The Effect of Public Disclosure on Reported Taxable Income: Evidence from Individuals and Corporations in Japan

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Abstract: The potential behavioral response to public disclosure of income tax returns figures prominently in policy debates about its advisability. Although supporters stress that it encourages tax compliance, policy debates proceed in the absence of empirical evidence about this, and any other, claimed behavioral impact. This paper provides the first such evidence by examining the behavioral response to the Japanese tax return public notification system. The analysis suggests that, when there is a threshold for disclosure, a non-trivial number of both individual and corporate taxpayers whose tax liability would otherwise be close to the threshold will underreport so as to avoid disclosure, provoking a response of the opposite direction than what supporters stress. An analysis of public corporations' financial statements offers no evidence that these companies' taxable income declined after the end of the disclosure system.

1.   **Introduction and Motivation**

  1.1.   **Background**

Public disclosure of income tax return information is an intriguing potential tax system

policy instrument. The U.S. income tax contained disclosure provisions during the Civil War,

and again in the 1920's and 1930's; disclosure of corporate tax information received a flurry of

attention in 2003. Norway, Sweden, and Finland all currently have a policy requiring the public

disclosure of taxable incomes. In Japan, the focus of this study, public disclosure of income tax

information was required from 1950 until 2004.

Supporters of tax disclosure argue that it reduces tax evasion. One of its early American

supporters, progressive Senator Robert LaFollette, Jr., argued in the 1930s that if a person

"knows that his return is a matter of public record, he will hesitate a long time before he will

resort to any device designed to relieve him of his fair share of the tax."[1] Others have argued that

the information provided by public discourse enriches the public debate about tax policy.

Opponents decry the invasion of privacy. An opponent of the earlier U.S. disclosure

regime, Senator Louis Murphy (D-IA), stated that disclosing income tax data is equivalent to

taking "the curtains and shades from the homes of our taxpayers and pulled out the walls of the

bathroom to assure that the Peeping Toms shall have full and unobstructed opportunity to feast

their eyes on the [tax return]."[2] Some who oppose disclosure worry that public access to such

information will expose taxpayers, particularly wealthy ones, to those who might take advantage

of that information. This was also one of the principal arguments made leading up to the

elimination after 2005 of the Japanese system (Tax Advisory Commission, 2005). Similarly,

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[1] Robert LaFollette, Jr., in U.S. Congress, Senate, *Congressional Record*, 73d Cong., 2nd sess., 1934, 78, pt 6:6553; cited in Leff (1984, p. 69).
[2] Leff, (1984, pp. 70-71)

opponents of corporate tax disclosure assert that disclosure would impose unnecessary loss of proprietary information for firms (Lenter, Shackelford and Slemrod, 2003).

Although 1935 marked the end of the public disclosure of income tax information in the U.S., in the wake of the Enron and WorldCom scandals there was a recent burst of interest in the issue of the public disclosure of corporate tax return information. In April, 2003 a bill was introduced into Congress that would have provided for public disclosure of certain corporate tax return information; it was not enacted. Recently, an article in the *New York Times* (Feb 13, 2010) entitled "Should Tax Bills Be Public Information?" has brought this topic back in to the public debate (Bernasek, 2010). Although the effect of alternative disclosure regimes on taxpayer behavior is a prominent issue in the debate, it necessarily proceeded in the complete absence of empirical evidence about what these effects might be. In particular, we know essentially nothing about the impact of disclosure rules on compliance behavior.[3]

In this paper we begin to fill the vacuum of empirical evidence about the behavioral response to disclosure by offering some evidence from the Japanese experience with public disclosure. Our analysis of the Japanese evidence suggests that, when there is a threshold for disclosure, a non-trivial number of taxpayers, both individual and corporate, whose tax liability would otherwise be close to the threshold underreport so as to avoid disclosure, provoking a response in the opposite direction (i.e., toward *reduced* reports of tax liability) than what supporters of disclosure stress. An analysis of public corporations' financial statements offers no evidence that these companies' taxable income declined after the end of the disclosure system.

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[3] Laury and Wallace (2005) use experimental methods to analyze the relationship between the perceptions of confidentiality and taxpayer compliance, and find some evidence suggesting that when individuals perceive a breach of confidentiality, they increase their level of compliance.

1.2. Experience with Disclosure in the U.S. and Other Countries

Disclosure has figured prominently in the history of the U.S. income tax.[4] The first U.S. income tax, enacted during the Civil War, included publicity features. The 1862 Act permitted the public to examine the names of taxpayers and the amounts of their tax liabilities and, with the Revenue Act of 1864, newspapers started to publish lists of taxpayers, their reported incomes, and the amounts of taxes they paid.[5] In 1870, however, a new commissioner of the Bureau of Internal Revenue barred assessors from providing tax lists for publication, and a statute from Congress prohibited the publication of all or any part of an income tax return, although the public was still permitted to inspect returns. In 1871, the income tax was allowed to expire, in part, because of privacy concerns (Pomp, 1993).

The modern U.S. income tax was introduced in 1913, and the Revenue Act of June 2, 1924 made public the names and addresses of individuals and corporations filing returns along with their respective tax payments. Before the 1924 elections, newspapers across the country published the names and tax payments of large companies, celebrities, and local residents. President Calvin Coolidge, elected in 1924, and his Secretary of Treasury, Andrew Mellon, vigorously opposed making tax return information public. They and other opponents of publicity argued that disclosure gave hucksters access to names of wealthy taxpayers to target for scams, compromised business secrecy, and proved useless – and perhaps harmful – to tax administration and collection efforts. With the passage of the Act of Feb. 26, 1926, the law was changed so that only the names and addresses of taxpayers, and not their tax liabilities, were public.

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[4] A more complete discussion of tax disclosure in the U.S. and other countries is presented in Lenter, Shackelford, and Slemrod (2003), on which this discussion draws.
[5] The wording of the initial 1861 Act suggested that tax assessment information was public, but because collection efforts were minimal, this Act never truly took effect.

After a 1934 Senate committee investigating financial institutions in the aftermath of the 1929 stock market crash revealed that many owners of those institutions had paid no income tax in the years since the crash, Congress inserted a publicity provision in the 1934 Revenue Act. The Act required individuals and corporations to attach to their returns a form, dubbed the "pink slip," that would become a public record. This pink slip contained the taxpayer's name, address, gross income, amount of deductions, net income, and tax liability. This provision generated intense controversy. Proponents of publicity made a range of arguments: making tax information public would help Congress close loopholes that permitted tax avoidance; publicity would help keep tax administration honest by preventing officials from favoring high-income taxpayers; publicity was necessary if the tax rules were to be *seen as* fair; and if wealthy taxpayers knew tax information was public, they would not engage in transactions that would reduce their tax liability. Opponents argued that publicity was an invasion of privacy and, in the case of companies, would give competitors valuable proprietary information. One month before tax returns were due to be filed (in 1935) a campaign to repeal the pink slip provision urged people – many of whom were not affected by the pink slip provision – to send mock pink slips to their representatives in Congress and to send letters and telegrams opposing disclosure. Soon thereafter Congress passed a statute that repealed the pink slip provisions, and President Roosevelt signed the bill into law before the publicity provisions requiring disclosure came into effect.[6]

No similar disclosure provision has been implemented since that time in the U.S. at the federal level, and there are now stringent provisions that limit the dissemination of tax return

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[6] This episode is described in Kornhauser (2002) and Leff (1984).

information, even within the U.S. government.[7] Among OECD countries, Norway,[8] Sweden,

Finland, and (until it was abolished in 2005) Japan, currently permit some form of public access

to the information in the corporate tax return.

