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Three Studies on the Timing of Investment Advisers' Loss Realizations

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Three Studies on the Timing of Investment Advisers' Loss Realizations

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Dedication

To Mom and Dad

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Three Studies on the Timing of Investment Advisers' Loss Realizations

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In this dissertation, I use a unique data set to address three questions related to the timing of loss realizations by institutional investors. The data include clienteles and quarterly holdings of investment advisers, whom I classify as “tax-sensitive” if their clients are primarily high net-worth individuals and as “tax-insensitive” if their clients are primarily tax-exempt entities or individuals with tax-deferred accounts.

Prior empirical studies attribute abnormal stock return patterns around calendar year-end (the “January effect”) to individual investors’ tax-loss-selling and to institutional investors’ window-dressing. In chapter two, I examine whether investment advisers contribute to the January effect via tax-loss-selling rather than via window-dressing. I find that tax-sensitive advisers’ year-end sales of loss stocks (but not those of tax-exempt client advisers whose detailed disclosures to clients provide more incentive to window-dress) are associated with abnormally low (high) returns at the end of December (beginning of January). These results suggest that investment advisers contribute to the January effect via tax-loss-selling rather than via window-dressing.

In chapter three, I examine whether tax-sensitive advisers respond to holding period incentives at year-end. Under U.S. tax law, net short-term gains are taxed as ordinary income, while net long-term gains are taxed at a lower rate. Prior studies find little or no response to holding period incentives by individual investors. In contrast, tax-sensitive advisers are more likely to sell stocks with short-term losses the larger the difference between the current short-term loss deduction and what the long-term loss deduction would be.

In chapter four, I examine whether, like individual investors, tax-sensitive advisers realize their losses at year-end because they exhibit the “disposition effect,” or the tendency to realize gains at a quicker rate than losses, earlier in the year. I compare the likelihood of advisers’ realizations of “losers” (stocks the cumulative return of which over the prior nine months is negative) to the likelihood of their realizations of “winners” (stocks the cumulative return of which over the prior nine months is positive) by calendar quarter. Tax-insensitive, but not tax-sensitive, advisers exhibit the disposition effect, suggesting that tax incentives combined with investor sophistication prevent the disposition effect.

Table of Contents

List of Tables	x
Chapter 1: Introduction	1
Chapter 2: The January Effect and Investment Advisers: Tax-Loss-Selling or Window-Dressing?	7
2.1 Introduction.....	7
2.2 Literature Review and Development of Hypothesis 1	10
2.3 Sample Selection and Research Design.....	15
2.4 Descriptive Statistics and Univariate Results	20
2.5 Results for Hypothesis 1	21
2.6 Conclusion	30
Chapter 3: Investment Advisers' Response to Holding Period Incentives.....	32
3.1 Introduction.....	32
3.2 Literature Review and Development of Hypothesis 2.....	33
3.3 Sample Selection and Research Design.....	36
3.4 Descriptive Statistics and Univariate Results	39
3.5 Results for Hypothesis 2	40
3.6 Conclusion	42
Chapter 4: Taxes, Investor Sophistication, and the Disposition Effect	44
4.1 Introduction.....	44
4.2 Literature Review and Development of Hypothesis 3.....	49
4.3 Sample Selection and Research Design	51
4.4 Descriptive Statistics and Univariate Results	54
4.5 Results for Hypothesis 3	55
4.6 Conclusion	61

Appendix 1: Variable Definitions for Chapter 2.....	97
Appendix 2: Variable Definitions for Chapter 3.....	98
Appendix 3: Variable Definitions for Chapter 4.....	99
References.....	100
Vita.....	105

List of Tables

Table 1:	Descriptive Statistics and Univariate Analysis of the January Effect and Investment Advisers.....	63
Table 2:	Multivariate Analysis of the January Effect and Investment Advisers.....	66
Table 3:	Sensitivity Analysis of the January Effect and Investment Advisers: Requiring Positive Percent Ownership by Tax-Sensitive Advisers.....	67
Table 4:	Sensitivity Analysis of the January Effect and Investment Advisers: Requiring Replacing Change Variables with Sell Indicator Variables.....	68
Table 5:	Sensitivity Analysis of the January Effect and Investment Advisers: Requiring Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years	70
Table 6:	Sensitivity Analysis of the January Effect and Investment Advisers: Estimating Equations (1a) and (1b) with Standard Errors Clustered by Year rather than by Firm	76
Table 7:	Sensitivity Analysis of the January Effect and Investment Advisers: Estimating Equations (1a) and (1b) using Fama-MacBeth Regressions ...	78
Table 8:	Statutory Capital Gains Tax Rates Years 1993-2006	82
Table 9:	Descriptive Statistics and Univariate Analysis of Investment Advisers’ Response to Holding Period Incentives	83
Table 10:	Multivariate Analysis of Investment Advisers’ Response to Holding Period Incentives.....	86
Table 11:	Sensitivity Analysis of Investment Advisers’ Response to Holding Period Incentives	87
Table 12:	Descriptive Statistics and Univariate Analysis of Investment Advisers’ Realizations of Winners and Losers	88
Table 13:	Multivariate Analysis Comparing Realizations of Winners and Losers Within and Between Tax-Sensitive and Tax-Insensitive Advisers.....	90
Table 14:	Multivariate Analysis Comparing Realizations of Winners and Losers by Tax-Sensitive Advisers by Calendar Quarter	91

List of Tables (continued)

Table 15: Multivariate Analysis Comparing Realizations of Winners and Losers by Tax-Insensitive Advisers by Calendar Quarter.....	93
Table 16: Multivariate Analysis Comparing Realizations of Winners and Losers Within and Between Tax-Sensitive and Tax-Insensitive Advisers, Controlling for Portfolio Rebalancing	95
Table 17: Comparison of Performance of Losers Held versus Performance of Winners Sold.....	96

Chapter 1: Introduction

This dissertation addresses how taxes influence the trading decisions of “investment advisers” (institutional investors with investment discretion over \$100 million or more in Section 13(f) securities and fiduciary obligations to act in their clients’ interests) whose clients are primarily high net-worth individuals. I classify these investment advisers as “tax-sensitive.” I address three research questions. First, in chapter two, do investment advisers contribute to the abnormal pattern of stock returns around calendar year-end, commonly referred to as the “January effect”, via tax-loss-selling rather than via window-dressing? Second, in chapter three, in choosing which loss stocks to sell at year-end, do tax-sensitive advisers respond to holding period incentives by realizing short-term losses? Third, in chapter four, if tax-sensitive investment advisers contribute to the abnormal pattern of stock returns around calendar year-end, is the timing of their loss realizations at year-end the result of these advisers exhibiting the “disposition effect” (the tendency to realize gains at a quicker rate than losses) earlier in the year? Or, does the combination of tax incentives and investor sophistication prevent tax-sensitive investment advisers from exhibiting the disposition effect?

Prior empirical studies attribute the pattern of abnormally low returns over the last few days of December and abnormally high returns over the first few days of January (the “January effect”) to tax-loss-selling by individual investors and to window-dressing by institutional investors. In chapter two, I compare the calendar year-end trading of tax-sensitive investment advisers to the calendar year-end trading of investment advisers

whose clients are primarily tax-exempt entities (i.e., pension funds, state and local governments, and charitable organizations). I choose these two groups among all types of investment advisers because the former has tax incentives with little, if any, incentive to window-dress, and the latter has no tax incentive but does have an incentive to window-dress. When examining the relationship between institutional investor trading and the abnormal pattern of stock returns around calendar year-end, prior studies consider window-dressing, but not taxes, as a motivation. Because tax-sensitive advisers are constrained from spreading out their tax-motivated transactions that are in response to clients' requests, while advisers serving tax-exempt entities are less constrained in spreading out their window-dressing transactions, I expect that the relationship between advisers' year-end sales of stocks with negative prior returns and the abnormal pattern of stock returns around calendar year-end is related to tax-loss-selling and not to window-dressing.

Consistent with this expectation, I find that year-end returns of firms with negative prior returns are related to changes in ownership by tax-sensitive advisers during quarter four but are unrelated to changes in ownership by advisers serving tax-exempt clients. Because tax-sensitive advisers have less of an incentive to sell stocks with negative prior returns to window-dress their portfolios than do advisers serving tax-exempt clients, I conclude that the relationship between the change in ownership by tax-sensitive advisers and year-end returns is driven by tax-loss-selling rather than by window-dressing.

This is the first paper to document that tax-loss-selling by institutional investors is related to the abnormal pattern of stock returns around calendar year-end. This result is important because although the January effect has been widely studied, academics and the investment community have yet to reach an agreement on its cause. Unlike window-dressing, which is motivated by portfolio managers' self-interests, tax-loss-selling is conducted with the interests of portfolio managers' clients in mind. Moreover, corporate managers care about what factors influence institutional investors' trading decisions. If tax-sensitive investment advisers own shares in a firm that has performed poorly over the year and if management of the firm believes the firm's performance will improve in the near-term, management should communicate the firm's future prospects to tax-sensitive investment advisers. In doing so, management might prevent tax-sensitive investment advisers from selling the firm's shares, thereby preventing stock price volatility around calendar year-end.

Upon finding that tax-sensitive advisers conduct tax-loss-selling at calendar year-end, in chapter three I examine whether they respond to holding period incentives when choosing which loss stocks to sell. Under U.S. tax law, net short-term gains are taxed as ordinary income, while net long-term gains are taxed at a lower rate. This differential treatment provides investors with an incentive to realize losses before they have held a stock for a year and to defer the realization of gains until after they have held a stock for a year. According to Chan (1986), investors should have more of an incentive to realize losses at year-end when the losses qualify as short-term in December but as long-term in January. However, Badrinath and Lewellen (1991) find no response and Ivkovic,

Poterba, and Weisbenner (2004) find a weak response to holding period incentives by individual investors at year-end.

I find that tax-sensitive advisers respond to holding period incentives at year-end. Specifically, they are more likely to sell stocks with short-term losses the larger the difference between the current short-term loss deduction and what the long-term loss deduction would be if they wait to sell, consistent with Chan's (1986) suggestion. This paper contributes to prior literature by documenting a response to holding period incentives by a group of tax-sensitive, sophisticated investors. Over time the U.S. government has varied the length of the holding period required for long-term capital gains treatment. The results in this paper show that the holding period length impacts the trading of at least one group of investors sensitive to taxes.

In the final chapter, I examine whether tax-sensitive advisers' year-end tax-loss-selling is related to these advisers exhibiting the disposition effect earlier in the year. The realization-based tax system in the United States provides investors with the incentive to realize their losses and to defer realization of gains. However, prior empirical studies (e.g., Odean 1998; Barber and Odean 2003; Ivkovic et al. 2004) find that individual investors are more likely to realize gains than losses, even in their taxable accounts, with the exception of in December when they realize losses for tax purposes.

According to Shefrin and Statman (1985), the disposition effect results from investors being reluctant to admit their mistakes (Kahneman and Tversky 1979) and to close a mental account at a loss (Thaler 1985). In discussing studies that find the presence of the disposition effect among individual investors, James Poterba says "One

general difficulty with the literature on taxation and optimal trading behavior remains something of a mystery” (Poterba 2002, p.1140). Furthermore, in the conclusion of his paper, Odean writes, “It would be illuminating to repeat this study with data on institutional trading” (Odean 1998, p. 1796). Although prior studies have examined whether institutional investors exhibit the disposition effect, to my knowledge, no study has tested whether tax incentives prevent the disposition effect among institutional investors.

Thus, my goal in chapter four is to shed light on the “mystery” described by Poterba (2002). I compare the likelihood of realizing “losers” to the likelihood of realizing “winners” both within and between tax-sensitive investment advisers and “tax-insensitive” investment advisers by calendar quarter. Tax-insensitive investment advisers are advisers whose clients are primarily tax-exempt entities or primarily individuals with tax-deferred accounts. Losers (winners) are defined as stocks whose cumulative return over the prior nine months is negative (positive). After controlling for an investment adviser’s year-to-date portfolio return and turnover during the quarter, I find that tax-sensitive advisers are more likely to sell losers than to sell winners, and that their sales of losers are not isolated to quarter four. These results are inconsistent with the presence of a disposition effect. In contrast, tax-insensitive investment advisers are more likely to sell winners than to sell losers, consistent with them exhibiting the disposition effect. In addition, tax-sensitive advisers are more likely than tax-insensitive advisers to realize losers and less likely to realize winners. I conclude that investor sophistication combined with tax incentives prevents the disposition effect. The results should be of interest to

academics and investment professionals who seek to understand why some investors realize gains at a quicker rate than losses.

