

Stock ownership bunching^{*}

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Abstract

Under the Japanese tax system, individual investors whose ownership stakes are at or above a statutory threshold face over 30 percentage points higher dividend tax rates relative to those below the threshold. The April 2003 dividend tax reform created a sharp tax differential across a threshold of 5% ownership share while the October 2011 tax reform reduced the threshold to 3%. We hypothesize that these tax reforms induced individual shareholders to restrict their ownership stakes to levels below these thresholds, and test this hypothesis using an investor-level panel dataset. We find that half of the affected individual shareholders sold stocks to restrict ownership stake, but one-third of these stock sales were nominal in a sense that these transactions took place between shareholders and their personal asset management companies. Our study suggests that dividend taxes may not affect the substance of corporate ownerships at large if tax avoidance strategies are available.

JEL classifications: G32, G38, H24, H26

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1. Introduction

A large body of studies provides evidence that tax incentives affect individual investors' stock ownership (Barber & Odean, 2004; Callaghan & Barry, 2003; Ivkovic, Poterba, & Weisbenner, 2005; Poterba, 2001, 2002; Poterba & Samwick, 2003; Poterba & Weisbenner, 2001; Starks, Yong, & Zheng, 2006). While the primary focus of these studies, households and retail investors, are of importance, we still know little about how taxes affect the behavior of large individual investors, whose influence can alter corporate policies (Cronqvist & Fahlenbrach, 2009). We aim to fill this gap in the literature by documenting the response of large individual investors to taxes on dividend.

Japan provides an interesting setting to study the behavior of large individual shareholders for two reasons. First, the Japanese tax system distinguishes between a large individual shareholder (LIS) and a non-large individual shareholder (non-LIS). A LIS is an individual shareholder whose ownership share is at or above a statutory threshold. The April 2003 dividend tax reform created a sharp tax differential across a threshold of 5% ownership share while the October 2011 tax reform reduced the threshold to 3%. The dividend tax rates are considerably higher for LISs than for non-LISs. Averaged over 2002-2014, a marginal tax on dividend is over 30 percentage points higher for LISs who face the top statutory personal income tax (PIT) rate than non-LISs. Thus, individual shareholders of Japanese companies face substantial incentives to restrict their ownership shares to below the threshold levels. We employ this notch in the dividend tax as an exogenous source of variation to ask whether and to what extent did LISs respond to tax reforms.

Second, unlike in the U.S. where the regulation stipulates public firms to disclose shareholders who own 5% or more stakes but not those below, the Japanese disclosure requirement has no such a counterpart. We employ an investor-level panel dataset constructed from Nikkei NEEDS Large Shareholder Database, which provides information on top shareholders of large firms, most of which are publicly traded. The data contain up to the top 30 shareholders for each firm. The standard deviation of the ownership shares is 5.74. Thus, we can observe shareholders with much smaller stakes and also those from around the tax threshold. The panel data structure allows us to observe which shareholders sold how many stocks by tracing a change in ownership share of each investor across time. Moreover, we can infer a buyer in a stock transaction by identifying an investor whose purchase amount matches with sales by another in the same year. These features of the dataset are of importance since LISs face incentives to engage in tax avoidance by transferring their stocks to their personal

asset management companies to maintain their ownership stakes while reducing tax payments. By analyzing trading parties, we can show whether tax incentives lead to real or nominal changes in ownership.

We obtain financial information from Nikkei NEEDS FinancialQUEST, and construct a balanced panel dataset at the corporate-level. We do not use a unbalance panel since we would not able to distinguish between cases where the investor disappeared from the large holder list after selling stocks and cases where a firm disappeared from the data because, for example, the firm delisted their stocks. The final sample consists of 535,076 investor-year observations with the number of firms of 2,355. 57,335 observations in this investor-year sample are individual shareholders. The sample period is from April 2002 to March 2014. It is common in Japan that fiscal year starts in April and ends in the next year's March. We follow this definition of the fiscal year in this paper.

There are two timings when the tax reforms could affect individual investors' stock ownership: April 2003 and October 2011. We define that individual shareholders are in the treatment group if the individual investor's ownership share was 5% or higher between April 2002 and March 2003, or the ratio was 3% or higher and below 5% between October 2010 and September 2011. The total number of individual shareholders that appear in the sample in either of these periods is 9,844. Among them, 2,692 (27.3%) shareholders are in the treatment group. Therefore, the tax reforms affected a considerable number of large individual investors' tax incentives.

We find clear evidence that the tax reforms encouraged the investors in the treatment group sell stocks; 1,494 investors (56.9% of the treated investors) sold stocks between 2003 and 2014. The number of sellers is largest in 2012, which is 403 (28.2%), and it is second largest in 2003, which is 196 (13.7%). This finding suggests that investors' reaction is strongest right after the tax reforms. In addition, given that not all shareholders sold stocks right after the reforms, there exists a time-series variation in stock selling, possibly because of behavior reasons.

We find that investors whose ownership is close to the thresholds are more likely to sell stocks after the tax reforms. This finding suggests that investors who need to sell a relatively small amount of stocks are more likely to adjust their ownership stakes. A notable difference between these two tax reforms is that the seller's ownership distribution of one year before the tax reforms was single-peaked at just above the 5% ownership threshold for the 2003 tax reform, and the distribution was bi-peaked at just above 3% and just below 5%

ownership shares for the 2011 tax reform. This finding suggests that individual investors who sold their stocks in 2003 to restrict their ownership just below the 5% threshold sold stocks again after the 2011 tax reform. The number of such shareholders (shareholder-year observations) is 155 (310). This finding suggests that some individual investors are highly sensitive to tax incentives. Thus, there appears to be a considerable heterogeneity in tax preferences among the same type of investors. Our finding poses a question whether we can treat the same class of shareholders at the aggregated level.

We furthermore find that the tax reforms result in a stock ownership bunching; investors restrict their ownership to just below the thresholds. The median difference between the thresholds and the investor's ownership share after selling stocks is 0.13 percentage points. We also document that the excess mass just below the thresholds is larger for the 2011 tax reform relative to that for the 2003 tax reform. This finding suggests that the response to the tax incentives is clearer under the 2011 tax reform, possibly because of learning effects of tax avoidance schemes among investors.

We then examine if the change in stock ownership is real or nominal. We define that the change is nominal if the investors transferred their stocks to either of the followings: personal asset management companies that the shareholders or their family members fully control, their family members, or their family foundations. On average, the amount of stocks sold by the shareholders in response to the tax reforms is 3.98 percentage points in the firm-year observation. We find that 34.07% of the stocks are transferred to these types of shareholders, mostly to personal asset management companies. Our finding suggests that tax incentives do not necessarily lead to a real change in ownership structures.

Our paper contributes to the literature on the relationship between managerial ownership and dividend payout policies by documenting the agility with which large individual shareholders respond to tax incentives. Brown, Liang, & Weisbenner (2007) argue that studies on the relationship between executive compensation, in form of option or stock, and dividend payout policy assume away potential unobserved cross-section correlation between executive compensation and dividend payout policy. Given that studies document dividend taxes affect firms' shareholder composition (Dahlquist, Robertsson, & Rydqvist, 2014; Desai & Jin, 2011; Graham & Kumar, 2006; Korkeamaki, Liljeblom, & Pasternack, 2010), their concern is important. To mitigate the unobserved correlation, Brown et al. (2007) employ the 2003 tax reform in the U.S. as an exogenous source of variation in tax incentives that control for the unobservable correlation. Since the anticipation period of the 2003 reform

was less than five months, the assumption that executives did not have time to adjust stock ownership appear plausible. Although our study is in non-U.S. setting where shareholders face a different set of institutional constraints, our results suggest that an investigating executive response to the 2003 dividend tax cut in the U.S. would warrant further investigation.

More broadly, our study contributes to the burgeoning literature studying kinks and notches in the tax system. Previous studies have documented bunching responses to various discontinuities in the public policies, such as value-added tax (Onji, 2009), income tax (Saez, 2010), and fuel economy policy (Sallee & Slemrod, 2012). Since the seminal work by Saez (2010), which utilizes kinks in personal income tax rates to estimate elasticity of taxpayer responses, the bunching design has become an important tool in economics (Kleven, 2016). Our study adds to the literature by providing, for the first time to our knowledge, evidence from the financial sector, where responses can be pronounced due to tax avoidance.

The rest of this paper is organized as follows. Section 2 explains the background information on the tax system in Japan. Section 3 describes the data. Section 4 shows the results. Section 5 concludes.