In certain countries, there is public disclosure of information about tax *evaders*. For

example, under Greek law the presentation of a new budget is accompanied by the names of tax

evaders in the previous year compiled by the finance ministry. In New Zealand the

Commissioner of Inland Revenue regularly releases a document entitled "Tax Evaders Gazette"

that lists those taxpayers who have been prosecuted or had penal tax imposed for evading their

taxation obligations; as of April 1997 the Commissioner is able to also publish the names of

those taxpayers involved with "abusive tax avoidance." The Canadian Customs and Revenue

agency compliance strategy includes publicizing court convictions for tax fraud. In Ireland, a list

of tax defaulters is published on a quarterly basis in Iris Oifigiuil, the official newspaper of

record, and is routinely reported in national and local newspapers. The 2009 Budget of the

United Kingdom provides for their tax authority to publish the names and details of individuals

and companies who are penalized for deliberate defaults leading to a tax loss exceeding £25,000.

2.   The Japanese Income Tax Disclosure Regime

Concern about tax evasion figured prominently in the development of a post-war Japanese

income tax system. In a thoroughgoing post-war income tax revision of 1947, a third-party

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[7] Many of these restrictions on intergovernmental tax disclosure were put in place in response to Richard Nixon's attempts to obtain taxpayer information from the IRS for political purposes not authorized by law (Benedict and Lupert, 1978). Some allowance for disclosure within the U.S. government is allowed by §6103(i)(3) of the Internal Revenue Code, which allows for disclosure of tax return data by the IRS to other governmental agencies if the information is evidence of the violation of a federal crime.

[8] Norwegian tax returns have been public information since 1863, but until 2002 it was only possible to see other people's tax information by applying in person at a tax office. In 2002 the information was published, and made easily searchable, on the Internet or through a text-messaging service for mobile phones (BBC News web site, October 11, 2002).

reporting system (offering a reward if the information provided contributed to discovering tax evasion) and a tax return inspection system (under which for a fee private citizens could inspect all tax returns) were introduced. However, based on the Shoup Mission report of 1949, the tax return inspection system was abolished and, in 1950, the taxpayer notification system for high-income taxpayers was introduced in its place. The third-party reporting system was abolished in 1954, but the high-income taxpayer notification system continued until tax year 2004. The last notification in 2005 corresponded to tax year 2004 information.

The high-income taxpayer notification system was designed to prevent underestimated tax declarations and tax evasion. The idea was that the system would introduce the possibility that tax evasion would be discovered by third parties if the amount of a declaration was strikingly low compared to the lifestyle and other publicly known information about the taxpayers. Under the notification system, the name, address, and the amount of taxable income (until tax year 1982) or income tax liability (after 1982) of the affected taxpayers were publicly posted (e.g., on the bulletin board) of each tax office for a period of about two weeks. The information was often collected and published by private companies, and frequently attracted media attention.

The same objective motivated the corporate notification system, which was introduced at the same time. Disclosure applied to corporations whose taxable income exceeded thresholds as noted in Table 1. The information disclosed included the corporate name, taxable income, the tax office to which the tax was remitted, the name of the company's president, and the beginning and ending day of the accounting year. The information was usually posted publicly at the tax office within three months after the company submitted its tax return, and was public for at least one month. Although the corporate tax information apparently attracted less frequent media

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attention than the individual tax information, it was at times collected and published by private publishing companies.

While many of the features of the corporate disclosure system were similar to the individual disclosure system, unlike the case of individuals, corporations could not escape disclosure by first understating their tax liability and then later correcting the report. This is because the corrected report would also be subject to disclosure. However, if reported corporate tax liability was changed on the initiative of the tax office, the new liability was not subject to disclosure, but was subject to penalties for understatement of tax liability.[9]

From the beginning of the notification system, disclosure was required only of taxpayers whose reports exceeded a high threshold of tax liability or taxable income. Until tax year 1982 [10]the threshold for individuals was defined in terms of taxable income, and thereafter it was defined in terms of tax liability. For corporations, the threshold was defined in terms of taxable income for all the years of the disclosure regime. The thresholds were high enough so that, over the course of the disclosure law, only between 0.9 percent and 6.7 percent of individual taxpayers were subject to the notification rule. In 2004, 2.4 percent of all corporations were subject to disclosure. The cutoff for disclosure was increased five times over its life. Table 1 presents relevant statistics about the evolution of the system.

In its 2005 report, the Japanese Tax Advisory Commission recommended the elimination of the notification system, asserting that it "is being utilized in various ways inconsistent with its initial aim, and there are various reports of the disclosure being a factor in causing crimes and harassment…Based on circumstances such as these, the system of disclosure should be

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[9] Anecdotal evidence gathered from conversations with Japanese tax professionals suggest that companies would occasionally understate their tax liability to escape disclosure with an implicit understanding with the tax office that it would correct the report without penalty, thus undermining the disclosure but not underpaying their tax liability.
[10] The Japanese tax year goes from January 1 to December 31.

abolished."[11] Following this recommendation, the notification system was abolished by the Act

on the Protection of Personal Information, which became law on April 1, 2005. This Act

stipulated that the last notification date for individuals was May 31, 2005, and was February,

2006 for corporations.[12]

Because the notification process reveals the number and tax liabilities of high-income

individual taxpayers (and little other information is publicly released about the tax system, even

in aggregated form), some researchers have used the disclosed information to study the effect of

tax policies (e.g., Makino, 1997). Others have utilized the longitudinal nature of the data to

study the evolution of individual incomes in Japan.[13] Researchers have also used the corporate

tax disclosure data to evaluate properties of book-tax differences for Japanese firms (Hiroki et al,

2007). But the impact of the disclosure system itself on taxpayer behavior has not been studied

empirically heretofore.

3.   Effects on Behavior

We investigate the hypothesis that individuals and corporations will under-report tax

liability so as to fall (just) below the threshold, thus avoiding public disclosure. If, as is

reasonable, the costs of so doing increase with the amount of underreporting needed to escape

disclosure, this hypothesis implies that the frequency of reports with taxable income or tax

liability just above the threshold should be less than what they would be in the absence of a

disclosure rule.

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[11] Tax Advisory Commission (2005), translation provided by Lingua Science Corporation of Ann Arbor, MI. The
Tax Advisory Commission was established by the Japanese government in 1953 to review the whole tax system and
to formulate annual tax changes as well as long-run tax policy. (Ishi, 1993, p. 15)

[12] Disclosure has returned to Japan. As of March 31, 2010, the Financial Services Agency requires corporate
executives with salaries exceeding ¥100,000,000 to publicly disclose their salary.

[13] For example, see Hashimoto (1995). Moriguchi and Saez (2008), in their study of the evolution of income
concentration in Japan from 1885 to 2002, use different data sources. Ichikawa (1991) uses the notification data to
analyze earnings patterns by occupation and educational status.

Note that the private cost of under-reporting to escape notification is affected by the fact that over this period it was possible for an individual, but not corporate, taxpayer to file a corrected income tax declaration in April after they underestimated tax liability in their initial return subject to the notification deadline of March 31. This would subject the taxpayer to arguably small penalties for arrears and understatement. There is, however, no evidence about the extent of this behavior. Corporations could not use a similar method because both the initial tax report and any corrected tax report were subject to disclosure. However, any corrections initiated by the tax authority were not subject to disclosure. There is anecdotal evidence that some companies asked the tax authorities to correct their understated tax reports so they could avoid notification. There is, however, no systematic evidence about the extent of this behavior.

4.   Analysis of Individual Income Tax Disclosure Data

4.1.   Data Source

The data we use pertain to tax years 2001, 2002, and 2003 and include information about tax liability and an estimate of the taxable income corresponding to the tax liability. These data were purchased from General Legal Security, Inc., a Japanese company that compiles the data from the public notification records. The company advertises the sale of this data on a Web site (http://chouja.houmu.co.jp/about.html) that claims that the compilation follows the regulations of the Act on the Protection of Personal Information. Note that, although the name and address of the individual taxpayers are included in the public disclosure, they are not part of the database that is available for purchase.[14]

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[14] Other databases, such as the *Who's Who*, do have this information, for some years and not in electronic form. In scattered cases the publishers supplemented the disclosure data with information about occupation.