In light of results in prior empirical studies, the results in chapters three and four suggest that institutional investors who trade on behalf of high net-worth individuals respond more to tax incentives than do individual investors trading on their own behalf. Such a differential response to tax incentives, which could be provided by the U.S. realization-based tax system or by holding period rules as in this paper, or by tax reforms, should be of interest to policy makers as high net-worth individuals allocate more of their wealth to the investment discretion of institutional investors over time.

Chapter 2: The January Effect and Investment Advisers: Tax-Loss-Selling or Window-Dressing?

2.1 Introduction

Prior research attributes the pattern of abnormally low returns at the end of December and abnormally high returns at the beginning of January (“the January effect”) to window-dressing by institutional investors and to tax-loss-selling by individual investors. According to the window-dressing hypothesis, just prior to year-end, institutional investors buy stocks with positive prior returns (“winners”) and sell stocks with negative prior returns (“losers”) in order to present respectable year-end portfolio holdings to their clients. Institutional investors have an incentive to window-dress if they are evaluated relative to their peers or if their year-end disclosures to clients include the return of each stock held in their portfolios, opposed to just the portfolio’s overall return. The most frequently mentioned form of window-dressing is selling losers (Lakonishok, Shleifer, Thaler and Vishny 1991). The tax-loss-selling hypothesis holds that prior to year-end, individual investors sell stocks that have declined in value in order to realize tax losses. Selling stocks with negative prior returns either for tax purposes or for window-dressing purposes has the same effect on year-end returns. I predict that some of the relationship between sales of stocks with negative prior returns by institutional investors and the abnormal pattern of returns around calendar year-end that prior research attributes to “window-dressing” is actually attributable to “tax-loss-selling.”

Prior empirical studies do not address the possibility that institutional investors contribute to the abnormal pattern of stock returns around calendar year-end via tax-loss-selling rather than via window-dressing, likely because it is difficult to identify which

institutional investors are tax-sensitive. The data that I use allows me to address this question. It includes information on the clienteles and quarterly holdings of “investment advisers” (institutional investors with investment discretion of \$100 million or more in Section 13(f) securities and fiduciary obligations to act in their clients’ interests).

Knowing the clienteles of the investment advisers allows me to identify which investment advisers have incentives to sell losers for tax purposes and which have incentives to sell losers for window-dressing purposes. I focus on advisers whose clients are primarily high net-worth individuals (“tax-sensitive” advisers) and advisers whose clients are primarily pensions, charitable endowments, and state and local governments (“tax-exempt” advisers).¹ The former have tax incentives but little, if any, incentive to window dress their portfolios. The latter have no tax incentives but their detailed disclosures to clients provide an incentive to window dress.

The sample includes firms whose cumulative return over the year is negative. I examine the relationship between returns at the end of December and at the beginning of January of these firms and changes in ownership in these firms by tax-sensitive advisers during quarter four. I also examine the relationship between returns at the end of December and at the beginning of January of these firms and changes in ownership by tax-exempt advisers during quarter four. Because tax-sensitive advisers are more constrained in their ability to spread out tax-motivated transactions that are initiated in response to clients’ requests than are tax-exempt advisers in spreading out their window-

¹ I classify advisers whose clients are primarily pensions, charitable endowments, and state and local governments as “tax-exempt”; however, note that it is their clients, not the advisers themselves, that are tax-exempt.

window-dressing transactions, I expect sales of losers by tax-sensitive advisers, but not sales of losers by tax-exempt advisers, to be related to the abnormal pattern of stock returns around calendar year-end.

Consistent with this expectation, I find that abnormally low returns over the last few days of December and abnormally high returns over the first few days of January are related to changes in ownership by tax-sensitive advisers during quarter four but are unrelated to changes in ownership by advisers serving tax-exempt clients. Because tax-sensitive advisers have little, if any, incentive to sell stocks with negative prior returns to window-dress their portfolios, I conclude that the relationship between the change in ownership by investment advisers and the abnormal pattern of stock returns around calendar year-end is associated with tax-loss-selling and not with window-dressing.

This is the first paper to document that tax-loss-selling by institutional investors is related to the abnormal pattern of stock returns around year-end. This result is important because although the abnormal pattern of returns has been widely studied, academics and the investment community have yet to reach an agreement on its cause. This paper provides further support for tax-loss-selling as an explanation for the abnormal pattern of returns around calendar year-end. Unlike window-dressing, which is motivated by portfolio managers' self-interests, tax-loss-selling is conducted with the interests of portfolio managers' clients in mind. Moreover, corporate managers care about what factors influence institutional investors' trading decisions. If tax-sensitive investment advisers own shares in a firm that has performed poorly over the year and if management of the firm believes the firm's performance will improve in the near-term, management

should communicate the firm's future prospects to tax-sensitive investment advisers. In doing so, management might prevent tax-sensitive investment advisers from selling the firm's shares, thereby preventing stock price volatility around calendar year-end.

2.2 Literature Review and Development of Hypothesis 1

The phenomenon whereby some stocks experience abnormally low returns over the last few days of the calendar year and then rebound at the beginning of the following year is commonly referred to as the "January effect" and was first documented by Rozeff and Kinney (1976). The two most cited explanations for the January effect are window-dressing by institutional investors and tax-loss-selling by individual investors. The window-dressing hypothesis predicts that just prior to year-end institutional investors buy stocks with positive prior returns ("winners") and sell stocks with negative prior returns ("losers"). Institutional investors have an incentive to do so if they disclose details on portfolio holdings, as opposed to just the portfolio's overall return, to their clients at year-end. Selling losers is the most frequently mentioned form of window-dressing (Lakonishok et al. 1991). Empirical studies present mixed support for the window-dressing hypothesis (e.g., Athanassakos 1992; Griffiths and White 1993; among others).

Investment advisers whose clients are primarily tax-exempt entities have no incentive to conduct tax-loss-selling; however, they have more of an incentive to sell stocks with negative prior returns to window-dress their portfolios than do advisers whose clients are primarily high net-worth individuals. Lakonishok et al. (1991) document that pension fund managers sell stocks with negative prior returns in order to

window dress their disclosures. In order to learn more about the disclosure practices of these two groups of investment advisers, I conduct an online survey of investment advisers. In response to a question regarding the frequency and content of their disclosures to clients, the majority of the responding tax-sensitive advisers say that they send disclosures to clients on a quarterly or monthly basis and only disclose the overall return of the client's portfolio. These disclosure practices provide little incentive for tax-sensitive advisers to window-dress their portfolios at year-end because selling stocks with negative prior returns does not improve a portfolio's overall return. In addition, tax-sensitive advisers manage their portfolios on an individual client basis. As a result, their clients can generally request information on the performance of the client's portfolio at any time, which provides no benefit to window-dressing. The responses by advisers whose clients are primarily tax-exempt entities reveal that they also send disclosures to clients on a quarterly or monthly basis; however, they disclose more than just the portfolio's overall return (e.g., portfolio holdings) in their year-end disclosures. These responses suggest that investment advisers whose clients are primarily pensions, charitable endowments, and state and local governments have an incentive to window dress their portfolios, consistent with Lakonishok et al.'s (1991) finding of window-dressing by pension fund managers.²

² Fifty-six (15 percent) of the 376 tax-sensitive investment advisers in my sample responded to the online survey. Forty responded to a question regarding the frequency of their disclosures to clients, with 32 (80 percent) responding that they send quarterly reports to clients and the remainder responding that they send monthly or quarterly reports. Moreover, 26 (65 percent) of the 40 responded that at year-end they only disclose the overall return of the portfolio. Seventeen (12 percent) of the 145 investment advisers serving primarily tax-exempt clients responded to the online survey. The frequency of their disclosures is similar to that of the tax-sensitive advisers; however, they are more likely to disclose more than just the portfolio's overall return (e.g., portfolio holdings).

The tax-loss-selling hypothesis holds that prior to year-end, individual investors sell stocks that have declined in value in order to realize tax losses. As with the window-dressing hypothesis, empirical studies provide mixed support for the tax-loss-selling hypothesis as an explanation for the January effect (Dyl 1977; Givoly and Ovadia 1983; Reinganum 1983; Tinic, Baroni-Adesi, and West 1987; Ritter 1988; Dyl and Maberly 1992; Koogler and Maberly 1994; Sias and Starks 1997).

Sias and Starks (1997) examine whether the January effect is driven more by tax-loss-selling by individual investors or by window-dressing by institutional investors. They compare securities with high ownership by individual investors to securities with high ownership by institutional investors. They find that the abnormal pattern of stock returns around calendar year-end is more pervasive among the former. This result suggests that the January effect is related more to tax-loss-selling than to window-dressing.

Starks, Yong, and Zheng (2006) document tax-loss-selling in municipal bond closed-end funds by individual investors. They find that tax-loss-selling is greater if the fund is associated with a brokerage firm. Starks et al. (2006) predict that brokers have an incentive to recommend year-end tax-loss-selling because of the commissions generated by these trades. Unlike brokers, investment advisers have fiduciary obligations to act in their clients' interests, without conflicts of interest.³ I do not expect investment advisers to conduct tax-loss-selling in order to generate commissions.

³ The Investment Advisers Act of 1940 regulates the activities of investment advisers. Investment advisers have an obligation to act solely with their clients' investment goals and interests in mind.

Although the results in Starks et al. (2006) suggest that brokers might play a role in year-end tax-loss-selling by providing tax counseling to individual investors, Starks et al. (2006) only examine trades made by individual investors. Unlike brokers, the investment advisers in my sample have complete discretion over the accounts that they manage throughout the year. The brokers might advise their clients to sell stocks with losses at year-end because their clients have realized more gains than losses throughout the year. Prior studies (e.g., Odean 1998; Barber and Odean 2003) claim that individual investors realize gains at a quicker rate than losses because they are subject to a behavioral bias known as the “disposition effect” whereby they are reluctant to admit their mistakes. One exception is in December when they realize losses for tax purposes. Several empirical studies (e.g., Grinblatt and Keloharju 2001; Shapira and Venezia 2001; Feng and Seasholes 2005) find that trading experience and investor sophistication attenuate the disposition effect. Therefore, one might expect for tax-sensitive investment advisers to balance their gain and loss realizations throughout the year and thus have no need to realize losses at calendar year-end for tax purposes.

However, even if advisers do not exhibit the disposition effect and realize gains and losses consistently throughout the year, I expect that advisers will harvest tax losses at year-end if their clients request for them to do so. For instance, clients might want to offset capital gains that they have realized outside of advisers’ accounts. Consistent with this story, in my conversations with tax-sensitive advisers, they say that they only conduct tax-loss-selling at year-end when their clients request them to do so.

Many mutual fund managers are also sensitive to taxes. The Tax Reform Act of 1986 (TRA86) mandated an October 31 tax year-end for all mutual funds. Prior to TRA86, the tax year-ends of mutual funds were widely dispersed. Gibson, Safeiddine, and Titman (2000) examine tax-motivated trades made by mutual funds following the passage of TRA86. They find that tax-loss-selling by mutual funds only decreased returns over the last few days of October (creating a “November effect”) in 1990, the year in which the TRA86 rules became fully effective. After 1990, mutual fund managers spread out their tax-motivated trades in order to prevent price pressure at their October 31 tax year-end. The results in Gibson et al. (2000) suggest that liquidity considerations affect mutual funds’ tax-minimizing trades. After 1990, when mutual funds collectively held more than five percent of a losing firm’s outstanding shares, they began their tax-motivated sales two quarters prior to October 31. As a result, mutual funds minimized any potential price pressure that would arise if they sold all their losers at the end of their tax year.

In the conclusion of their paper, Gibson et al. (2000) discuss Sias and Starks’ (1997) finding that the January effect is related more to tax-loss-selling by individual investors than to window-dressing by institutional investors. Gibson et al. (2000) comment that Sias and Starks’ (1997) finding does not necessarily suggest that institutional investors do not window-dress. Rather, Gibson et al. (2000) explain that institutional investors could spread out their window-dressing transactions similar to how mutual funds spread out their tax-motivated trades. Thus, one might expect for advisers serving tax-exempt clients to spread out their window-dressing transactions. In addition,

one might expect for tax-sensitive advisers to spread out their tax-motivated trades, similar to mutual fund managers. Yet, because anecdotal evidence suggests that tax-sensitive advisers' year-end tax-motivated trades are in response to their clients' requests, which likely come late in the year, tax-sensitive advisers might be constrained in their ability to spread out these transactions. I formally test the following hypothesis (stated in the alternative):

H1: Investment advisers contribute to the abnormal pattern of stock returns around calendar year-end via tax-loss-selling rather than via window-dressing.