2. Dividend taxation in Japan

This section describe the tax treatment of dividend paid out by publicly-traded companies, which are the subject of the empirical analysis. The Japanese PIT in principle requires taxpayers to combines dividend income with other sources of income but also provides a simplifying scheme where only a withholding tax applies. Individual income is subject to a national tax and a regional tax, and Japan applies the credit system to ameliorate, partially, for the double taxation.

Prior to the 2003 reform, the application of the simplified filing principally depended on the amount of dividend that a tax payer receives from a given company in a tax year, but a distinction between a LIS and non-LIS existed. Specifically, a withholding rate of 20% applied if the sum of mid-term and year-end dividend from one company was below 100,000 yen and taxpayer needed not report dividend income in a tax return. A withholding rate of 35% applied if the total dividend was below 500,000 yen *and* the holding was less than 5%. Otherwise, dividend income was combined with other sources of income. Notice that shareholders who hold 5% in publicly-traded companies must file disclosure reports with the Ministry of Finance, so the tax threshold coincided with the disclosure requirement threshold.

The April 2003 tax reform abolished the distinction based on the amount of dividend

for the purpose of judging eligibility to the simplified scheme. Non-LISs faced a low withholding rate of 10%, but could opt in to file a tax return. This 10% tax rate was to be a temporary measure until March 2008, but was subsequently extended to 2014 when the rate increased to 20%. LISs on the other hand needed to combine dividend income with other sources. After the reform, LISs must combine dividend income with other sources regardless of amount received.¹ The October 2011 tax reform reduced the threshold to 3%.

This difference in the availability of the simplified filing has an important implication on the marginal tax rates on dividend income. Table 1 describes the dividend tax rate for each class of the individual investors between 2002 and 2014. This table shows that dividend income for LISs is taxed as high as 42.9% on average across our data periods. In contrast, the dividend tax rate among non-LISs is 11.6% on average. The average difference in the tax rates between LISs and non-LISs is 31.3 points. Thus, the top marginal tax rates on dividends for non-LISs are considerably lower than those for LISs. The policymakers justify this heavier tax treatment of LIS by arguing that dividend income of an individual with a high degree of business involvement in a company should be treated as ordinary income rather than income from financial investment.²

This tax differential across an ownership threshold leads to several hypotheses. First, LISs have an incentive to become non-LISs to reduce the tax burden on dividend income. We test this prediction by examining whether individual investors whose ownership shares were above the threshold of 3% or 5% before the tax reform sold stocks to maintain their tax status as non-LISs. Specifically, we evaluate that individual shareholders are affected by the tax reform (in other words, they are in the treatment group) if either of the two conditions are satisfied: ownership stakes were at 5% or higher between April 2002 and March 2003, or the stakes were at 3% or higher and below 5% between October 2010 and September 2011. Second, given that the tax reform is relevant only for dividend income, we expect that the change in tax code affects investors' incentives to sell stocks only when the firms pay dividends. Therefore, we test whether firms were more likely to pay dividends when the affected investors sold stocks.

3. Data

We use unique investor-level data: Nikkei NEEDS Large Shareholder Database collected by Nikkei Digital Media Inc. This dataset discloses ownership information of the maximum of

¹ With respect to capital gain income, the simplified filing is available for both LISs and non-LISs.

² For example, see a report by the Tax Commission in Japan issued on June 15, 2004 "Basic Idea about the Unification of Taxation on Income from Financial Investment" (in Japanese).

the top 30 largest shareholders. The average number of investors reported in the data per firm is 21.8.³ This database reports annual data on ownership. Thus, we observe ownership shares as of each fiscal year end of the firm.

An advantage of this dataset is that it does not impose any restriction on the lower bound of the ownership shares of investors about which firms must disclose. This is in contrast to the data in the U.S., where the ownership information of only those investors whose ownership stakes are 5% or higher is disclosed. Our data show that the standard deviation of ownership stakes of large shareholders is 5.74. Thus, this database discloses more detailed information relative to commonly used datasets in the U.S. We also use Nikkei NEEDS FinancialQUEST as the sources of other information on financial statements such as firms' dividend payments.

We create an identification code using the name of the large investors to construct an investor-level panel dataset. We create the code within the firm-level. For example, if Taro Yamada is a large investor of firms A and B, we provide different codes to him in firms A and B. We drop observations when the investor name duplicates in the firm-year shareholder list. This issue happens, for example, when the data report the name of the investor just as an "Individual Investor". This issue occurs when the rank of the individual investor is below top 10 since firms are required to disclose the name of individual investors only when the rank is within top 10. This data limitation is not likely to cause a problem in our analysis, because almost all the investors in the treatment group are ranked within top 10 large shareholders; the average rank of the treated shareholders is 3.66. This dataset allows us to trace the change in ownership stakes of each investor across time. Thus, we can study the impact of tax incentives on each investor in detail, such as a transfer of stocks between two investors.

One issue is that some investors dropped from the large shareholders' list when they sold almost all of their stocks. To clearly identify this case, we construct balanced panel data at the firm-level. This data construction enables us to eliminate firms that disappeared from the data as a result of, for example, delisting their stocks. In this dataset, if the individual investor disappeared from our data, we can judge that the shareholder dropped from the large shareholder list. We also drop firms whose minimum ownership shares are at 2.5% or higher in at least one firm-year, because it is difficult to judge if the investors sold stocks to restrict their ownership share below the threshold or they sold all of their stocks. We remove firms

³ The Japanese law requires firms to report information on the top ten largest investors. Nikkei Digital Media collects more information by sending questionnaires to corporations. Given that not all firms answer all the top 30 shareholders' information, the number of large investors reported in the data can be different across firm-years.

that were observed over twice in a year, which can happen when the firms change their fiscal year periods.⁴ The final sample consists of 535,076 investor-year observations with the number of firms of 2,355 between April 2002 and March 2014.

Table 2 presents the descriptive statistics. The total number of individual shareholders is 57,335 (10.7% of total observations). 9,844 of shareholder-year observations appeared either between April 2002 and March 2003, or between October 2010 and September 2011, with almost equal number of observations (4,931 and 4,913, respectively). Therefore, there are not a large difference in the number of individual shareholders across time.

This table reports that 2,625 observations are affected by either of the tax reforms. This proportion is 26.7% of the observations that appeared on the data periods one year before the tax reforms. Thus, the tax reforms affected a considerable proportion of individual shareholders' tax incentives. The number of shareholders that are affected by the tax reforms is larger under the 2003 tax reform (1,564) than under the 2011 tax reform (1,061). This would be intuitive because the range of the ownership shares that are subject to the tax reform is narrower for the 2011 tax reform, between 3 – 5%, than that under the 2003 tax reform, at or over 5%.

This table also shows that 285 shareholder-year observations (570 shareholders) are affected by both tax reforms. This suggests that investors that sold stocks in response to the 2003 tax reform changed their ownership into between 3% – 5% ownership shares. We can identify shareholders that are highly sensitive to tax incentives, by examining whether these investors again sold stocks after the 2011 reform. This is important to understand the degree of heterogeneity in tax preferences among the same class of investors.

Figure 1A presents the distribution of ownership shares of individual investors from April 2002 to September 2011. The width of each bin is 0.1 points. The two vertical lines represent 3% and 5% ownership shares, respectively. All the figures in this paper include individual investors whose ownership shares are at or below 30% for simplicity. This range of ownership shares covers almost all individual investors in our sample: for example, the coverage is 97.8% of individual investors in Figure 1A. This figure shows that the distribution is right skewed with a long tail, with mean (median) ownership shares of 5.42% (2.84%). What attracts our attention is that there exists a mass at just below the 5% ownership shares. The number of individual shareholder-year observations with the ownership shares between

⁴ We also remove firm-years when they do not include all the top three shareholders. This can happen in rare occasions when there exist multiple investors on the large shareholder's list, presumably because of the data entry errors.

4.9% and at or below 5% is 910. Thus, this figure provides descriptive evidence that tax incentives encouraged individual investors restrict their ownership stakes just below the thresholds.

Figure 1B presents the distribution of ownership shares of individual shareholder-year observations from October 2011 on. This figure also presents a right skewed distribution with a long tail, with mean (median) ownership shares of 4.28% (2.55%). A striking difference between Figures 1A and 1B is that the excess mass is shifted from below 5% to below 3% ownership shares in Figure 1B. This change in the threshold corresponds to that in the tax code on October 2011. Thus, this table also supports that individual investors responded to the tax incentives after the 2011 tax reform. The number of individual shareholders whose ownership shares are between 2.9% and below 3% is 1,102, which is larger than the excess mass just below the 5% threshold of 910 in Figure 1A. This comparison in the excess mass suggests that individual shareholders' responses to tax incentives became stronger after the 2011 tax reform relative to the 2003 tax reform.