4.2. Analysis

We begin our examination of the behavioral response to the abolition of the Japanese disclosure system by examining the distribution of taxable income as per the disclosure data, and searching for "missing returns" right above the disclosure threshold. This, of course, requires an assumption about the counterfactual distribution for taxable income. There is considerable evidence that, absent disclosure, income for the top percentiles of the income distribution follows a Pareto distribution.[15] Piketty and Saez (2006), and Moriguchi and Saez (2006) for Japan in particular, argue that the Pareto distribution is also a reasonable approximation for top incomes.[16] Given this assumption, we analyze the micro-disclosure data to determine whether there is evidence in the disclosure data of "missing" tax returns with taxable income corresponding to tax liability just above the disclosure threshold. To do this, we use a maximum-likelihood procedure to estimate the parameters of a Pareto distribution based on the disclosure information. We then compare the actual number of returns just above the threshold to the predicted number of returns based on the estimated Pareto distribution.[17] Observing "too few" actual tax returns with taxable income just above the threshold would be consistent with some taxpayers underreporting their tax liabilities in order to avoid public disclosure.

We report below several variations of this procedure and robustness tests, and find that our results are robust to the use of these alternative procedures. We do these calculations for tax year 2003, and then briefly summarize the (similar) findings obtained for tax years 2001 and 2002.

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[15] Pen (1971) discusses the basis for this claim and theories about why it might be true.

[16] Our analysis below is necessarily based on taxable income, a slightly different concept from the one studied by, for example, Piketty and Saez (2006), who focus on gross income reported on tax returns, which is before deductions.

[17] The disclosure thresholds were always higher than the lower threshold for the top marginal tax rate, so we are not in danger of conflating responses to marginal tax rates with responses to disclosure rules.

4.2.1. Estimation Based on Reported Individual Taxable Income

We begin by estimating the distribution of individual taxable income. The advantage of focusing on income is that the prior literature concludes that top incomes follow a Pareto distribution (e.g. Moriguchi and Saez, 2006). The disadvantage is that we do not have information on actual reported taxable income, but rather have to estimate taxable income using the tax liability. This is done by "grossing up" the tax liability by the applicable statutory tax schedule to arrive at an estimate of taxable income.[18] Using these taxable incomes, we estimate the Pareto parameter[19] with a maximum likelihood procedure using all the disclosed tax returns for tax year 2003. This produces an estimated Pareto index of 2.213. The top panel of Figure 1 shows a histogram of taxable income, where the bin width is ¥338,435, as well as the estimated Pareto distribution for taxable incomes between the disclosure threshold and ¥50,000,000. The comparison suggests that there are fewer returns reported just above the disclosure cutoff in the empirical distribution than in the estimated Pareto distribution.

In order to quantify the extent of this phenomenon, we next compare the estimated Pareto distribution to a non-parametric, kernel density estimation, with a bandwidth of ¥1,037,694, to the actual probability density function. We use the Epanechnikov kernel function and Silverman's optimal bandwidth technique, as used as the default procedure in STATA, and a boundary correction procedure.[20]

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[18] For example, the ¥10,000,000 tax liability threshold corresponds to ¥34,432,000 of taxable income according to the formula used by the data provider. The general formula is estimated taxable income = (tax liability + 2,740,000)/0.37. The grossing up of a tax liability by a statutory rate is a common method of estimating taxable income for corporations given only financial statement data (e.g. Hanlon, 2005; Hanlon and Heitzman, 2010).

[19] The Pareto probability density function is $f(x)=ak^a x^{-(a+1)}$, $x \geq k$. We refer to a as the Pareto parameter. The procedure uses the *paretofit* command that can be downloaded from Statistical Software Components (at http://ideas.repec.org/s/boc/bocode.html).

[20] The boundary correction procedure makes use of the *kdens* command that can be downloaded from Statistical Software Components (at http://ideas.repec.org/s/boc/bocode.html). We also repeated the procedure using twice, and half, the Silverman bandwidth. Using twice the bandwidth generates results that are very similar to the reported results. In some cases using half the bandwidth approximately halves the estimated extent of cases (but keeps the

The estimated Pareto distribution and the kernel density estimate are shown together in the lower panel of Figure 1. Unsurprisingly, the latter lies below the former for declared incomes close to the threshold. We can derive an estimate of the number of "missing" returns by calculating the area between the two curves in the range between the threshold and where the estimated Pareto probability density function first intersects the kernel density function. When we do so, we get an estimate of 870 missing returns. This amounts to 4.1 percent of the number of returns predicted by the Pareto distribution.

The avoidance response is almost certainly understated by the procedure just described because the Pareto parameter is estimated including the range of reports we hypothesize are affected by the "under-the-radar" responses themselves. In other words, the Pareto parameter meant to approximate the counterfactual is based on a distribution of returns that are absent—the returns whose tax liability was manipulated so as not to be disclosed. To investigate this issue, we repeat the previous exercise, but estimate the Pareto parameter using only the reports with tax liabilities that exceed ¥40,039,000 of estimated taxable income, at which point the two curves of the kernel density estimate and fitted Pareto distribution first intersect. Note that the Pareto parameter estimated in this alternative manner should be higher, if as hypothesized there are "missing" returns just above the threshold. Indeed, the estimate is higher than before, 2.256 compared to 2.213.

Comparing the newly estimated Pareto distribution to the distribution from the kernel density procedure suggests that the number of missing returns is 1,221. This amounts to 5.3 percent of the number of returns predicted by the Pareto distribution. Thus, using this procedure

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estimated percentage of "missing" returns about the same) because the estimated kernel density first intersects the estimated Pareto distribution at a lower value of taxable income. This is not surprising because reducing the bandwidth reduces the smoothness of the kernel density and so makes it more likely that at some point its density exceeds the density of the estimated Pareto distribution.

produces estimates of the extent of the missing disclosed returns that is 40 percent higher than the previous method. The relevant graphs are shown in Figure 2.

4.2.2. Results for Tax Years 2001 and 2002

To check that the previously described results for tax year 2003 were not just a fluke, we repeated the same tests for tax years 2001 and 2002. The results are summarized in Table 2, which reveals that we obtain very similar results for 2001 and 2002 as we find for 2003. For each of the two methodologies the estimated number of missing returns in 2002 is below the estimated number in either 2001 or 2003. The details of these calculations are available from the authors.

4.2.3. A False Experiment Robustness Test

As a robustness test we repeat our methodology using four arbitrarily picked threshold levels, all of which exceed the real threshold level of ¥34,432,000.[21] In all four cases, our method produces a trivially small number of "missing returns." For example, when we use ¥70 million as our false experiment threshold, we estimate a total of three missing returns, compared to 870 (1,221) using the actual disclosure threshold.[22] We obtain similar results when we examine the false thresholds of 50, 60, and 80 million yen. This result suggests that our missing returns are not merely a result of our distributional assumption or some other methodological problem.

5.   Analysis of Corporate Income Tax Data

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[21] Because the data are unavailable due to the nature of the disclosure system, we cannot investigate an arbitrarily lower threshold.
[22] The estimated Pareto parameter is 2.229.

5.1. Data Source

The corporate data were purchased from Diamond, Inc, a Japanese company that compiles the data from the public notification records and other publicly available information. The data we use pertain to the 2005 calendar year and includes 68,824 observations, with information about taxable income (current and back three years if it was disclosed), corporation name, the tax office to which the tax was remitted, sector, whether the company is public or private, the name of the company's president, and the beginning and ending month of the accounting year about tax liability.[23]

5.2. Analysis of Disclosure Data

We follow basically the same procedures to analyze the corporate data. The estimated Pareto index for reported corporate income in the 2005 calendar year is 0.860 when estimated over all observations, and is 0.900 when using only observations with reported taxable income over ¥75,022,000, at which point the two curves of the kernel density estimate and the fitted Pareto distribution based on the former Pareto parameter (0.860) first intersect. The top panel of Figure 3 shows a histogram of corporate taxable income, where the bin width is ¥1,111,089, as well as the estimated Pareto distribution of corporate taxable income between the threshold and ¥90,000,000. The lower panel of Figure 3 compares the estimated kernel density for taxable incomes below ¥90,000,000, with bandwidth of ¥3,497,544, to the former estimated Pareto distribution, while Figure 4 does the same for the latter estimated Pareto distribution.