2.3 Sample Selection and Research Design

Sample

Institutional investment managers who exercise investment discretion of \$100 million or more in Section 13(f) securities must report to the Securities and Exchange Commission (SEC) holdings of more than 10,000 shares or holdings valued in excess of \$200,000. Data on these holdings are available on Thomson Financial. Thomson Financial divides institutional investors into the following five types: banks, insurance companies, investment companies (open-ended or closed-end mutual funds), independent investment advisers, and others (i.e., endowments, foundations, employee stock ownership plans, pensions, etc.).

I collect data on the client types of investment advisers using the SEC's Investment Adviser Public Disclosure (IAPD) database.⁴ According to Abarbanell,

⁴ http://www.adviserinfo.sec.gov/IAPD/Content/IapdMain/iapd_SiteMap.aspx

Bushee and Raedy (2003), there is overlap between the investment companies and independent investment advisers in Thomson Financial. In addition, beginning in 1998, Thomson Financial misclassified many investment companies and independent investment advisers by including them in the type “other.” Therefore, I begin my search for investment adviser client types by compiling a list of all institutional investors classified as an investment company, an independent investment adviser, or “other” in Thomson Financial in years 1997 through 2005. I then check whether the institutional investor from Thomson Financial is in the IAPD database. If it is, I collect data on the investment adviser’s client types.

The Form ADV, which SEC-registered investment advisers must file, lists the following ten client types: individuals (other than high net-worth individuals); high net-worth individuals; banking or thrift institutions; investment companies (including mutual funds); pension and profit-sharing plans (other than plan participants); other pooled investment vehicles (e.g., hedge funds); charitable organizations; corporations or other businesses not listed above; state or municipal government entities; and “others” such as non-U.S. government entities.⁵ Investment advisers must provide the approximate percentage of their business represented by each client type: none, up to 10 percent, 11-25 percent; 26-50 percent; 51-75 percent; more than 75 percent. If over 50 percent of an investment adviser’s clients are high-net worth individuals, I classify the adviser as “tax-

⁵ The Form ADV, which registered investment advisers must file with the SEC, defines a “high net-worth individual” as “an individual with at least \$750,000 managed by [the investment adviser], or whose net worth [the investment adviser] reasonably believes exceeds \$1,500,000, or who is a ‘qualified purchaser’ as defined in section 2(a)(51)(A) of the Investment Company Act of 1940. The net worth of an individual may include assets held jointly with his or her spouse.” The category “individuals” on the Form ADV includes trusts, estates, 401(k) plans and IRAs of individuals and their family members.

sensitive.” If over 50 percent of an adviser’s clients are pensions, state and local governments, and/or charitable endowments, I classify the adviser as “tax-exempt.” I match 1,124 institutional investors in Thomson Financial to independent investment advisers in the IAPD database. Of the 1,124, 376 are “tax-sensitive” and 145 are “tax-exempt.” I isolate these two groups of investment advisers because “tax-sensitive” advisers have clear tax incentives and little, if any, incentive to window-dress their portfolios and advisers serving tax-exempt entities have no tax incentives but do have incentives to window-dress because of their detailed disclosures to clients. The disclosure practices of the advisers who primarily serve the remaining client types do not provide a greater incentive to window dress by selling past losers than do the disclosure practices of advisers primarily serving pensions, charitable endowments, or state and local governments.

I collect quarterly stock holdings of investment advisers from Thomson Financial, stock return and market capitalization data from the Center for Research in Security Prices (CRSP), and financial statement variables from Compustat.

Research Design for Hypothesis 1

H1 predicts that investment advisers contribute to the abnormal pattern of stock returns around calendar year-end via tax-loss-selling and not via window-dressing. I isolate firms whose cumulative return over the year, excluding the last four trading days, is negative. I do so because Lakonishok et al. (1991) document that selling past losers is the most common form of window-dressing among pension funds. Moreover, I expect that these are the same set of stocks from which investors select to sell to generate a tax

loss. Extending Sias and Starks (1997), I estimate the following ordinary least squares regression twice, once where the dependent variable equals the average return over the last four trading days of December (Return_Dec_{it}) and once where the dependent variable equals the average return over the first four trading days of January (Return_Jan_{it+1}):

$$\begin{aligned} \text{Return_Month}_{it} = & \beta_0 + \beta_1 \text{Chg_Tax-Sensitive}_{it} + \beta_2 \% \text{Tax-Sensitive}_{it} + \\ & \beta_3 \text{Chg_Tax-Exempt}_{it} + \beta_4 \% \text{Tax-Exempt}_{it} + \beta_5 \text{Chg_Individual}_{it} + \beta_6 \% \text{Individual}_{it} + \\ & \beta_7 \text{Return}_{it} + \beta_8 \text{Ln_Cap}_{it} + \beta_9 \text{Book/Market}_{it} + \beta_{10-20} \text{YearDummies} + \varepsilon \quad (1a) \end{aligned}$$

Observations are firm-years over the years 1996-2006.⁶ Only observations associated with firms with a negative cumulative return over year t , excluding the last four trading days of year t , are included. The independent variables of interest are the change in ownership in firm i in quarter four of year t by tax-sensitive advisers as a percent of outstanding shares of firm i at the end of quarter three ($\text{Chg_Tax-Sensitive}_{it}$) and the change in ownership in firm i in quarter four of year t by advisers serving tax-exempt clients as a percent of outstanding shares of firm i at the end of quarter three ($\text{Chg_Tax-Exempt}_{it}$). I control for the percent of outstanding shares of firm i owned by tax-sensitive advisers at the end of quarter three ($\% \text{Tax-Sensitive}_{it}$) and the percent owned by advisers serving tax-exempt clients ($\% \text{Tax-Exempt}_{it}$). A positive coefficient on $\text{Chg_Tax-Sensitive}_{it}$ when Return_Dec_{it} is the dependent variable, a negative coefficient on $\text{Chg_Tax-Sensitive}_{it}$ when Return_Jan_{it+1} is the dependent variable, and insignificant coefficients on $\text{Chg_Tax-Exempt}_{it}$ will support H1.

⁶ Return_Jan_{it+1} is measured in years 1997 through 2007.

To control for the effect of tax-loss-selling by individual investors on year-end returns, I include the percent of firm i owned by individual investors at the end of quarter three of year t ($\%Individual_{it}$) and the change in ownership in firm i by individual investors in quarter four as a percent of outstanding shares of firm i at the end of quarter three ($Chg_Individual_{it}$). I estimate the percent of outstanding shares of firm i owned by individual investors as one minus the percent of outstanding shares of firm i owned by institutional investors (Ayers, Cloyd, and Robinson 2002; Ayers, Lefanowicz and Robinson 2003; Dhaliwal, Li, and Trezevant 2003). A negative coefficient on $\%Individual_{it}$ when $Return_Dec_{it}$ is the dependent variable and a positive coefficient on $\%Individual_{it}$ when $Return_Jan_{it+1}$ is the dependent variable will be consistent with Sias and Starks' (1997) finding that the January effect is associated more with tax-loss-selling by individual investors than with window-dressing by institutional investors.

Sias and Starks (1997) find that the average return in both late December and early January is stronger for small capitalization firms and for poorer performing firms. Thus, I control for firm size by including the natural log of firm i 's average market capitalization over the 12 months of year t (Ln_Cap_{it}), and for prior performance by including firm i 's cumulative return over year t , excluding the last four trading days of year t ($Return_{it}$). I also control for firm i 's book-to-market ratio in year t ($Book/Market_{it}$). Book equity is measured at the end of the latest fiscal year ending prior to July of year t , and market equity is measured at June 30 of year t (Fama and French 1992). Finally, I control for time effects by including year dummy variables and for firm effects by clustering the standard errors by firm.

2.4 Descriptive Statistics and Univariate Results

Panel A of Table 1 provides descriptive statistics of the variables in equation (1a). The mean (median) average return of firms over the last four trading days of December (Return_Dec_{it}) is 0.63 percent (0.31 percent) and the mean (median) return of firms over the first four trading days of January (Return_Jan_{it+1}) is 0.87 percent (0.39 percent). The mean and median Return_Dec_{it} are significantly less than the mean and median Return_Jan_{it+1} , confirming that a “January effect” is present among the sample firms.⁷

The mean (median) percent ownership in firms by tax-sensitive investment advisers ($\% \text{Tax-Sensitive}_{it}$) equals 2.37 percent (0.45 percent). The mean (median) percent ownership in firms by investment advisers primarily serving tax-exempt clients ($\% \text{Tax-Exempt}_{it}$) equals 2.14 percent (0.10 percent). The mean (median) percent ownership by individual investors ($\% \text{Individual}_{it}$) is 67 percent (74 percent). The mean (median) natural logarithm of average market capitalization over year t (Ln_Cap_{it}) is 18.85 (18.71). The mean (median) cumulative return of firm i over year t excluding the last four trading days of year t (Return_{it}) is -33 percent (-28 percent). The mean (median) book-to-market ratio of firm i in year t (Book/Market_{it}) is 1.38 (0.52).

Panel B of Table 1 provides correlations of the variables used in regression (1a). Many of the correlations are significant at the 0.10 level or better. The mean return over

⁷ The mean Return_Dec_{it} and mean Return_Jan_{it+1} are also similar to those documented in Sias and Starks (1997). Sias and Starks’ (1997) sample includes New York Stock Exchange stocks from 1977-1992. For stocks considered to be losers (i.e., those with a negative cumulative return over the year, excluding the last four trading days) and with high institutional holdings, Sias and Starks (1997) document a mean return over the last four trading days of December equal to 0.39 percent and a mean return over the first four trading days of January equal to 0.60 percent. For stocks considered to be losers and with low institutional holdings, Sias and Starks (1997) document a mean return over the last four trading days of December equal to 0.25 percent and a mean return over the first four trading days of January equal to 1.46 percent.

the last four trading days of December (Return_Dec_{it}) is negatively correlated with the mean return over the first four trading days of January (Return_Jan_{it+1}) (Spearman $\rho = -0.2498$). Consistent with poorer performing firms having stronger late December and early January returns, the cumulative return over year t , excluding the last four trading days of year t , (Return_{it}) is negatively correlated with the mean return over the first four trading days of January (Spearman $\rho = -0.2026$) and with the mean return over the last four trading days of December (Spearman $\rho = -0.0749$). There is overlap in the firms in which tax-sensitive advisers ($\% \text{Tax-Sensitive}_{it}$) and tax-exempt advisers ($\% \text{Tax-Exempt}_{it}$) own shares (Spearman $\rho = 0.4891$). On the other hand, ownership by individual investors is negatively correlated with ownership by tax-sensitive advisers (Spearman $\rho = -0.6484$) and with ownership by tax-exempt advisers (Spearman $\rho = -0.7022$). Firm size (Ln_Cap_{it}) is positively correlated with the percent of the firm owned by tax-sensitive advisers (Spearman $\rho = 0.5199$) and by tax-exempt advisers (Spearman $\rho = 0.6330$) and negatively correlated with the percent of the firm owned by individual investors (Spearman $\rho = -0.6495$).

2.5 Results for Hypothesis 1

Table 2 provides the results of estimating regression (1a) by firm-year with robust standard errors clustered by firm. Year dummy variables are suppressed. As expected, columns (1) and (2) show that the change in ownership by tax-sensitive investment advisers in quarter four ($\text{Chg_Tax-Sensitive}_{it}$) is positively associated with a firm's average return over the last four trading days of December (p-value < 0.01 , two-tailed) and negatively associated with a firm's average return over the first four trading days of

January (p-value < 0.01, two-tailed), respectively. These results are consistent with the abnormal pattern of returns around calendar year-end being associated with year-end tax-loss-selling by tax-sensitive advisers. The coefficient on $\text{Chg_Tax-Exempt}_{it}$ is insignificant in columns (1) and (2), suggesting that investment advisers serving tax-exempt clients do not create price pressure at year-end by selling stocks with negative prior returns in order to window-dress their portfolios. Because tax-sensitive advisers have less of an incentive to window-dress their portfolios than do advisers serving tax-exempt clients, the insignificant coefficient on $\text{Chg_Tax-Exempt}_{it}$ provides further support that investment advisers contribute to the pattern of abnormally low returns at the end of December and abnormally high returns at the beginning of January via tax-loss-selling rather than via window-dressing.⁸ These results support H1.