4. Results

4.1. The number of shareholders that sold stocks

We examine whether the shareholders in the treatment group sold stocks in response to the tax reforms. Although our data report the ownership share of each large shareholder of the firm-year, they do not directly tell whether and how many stocks the shareholder sold. We define that the investor sold stocks based on two basic criteria. First, given that we have investor-level panel data, we can directly calculate the difference in the ownership share between this year and the next year, as long as the investor does not disappear from the large shareholder list. We refer this difference as the amount of stocks the investor sold. We also call the investor who sold stocks a seller.

We apply an exception of this rule to firms with the fiscal year end of January to March 2003. Investors who owned 5% or higher on January to March 2002 and owned less than 5% on January to March 2003 are not defined as sellers, because they are not in the treatment group in our definition. However, we observed many shareholders behaved in this way. This selling activity is likely to reflect their incentive to avoid taxes because they are just a few months before the April 2003 tax reform. In addition, the fiscal year end of March is most common for Japanese firms, which provides economic circumstances where many shareholders sold stocks on March 2002. Thus, we refer investors who sold stocks between January and March 2003 as the sellers in 2003. Recall that we have defined that the fiscal year

of 2003 means time periods from April 2003 to March 2004, which is a most common practice in Japan.

Second, investors can disappear from the large shareholder list as a result of selling a sufficient amount of their stocks. In this case, we cannot directly calculate the amount of stocks sold by the investor based on the difference in ownership stakes between this year and next year. For simplicity, we assume that the shareholders sold all of their stocks. This assumption appears to be plausible because the average minimum ownership share of the lowest rank shareholder of each firm-year is 0.65%, which is close to zero ownership stakes.

Figure 2A reports how many of the treated individual shareholders sold stocks in each year to avoid being classified as non-LISs. We separately report the number of sellers that remained in the data, and disappeared from the data, and the total number of sellers. The total number of sellers is 1,494. Thus, 56.9% of the affected shareholders, which was 2,625 from Table 2, sold stocks in response to the tax reforms. Note that individual shareholders that sold stocks between January to March 2003, which is 67, are included in these 1,494 shareholders, while they are not included in the treatment group in our definition. Even if we do not count these shareholders as the sellers, the proportion of the sellers is 54.4% of the treated individual shareholders.

This figure also shows that the number of sellers is largest in 2011 (403) followed by that in 2003 (196). This observation suggests that the response to a change in tax incentives are strongest right after the change in tax code. In the year of tax reforms, especially 2011, the response to the tax incentives is larger for individual investors who remained in the data relative to those who disappeared from the data. This finding supports our prediction that tax incentives affect stock ownership, because investors need not sell too large amounts of stocks that lead them to drop from the shareholder list, and it is enough to sell stocks that allow them to remain on the shareholder list.

We also observe a time-series variation in stock selling in Figure 2A. One interpretation behind this time-series variation is that some behavioral reasons cause a time-lag for responding to a change in tax disincentives. Alternatively, the shareholders sold stocks when the firms pay dividends. This interpretation appears to be plausible from the economic theory because an increase in tax rate is relevant only for dividend income. Figure 2B examines this possibility. The two lines represent the ratio of firms that pay dividend among firm-years with at least a seller, and the ratio of dividend paying firm-years in our whole sample. This table shows that firms that pay dividends are more likely to have a seller

in the years with the tax reforms. However, we do not observe a clear relation between stock selling and dividend payments in other years. Therefore, the dividend payment does not appear to explain the time-series variation in stock selling, and it would be more likely to be explained by behavior reasons.

4.2. Ownership distribution before selling stocks

We examine the ownership distribution of the treated shareholders before selling the stocks. We predict that those investors with ownership stakes close to the thresholds are more likely to sell stocks below the thresholds, because such investors can avoid a tax increase by adjusting their ownership stakes relatively slightly.

Figures 3A and 3B present the distribution of individual shareholders' ownership shares one year before the 2003 and 2011 tax reforms, respectively, when the investors sold stocks and remained in the panel data. Figures 3C and 3D present the corresponding distribution when the investors sold stocks and disappeared from the large holder's list.

Figure 3A shows that the distribution is single-peaked whose peak is just above the 5 ownership shares. This is consistent with our prediction. Note that some investors' ownership shares are already below the 5% threshold in this figure. This is because of the exception in our rule about the classification of sellers: those investors who sold their stocks between January to March 2003 is treated as a seller even though they sold stock a few months before the 2003 tax reform.

Figure 3B shows that the distribution is bi-peaked whose peaks are just above the 3% ownership shares and just below the 5% ownership shares. The peak around 3% ownership shares is consistent with our prediction. The mass just below the 5% ownership share suggests that those shareholders that had sold their stocks in response to the 2003 tax reform sold the stocks again after the 2011 tax reform. The number of such shareholders (shareholder-year observations) is 155 (310). Thus, we detect that some shareholders are highly sensitive to tax incentives.

Figures 3C and 3D also exhibit a similarly shaped distribution. However, the dispersion of the distribution looks larger in Figures 3C and 3D than Figures 3A and 3B. This wider dispersion in the former two figures would suggest that non-tax factors largely affected the decision to sell stocks for investors that disappeared from the large shareholder list; otherwise, it is relatively less likely that investors changed their ownership stakes when they are not close to the thresholds.

4.3. Ownership distribution after selling stocks

We examine the distribution of ownership stakes after the treated shareholders sold stocks. We present the distribution only for the investors who remained in the panel data after selling stocks, which correspond to investors included in Figures 3A and 3B. This is because we cannot observe the *ex post* ownership shares of investors who disappeared from the large shareholder list.

Figures 4A and 4B show the distribution of ownership after selling stocks in response to the 2003 and 2011 tax reforms, respectively. In both figures, we see a large mass just below the thresholds. The number of shareholder-year observations within the 0.1 points below the threshold is 170 in Figure 4A, and it is 352 in Figure 4B. Therefore, the mass is larger for the 2011 tax reform relative to the 2003 tax reform. In addition, the median difference between the threshold and the ownership shares after selling stocks is 0.05 percentage points after the 2011 tax reform, and it is 0.4 percent points after the 2003 tax reform. These findings suggest that the response to the tax incentives is clearer under the 2011 tax reform, possibly because of learning effects of tax avoidance schemes among investors.

4.4. Substance of ownership change

In the previous subsection, we have focused on who sold stocks. In this subsection, we examine who bought the stocks. In particular, we study if the stock selling induced by the tax reforms lead to a nominal or real change in ownership. As a possibility, the buyer can be a shareholder controlled by the seller such as the seller's personal asset management company, which is wholly owned by the seller. Alternatively, the seller may sell stocks to their family members. In these cases, the changes in ownership appear to be nominal. Second, the buyer can sell stocks in markets. In this case, the change in ownership is a real one.

Our panel data allow us to examine this issue by tracing the changes in ownership stakes across time. For example, if an individual shareholder sold their stocks by 4 percentage points, and another shareholder's ownership share is increased by the same amount within the same firm-year, it appears to be plausible to infer that there existed a transferring of stocks among these shareholders. We define the difference between the amount of stocks sold and bought as a seller-buyer difference. In this example, the seller-buyer difference is zero.

We turn to a more precise explanation of the procedure to find the seller-buyer link. We first calculate the stocks sold by the treated investors in response to the tax reforms. This is the difference in the ownership share between the year when the investor sold stocks to below the relevant threshold and that in the previous year. We then find another investor who bought the same amount of stocks. When we cannot find an investor who bought exactly the

same amount of stocks, we define that the investor that makes the seller-buyer difference smallest as the buyer.

In some cases, two or more individual shareholders sold the stocks in response to the tax reform in the same firm-year. This case happened 17.2% of the firm-years with sellers that remained in the data, and 6.7% of the firm-years with sellers that dropped from the data. We first aggregate the amount of the stocks sold by the multiple shareholders, and we find a buyer with the smallest seller-buyer difference. We also examine the possibility that each investor sells stocks to a different shareholder. For example, we found some firm-years where Shareholder A sold stocks to Personal Asset Management Company X, and Shareholder B sold stocks to Personal Asset Management Company Y. If the latter case allows a smaller seller-buyer difference, we choose these shareholders as the buyers.