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[23] Most companies' accounting periods span one year. The data show that a small fraction of companies (1,608 of 68,824) have accounting periods shorter than one year, of which 289 have a half year or shorter accounting period. For this latter group, the disclosure threshold was ¥20 million rather than ¥40 million. In the analysis that follows we exclude all the companies with an accounting period that is six months or less.

As with the individual data, we find evidence that is consistent with behavior designed to avoid disclosure. The number of missing returns based on the Pareto distribution estimated from all disclosed returns is 1,380, while the number based only on the "unmanipulated" returns is 2,449; this compares to 68,824 corporations that disclosed taxable income, and 2,915,259 corporations overall. These estimates are almost twice as high as the estimates for individual tax returns calculated earlier.

The phenomenon of companies understating taxable income below 40 million yen to avoid disclosure was well-known, if rarely publicly discussed, in Japan. In fact, the practice was common enough to have merited a moniker: "39 companies."[24] Note also that most of the companies around the disclosure threshold, where we find evidence of underreporting to avoid disclosure, are not particularly large and are generally not public corporations that of necessity must provide financial information to the public on a regular basis. It is reasonable to expect that, for public firms which face capital markets pressures and must report financial information to the public, the effect of disclosure might be different.[25]

5.3. Analysis of Corporate Financial Data

To this point all of the analysis has been directed toward the hypothesis that some taxpayers will understate their reports in order to avoid disclosure. Another important issue is whether taxpayers subject to disclosure will restrain their underreporting because of a fear that the public nature of their report will raise suspicion about underreporting, and ultimately increase

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[24] Anecdotally, one explanation for "39 companies" was their desire to hide their profitability from suppliers who might seek better contractual terms from an apparently more profitable firm. This is a non-tax-related reason for avoiding disclosure.

[25] For example, Rice (1992) finds that private firms are more tax aggressive than public firms, likely because private firms face fewer constraints on disclosing lower taxable incomes. For a review of literature that examines the choices that public firms make given the tradeoffs between reporting taxable income to the government and financial accounting income to investors, see Hanlon and Heitzman (2010).

the chance of detection and punishment for noncompliance. Investigating this hypothesis is, however, hampered by the fact that, by its nature, the disclosure data is not available after the notification system was abolished.

However, for public corporations, the situation is not as dire because firms' publicly disclosed financial statements are available both before and after abolition, and from these financial statements it is possible to estimate a firm's taxable income.[26] To examine whether public firms altered their taxable income after the abolition of the disclosure system, we analyze data from Compustat Global, which contains financial statement information about public firms located throughout the world. Our sample consists of the universe of firms covered by Compustat Global incorporated in Japan for which the relevant financial statement data is available for all the years considered.[27]

We estimated the following model:

$$(1)\ TIDiff_{it} = \beta_0 + \beta_1 Treatment_{it} + \beta_2 UnemDiff_t + \beta_3\ UnemDiff\ Sq_t + \beta_4 IndustryFixedEffects_i$$

where:

$TIDiff_{it}$ = firm i's estimated taxable income in year t less the firm's estimated taxable income in year t-1, scaled by total assets in year t-1

$Treatment$ = one if the firm was subject to disclosure in year t-1 but not in year t, and zero otherwise

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[26] Actual taxable income is not available from financial statements as the financial reporting system in Japan (as in the U.S.) does not require taxable income as calculated for the firm's financial statements to be completely conformed with taxable income from the firm's tax return (although the degree of conformity is much greater than in the U.S.). As a result, we estimate taxable income by grossing up the current tax expense of the firm by the top corporate statutory rate (Hanlon and Heitzman, 2010). Our estimates of taxable income seem reasonable when compared with the disclosed taxable income figures available under the tax disclosure system; the correlation between the two measures exceeds .75.

[27] To minimize the influence of outliers, we winsorize *TIDiff* at the 1% and 99% level. Winsorizing, discussed in Tukey (1962), is a standard procedure in analysis of corporate financial data (e.g., Baker, Stein and Wurgler (2003) and Hanlon, Mills and Slemrod (2007)).

UnemDiff = average monthly unemployment rate, as defined by the OECD, in year *i* minus the

average monthly unemployment rate in year *t-1*

UnemDiffSq = (*UnemDiff*)^2

Industry Fixed Effects = a vector of dummy variables indicating membership in a specific

industry (where industries are defined by two-digit SIC-type codes)

We define *Treatment* by the fiscal year end of the firm. This identification strategy relies

upon the fact that the law mandated that disclosure would be abolished in February, 2006.

However, because firms have two or three (depending on the type of company) months to file

their tax returns, and some time is required for the National Tax Authority to process and

disclose the returns, we observe almost no public firms disclosed that had fiscal year ends in

November, 2005 and no firms at all with fiscal year ends in December and thereafter. Thus, a

firm with an October 2005 fiscal year end was likely to face disclosure (subject only to being

above the threshold level of taxable income), while a firm with a December 2005 and thereafter

fiscal year end was not likely to face disclosure.[28]

The unemployment variables are intended to control for the effect of cyclical and secular

economic conditions that would affect true, and therefore possibly reported, corporate earnings.

We include industry fixed effects to allow for any other systematic differences in firms with

different fiscal year end months.[29]

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[28] We considered coding the *Treatment* variable using the actual disclosure data to specify which firms actually faced disclosure ex post. However, this has two serious problems. First, it assumes that firms who where ultimately not disclosed anticipated non-disclosure and acted accordingly; this may not be the case. Second, and more importantly, given that some firms did face disclosure because their income turned out to be under the threshold limit of income, coding *Treatment* using ex post disclosure data would mechanically be related to firms having lower income and thus would create an endogeneity problem that would undermine a causal interpretation of the estimated coefficients.

[29] For example, in Japan firms with March fiscal year ends are on average larger than other firms, and there are many more March fiscal year end firms than any other month.

We start by presenting the data visually. Figure 5 graphs the mean and the median *TIDiff* by fiscal year end for the time period for which continuous data are available, from June, 1992 to-February, 2010, with a vertical line indicating roughly where disclosure will no longer be required of firms (after October, 2005). Figure 6 focuses on a 24-month window, starting from six months before the end of disclosure to eighteen months after it ended. The figures do not provide clear evidence of distinctly lower values of *TIDiff* in the year after disclosure no longer was in place.

We estimate the above regression with all data available from Compustat Global, which includes data from 1992 to 2010. This time series includes 59,667 firm/year observations and 4,714 unique firms. The results of this regression are shown in Table 3, using the least absolute deviation estimator in Column 1, and ordinary least squares in Column 2. Notably the estimated coefficient on the treatment dummy for both specifications is positive; using two-way clustering of standard errors by year and fiscal year end month (for the OLS estimator), this estimated coefficient is statistically different from zero at a one percent level.

The estimated positive sign is inconsistent with the hypothesis that disclosure restrains aggressive tax behavior. One reason the data do not support this hypothesis might be that because of an accounting system that is highly conformed, the tax situation of public corporations in Japan are effectively disclosed even in the absence of the notification system.[30] This is not inconsistent with our earlier finding that a non-trivial amount of firms understated their taxable income to avoid disclosure, because this finding related to relatively small, mostly non-public corporations. Of the 1,000 disclosed firms with the smallest disclosed tax liability, only one was a public corporation. Moreover, because we are using financial accounting

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[30] Japan's book and tax systems, while not completely conformed, are more closely conformed than most other countries. Indeed, in a sample of 33 major countries, Atwood, Drake and Myers (2010) find that Japan has the fifth most book-tax conformed system.

numbers to estimate taxable income, we may not be able to uncover declines in the true taxable income as readily as we may be able to if we had access to taxable income as per the tax return for the post-disclosure period.