Consistent with Sias and Starks (1997), ownership by individual investors ($\% \text{Individual}_{it}$) is negatively associated with a firm's average return over the last four trading days of December and is positively associated with a firm's average return over the first four trading days of January, both at a 1 percent two-tailed significance level. Also consistent with Sias and Starks (1997), a firm's average return over the last four trading days of December and its average return over the first four trading days of January are negatively associated with the firm's market capitalization (Ln_Cap_{it}) and with prior performance (Return_{it}), each at a 1 percent two-tailed significance level. A firm's book-to-market ratio (Book/Market_{it}) is negatively associated with the firm's

⁸ An untabulated *F*-test shows that the difference between the coefficients on $\text{Chg_Tax-Sensitive}_{it}$ and $\text{Chg_Tax-Exempt}_{it}$ in columns (1) and (2) is statistically significant (p-value < 0.01, two-tailed), providing further support for H1.

average return over the last four trading days of December (p-value < 0.05, two-tailed) and positively associated with the firm's average return over the first four trading days of January (p-value < 0.10, two-tailed). This suggests that, holding all else constant, the abnormal return pattern around calendar year-end is more common among value firms than among growth firms.⁹

Economic Significance

The change in ownership by tax-sensitive advisers in quarter four accounts for 0.002 percent of the average return over the last four trading days of the year of firms with negative cumulative returns over the year. This is 0.30 percent of the average return of these firms over the last four trading days of the year. A one standard deviation increase (decrease) in the change in tax-sensitive advisers' ownership in quarter four increases (decreases) the average return over the last four trading days of December by 0.04 percent, a 6.15 percent change for the mean firm.¹⁰

The change in ownership by tax-sensitive advisers in quarter four accounts for 0.004 percent of the average return over the first four trading days of the following year of firms with negative cumulative returns over the year. This is 0.46 percent of the average return of these firms over the first four trading days of the year. A one standard deviation increase (decrease) in the change in tax-sensitive advisers' ownership in quarter

⁹ The R-squared reported for each regression in Table 2 is slightly greater than the R-squared reported in Sias and Starks (1997) for the December regression (0.05 vs. 0.02 in Sias and Starks (1997)) and for the January regression (0.13 vs. 0.08 in Sias and Starks (1997)).

¹⁰ I calculate 0.002 percent as the coefficient on $\text{Chg_Tax-Sensitive}_{it}$ (0.0337) multiplied times the mean value of $\text{Chg_Tax-Sensitive}_{it}$ (0.0006). The 0.30 percent equals 0.002 percent divided by the mean value of Return_Dec_{it} (0.0063). The 0.04 percent equals the standard deviation of $\text{Chg_Tax-Sensitive}_{it}$ (0.0115) multiplied by the coefficient estimate on $\text{Chg_Tax-Sensitive}_{it}$ (0.0337). The 6.15 percent equals 0.04 percent divided by the mean value of Return_Dec_{it} (0.0063).

four decreases (increases) the average return over the first four trading days of January by 0.07 percent, a 8.20 percent change for the mean firm.¹¹

Sensitivity Tests

Requiring Positive Percent Ownership by Tax-Sensitive Advisers

Table 3 reports the results of re-estimating regression (1a) and requiring the percent of firm i owned by tax-sensitive advisers at the end of quarter three ($\%Tax-Sensitive_{it}$) to be positive. The idea is that tax-sensitive advisers can only sell shares in quarter four if they own shares at the beginning of quarter four. Eliminating observations where $\%Tax-Sensitive_{it}$ equals zero partially controls for the possibility that positive changes in ownership by tax-sensitive advisers in quarter four (i.e., purchases rather than sales) are responsible for the results in Table 2. When I eliminate observations where $\%Tax-Sensitive_{it}$ equals zero, I lose 7,360 observations, and the results are qualitatively the same as those reported in Table 2.

Replacing Change Variable with Sell Indicator Variable

In addition to the sensitivity test described above, I conduct a second sensitivity test to control for the fact that the change variables in equation (1a) capture net changes in ownership, which could either be net increases or net decreases. I re-estimate equation (1a) and replace $Chg_Tax-Sensitive_{it}$, $Chg_Tax-Exempt_{it}$, and $Chg_Individual_{it}$ with indicator variables ($Sell_Tax-Sensitive_{it}$, $Sell_Tax-Exempt_{it}$, and $Sell_Individual_{it}$) equal to one if the respective group sells shares of firm i in quarter four and equal to zero

¹¹ I calculate 0.004 percent as the coefficient on $Chg_Tax-Sensitive_{it}$ (0.0620) multiplied times the mean value of $Chg_Tax-Sensitive_{it}$ (0.0006). The 0.46 percent equals 0.004 percent divided by the mean value of $Return_Jan_{it}$ (0.0087). The -0.07 percent equals the standard deviation of $Chg_Tax-Sensitive_{it}$ (0.0115) multiplied by the coefficient estimate on $Chg_Tax-Sensitive_{it}$ (-0.0620). The -8.20 percent equals -0.07 percent divided by the mean value of $Return_Jan_{it}$ (0.0087).

otherwise. Moreover, I interact each of the indicator variables with the respective group's percentage ownership in firm i at the end of quarter three ($\%Tax-Sensitive_{it}$, $\%Tax-Exempt_{it}$, and $\%Individual_{it}$) in order to estimate the potential magnitude of each group's fourth-quarter sales. Equation (1b) is as follows:

$$\begin{aligned}
Return_Month_{it} = & \beta_0 + \beta_1 \%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it} \\
& + \beta_2 \%Tax-Sensitive_{it} + \beta_3 Sell_Tax-Sensitive_{it} \\
& + \beta_4 \%Tax-Exempt_{it} * Sell_Tax-Exempt_{it} + \beta_5 \%Tax-Exempt_{it} \\
& + \beta_6 Sell_Tax-Exempt_{it} + \beta_7 \%Individual_{it} * Sell_Individual_{it} \\
& + \beta_8 \%Individual_{it} + \beta_9 Sell_Individual_{it} + \beta_{10} Return_{it} + \beta_{11} Ln_Cap_{it} \\
& + \beta_{12} Book/Market_{it} + \beta_{13-23} YearDummies + \varepsilon
\end{aligned} \tag{1b}$$

As with equation (1a), I estimate equation 1(b) twice, once with $Return_Dec_{it}$ as the dependent variable and once with $Return_Jan_{it+1}$ as the dependent variable. Moreover, observations are firm-years over the years 1996-2006 and only observations associated with firms with a negative cumulative return over year t , excluding the last four trading days of year t , are included. A negative coefficient on the interaction $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ when $Return_Dec_{it}$ is the dependent variable, a positive coefficient on the interaction $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ when $Return_Jan_{it+1}$ is the dependent variable, and insignificant coefficients on $\%Tax-Exempt_{it} * Sell_Tax-Exempt_{it}$ will support H1. I do not make predictions for the main effects of $\%Tax-Sensitive_{it}$, $Sell_Tax-Sensitive_{it}$, $\%Tax-Exempt_{it}$, or $Sell_Tax-Exempt_{it}$.

Panel A of Table 4 provides the frequencies of the indicator variables in equation (1b). For 32 percent of observations, tax-sensitive advisers decrease their ownership in

firm i in quarter four. Similarly, 27 percent of the observations are associated with tax-exempt advisers decreasing their ownership in firm i during quarter four. Not surprisingly, more of the observations are associated with individual investors selling shares in quarter four (49 percent). This is consistent with year-end tax-loss-selling by individual investors documented in prior empirical studies. Moreover, if ownership by a particular group at the end of quarter three equals zero, the sell indicator variable for that group equals zero. Because individual investors own shares in more firms than do tax-sensitive advisers or advisers serving tax-exempt clients, it is not surprising that a higher percentage of the observations are associated with sales made by individual investors than with sales made by tax-sensitive or tax-exempt advisers.

The results of estimating equation (1b) are presented in Panel C of Table 4. The coefficient on the interaction $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ is negative and significant ($p < 0.01$, two-tailed) when $Return_Dec_{it}$ is the dependent variable and positive and significant ($p\text{-value} < 0.10$, two-tailed) when $Return_Jan_{it+1}$ is the dependent variable, and the coefficient on $\%Tax-Exempt_{it} * Sell_Tax-Exempt_{it}$ is insignificant in columns (1) and (2). These results provide further support for H1.¹²

The coefficients on $\%Individual_{it}$, Ln_Cap_{it} , $Return_{it}$, and $Book/Market_{it}$ in columns (1) and (2) are consistent with those in Table 2. The coefficient on the interaction $\%Individual_{it} * Sell_Individual_{it}$ is negative and significant ($p\text{-value} < 0.01$,

¹² Although the coefficient on $Sell_Tax-Sensitive_{it}$ is positive and significant in column (1) and the coefficient on $\%Tax-Sensitive_{it}$ is negative and significant in column (2), I cannot interpret these coefficients because neither variable alone captures the magnitude of potential sales. When I sum the coefficients on $\%Tax-Sensitive_{it}$, $Sell_Tax-Sensitive_{it}$, and $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ in column (1), an F -test shows that the sum is negative and statistically significant ($p\text{-value} < 0.05$, two-tailed). However, when I sum the coefficients on $\%Tax-Sensitive_{it}$, $Sell_Tax-Sensitive_{it}$, and $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ in column (2), the sum is positive but is statistically insignificant.

two-tailed) in column (2). This suggests that sales made by individual investors in quarter four are related to lower, rather than higher, returns over the first few days of January. However, when I sum the coefficients on %Individual_{it}, Sell_Individual_{it}, and %Individual_{it}*Sell_Individual_{it}, the sum is negative and significant (p-value < 0.01) in column (1) and positive and significant (p-value < 0.01) in column (2), consistent with tax-loss-selling by individual investors being related to abnormally low returns over the last few days of December and abnormally high returns over the first few days of January.

Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

In additional sensitivity tests, I analyze whether the association between the change in ownership by tax-sensitive advisers during quarter four and the abnormal pattern of returns around calendar year-end varies with the performance of the market over the year. For instance, one might expect more tax-loss-selling at the end of years when the market has performed well because investors will have had more opportunities to realize capital gains, which they will want to offset with capital losses (Poterba and Weisbenner 2001; Grinblatt and Moskowitz 2004). I use the cumulative return of the S&P 500 Index over year t as a proxy for the market's performance in year t and conduct two sensitivity tests.

First, I re-estimate equations (1a) and (1b) separately for good years (years when the cumulative return of the S&P 500 Index is positive) and for bad years (years when the cumulative return of the S&P 500 Index is negative). Panels A and B of Table 5 report the results of estimating equation (1a) for bad market years and good market years,

respectively. The results are qualitatively the same as those in Table 2, suggesting that the relationship between tax-loss-selling by tax-sensitive advisers and the abnormal pattern of returns around calendar year-end is not dependent on the market's performance.

Panels C and D of Table 5 report the results of estimating equation (1b) for bad market years and good market years, respectively. When I re-estimate regression (1b) for bad years, %Tax-Sensitive_{it}*Sell_Tax-Sensitive_{it} is insignificant when Return_Dec_{it} is the dependent variable but is positive and significant when Return_Jan_{it+1} is the dependent variable (p-value < 0.10, two-tailed). When I re-estimate regression (1b) for good years, %Tax-Sensitive_{it}*Sell_Tax-Sensitive_{it} is negative and significant (p < 0.01, one-tailed) when Return_Dec_{it} is the dependent variable but is insignificant when Return_Jan_{it+1} is the dependent variable. The results from re-estimating equation (1b) separately for good and bad market years provide mixed evidence of whether the relationship between tax-loss-selling by tax-sensitive advisers and the abnormal pattern of stock returns around calendar year-end varies with the market's performance.

Second, I include an indicator variable (Goodyear_t) equal to one if the cumulative return of the S&P 500 Index is positive over year *t*, and equal to zero otherwise, in equations (1a) and (1b). I interact Goodyear_t with the change variables in equation (1a) and with the main effects (%Tax-Sensitive_{it}, Sell_Tax-Sensitive_{it}, %Tax-Exempt_{it}, Sell_Tax-Exempt_{it}, %Individual_{it}, Sell_Individual_{it}) and interactions (%Tax-Sensitive_{it}*Sell_Tax-Sensitive_{it}, Tax-Exempt_{it}*Sell_Tax-Exempt_{it}, Individual_{it}*Sell_Individual_{it}) in equation (1b). The results of re-estimating equations (1a) and (1b) as described above, which are reported in Panels E and F of Table 5,

suggest that the relationship between the change in ownership by tax-sensitive advisers in quarter four and the abnormal pattern of returns around calendar year-end does not vary with the overall performance of the market. Specifically, the coefficient on $\text{GoodYear}_t * \text{Chg_Tax_Sensitive}_{it}$ is insignificant in Panel E, and the coefficient on $\text{GoodYear}_t * \% \text{Tax_Sensitive}_{it} * \text{Sell_Tax-Sensitive}_{it}$ is insignificant in Panel F.