The unit of analysis is reduced to the firm-year level in this subsection. This is because we investigate a potential transfer of stocks among shareholder in the same firm-year, and therefore our analysis is based on a change in ownership at the firm-year level. The number of firm-years that include at least one seller-buyer link is 906 for the case that a buyer remained in the data, and it is 359 for the case that a buyer dropped from the data. The number of seller-buyer links is 966 for the former and 379 for the latter. Note that the number of buyers and that of sellers can be different for two reasons. First, two or more sellers can sell stocks to one shareholder in the firm-year. This decreases the number of buyers relative to that of sellers. This situation was common when the same family members of the firm-year sold their stocks to their personal asset management companies. Second, one shareholder can sell stocks to multiple buyers. This happened in some cases where the seller sold stocks to multiple family members. This case increases the number of buyers relative to that of sellers.

Buyers are classified into the following ten categories: personal asset management companies; other firms; company's own stocks; family members; non-family members; foundations; financial institutions; employee (or affiliated company) stock ownership plans; trust accounts; and others. Our dataset tells whether the shareholders are firms, individuals, foundations, financial institutions, employee (or affiliated company) stock ownership plans, or trust accounts. Therefore, some classifications are not clear from the original definition of the data. Thus, we make additional classifications by hand.

The most important distinction for our study is among corporate shareholders. We first make a classification based on the corporate shareholders' name; if the name of the corporate shareholder includes the name of the seller of the company, we classify the

corporate shareholder into a personal asset management company. When this condition is not satisfied, we use internet search to find a document to see if the seller manages the company. In many cases, such documents explicitly state that the purpose of the company is to manage the corporate managers' assets. If we cannot obtain clear evidence that the company is managed by the seller, we classify the firm as other firms. It is also important to distinguish between family shareholders and non-family shareholders. We classify that the individual shareholder is a family member if they share the same last name.

Figures 5A and 5B report the distribution of stocks sold by the sellers when the seller remained in the data and when they dropped from the data, respectively. We represent the amount of stocks sold in the negative values to compare our finding from these two figures with that from Figures 6A and 6B, which we will show later. Figure 5A shows that the amount of stocks sold in response to the tax reforms are relatively close to zero with its mean and median values of -3.98 and -1.98 percentage points. Figures 5B shows that the distribution of the sold amounts is more dispersed than Figure 5A with its mean and median values of -10.86 and -7.93 percentage points, respectively. This appears to be reasonable because these sellers in Figure 5B dropped from the large shareholder list and thus the amounts sold are large.

Table 3 reports the classification of the buyer types. This table includes seller-buyer links where sellers remained in the data. We report the classifications when the seller-buyer difference is 0.02 points or less. This means that the difference is almost zero but we allow for potential issues related to rounding numbers. We also report the cases only when the aggregated stock sold is one percent points or larger, because it is difficult to accurately classify buyer types when the amount sold is too small. In addition, when the aggregated stocks sold is small, changes in the ownership structure are relatively less important. Thus, it is sensible to restrict our classification to the seller-buyer link where the shareholder sold a relatively large amount of stocks for our purpose.

Table 3 reports that the number of seller-buyer links that satisfy the above conditions is 166. Among them, stocks are transferred to personal asset management companies in 135 (81.3%) of the cases. In addition, stocks are transferred to family members and their foundations in 7 (4.2%) and 3 (1.8%) cases. In total, the stocks are transferred to these shareholders in almost 90% of cases. Given that these shareholders are closely affiliated to the

seller, the change in ownership is completely nominal in these cases.⁵

We cannot conclude, however, that the change in ownership induced by the tax reform is completely nominal from Table 3. This is because the table examines only a subset of firm-years that include a seller. We then more generally calculate the seller-buyer difference that is adjusted for the amounts transferred to related parties. We assume that the related parties include personal asset management companies, family members, and foundations. More specifically, we subtract the stocks bought by these three types of investors from the total amount of stocks sold by the sellers.

Figures 6A and 6B report the distribution of this adjusted seller-buyer difference respectively when the sellers remained in the data and when they dropped from the data. Figure 6A shows that the distribution is more centered around zero compared to Figure 5A. This finding suggests that some investors transferred their stocks to related parties to maintain their ownership stakes. In Figure 6A, the mean and median values of the adjusted seller-buyer ownership difference is -1.53 and -0.72 percentage points, respectively. These numbers are smaller than those from Figure 5A with mean and median values of -3.98 and -1.98.

To quantify the impact of the stock transfers, we calculate a real ownership change ratio: the adjusted negative seller-buyer difference divided by the total amounts of stocks sold in percentage. This variable presents the real change in ownership after adjusting the stock transfers. Its mean value is 65.9%. In other words, 34.1% of the change in ownership is a nominal one. We also find that this variable takes a value of 100% for 572 firm-years (63.1% of firm-years). This observation implies that there is a considerable heterogeneity in arranging tax avoidance schemes.

Figure 6B shows a similar pattern with a larger dispersion. The mean and median values of the adjusted seller-buyer ownership difference is -8.94 and -6.41 percentage points, respectively. The real ownership change ratio is 85.4%, and this variable takes a value of 100% for 277 (77.2%) firm-years. Thus, it is more likely to observe a real change when the investors disappeared from the large shareholder list relative to the case where the investors remained in the data. These findings support that tax reforms affect stock ownership, but the change is not necessarily a real one.

5. Conclusion

We employed two tax reforms in 2003 and 2011 in Japan that raised the dividend tax rates for

⁵ We do not report the case where the firm-years include sellers that disappeared from the data. This is because the criterion of the absolute buyer-seller difference of 0.02 percentage points is so strong that no observations can satisfy this criterion.

individual investors whose ownership shares are at or above statutory thresholds. We tested whether taxes affected stock selling using these tax reforms as a quasi-experiment. We provided clear evidence that the affected investors sold stocks to avoid the increase in tax burden. We also found that some investors' reaction to these tax reforms is stronger relative to other investors. This finding suggests that there exists heterogeneity in tax preference among individual shareholders.

We also found that not a small fraction of “sales” documented in this paper took place between related parties; we found that a one-third of stock transactions are classified in this category. Therefore, our finding suggests that tax incentives may not affect the substance of ownership.

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Table 1
Dividend tax rates for individual shareholders

This table reports the dividend tax rates for individual shareholders. An LIS refers to a Large Individual Shareholder. An LIS is an individual shareholder with ownership stake of at 5% or higher up to September 2011 and at 3% or higher and below 5% from October 2011.

| | Dividend tax rate | | |
|---------|-------------------|---------|-------------------------|
| | LIS | Non-LIS | Difference in tax rates |
| 2002 | 40.6% | 20% | 20.6 points |
| 2003 | 40.6% | 10% | 30.6 points |
| 2004 | 40.6% | 10% | 30.6 points |
| 2005 | 40.6% | 10% | 30.6 points |
| 2006 | 40.6% | 10% | 30.6 points |
| 2007 | 43.6% | 10% | 33.6 points |
| 2008 | 43.6% | 10% | 33.6 points |
| 2009 | 43.6% | 10% | 33.6 points |
| 2010 | 43.6% | 10% | 33.6 points |
| 2011 | 43.6% | 10% | 33.6 points |
| 2012 | 43.6% | 10% | 33.6 points |
| 2013 | 43.684% | 10.147% | 33.5 points |
| 2014 | 49.545% | 20.315% | 29.2 points |
| Average | 42.9% | 11.6% | 31.3 points |

Table 2
Number of observations

This table reports the number of observations. The unit of observations is shareholder-year.
The year periods are between April 2002 and March 2014.

| | Observations |
|--|--------------|
| All shareholder-year observations | 535,076 |
| Individual shareholder-year observations | 57,335 |
| Details on individual shareholder-year observations | |
| Individual shareholder-year observations that appeared on the data between April 2002 and March 2003 | 4,931 |
| Individual shareholder-year observations that appeared on the data between October 2010 and September 2011 | 4,913 |
| Individual shareholder-year observations that appeared on the data at either of the above time periods | 9,844 |
| Individual shareholder-year observations that appeared on the data at both of the above time periods | 5,650 |
| Individual shareholder-year observations that are affected by the tax reforms | |
| Individual shareholder-year observations that are affected by the April 2003 tax reform | 1,564 |
| Individual shareholder-year observations that are affected by the October 2011 tax reform | 1,061 |
| Individual shareholder-year observations that are affected by either of the tax reforms | 2,625 |
| Individual shareholder-year observations that are affected by both of the tax reforms | 285 |

Table 3
Buyer type

This table reports the shareholder who bought the stocks sold in response to the tax reforms.

| Buyer | Number |
|-----------------------------------|--------|
| Personal asset management company | 135 |
| Family | 7 |
| Financial institution | 7 |
| Own company | 6 |
| Non-family person | 4 |
| Foundation | 3 |
| Other company | 3 |
| Trust account | 1 |
| Total | 166 |

Figure 1A
Individual shareholders' ownership shares between April 2002 and September 2011