Thus, disclosure having no significant effect on reported taxable income for large public corporations can be explained. But why abolishing disclosure might cause an *increase* in reported taxable income, as the regression result from Table 3 suggests, is more difficult to understand. The result might, of course, be a spurious one due to an inadequate identification strategy. More positively, we can speculate that, absent the independent corroborating information about profitability provided by the tax disclosure, some public corporations might have felt it more important to signal the profitability of their operations by reporting strong earnings. But we have no evidence to support this explanation, and we must leave it to future research to resolve.

6.   Conclusions

Public disclosure of tax return information is one weapon in the arsenal of tax enforcement policy instruments, one that has been employed historically—and currently—in several countries and one that, for corporate returns, has recently been debated in the United States. The potential behavioral response to public disclosure of income tax returns figures prominently in policy debates about its advisability. Supporters stress that it encourages compliance, while opponents decry the violation of taxpayer privacy and its consequences, including harassment of and crimes against rich households, and loss of proprietary information for corporations. Strikingly, all debates proceed in the near-complete absence of empirical evidence about the effects of public disclosure on behavior.

This paper provides what, to our knowledge, is the first empirical evidence about the behavioral response to a tax return public notification system. Our analysis of data from the Japanese disclosure regime suggests that, when there is a threshold for disclosure, a non-trivial number of both individual and corporate taxpayers whose tax liability would otherwise be close to the threshold will underreport so as to avoid disclosure, provoking a response of the opposite direction than what supporters stress. An analysis of public corporations' financial statements offers no evidence that these companies' reported taxable income declined after the end of the disclosure system.

There are, to be sure, caveats to generalizing our results. The strong result applies only to disclosure systems with a threshold. The behavioral response will depend on the social stigma, or reward, from a public disclosure of high taxable income, which arguably varies across countries and cultures. Nevertheless, this research does establish with some degree of confidence that public disclosure will change behavior, as most other tax policy instruments do.

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Table 1-1: Details of the Japanese Individual Tax Notification System, Tax Years 1950-2004

Tax Year	Range of notification	Approximate total number of taxpayers	Approximate number of taxpayers subject to notification	Percentage of taxpayers subject to notification
1950-1951	Taxable Income >500,000 yen	3,500,000-4,300,000	90,000-150,000	2.1-4.3
1952-1956	Taxable Income >1,000,000 yen	2,200,000-2,900,000	30,000-70,000	1.2-3.2
1957-1962	Taxable Income >2,000,000 yen	2,000,000-2,300,000	20,000-150,000	1.1-6.3
1963-1969	Taxable Income >5,000,000 yen	2,600,000-4,200,000	30,000-170,000	1.2-3.9
1970-1982	Taxable Income >10,000,000 yen	4,500,000-6,600,000	80,000-440,000	1.7-6.7
1983-2004	Tax Liability >10,000,000 yen (taxable income ~ 34,000,000)	7,000,000-8,600,000	70,000-180,000	0.9-2.0

Source: Tax Advisory Commission explanatory material (5/10/2002).
Note: As a rough approximation, the yen-dollar exchange rate averaged about 360 from 1950 until 1971, 290 from 1972 to 1977, 230 from 1978 to 1985, 140 from 1986 to 1992, and 110 from 1993 to 2005.

Table 1-2: Details of the Japanese Corporate Tax Notification System, Tax Years 1950-2004

Tax Year	Range of notification	Approximate total number of corporations	Approximate number of corporations subject to notification	Percentage of taxpayers subject to notification
1950-1951	Taxable Income >2,000,000 yen	208,000-239,000		
1952-1956	Taxable Income >4,000,000 yen	269,000-424,000		
1957-1969	Taxable Income >20,000,000 yen	449,000-952,000		
1970-2004	Taxable Income >40,000,000 yen	1,000,000-2,915,000	69,000-84,000[31]	

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[31] Data available for 1996, 1999-2003, and 2005.

Table 2: Summary of Findings for Individual Income Tax: Alternative Methodologies for the Tax Years 2001, 2002, and 2003

Tax Year	Based on all returns		Based on "unmanipulated" returns	
	Estimated Pareto parameter	Estimated number of missing returns	Estimated Pareto parameter	Estimated number of missing returns
2001	2.2500	982	2.2986	1418
2002	2.2461	754	2.2834	1065
2003	2.2129	870	2.2557	1221

Table 3. Analysis of Corporate Response to the Table 3
Panel A. Descriptive Statistics

Variable	Obs	Mean	S.D.	P25	Mdn	P75
TIDiff	59671	0.01	0.05	-0.01	0	0.01
Treatment	59671	0.07	0.25	0	0	0
UnemDiff	59671	0.1	0.36	-0.26	0.13	0.32
UnemDiffSq	59671	0.14	0.19	0.04	0.08	0.16

Panel B. Regression Results

	Dependent Variable: TIDiff	
Independent Variables	Coefficient (t-statistic)	Coefficient (t-statistic)
	(1)	(2)
Treatment	0.00298***	0.00592***
	(18.41)	(6.46)
UnemDiff	-0.00284***	-0.00997**
	(-20.73)	(-2.49)
UnemDiffSq	0.00224***	0.00830
	(9.23)	(1.56)
Constant	-0.00011	0.00106
	(-0.25)	(1.60)
Industry Fixed Effects	Yes	Yes
Quantile Regression	Yes	No
Observations	59667	59667
R-squared	0.0048	0.035

Notes: The dependent variable, *TIDiff*, is the firm's estimated taxable income less the firm's estimated taxable income in the prior year, scaled by prior year's assets. *Treatment* is one if the firm was subject to disclosure in year t-1 but not in year t, and zero otherwise. *UnemDiff* is the average monthly unemployment rate, as defined by the OECD, in year i minus the average monthly unemployment rate in year t-1. *UnemDiffSq* is the squared value of UnemDiff. Industry Fixed Effects are defined by two-digit SIC codes. The t-statistics for the OLS regression (included in parentheses) are calculated using standard errors clustered by fiscal year end month, and year. Two-tailed significance is indicated by ***, **, * for the $p<0.01$, $p<0.05$ and $p<0.1$ levels, respectively.