In summary, the sensitivity analyses described above suggest that tax-sensitive advisers conduct tax-motivated trades that are associated with the abnormal pattern of returns around calendar year-end in both good and bad market years.

Clustering Standard Errors by Year and Estimating Fama MacBeth Regressions

In estimating equations (1a) and (1b), I control for time effects by including year indicator variables and for firm effects by using White standard errors clustered by firm. Petersen (2008) explains how using different methods for controlling for firm effects and for time effects can produce different results. Therefore, in sensitivity tests, I re-estimate equations (1a) and (1b), drop the year indicator variables and use two different methods for controlling for time effects. First, I cluster the standard errors by year, rather than by firm. The results, which are reported in Panels A and B of Table 6, are qualitatively the same as those reported in Table 2 and in Panel C of Table 3, respectively.

Second, I re-estimate equations (1a) and (1b) using the Fama MacBeth (1973) procedure. The results are reported in Table 7. The coefficient on $\text{Chg_Tax-Sensitive}_{it}$ is positive but not statistically significant when Return_Dec_{it} is the dependent variable (Panel A); however, it is negative and significant ($p\text{-value} < 0.01$, two-tailed) when Return_Jan_{it+1} is the dependent variable (Panel B), consistent with the results in column

(2) of Table 2. When I re-estimate equation (1b) using the Fama MacBeth (1973) procedure, the coefficient on $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ is negative and significant (p-value < 0.05, two-tailed) when $Return_Dec_{it}$ is the dependent variable (Panel C), consistent with the result in column (1) of Panel C of Table 4; however, the coefficient on $\%Tax-Sensitive_{it} * Sell_Tax-Sensitive_{it}$ is insignificant when $Return_Jan_{it+1}$ is the dependent variable (Panel D).

With the exception of the results for regression (1a) when $Return_Dec_{it}$ is the dependent variable and the results for regression (1b) when $Return_Jan_{it+1}$ is the dependent variable using the Fama MacBeth (1973) procedure, the results of the sensitivity tests described above are consistent with those reported in Table 2 and in Panel C of Table 3. The fact that the Fama MacBeth (1973) procedure produces insignificant results in two cases suggests that there is potentially a firm effect and that the standard errors generated using the Fama MacBeth (1973) procedure are biased.

2.6 Conclusion

In summary, I find that the abnormal pattern of stock returns around calendar year-end for firms with negative prior returns is related to the change in ownership by tax-sensitive investment advisers during quarter four and unrelated to the change in ownership by advisers serving tax-exempt clients during quarter four. Tax-sensitive advisers have little, if any, incentive to sell stocks with negative prior returns in order to window dress their portfolios. Advisers serving tax-exempt clients have no incentive to sell stocks with negative prior returns for tax purposes and more of an incentive than tax-sensitive advisers to sell stocks with negative prior returns to window-dress their

portfolios. Thus, I conclude that investment advisers contribute to the pattern of abnormally low returns over the last few trading days of December and abnormally high returns over the first few days of January via tax-loss-selling rather than via window-dressing.

This is the first paper to document that tax-loss-selling by institutional investors is related to the abnormal pattern of stock returns around calendar year-end. This result is important because although the January effect has been widely studied, academics and the investment community have yet to reach an agreement on its cause. Unlike window-dressing, which is motivated by portfolio managers' self-interests, tax-loss-selling is conducted with the interests of portfolio managers' clients in mind. Moreover, corporate managers care about what factors influence institutional investors' trading decisions. If tax-sensitive investment advisers own shares in a firm that has performed poorly over the year and if management of the firm believes the firm's performance will improve in the near-term, management should communicate the firm's future prospects to tax-sensitive investment advisers. In doing so, management might prevent tax-sensitive investment advisers from selling the firm's shares, thereby preventing downward price pressure at year-end.

Chapter 3: Investment Advisers' Response to Holding Period Incentives

3.1 Introduction

Under U.S. tax law, net short-term gains are taxed as ordinary income, while net long-term gains are taxed at a lower rate. The long-term holding period is currently one year. This differential treatment provides investors with an incentive to realize losses before they have held a stock for a year and to defer the realization of gains until after they have held a stock for a year. According to Chan (1986), investors should have more of an incentive to realize losses at year-end when the losses qualify as short-term in December but as long-term in January. However, Badrinath and Lewellen (1991) find no response, and Ivkovic et al. (2004) find a weak response to holding period incentives by individual investors at year-end. The results in chapter one are consistent with tax-sensitive advisers realizing losses for tax purposes at calendar year-end. In this chapter, I examine whether tax-sensitive advisers respond to holding period incentives at year-end when choosing which loss stocks to sell.

The results are consistent with tax-sensitive advisers responding to holding period incentives at year-end by accelerating the realization of short-term losses. Tax-sensitive advisers are more likely to sell stocks with short-term losses the larger the difference between the current short-term loss deduction and what the long-term loss deduction would be if they wait to sell, consistent with Chan's (1986) suggestion. In light of results in prior empirical studies (e.g., Badrinath and Lewellen 1991), the results also suggest that institutional investors who trade on behalf of high net-worth individuals respond more to tax incentives than do individual investors trading on their own behalf. Such a

differential response to tax incentives, which could be provided by the U.S. holding period rules as in this chapter or by tax reforms, should be of interest to policy makers as high net-worth individuals allocate more of their wealth to the investment discretion of institutional investors over time.¹³ Auerbach, Burman, and Siegel (2000) find that the fraction of individual investors who report net capital losses on their tax returns in the early 1990s is greater than the fraction of individual investors who report net capital losses in the 1980s (Poterba 1987; Seyhun and Skinner 1994). The increase in the net capital losses reported by individual investors could be related to individual investors allocating more of their wealth to the investment discretion of institutional investors from the early 1980s to the mid-1990s. This is the first paper to directly test the response to holding period incentives by institutional investors who trade on behalf of individual investors.

3.2 Literature Review and Development of Hypothesis 2

According to Chan (1986), investors should have more of an incentive to conduct tax-loss-selling at year-end when losses qualify as short-term in December but as long-term in January. However, prior literature finds little evidence that investors respond to holding period incentives. Using a compilation of over 80,000 actual purchase-to-sale cycles of investments in common stocks by a sample of 3,000 individual investors over

¹³ Prior studies find weak responses by individual investors to incentives provided by tax reforms. For example, Scholz (1994) finds limited evidence of changes in household portfolios around the Tax Reform Act of 1986. In contrast, Desai and Dharmapala (2007) find a sophisticated response by institutional investors to one incentive provided by the Jobs and Growth Tax Relief Reconciliation Act of 2003. They find that banks, institutional investors, securities brokers and dealers who trade on behalf of individual investors shifted their portfolio holdings from foreign corporations located in non-treaty countries to foreign corporations located in treaty countries in order to get preferential tax treatment on foreign dividends.

the period 1971-1979, Badrinath and Lewellen (1991) examine tax-loss-selling around two key dates: calendar year-end and the qualification date for long-term tax treatment. They only find weak evidence of a concentration of tax-loss-selling just prior to the dates when investments become eligible for long-term tax treatment. Moreover, although they find that individual investors concentrate tax-loss-selling at year-end, they do not find that individual investors accelerate the realization of short-term losses at year-end, even during years when investors could only deduct 50 percent of long-term losses from adjusted gross income, opposed to 100 percent of short-term losses. Blouin, Raedy, and Shackelford (2003) and Hurtt and Seida (2004) find similar lack of evidence in a different setting. They find that investors do not accelerate the realization of short-term losses around quarterly earnings announcements.

Using data on trades made by individual investors at a discount brokerage house from 1991-1996, Ivkovic et al. (2004) find that individual investors increased realizations of short-term losses at year-end after the 1993 Omnibus Budget Reconciliation Act increased the differential between short-term and long-term capital gains tax rates. However, their results also suggest that individual investors did not completely respond to holding period incentives, as they did not realize all of their short-term losses even when they had short-term gains to offset.

Although Badrinath and Lewellen (1991) find no response and Ivkovic et al. (2004) find a weak response to holding period incentives by individual investors at year-end, tax-sensitive investment advisers might be more tax-savvy than individual investors. Jin (2006) studies the effect capital gains have on the likelihood that tax-sensitive

institutional investors sell a stock. Jin (2006) defines tax-sensitive institutional investors as insurance companies and investment advisers whose clients are primarily high net worth individuals and hedge funds. Although Jin's (2006) focus is not holding periods, he does conduct tests allowing short-term and long-term capital gains to have a different impact on the likelihood that a tax-sensitive institution sells a stock. He finds that the differences in impacts are statistically insignificant. There are two differences between Jin (2006) and this paper that might result in my finding a response to holding period incentives, whereas Jin (2006) does not. First, Jin (2006) classifies insurance companies and investment advisers whose clients are primarily hedge funds as tax-sensitive institutions. Insurance companies and investment advisers primarily serving hedge funds might respond differently to holding period incentives than investment advisers serving high net-worth individuals. Second, Jin's (2006) tests are not restricted to year-end. Tax-sensitive institutions possibly respond more to holding period incentives at year-end.

I expect tax-sensitive investment advisers to respond to holding period incentives by realizing short-term losses at year-end. Such trading behavior would be consistent with the theoretical arguments in Chan (1986). This leads to the following hypothesis (stated in the alternative):

H2: In choosing which stocks with prior losses to sell at year-end, tax-sensitive investment advisers are more likely to sell a stock if the loss qualifies for short-term capital loss treatment, and the greater the difference between the short-term capital loss deduction and what the deduction would be if long-term.

3.3 Sample Selection and Research Design

Sample

Refer to section 2.3 of chapter two for an explanation of how I identify the clienteles of investment advisers. In this chapter, I only use the 376 “tax-sensitive” investment advisers. I collect investment advisers’ end-of-quarter stock holdings from Thomson Financial, stock return data from the Center for Research in Security Prices (CRSP), financial statement variables from Compustat, and analysts’ recommendations from I/B/E/S. The sample period is 1993-2006.

Research Design for Hypothesis 2

H2 predicts that tax-sensitive investment advisers are more likely to sell a stock with prior losses if the sale generates a short-term loss deduction and the greater the difference between the short-term deduction and what the long-term deduction would be. Because U.S. tax law provides complex netting rules, tax-sensitive investment advisers may not have an incentive to accelerate the realization of short-term losses in years when they only have long-term gains to offset. However, this will bias against finding the predicted result. I test H2 by estimating the following probit regression by investment adviser j -firm i -year t for transactions made in the fourth quarter of year t :

$$\begin{aligned} \text{Probability of Selling}_{jit} = & \beta_0 + \beta_1 \text{Drate}_t * \text{Base_Change}_{it} * \text{Short-Term}_{jit} \\ & + \beta_2 \text{Ltcg}_t * \text{Base_Change}_{it} + \beta_3 \text{Recommend}_{it} + \beta_4 \text{Base_Change}_{it} + \beta_5 \text{Ltcg}_t \\ & + \beta_6 \text{Drate}_t + \beta_7 \text{Drate}_t * \text{Base_Change}_{it} + \beta_8 \text{Short-Term}_{jit} + \beta_9 \text{Drate}_t * \text{Short_Term}_{jit} \\ & + \beta_{10} \text{Base_Change}_{it} * \text{Short-Term}_{jit} + \beta_{11} \text{Transient}_{jt} + \varepsilon \end{aligned} \quad (2)$$

The sample includes only observations associated with firms that have a negative cumulative return measured over the first three quarters of year t and that tax-sensitive investment adviser j owns at the beginning of quarter four. Probability of Selling $_{jit}$ equals one if tax-sensitive investment adviser j sells shares of firm i in quarter four of year t ; zero otherwise.

I estimate equation (2) over the years 1993-2006 in order to have variation in the difference between the short-term and long-term capital gains tax rates. Because I control for the effect of analysts' recommendations, which are only available from I/B/E/S for years 1993 forward, 1993 is the earliest that I can begin the sample period.

Table 8 outlines the holding period, the statutory short-term capital gains tax rate, the statutory long-term capital gains tax rate (Ltcg $_t$), and the difference between the short-term and long-term capital gains tax rates (Drate $_t$) over the sample period. The holding period required to qualify for long-term capital gain (loss) treatment is 12 months over the sample period, with the exception of the period from July 29, 1997 to December 31, 1997, when it was 18 months. The variable Drate $_t$ ranges from 11.6 percent to 20 percent over the sample period. The variable Ltcg $_t$ ranges from 15 percent to 28 percent over the sample period.