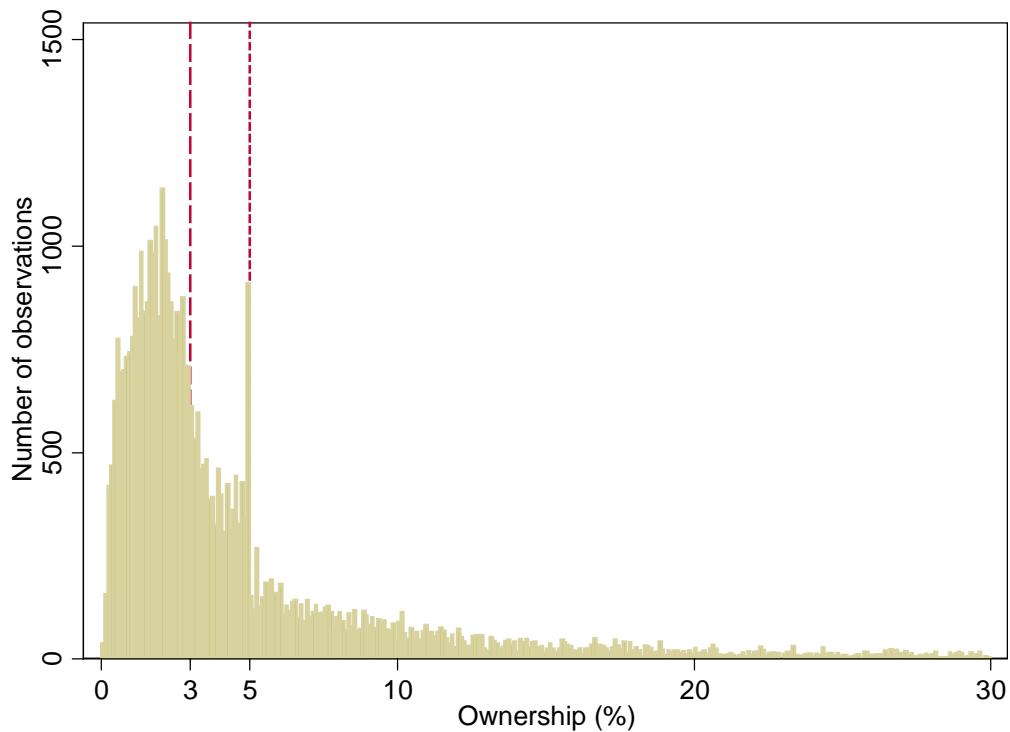


Figure 1B
Individual shareholders' ownership shares between October 2011 and March 2014