Figure 1: Comparing the Actual to Fitted Distribution of Individual Taxable Income Using All Returns, Tax Year 2003
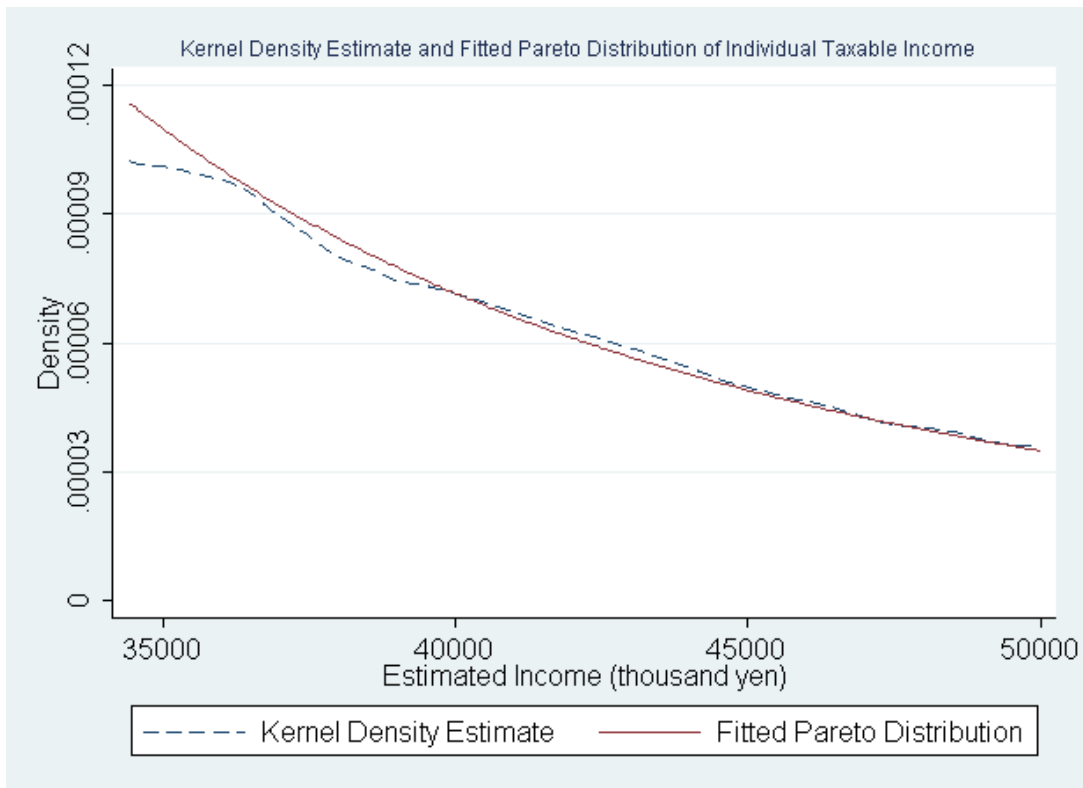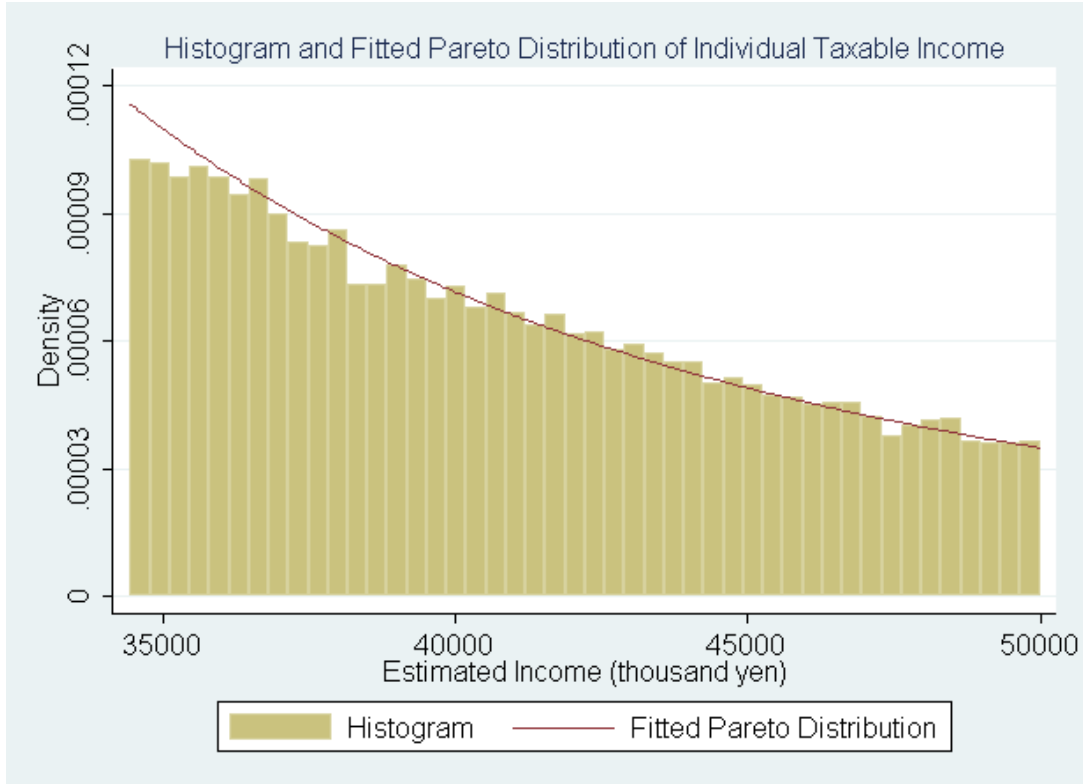
Figure 2: Comparing the Actual and Fitted Distribution of Individual Taxable Income Using