The variable Base_Change $_{it}$ equals the price appreciation (depreciation) over the holding period, assuming the holding period ends five trading days prior to the calendar year-end (Blouin et al. 2003). Short-Term $_{jit}$ is a dummy variable that captures whether some or all of the shares of firm i owned by investment adviser j qualify for favorable short-term capital loss treatment. Short-Term $_{jit}$ equals one if investment adviser j did not

own shares of firm i at the end of year $t - 1$ or if the number of shares of firm i owned by investment adviser j increased between the end of year $t - 1$ and the end of quarter three of year t ; zero otherwise. H2 predicts that if a loss qualifies for favorable short-term capital loss treatment at calendar year-end, a tax-sensitive adviser is more likely to realize the loss the greater the difference between the tax benefit of the short-term loss deduction and what the benefit would be if long-term. A negative β_1 will support H2.

Some losses will not qualify for favorable short-term capital loss treatment at calendar year-end. For stocks that will generate a long-term loss deduction upon sale, tax-sensitive advisers might be more willing to sell these stocks the greater the long-term loss deduction resulting from the sale. To control for this possibility, I include the interaction $Ltcg_t * Base_Change_{it}$. The interaction $Ltcg_t * Base_Change_{it}$ is a noisy measure of the actual long-term loss deduction because it only captures price appreciation (depreciation) over the prior 12 or 18 months.

Bushee (1998, 2001) divides institutional investors into three types: transient, quasi-indexer, and dedicated. “Transient” institutions have short-term investment horizons, high portfolio turnover, and highly diversified portfolio holdings. “Dedicated” and “quasi-indexer” institutions provide long-term, stable ownership because they focus on longer-term dividend income or capital appreciation. $Transient_{jt}$ equals one if Bushee (2001) classifies tax-sensitive investment adviser j as a transient institutional investor in year t ; zero otherwise. Because transient institutional investors trade often and focus on the short term, one might expect tax-sensitive investment advisers that are classified as “transient” institutions to be more likely to sell stocks with negative prior returns.

However, transient institutional investors might also take into account their expectation of near-term future performance. For example, Ali, Durtschi, Lev, and Trombley (2004) and Ke and Petroni (2004) find that changes in holdings by transient institutional investors are positively associated with firms' future earnings and returns. Thus, I do not make a directional prediction for Transient_{jt} .

Recommend_{it} equals the latest median buy/hold/sell recommendation made by analysts for firm i in either November or December of year t . Higher values of Recommend_{it} are associated with sell recommendations. A positive coefficient on Recommend_{it} will suggest that tax-sensitive investment advisers follow analysts' buy/hold/sell recommendations.

Standard errors are clustered by tax-sensitive investment adviser.

3.4 Descriptive Statistics and Univariate Results

Table 9 presents frequencies and descriptive statistics for the variables in equation (2). Panel A reports that nearly half (45 percent) of the observations are associated with a sale. For sixty-two percent of the observations, the tax-sensitive adviser either did not own the stock at the end of the previous year or bought additional shares of the stock in year t . Thirty-eight percent of the observations are associated with a tax-sensitive adviser who is classified as a "transient" institutional investor (Bushee 1998, 2001).

Panel B of Table 9 reports the descriptive statistics for the continuous variables in equation (2). The mean (median) difference between the long-term capital gains tax rate and the short-term capital gains tax rate (Drate_t) is 19 percent (20 percent). The mean (median) change in price over the holding period required for long-term capital gains tax

treatment, assuming the holding period ends five trading days prior to calendar year-end is (Base_Change_{it}) -0.145 (-0.135). The mean (median) median buy/hold/sell recommendation made by analysts at calendar year-end (Recommend_{it}) is 2.34 (2.0), indicating that more of the recommendations are “buy” rather than “sell.”

Panel C of Table 9 reports the Pearson and Spearman correlations of variables in equation (2). All of the correlations are statistically significant at the 0.10 level or better.

3.5 Results for Hypothesis 2

Table 10 reports the results of estimating equation (2) by tax-sensitive investment adviser j -firm i -year t over years 1993-2006. Standard errors are clustered by tax-sensitive investment adviser. Consistent with H2, the coefficient on the interaction $\text{Drate}_t * \text{Base_Change}_{it} * \text{Short-Term}_{jit}$ is negative and significant (p-value < 0.05, one-tailed). Tax-sensitive investment advisers are more likely to sell a stock with prior losses at year-end if the loss qualifies for favorable short-term capital loss treatment and the larger the difference between the short-term loss deduction and what the deduction would be if long-term.

This result is important because, although U.S. tax law provides investors with the incentive to realize losses when they qualify for short-term treatment and to defer the realization of gains until they qualify for long-term treatment, prior empirical studies find little evidence that investors respond to this incentive (Badrinath and Lewellen 1991; Blouin et al. 2003; Hurtt and Seida 2004; Ivkovic et al. 2004). Even though the results in Blouin et al. (2003) and Hurtt and Seida (2004) suggest that some segment of the market

responds to holding period incentives in the case of appreciated shares, neither paper is able to tie the result to a group of investors subject to individual income taxes.

The positive and significant coefficient on Recommend_{it} (p-value < 0.01, two-tailed) suggests that tax-sensitive investment advisers follow sell-side analysts' buy/hold/sell recommendations when choosing which stocks with prior losses to sell at year-end.

Sensitivity Tests

In sensitivity tests, I control for the possibility that tax-sensitive advisers have a greater incentive to realize tax losses in quarter four during years in which the overall market does well by including a variable equal to the cumulative return of the S&P 500 Index over year t , SP500Return_t (Poterba and Weisbenner 2001; Grinblatt and Moskowitz 2004). The results are reported in column (1) Table 11. The coefficient on SP500Return_t is insignificant, which does not support that tax-sensitive advisers have a greater incentive to realize capital losses at the end of years when the market performs well. The results for all other variables are qualitatively the same as those reported in Table 10.

In a second sensitivity test, I include an additional measure of the potential capital gains realized by investment adviser j during year t . I include a variable that equals the portfolio return earned by investment adviser j over the first nine months of year t ($\text{Portfolio_Return}_{jq}$), a variable that equals investment adviser j 's average portfolio turnover over the same nine months ($\text{Portfolio_Turnover}_{jq}$), and the interaction of the two variables. Investment adviser j 's quarterly portfolio turnover equals the minimum of

purchases and sales made by investment adviser j during quarter q divided by the market value of investment adviser j 's portfolio at the beginning of quarter q (Huddart and Narayanan 2002). A positive coefficient on the interaction $\text{Portfolio_Return}_{jq} * \text{Portfolio_Turnover}_{jq}$ will suggest that the greater the return earned by investment adviser j in year t and the higher the turnover in investment adviser j 's portfolio (i.e., the more capital gains realized), the greater the probability that investment adviser j will realize capital losses in quarter four. The results are reported in column (2) of Table 11. The coefficient on the interaction $\text{Portfolio_Return}_{jq} * \text{Portfolio_Turnover}_{jq}$ is positive but statistically insignificant, and the results for the remaining variables are qualitatively the same as those in Table 6.

3.6 Conclusion

Tax-sensitive investment advisers appear to respond to holding period incentives provided by U.S. tax law. When choosing which loss stocks to sell at year-end, the likelihood that tax-sensitive advisers sell a stock increases with the difference between the current short-term loss deduction and what the deduction would be if long-term, consistent with the theoretical arguments in Chan (1986). This result is important because although U.S. tax law provides investors with the incentive to realize losses when they qualify for short-term treatment and to defer the realization of gains until they qualify for long-term treatment, prior empirical papers find little evidence that investors respond to this incentive. However, I cautiously offer the conclusion in this chapter because it is unclear at this point if tax-sensitive advisers are selling loss stocks in order to satisfy redemptions, rather than in response to holding period incentives.

The results in this chapter highlight a response to a tax law incentive by institutional investors even though prior studies find little, if any, response to the same incentive by individual investors. This is important because as individual investors allocate more of their wealth to the investment discretion of institutional investors, we can expect to find a larger response to incentives provided by tax law.

Chapter 4: Taxes, Investor Sophistication, and the Disposition Effect

4.1 Introduction

The realization-based tax system in the United States provides investors with opportunities for tax management. For instance, prior theoretical work (Constantinides 1984) demonstrates that investors can raise the after-tax return on their investments if they realize their losses and defer realization of gains. However, empirical studies (e.g., Odean 1998; Barber and Odean 2003; Ivkovic et al. 2004) find that individual investors are more likely to realize gains than losses, even in their taxable accounts, with the exception of in December when they realize losses for tax purposes. The tendency of investors to realize gains at a quicker rate than losses is commonly referred to as the “disposition effect.”

The majority of the empirical literature (e.g., Shefrin and Statman 1985; Odean 1998; Barber and Odean 2003) focuses on a behavioral explanation for the disposition effect. According to Shefrin and Statman (1985), the disposition effect results from investors being reluctant to admit their mistakes (Kahneman and Tversky 1979) and to close a mental account at a loss (Thaler 1985). However, other studies propose rational explanations, such as portfolio rebalancing (Lakonishok and Smidt 1986), transaction costs (Harris 1988), and informational differences across investors (Lakonishok and Smidt 1986). Odean (1998) shows that individual investors’ tendency to realize gains at a quicker rate than losses is not due to portfolio rebalancing, transaction costs, or differences in information. Moreover, he finds that the “winning” stocks that individual investors sell continue to outperform the “losing” stocks that they continue to hold.

Unless stated otherwise, when I refer to the “disposition effect” throughout this chapter, I am simply referring to the tendency to realize gains at a quicker rate than losses, regardless of whether this tendency is rational or the product of a behavioral bias.

Individual investors’ delay of loss realizations until calendar year-end is cited as a contributing factor to the pattern of abnormally low returns over the last few days of December and abnormally high returns over the first few days of January, commonly referred to as the “January effect.” In chapter two, I document that institutional investors whose clients are high net-worth individuals also sell losing stocks for tax purposes at calendar year-end and that their sales are associated with the abnormal pattern of returns around calendar year-end. However, the finding in chapter two is not sufficient to conclude that tax-sensitive investment advisers exhibit the disposition effect throughout the rest of the year because tax-sensitive advisers’ year-end tax-motivated trades could be client-driven. For instance, even if an adviser realizes gains and losses consistently throughout the year in an attempt to maximize the after-tax returns of the investments that he or she manages for a client, a client might request for his or her adviser to harvest tax losses at year-end if the client wants to offset gains that he or she has realized outside of the adviser’s accounts.

In discussing studies that find the presence of the disposition effect among individual investors, James Poterba says “One general difficulty with the literature on taxation and optimal trading behavior remains something of a mystery” (Poterba 2002, p.1140). My goal is to shed light on this mystery. I examine whether, like individual investors, tax-sensitive investment advisers exhibit the disposition effect.

As mentioned above, Shefrin and Statman (1985) claim that the disposition effect results from investors being reluctant to admit their mistakes (Kahneman and Tversky 1979) and to close a mental account at a loss (Thaler 1985). Investors have difficulty closing mental accounts at a loss because, in doing so, they have to give up hope that they will make money on the particular investments. The very act of realizing a loss proves that their first judgment to make the investment was wrong. Shefrin and Statman (1985) suggest that sophisticated investors are more capable of closing mental accounts than the average investor. Prior empirical studies find that sophisticated investors are subject to the disposition effect (Grinblatt and Keloharju 2001; Shapira and Venezia 2001; Garvey and Murphy 2004; Locke and Mann 2005; Frazzini 2006; Jin and Scherbina 2006), although to a lesser extent than individual investors (Grinblatt and Keloharju 2001; Shapira and Venezia 2001; Feng and Seasholes 2005). Prior studies also find that tax incentives attenuate the effect among individual investors (Barber and Odean 2003; Ivkovic et al. 2004). I predict that the combination of tax incentives and investor sophistication will prevent the disposition effect among tax-sensitive advisers.

To test whether the combination of tax incentives and investor sophistication prevents the disposition effect, I compare the likelihood that tax-sensitive and tax-insensitive investment advisers sell “losers” to the likelihood that they sell “winners.” Losers (winners) are defined as stocks whose cumulative return over the prior nine months is negative (positive). Tax-sensitive advisers are more likely to sell losers than to sell winners, and their sales of losers are not isolated to quarter four. These results are inconsistent with the presence of a disposition effect. In contrast, tax-insensitive advisers

are more likely to sell winners than to sell losers. These results hold even after controlling for portfolio rebalancing and for differences in characteristics (e.g., prior portfolio performance and turnover in the portfolio) between tax-sensitive and tax-insensitive advisers.