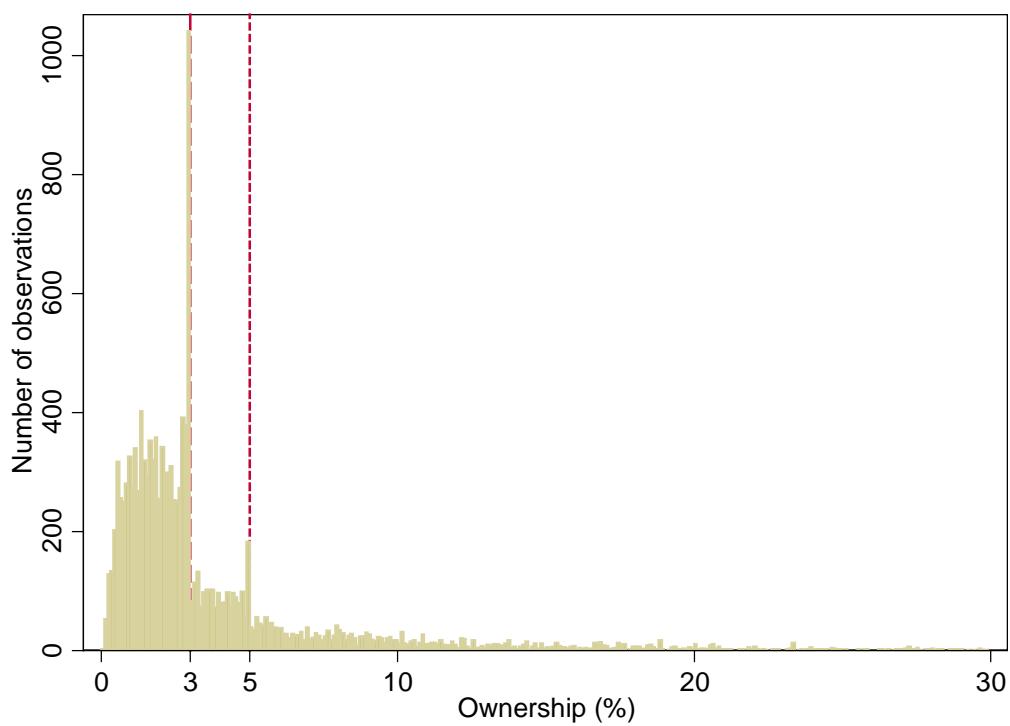


Figure 2A
Number of sellers

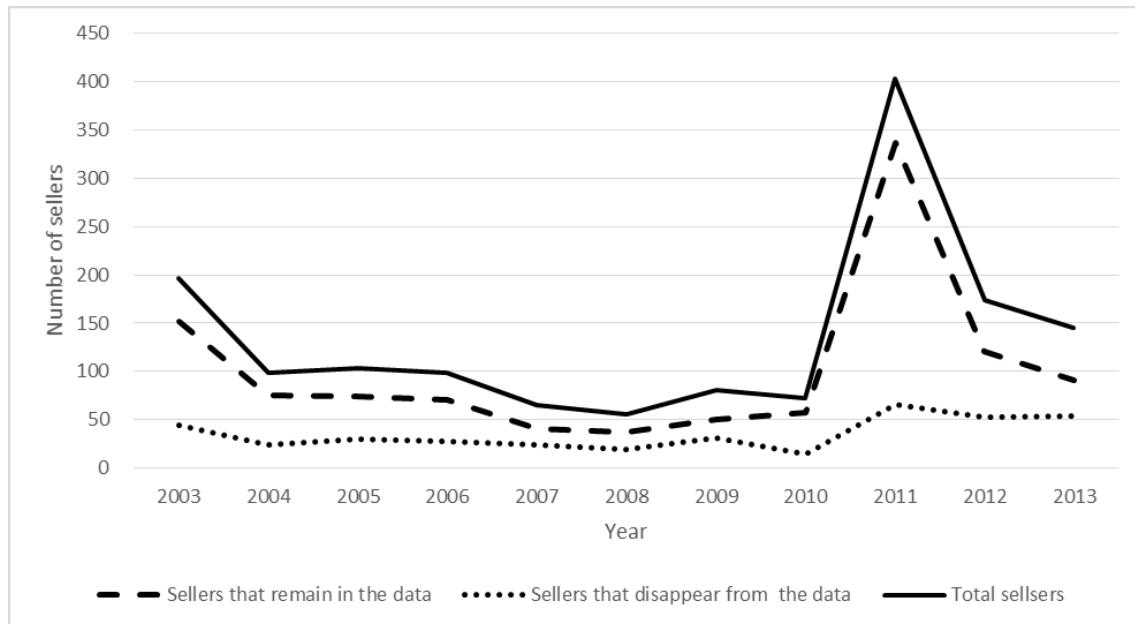


Figure 2B
Ratio of dividend paying firms

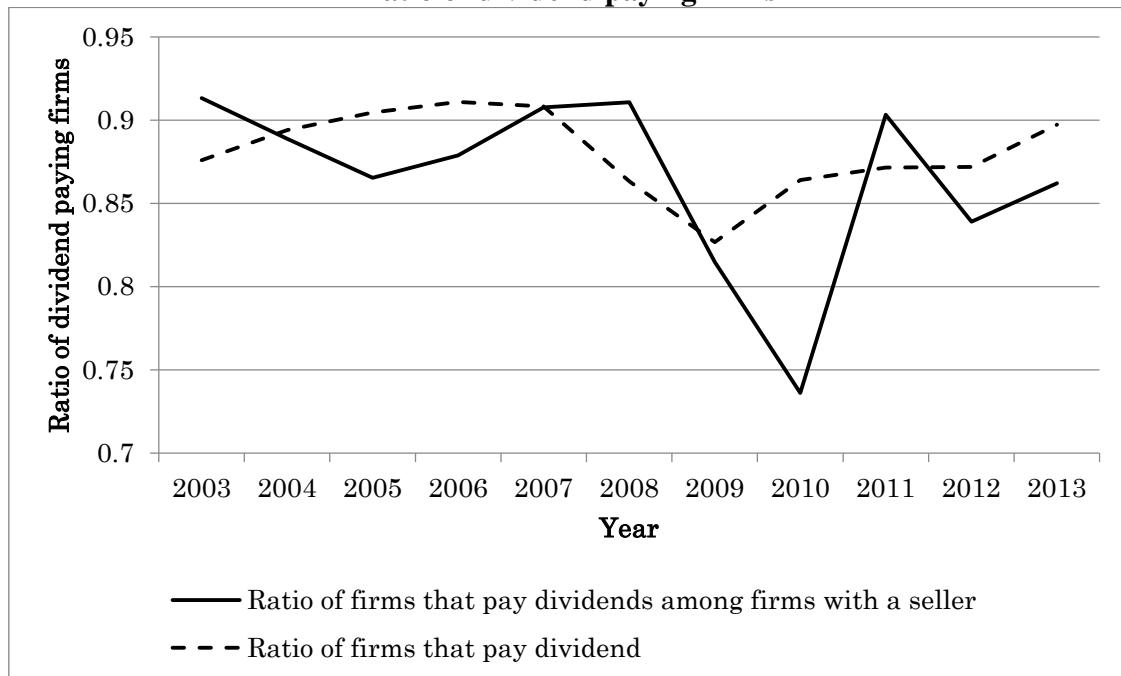


Figure 3A
Sellers' ownership shares before selling stocks between April 2002 and September 2011
(Shareholders that remained in the data)

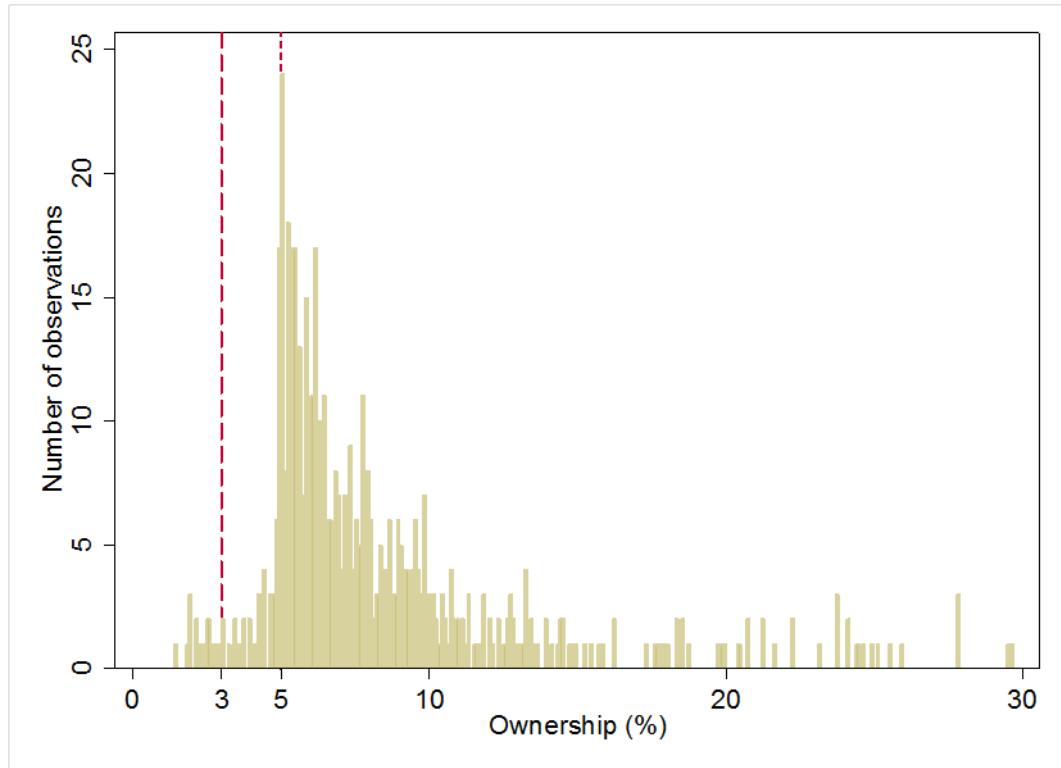


Figure 3B
Sellers' ownership shares before selling stocks between October 2011 and March 2014
(Shareholders that remained in the data)

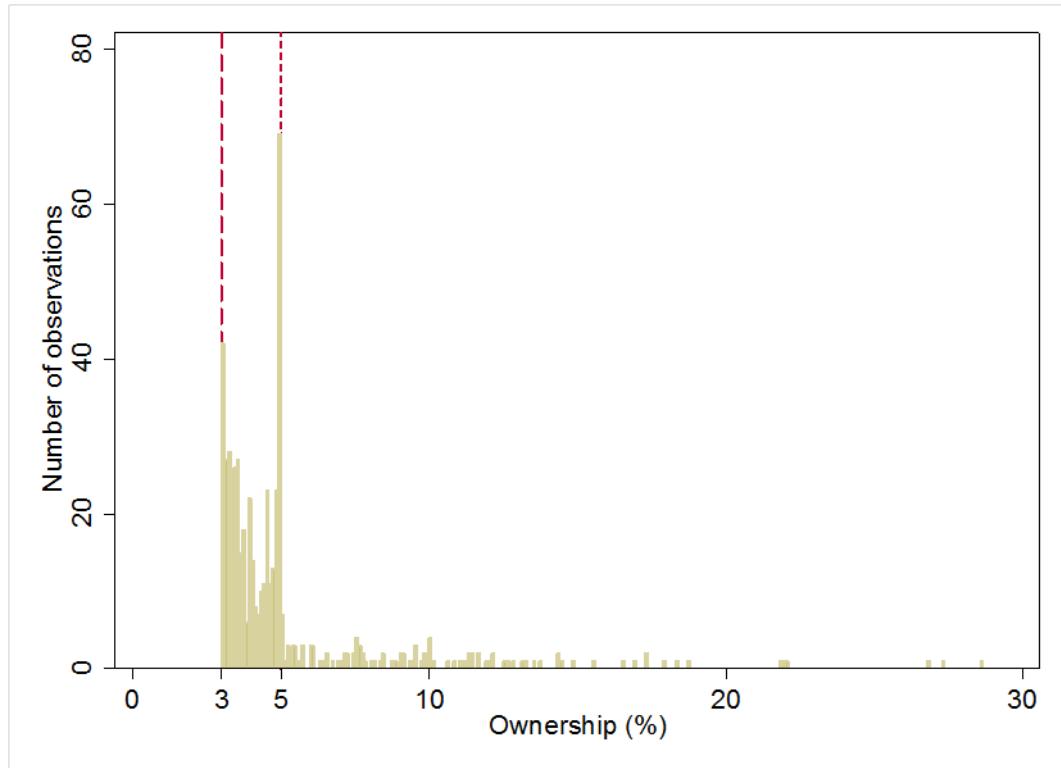


Figure 3C
Sellers' ownership shares before selling stocks between April 2002 and September 2011
(Shareholders that disappeared from the data)

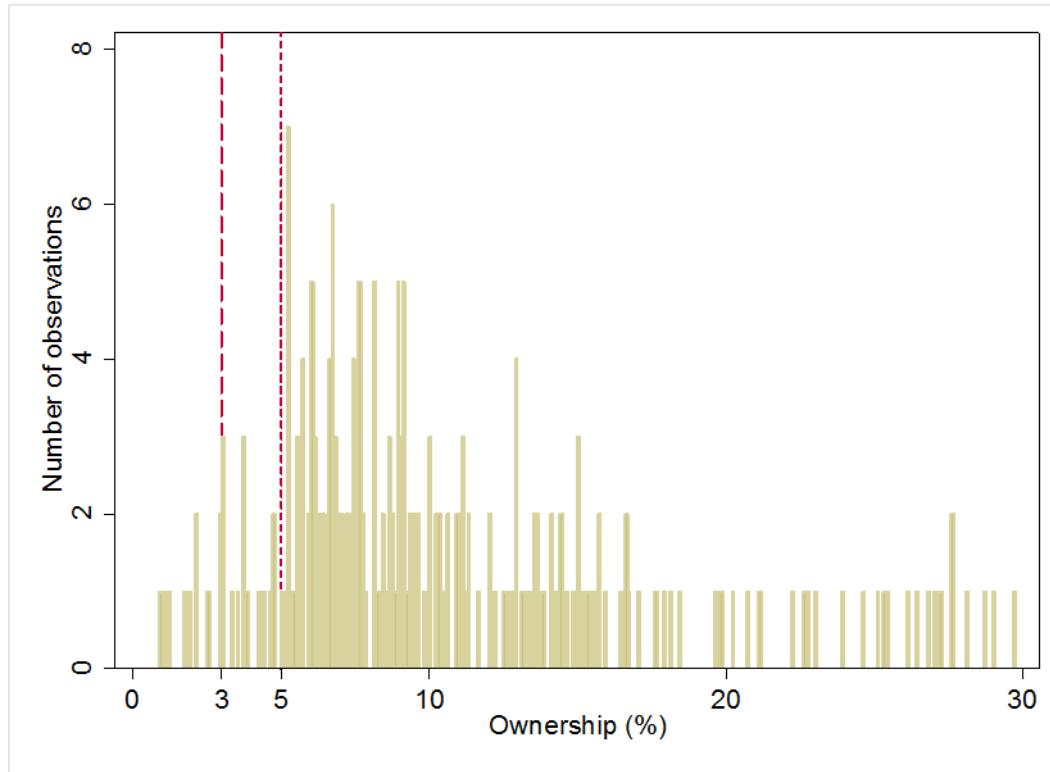


Figure 3D
Sellers' ownership shares before selling stocks between October 2011 and March 2014
(Shareholders that disappeared from the data)

