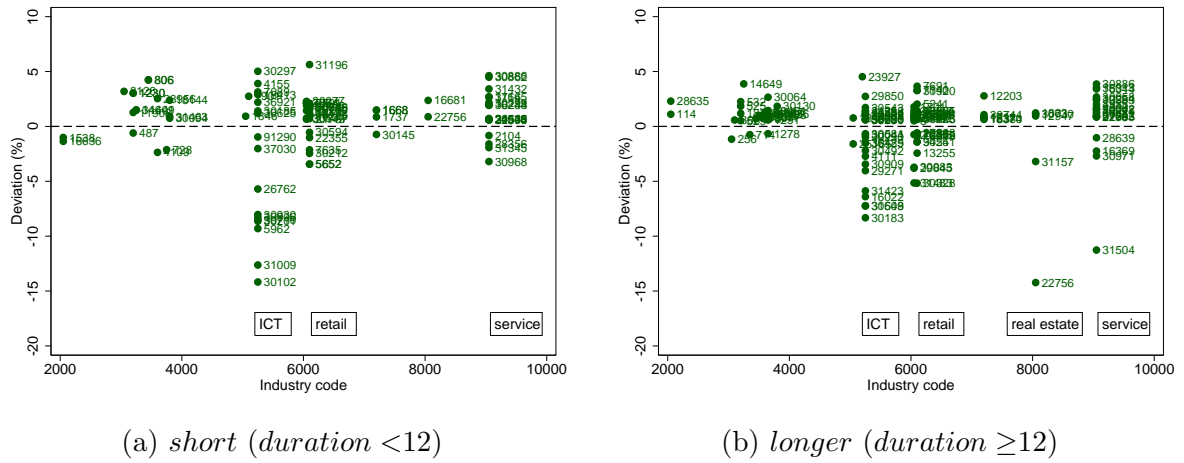
Note: This figure presents time-series plots of control variables employed in the regression discontinuity analysis on the sample restricted to step transactions with intervals of up to 24 months. All these control variables are dummies, and the vertical axis measures the proportions with a value of 1. The bin size is 1 year, which spans April to March.

Figure A5: Deseasonalized cases of takeovers by quarters



Notes: This figure presents the number of takeovers after removing quarterly seasonality. The sample is restricted to step transactions with intervals of up to 12 months. The dashed vertical line indicates the introduction of the TSCR.

Figure A6: Sensitivity of coefficient estimates to excluding a firm



Notes: This figure presents differences in estimates from the full sample and those from a sub-sample that excludes one panel unit at a time. The Nikkei Company Identification Code labels indicate an excluded unit for each iteration. Panels (a) and (b) show the coefficients on *short* and *longer*, respectively. The y-axis shows percentages. The x-axis shows the industry code adopted by the Tokyo Stock Exchange. The figure excludes panel units with deviations less than 0.5% for visibility.