In light of the finding in prior studies that individual investors are more likely to realize gains than losses even in their taxable accounts (Barber and Odean 2003; and Ivkovic et al. 2004), the finding that tax-insensitive, but not tax-sensitive, advisers exhibit the disposition effect suggests that tax incentives combined with investor sophistication prevents the disposition effect. Thus, I conclude that the ability of tax incentives to prevent the disposition effect differs between sophisticated and amateur investors. The results should be of interest to academics and investment professionals who seek to understand why some investors realize gains at a quicker rate than losses.

To my knowledge, this is the first paper to examine whether the combination of investor sophistication and tax incentives prevents the disposition effect. Jin (2006) finds that the likelihood of selling a stock by institutions serving tax-sensitive clients and the magnitude of the sale are negatively related to the cumulative capital gains on the stock. He does not find that sales made by institutions serving tax-exempt clients are related to cumulative capital gains. Although Jin's (2006) result suggests that tax incentives attenuate the disposition effect among institutional investors serving tax-sensitive clients, Jin (2006) does not directly test for the presence of the disposition effect. In order to directly test whether tax-sensitive investment advisers exhibit the disposition effect, one must compare the likelihood that advisers realize a gain to the likelihood that they realize

a loss (irrespective of the size of the gain or loss), relative to their opportunities to sell each. Furthermore, it is important to examine when tax-sensitive advisers realize losses. A finding that tax-sensitive advisers realize gains at a quicker rate than losses except in December would suggest that they exhibit the disposition effect throughout the year and that tax incentives attenuate the effect at year-end.

As mentioned above, the results suggest that tax-insensitive advisers are more likely to realize winners than to realize losers even after controlling for portfolio rebalancing, portfolio turnover, and prior portfolio performance. Tax-insensitive advisers' tendency to realize winners and to hold losers could be rational if tax-insensitive advisers expect the losers to outperform the winners in the future or if they believe that prices mean revert. Although the focus of this chapter is to test whether tax incentives prevent, not just attenuate, the disposition effect among sophisticated investors, I conduct preliminary tests of whether tax-insensitive advisers' tendency to sell winners and to hold losers is rational. I compare the *ex post* performance of the losers that they continue to hold to the *ex post* performance of the winners that they sell. The results suggest that the losers that tax-insensitive advisers continue to hold outperform the winners that they sell in the following six-month and 12-month periods. Thus, tax-insensitive advisers do not incur a cost from being more likely to sell winners than to sell losers and their trading behavior appears to be rational rather than the result of a behavioral bias.

4.2 Literature Review and Development of Hypothesis 3

The disposition effect is the tendency of investors to realize gains and to hold losses. According to Shefrin and Statman (1985), the disposition effect is the result of investors being reluctant to admit their mistakes (Kahneman and Tversky 1979) and to close a mental account at a loss (Thaler 1985). Shefrin and Statman (1985) claim that the fundamental reluctance to sell losers is not so much loss realization as the closure of a mental account at a loss. They assert that “astute” money managers are more capable of closing mental accounts than the average individual investor.

Consistent with this assertion by Shefrin and Statman (1985), several studies examine the existence of the disposition effect among professional traders and find that investor sophistication attenuates the effect. Using a unique dataset of daily buys, sells, and holds of individuals and institutions in the Finnish stock market, Grinblatt and Keloharju (2001) find that the disposition effect and tax-loss-selling are the two major determinants of the propensity to sell. However, they find that conditional on a trade, sophisticated investors place less weight than other investors on past returns in deciding whether to buy or sell. Similarly, Feng and Seasholes (2005) find that investor sophistication and trading experience reduce the disposition effect.

Shapira and Venezia (2001) analyze the investment patterns of a large number of clients of a major Israeli brokerage house during 1994. They find that both professional and individual investors exhibit the disposition effect, although the effect is stronger for individual investors. One difference between the setting used in Shapira and Venezia (2001) and this study is that capital gains in Israel are tax-free. Thus, tax incentives

cannot potentially prevent or attenuate the disposition effect among either type of investor in Israel.

Several studies address whether there are any costs associated with professional traders exhibiting the disposition effect. These studies find mixed results. Garvey and Murphy (2004) find that professional traders tend to hold on to losing stocks too long and to sell winning stocks too soon. In an analysis of intraday prices, they find that traders could increase trading profits by holding winners longer and selling losers sooner.

Using high-frequency transactions data, Locke and Mann (2005) study the trading behavior of professional futures traders on the Chicago Mercantile Exchange (CME). They find strong evidence that traders hold losers longer than winners. However, they do not find any cost associated with the apparent aversion to realize losses.

Jin and Scherbina (2006) document loss aversion, which is one side of the disposition effect, among mutual fund managers. Frazzini (2006) documents that a consequence of mutual fund managers exhibiting the disposition effect is stock price under-reaction to news, which results in return predictability and post-announcement price drift.

Among studies that examine the disposition effect among individual investors, two find that tax considerations attenuate the effect. Barber and Odean (2003) find that individual investors realize gains at a quicker rate than losses, except in December when they realize losses for tax purposes. Ivkovic et al. (2004) find that individual investors are less likely to realize gains and more likely to realize losses in their taxable accounts

relative to in their tax-deferred accounts. Yet, Ivkovic et al. (2004) find that gain realizations still outpace loss realizations in individual investors' taxable accounts.

In summary, the studies discussed above suggest that institutional and individual investors exhibit the disposition effect but that trading experience and investor sophistication attenuate the effect (Grinblatt and Keloharju 2001; Shapira and Venezia 2001; Feng and Seasholes 2005). Moreover, the results in Barber and Odean (2003) and Ivkovic et al. (2004) suggest that tax incentives attenuate the effect among individual investors. Finally, there is mixed evidence on whether there is any cost associated with institutional investors exhibiting the disposition effect (Garvey and Murphy 2004; Locke and Mann 2005; Frazzini 2006). I formally test the following hypothesis (stated in the alternative):

H3: Tax incentives combined with investor sophistication prevent the disposition effect.

4.3 Sample Selection and Research Design

Sample

Refer to section 2.3 of chapter two for an explanation of how I identify the clienteles of investment advisers. In this chapter, I use two groups of investment advisers. The first includes “tax-sensitive” advisers (376 of these), which I also use in chapters two and three. The second group includes investment advisers whom I classify as “tax-insensitive.” The clients of “tax-insensitive” advisers are either primarily tax-exempt entities (e.g., pensions, charitable organizations, and state and local governments) (145 of these) or primarily individuals with tax-deferred accounts (146 of these).

I collect investment advisers' end-of-quarter stock holdings from Thomson Financial and stock return data from the Center for Research in Security Prices (CRSP).

Research Design for Hypothesis 3

To test whether the combination of tax incentives and investor sophistication prevents the disposition effect, I compare the likelihood of investment advisers' realization of winners to the likelihood of their realization of losers within and between tax-sensitive and tax-insensitive advisers. I estimate the following logistic regression:

$$\text{Realize}_{jiq} = \beta_0 + \beta_1 \text{Tax-Sensitive}_{jq} + \beta_2 \text{Loser}_{iq} + \beta_3 \text{Tax-Sensitive}_{jq} * \text{Loser}_{iq} + \beta_4 \text{Portfolio_Return}_{jq} + \beta_5 \text{Portfolio_Turnover}_{jq} + \varepsilon \quad (3)$$

Observations are investment adviser j -firm i -quarter q over the years 1996-2006. In order for an observation to remain in the sample, investment adviser j must own shares of firm i at the beginning of quarter q . The variable Realize_{jiq} equals one if the number of shares of firm i owned by investment adviser j declines in quarter q ; zero otherwise. The variable $\text{Tax-Sensitive}_{jq}$ equals one if investment adviser j 's clients are primarily high net-worth individuals and equals zero if investment advisers j 's clients are primarily tax-exempt entities or individual investors with tax-deferred accounts. The variable Loser_{iq} equals one if the cumulative return of firm i over the nine months prior to quarter q is negative; zero if the cumulative return of firm i over the nine months prior to quarter q is positive.

I control for the prior performance of the investment adviser by including the variable $\text{Portfolio_Return}_{jq}$, which equals investment adviser j 's calendar year-to-date portfolio return as of the end of quarter q . I control for turnover in an investment

adviser's portfolio. I measure $\text{Portfolio_Turnover}_{jq}$ as the smaller of quarterly purchases and sales divided by the market value of the portfolio at the beginning of the quarter (Huddart and Narayanan 2002). Since turnover implies that an investment adviser reduces existing stock positions in order to acquire new stock positions, I predict a positive coefficient on $\text{Portfolio_Turnover}_{jq}$. The standard errors are clustered by firm.

I sum the coefficients to estimate the likelihood that tax-sensitive advisers realize a loser, the likelihood that tax-sensitive advisers realize a winner, the likelihood that tax-insensitive advisers realize a loser, and the likelihood that tax-insensitive advisers realize a winner. Note that these likelihoods are conditional on the respective adviser owning a stock that is considered to be a winner or loser. The following will provide initial support for H3: a finding that the likelihood that tax-sensitive advisers realize a loser is greater than the likelihood that tax-insensitive advisers realize a loser; a finding that the likelihood that tax-sensitive advisers realize a winner is less than the likelihood that tax-insensitive advisers realize a winner; a finding that the likelihood that tax-insensitive advisers realize a winner is greater than the likelihood that tax-insensitive advisers realize a loser; and a finding that the likelihood that tax-sensitive advisers realize a loser is either no different than or greater than the likelihood that tax-sensitive advisers realize a winner.

The above findings will only provide initial support for H3 because tax-sensitive advisers could exhibit the disposition effect throughout the year, except at calendar year-end when tax incentives attenuate the effect. A quarterly analysis is necessary to conclude that tax-sensitive advisers are not subject to the disposition effect. Even if the results of regression (3) show no difference between the likelihood of tax-sensitive

advisers' realizations of losers and the likelihood of their realizations of winners, if the quarterly analysis finds that the likelihood of their realizations of winners is significantly greater than the likelihood of their realizations of losers in the first three quarters of the year, I will conclude that tax-sensitive advisers cluster tax-motivated trades at year-end because they exhibit the disposition effect earlier in the year. I estimate the following logistic regression by tax-sensitive investment adviser j -firm i -quarter q over the years 1996-2006:

$$\begin{aligned} \text{Realize}_{jq} = & \beta_0 + \beta_1\text{Q2} + \beta_2\text{Q3} + \beta_3\text{Q4} + \beta_4\text{Loser}_{iq} + \beta_5\text{Q2}*\text{Loser}_{iq} + \beta_6\text{Q3}*\text{Loser}_{iq} \\ & + \beta_7\text{Q4}*\text{Loser}_{iq} + \beta_8\text{Portfolio_Return}_{jq} + \beta_9\text{Porfolio_Turnover}_{jq} + \varepsilon \end{aligned} \quad (4)$$

The variable Q2 equals one if the observation is for the second quarter of the calendar year; zero otherwise. The variables Q3 and Q4 are defined similarly. All other variables are previously defined. The standard errors are clustered by firm.

4.4 Descriptive Statistics and Univariate Results

Panels A and B of Table 12 provide descriptive statistics and frequencies of the variables used in equation (3). Panel A shows that tax-insensitive advisers earn a higher return each quarter than do tax-sensitive advisers. The mean (median) Porftolio_Return_{jq} for tax-sensitive advisers is 0.93 percent (1.60 percent), compared to 1.08 percent (1.83 percent) for tax-insensitive advisers. Tax-insensitive advisers also turnover a larger percentage of their portfolios each quarter. The mean (median) Portfolio_Turnover_{jq} for tax-sensitive advisers is 6.92 percent (5.09 percent), compared to 7.67 percent (6.88 percent) for tax-insensitive advisers. Panel B of Table 12 reports the frequency of the indicator variables in equation (3). Tax-insensitive investment advisers are also more

likely to sell stocks and to own stocks considered to be losers. Tax-insensitive advisers also manage larger portfolios of Section 13(f) securities than do tax-sensitive advisers (untabulated). The mean (median) market value of tax-insensitive advisers' portfolios of Section 13(f) securities over the sample period equals \$15,039 million (\$3,119 million), versus \$5,937 million (\$1,125 million) for tax-sensitive advisers.

Panel C of Table 12 reports Pearson and Spearman correlations between variables in equation (3). All of the correlations are statistically significant at the 0.01 level.