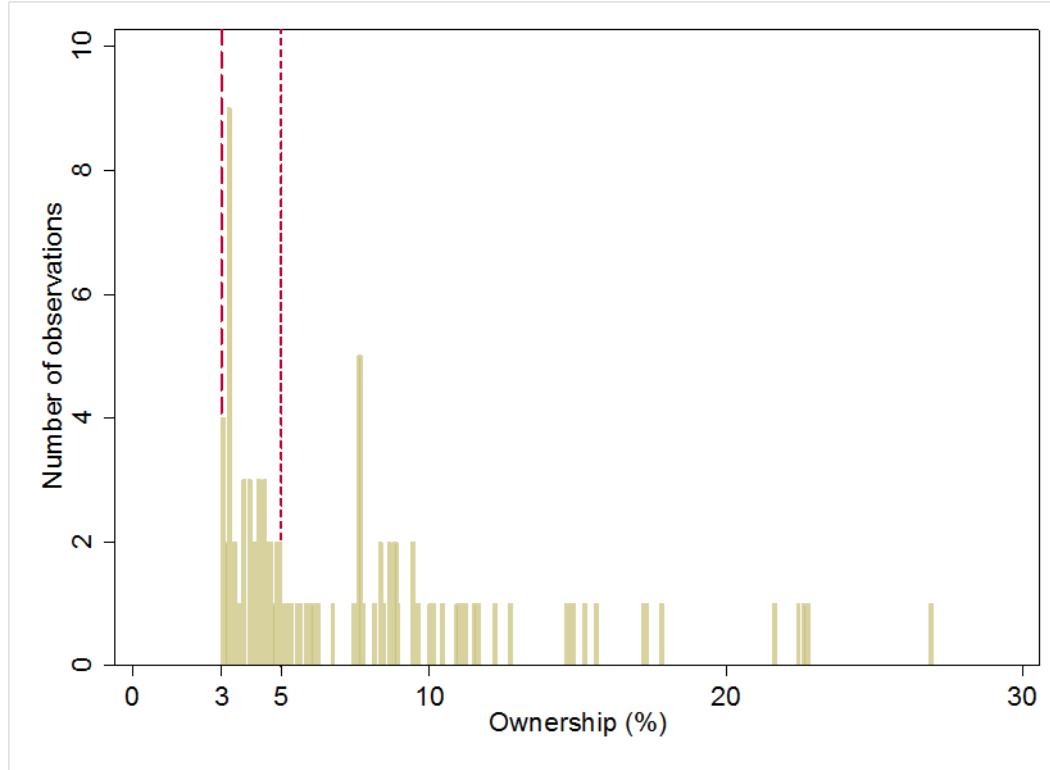


Figure 4A
Sellers' ownership shares after selling stocks between April 2002 and September 2011

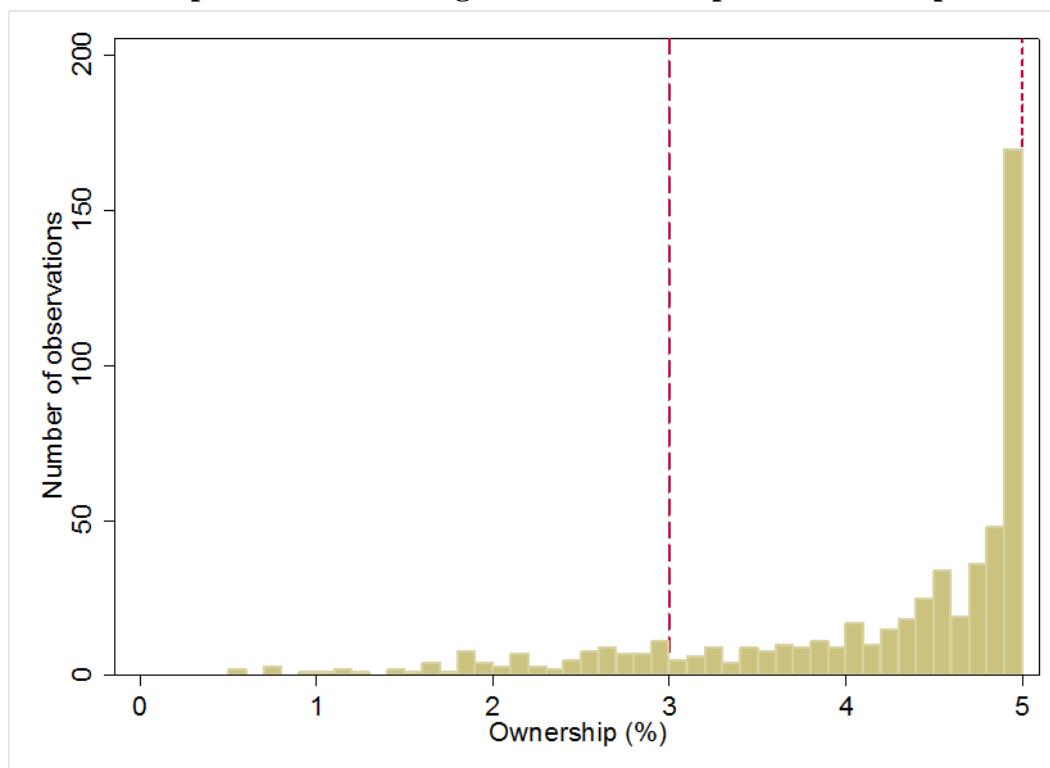


Figure 4B
Sellers' ownership shares after selling stocks between October 2011 and March 2014

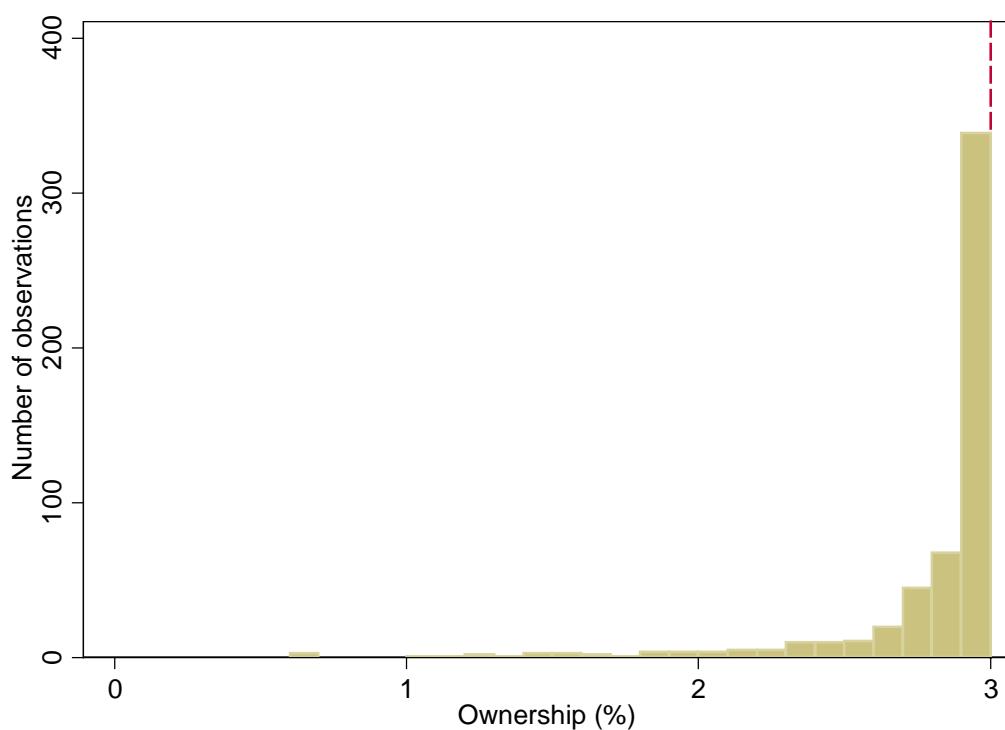


Figure 5A
Seller-buyer difference
(Shareholders that remained in the data)