Only "Unmanipulated" Returns, Tax Year 2003
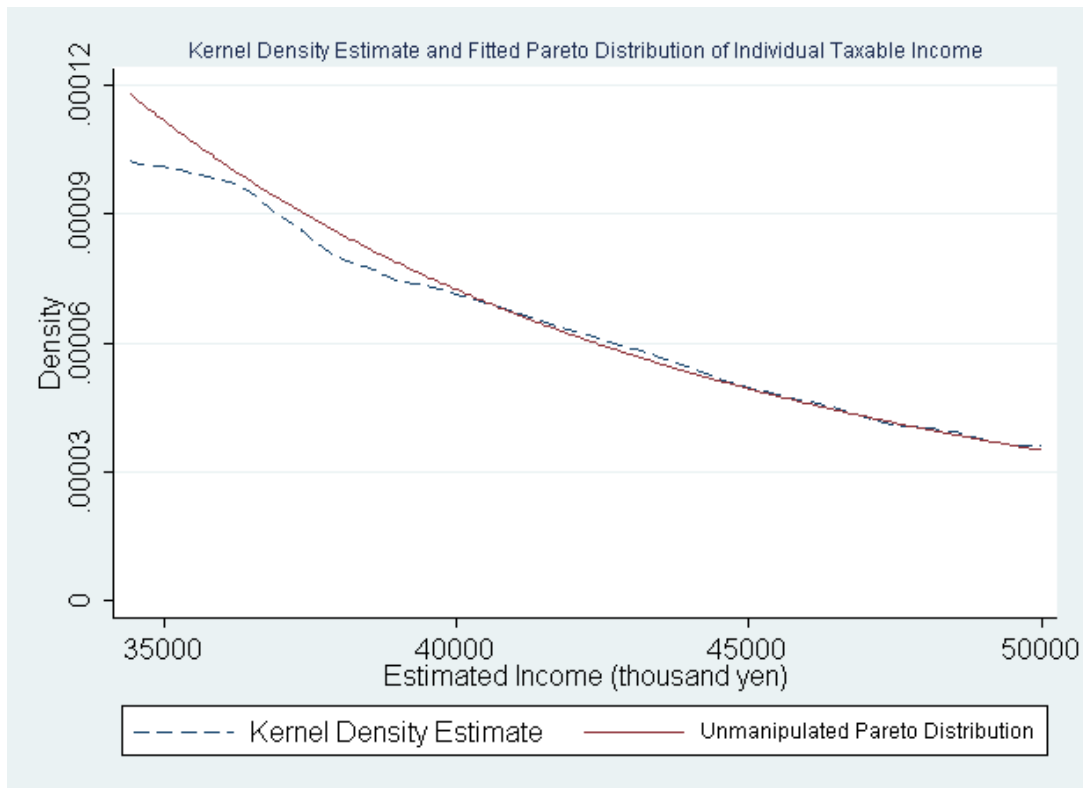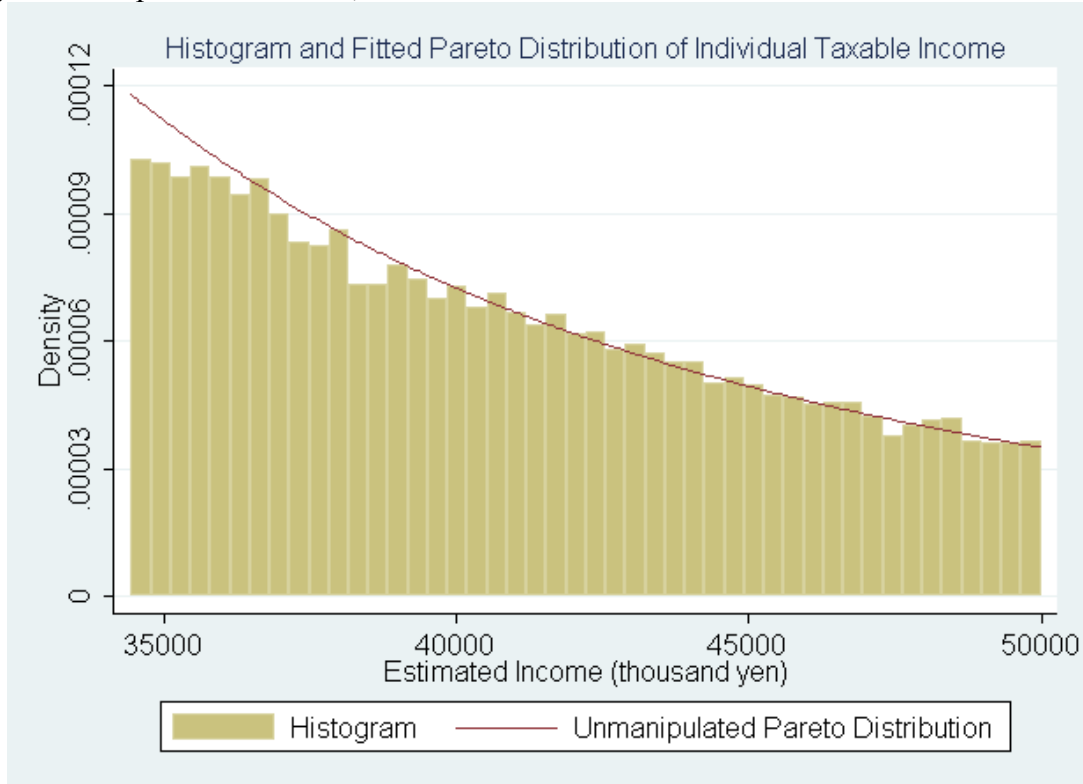
Figure 3: Comparing the Actual to Fitted Distribution of Corporate Taxable Income Using All
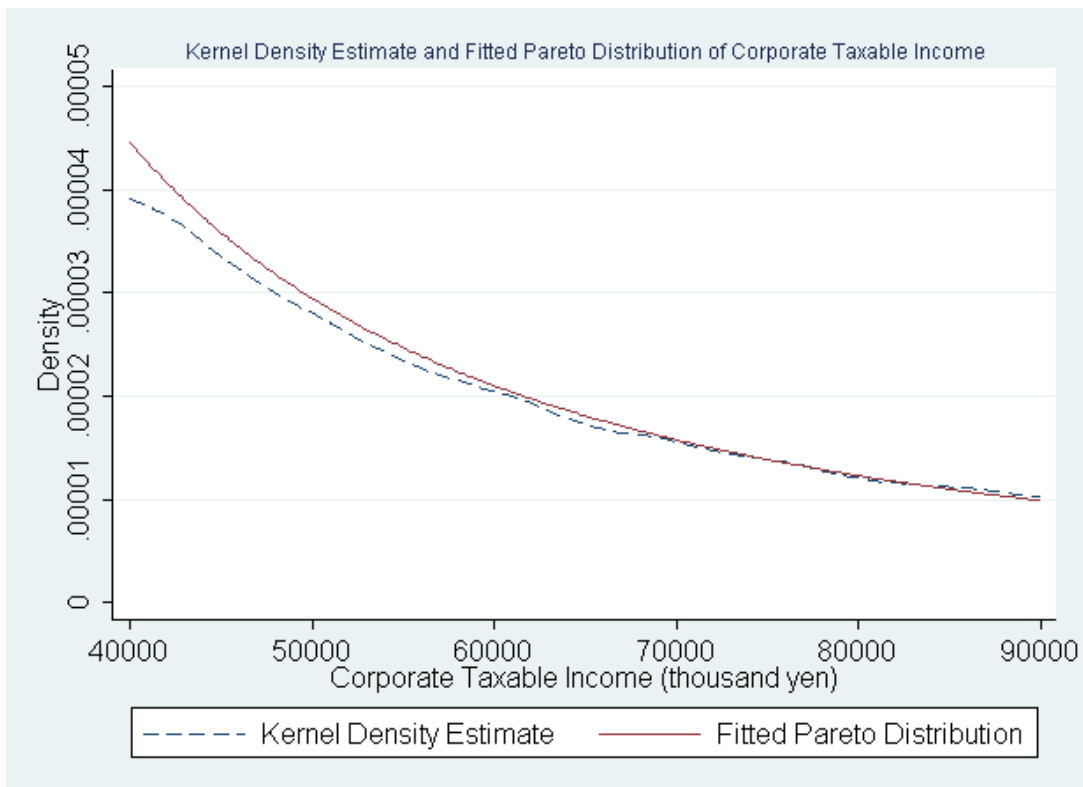Returns, Calendar Year 2005