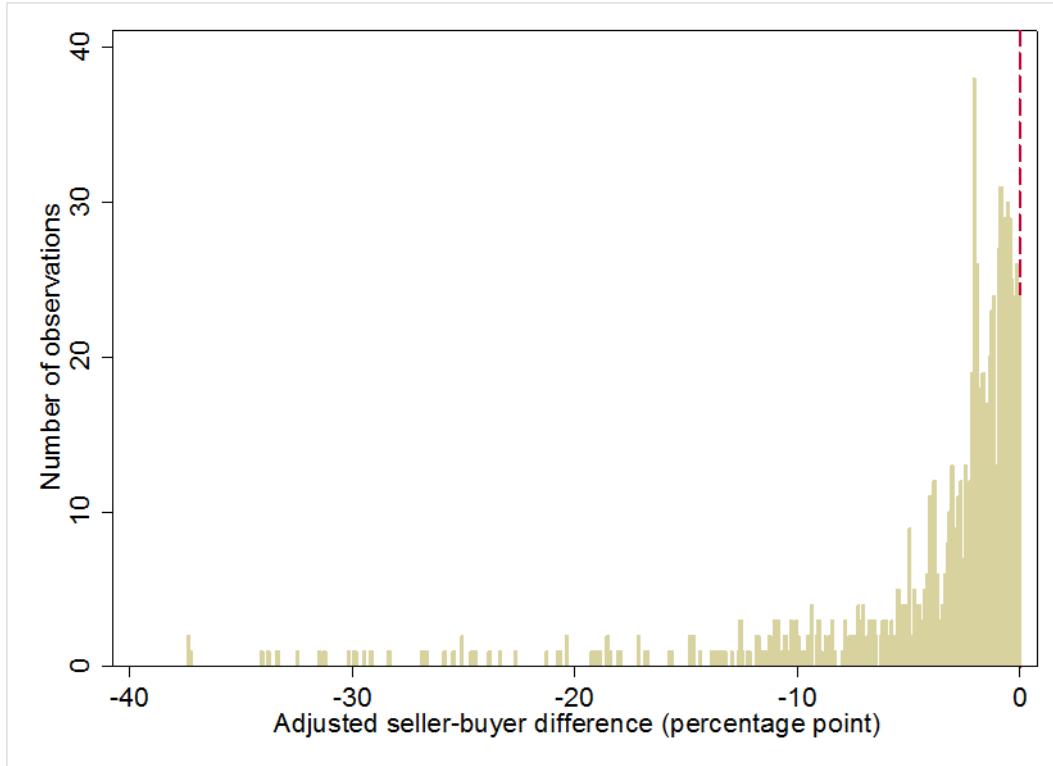


Figure 5B
Seller-buyer difference
(Shareholders that disappeared the data)

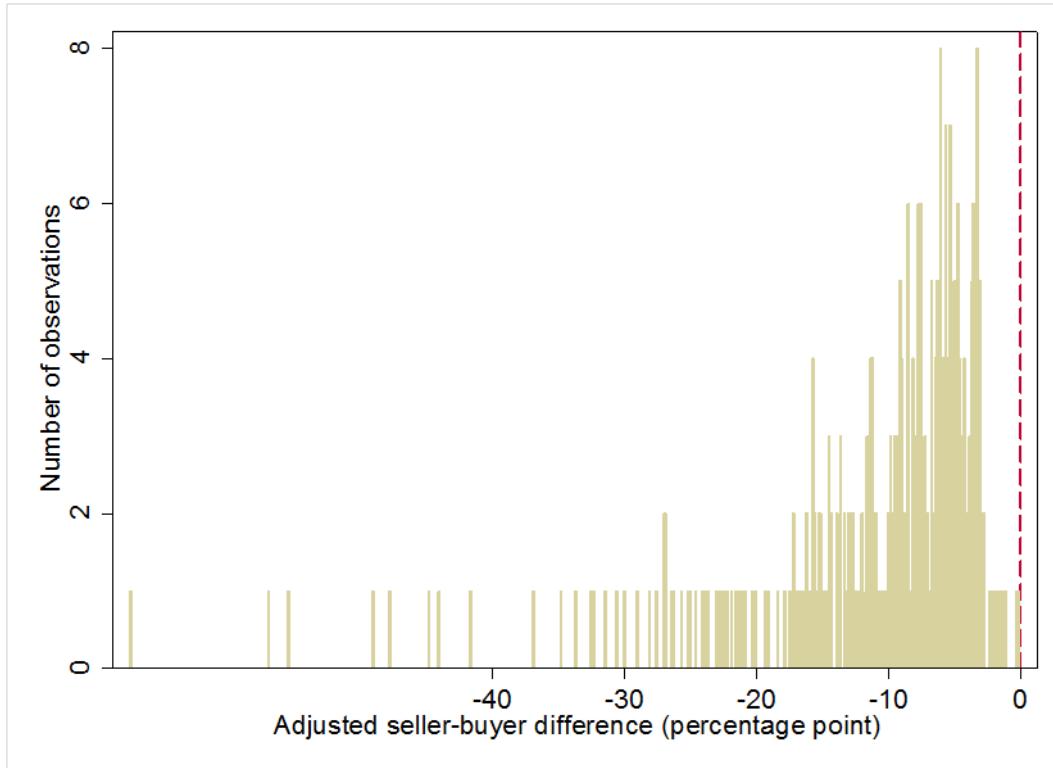


Figure 6A
Seller-buyer difference adjusted for stock transfers between them
(Shareholders that remained in the data)

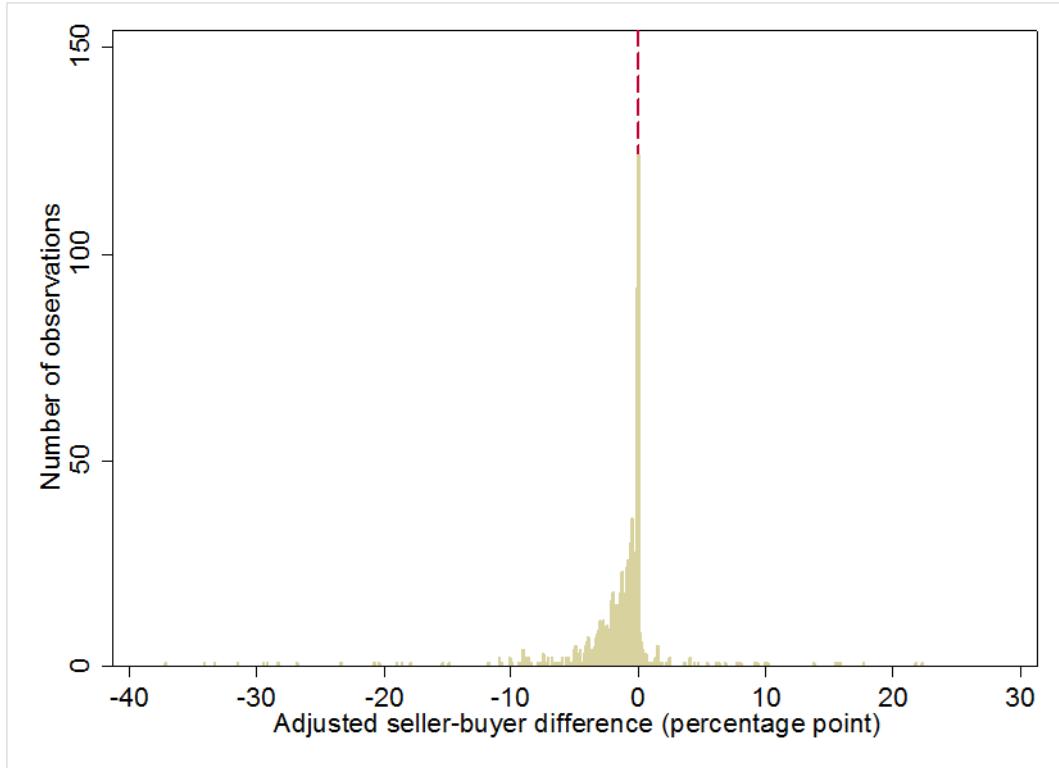


Figure 6B
Seller-buyer difference adjusted for stock transfers between them
(Shareholders that disappeared the data)