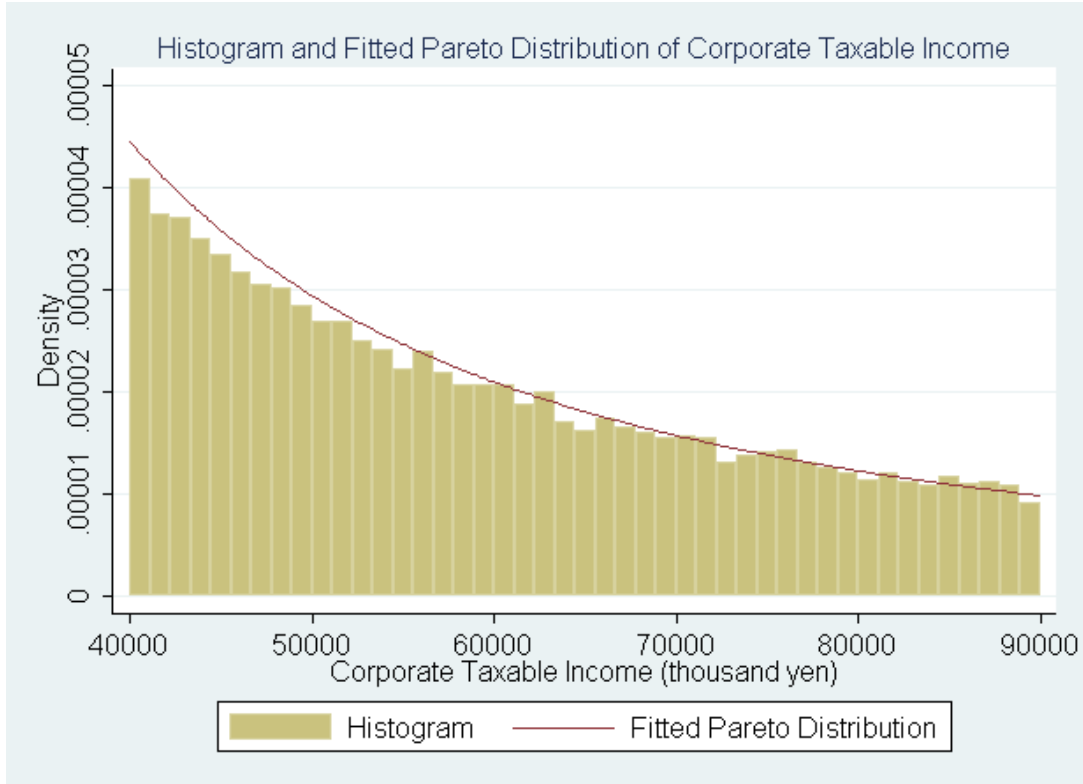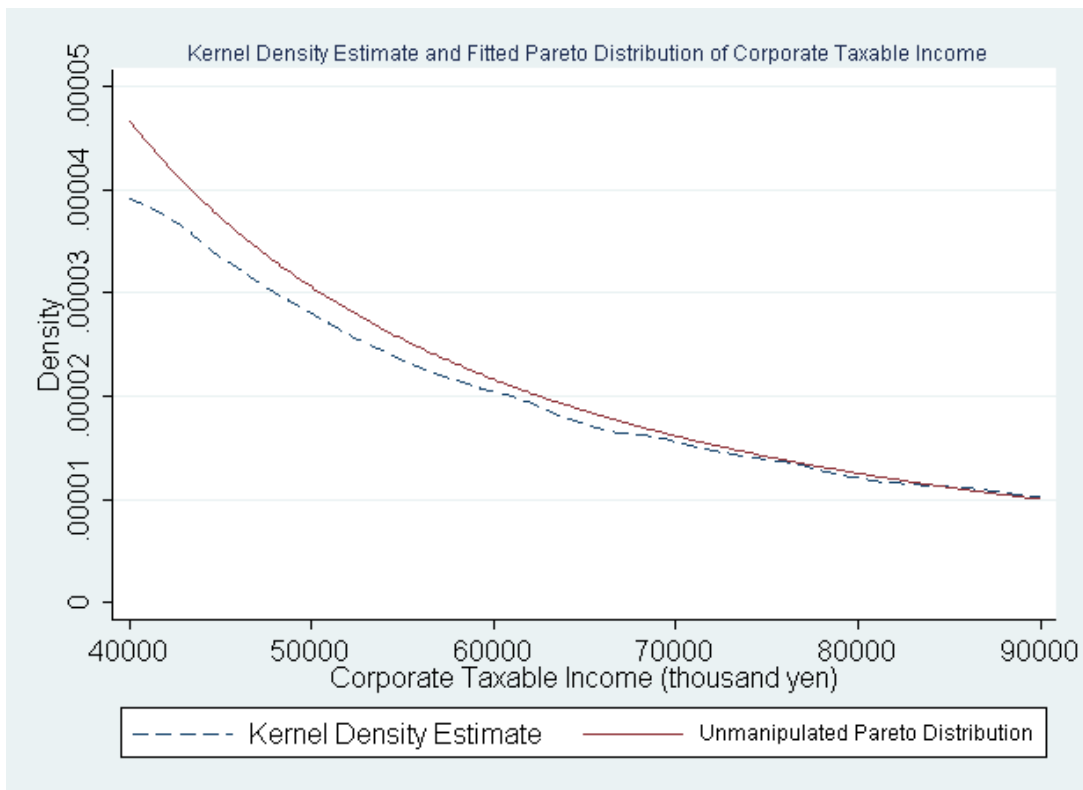Figure 4: Comparing the Actual to Counterfactual Distribution of Corporate Taxable Income Using Only "Unmanipulated" Returns, Calendar Year 2005
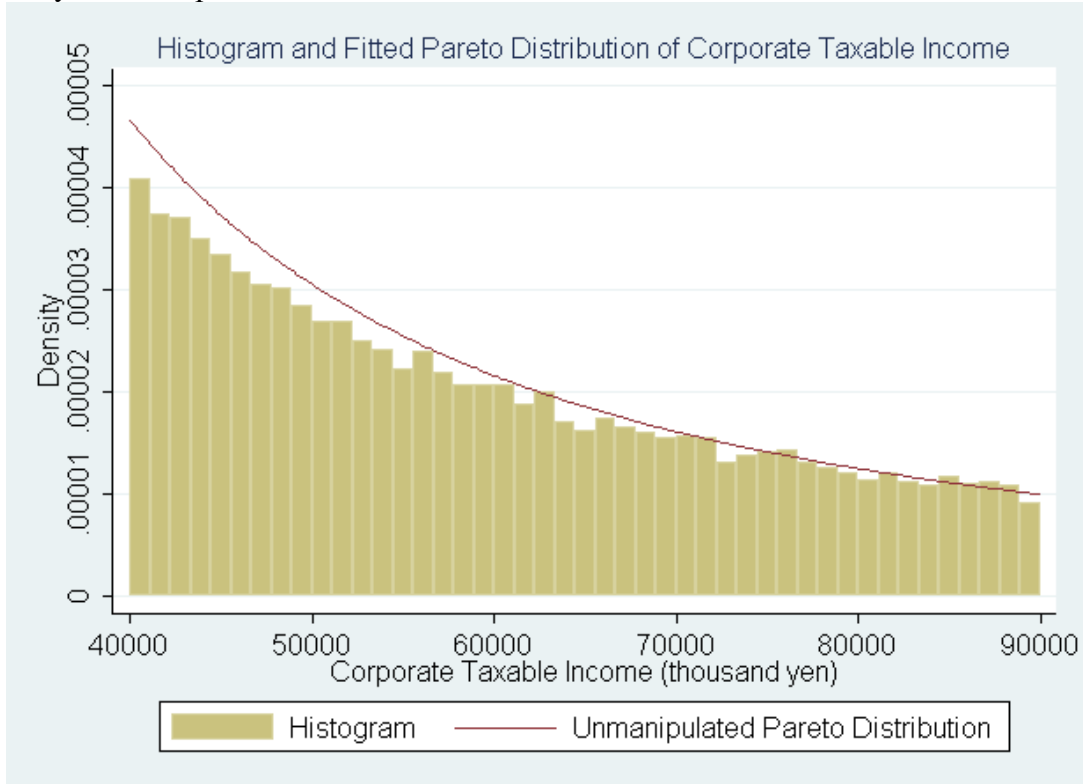
Figure 5. Mean and Median *TIDiff*, by Fiscal Year End, June, 1992 to February, 2010
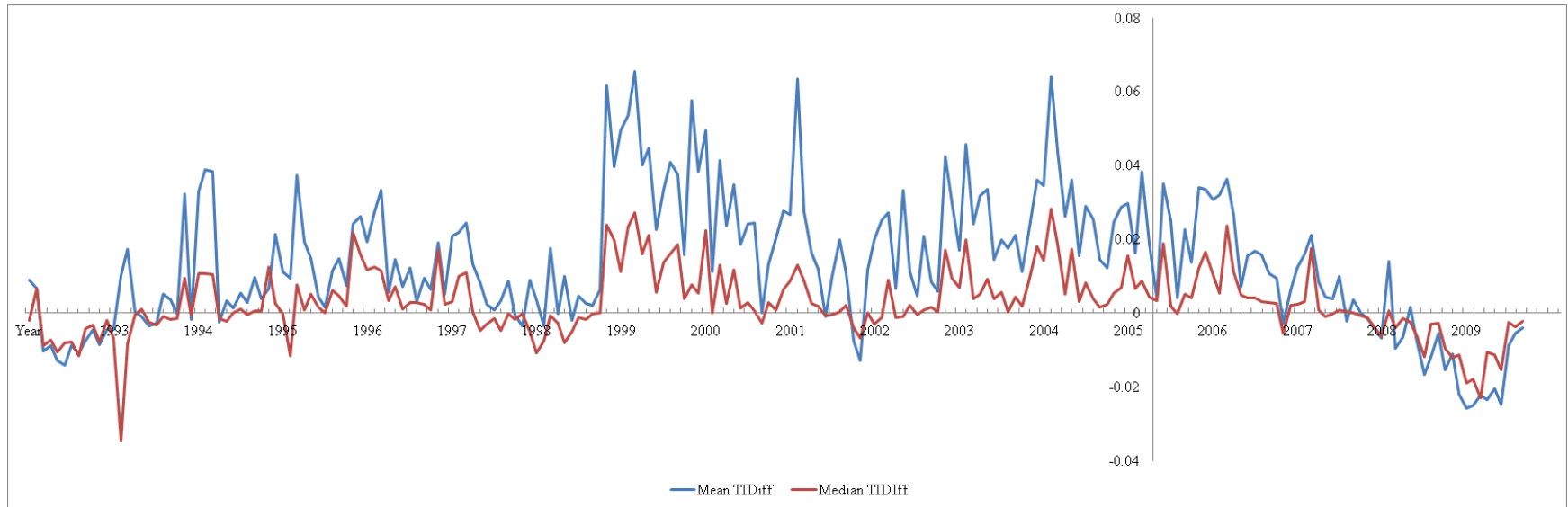
Figure 6. Mean and Median *TIDiff*, by Fiscal Year End, May, 2005 to April, 2007