4.5 Results for Hypothesis 3

Panel A of Table 13 report the results of estimating equation (3). The coefficient on $\text{Portfolio_Turnover}_{jq}$ is positive and significant (p-value < 0.01, two-tailed), consistent with advisers reducing existing stock positions to acquire new ones. The coefficient on $\text{Portfolio_Return}_{jq}$ is negative and significant (p-value < 0.01, two-tailed), suggesting that, all else equal, an adviser is less likely to sell a stock the higher his or her year-to-date portfolio return.

Panel B of Table 13 reports comparisons of the likelihoods of winner and loser realizations within and between tax-sensitive advisers and tax-insensitive advisers. Consistent with tax-insensitive investment advisers exhibiting the disposition effect, Panel B shows that the likelihood that tax-insensitive advisers realize a winner is significantly greater than the likelihood that they realize a loser (p-value < 0.01, two-tailed). Consistent with tax incentives preventing the disposition effect among tax-sensitive advisers, the likelihood that tax-sensitive advisers realize a loser is significantly greater than the likelihood that they realize a winner (p-value < 0.01, two-tailed).

Moreover, the likelihood that tax-sensitive advisers realize a loser is significantly greater than the likelihood that tax-insensitive advisers realize a loser, and the likelihood that tax-sensitive advisers realize a winner is significantly less than the likelihood that tax-insensitive advisers realize a winner, both significant at $p < 0.01$ two-tailed. These results provide initial support for H3.¹⁴

To ensure that tax-sensitive advisers' realizations of losers are not clustered in quarter four, which would suggest that tax-sensitive advisers exhibit the disposition effect in the first three quarters of the year and that tax incentives attenuate the effect in quarter four, I estimate equation (4). Panel A of Table 14 reports the results. The coefficients on $\text{Portfolio_Return}_{jq}$ and $\text{Portfolio_Turnover}_{jq}$ are consistent with those in Panel A of Table 13 for regression (3).

I sum the coefficients to calculate a coefficient for the likelihood of tax-sensitive advisers' realizations of losers and the likelihood of their realizations of winners for each quarter. Panel B of Table 14 reports these coefficients and the difference between the two for each quarter. The results in Panel B show that the likelihood that tax-sensitive advisers realize a loser exceeds the likelihood that they realize a winner in quarters two and four. The difference between the likelihood of their realizations of winners and the likelihood of their realizations of losers is not statistically significant in quarters one and three. In no quarter does the likelihood that tax-sensitive advisers realize a winner

¹⁴ The results are qualitatively the same if I include a variable that equals the year-to-date cumulative return of the S&P 500 Index in equation (3) to control for the effect of the market's performance on the likelihood of realization.

exceed the likelihood that they realize a loser.¹⁵ In summary, the results do not suggest that tax-sensitive advisers are more likely to realize winners than losers throughout the year until year-end when they are reminded of the need to realize losses. I conclude that the combination of tax incentives with investor sophistication prevents the disposition effect among tax-sensitive advisers, consistent with H3.

The results in Tables 13 and 14 contribute important insights regarding the disposition effect and the ability of tax incentives to prevent it among sophisticated investors. Tax-insensitive, but not tax-sensitive, advisers exhibit the disposition effect. Barber and Odean (2003) find that individual investors realize gains at a quicker rate than losses in their taxable and tax-deferred accounts. Only in December do individual investors realize losses at a quicker rate than gains in their taxable accounts. In addition, although Ivkovic et al. (2004) find that tax considerations attenuate the disposition effect among individual investors, they find that individual investors are still more likely to realize gains than losses in their taxable accounts.¹⁶ In light of the findings in Barber and Odean (2003) and Ivkovic et al. (2004), I conclude that the ability of tax incentives to prevent the disposition effect differs between sophisticated and amateur investors.

Is Tax-Insensitive Advisers' Tendency to Sell Winners & to Hold Losers Rational?

The results in Table 13 suggest that tax-insensitive advisers exhibit the disposition effect, while tax-sensitive advisers do not. In order to examine whether tax-insensitive

¹⁵ The results are qualitatively the same as those reported in Table 14 if I include a variable that equals the year-to-date cumulative return of the S&P 500 Index in equation (4) to control for the effect of the market's performance on the likelihood of realization.

¹⁶ Ivkovic et al. (2004) find that individual investors defer more gains in their taxable accounts the longer the holding period. However, even in taxable accounts, the hazard rate for stocks with gains is higher than that for stocks with losses for most holding periods.

advisers exhibit the disposition effect in each quarter of the year, I re-estimate equation (4) for tax-insensitive advisers. Table 15 reports the results. Panel B shows that in each quarter of the year, tax-insensitive advisers are significantly more likely to realize winners than to realize losers.

Tax-insensitive advisers' tendency to sell winners at a quicker rate than losers could be due to a behavioral bias whereby they are reluctant to admit their mistakes and to close mental accounts at a loss, or it could be rational. The focus of this chapter is to shed light on the "mystery" described by Poterba (2002) by testing whether tax incentives are able to prevent the disposition effect among sophisticated tax-sensitive investors. However, below I briefly address whether tax-insensitive advisers' tendency to sell winners and to hold losers is rational.

The majority of the empirical literature (e.g., Shefrin and Statman 1985; Odean 1998; Barber and Odean 2003) focuses on a behavioral explanation for the disposition effect. However, other studies offer rational explanations, such as portfolio rebalancing (Lakonishok and Smidt 1986), differences in information (Lakonishok and Smidt 1986), and higher trading costs associated with low-priced stocks (Harris 1988). Odean (1998) observes the disposition effect among individual investors even after controlling for portfolio rebalancing and transaction costs. Moreover, he finds that in subsequent months the winning investments that investors choose to sell continue to outperform the losing investments that they continue to hold, which suggests that differences in information do not explain why individual investors exhibit the disposition effect. In this section, I test

whether portfolio rebalancing and differences in information explain why tax-insensitive advisers are more likely to sell winners than to sell losers.

Portfolio Rebalancing

Odean (1998) holds that if investors are rebalancing their portfolios, they will only sell a portion of their shares of a winning stock. In order to control for portfolio rebalancing, I eliminate all partial sales and re-estimate equation (3). I lose 1,071,775 observations, or 36 percent of the sample. Table 16 reports the results, which are qualitatively the same as those reported in Panel A of Table 13, with the exception of the sign of the coefficient on $\text{Portfolio_Return}_{jq}$. Moreover, the comparisons of likelihoods reported in Panel B are qualitatively the same as those in Panel B of Table 13, with the exception that the difference in tax-sensitive advisers' likelihood of realizing a winner is not significantly different than their likelihood of realizing a loser. However, note that this insignificant difference is not inconsistent with H3's prediction (see discussion on page 53). These results suggest that tax-insensitive advisers' tendency to sell winners and to hold losers is not attributable to portfolio rebalancing.

Differences in Information

Tax-insensitive advisers might be more likely to sell winners and to hold losers because they expect the losers to outperform the winners in the future. For example, a tax-insensitive adviser who buys a stock because of favorable information might sell that stock when the stock's price increases because the adviser believes the information is now incorporated in the stock's price. On the other hand, if the stock's price declines, the adviser will continue to hold the stock, believing that the price has not yet incorporated

the information. Furthermore, a tax-insensitive adviser could sell winners and hold losers because the adviser believes that prices mean revert. I test whether such beliefs are justified *ex post*.

I conduct tests similar to those in Table VI of Odean (1998). I calculate the buy-and-hold return of stocks in excess of the CRSP value-weighted buy-and-hold return following the quarter in which an adviser chooses to sell a winner or to hold a loser. I calculate the excess buy-and-hold return over two windows: six and 12 months following the quarter in which an adviser chooses to sell a winner or to hold a loser. For each window, I compare the mean and median excess buy-and-hold return of the losers that tax-insensitive advisers continue to hold to the mean and median excess buy-and-hold return of the winners that they sell.¹⁷ Panel A of Table 17 reports the results. The mean and median excess buy-and-hold return is significantly greater (p-value < 0.01, two-tailed, in all cases) for the losing stocks that tax-insensitive advisers continue to hold than for the winning stocks that they sell. The only exception is the median six month excess buy-and-hold return. In that case, the median excess buy-and-hold for the losers that they hold is less than the median excess buy-and-hold return for the winners that they sell; however, the difference is not statistically significant. These preliminary results suggest that tax-insensitive advisers' tendency to sell winners and to hold losers is rational. The results are also consistent with the finding in Parrino et al. (2003) and in Sias et al. (2006) that independent investment advisers are informed.

¹⁷ I eliminate observations associated with an adviser selling a loser or with an adviser holding a winner.

Panel B of Table 17 reports a comparison of the *ex post* performance of losers that tax-sensitive advisers continue to hold to the *ex post* performance of the winners that tax-sensitive advisers sell. The results are similar to those in Panel A for tax-insensitive advisers, with the exception that the median six-month excess buy-and-hold return for the losers that tax-sensitive advisers continue to hold is significantly less than the median six-month excess buy-and-hold return for the winners that they sell.

4.6 Conclusion

The realization-based tax system in the United States provides investors with opportunities for tax management. However, empirical studies (Odean 1998; Barber and Odean 2003; Ivkovic et al. 2004) find that individual investors do not take advantage of these opportunities and rather realize gains at a quicker rate than losses, even in their taxable accounts, except in December when they realize losses for tax purposes. Such trading is consistent with the disposition effect, or the tendency to sell winners and to hold losers. Using unique data on the holdings and clienteles of investment advisers, I examine whether the combination of tax incentives and investor sophistication prevents the disposition effect among advisers whose clients are primarily high net-worth individuals.

I find that tax-sensitive advisers are more likely to sell stocks considered to be losers than to sell stocks considered to be winners, and they do not delay their loss realizations until year-end. These results are inconsistent with the presence of a disposition effect among tax-sensitive advisers. In contrast, investment advisers primarily serving tax-exempt clients or clients with tax-deferred accounts (“tax-insensitive”

advisers) are more likely to sell stocks considered to be winners than to sell stocks considered to be losers. In addition, tax-insensitive advisers are more likely to sell winners and less likely to sell losers than are tax-sensitive advisers. These results hold after controlling for differences in characteristics (i.e., prior portfolio performance and turnover) between tax-sensitive and tax-insensitive advisers and for portfolio rebalancing. In light of findings in prior literature that individual investors are more likely to realize gains than losses even in their taxable accounts (Barber and Odean 2003; Ivkovic et al. 2004), the results in this chapter suggest that the ability of taxes to prevent, not just attenuate, the disposition effect varies between sophisticated and amateur investors. This finding should be of interest to academics and investment professionals who seek to understand why investors trade.

Odean (1998) finds that the winning stocks that individual investors sell continue to outperform the losing stocks that they continue to hold. Similarly, Garvey and Murphy (2004) find that professional traders who exhibit the disposition effect could increase trading profits by holding winners longer and selling losers sooner. On the other hand, Locke and Mann (2005) do not find a cost associated with professional futures traders exhibiting the disposition effect. The results of preliminary tests suggest that in subsequent months the losers that tax-insensitive advisers continue to hold outperform the winning stocks that they sell. This suggests that tax-insensitive advisers do not incur a cost from exhibiting the disposition effect and that their trading decisions are rational.

TABLE 1
Descriptive Statistics and Univariate Analysis of
The January Effect and Investment Advisers

Panel A: Descriptive Statistics for Continuous Variables in Equation (1a)

See Appendix 1 for variable definitions.

Variable	Mean	Std. Dev.	1st Quartile	Median	3rd Quartile
Return_Dec _{it} ^{a,b}	0.0063	0.0219	-0.0048	0.0031	0.0142
Return_Jan _{it+1} ^{a,b}	0.0087	0.0262	-0.0061	0.0039	0.0187
Chg_Tax-Sensitive _{it}	0.0006	0.0115	-0.0007	0.0000	0.0014
%Tax-Sensitive _{it}	0.0237	0.0457	0.0000	0.0045	0.0281
Chg_Tax-Exempt _{it}	0.0000	0.0116	-0.0001	0.0000	0.0003
%Tax-Exempt _{it}	0.0214	0.0378	0.0000	0.0010	0.0283
Chg_Individual _{it}	0.0084	0.0864	-0.0206	0.0000	0.0226
%Individual _{it}	0.6671	0.2807	0.4557	0.7350	0.9181
Return _{it}	-0.3303	0.2421	-0.5000	-0.2793	-0.1265
Ln_Cap _{it}	18.8474	1.8283	17.5216	18.7140	20.0378
Book/Market _{it}	1.3803	4.8829	0.2560	0.5170	0.9425

Notes: ^a(^b) indicates that the difference in the means (medians) between Return_Dec_{it} and Return_Jan_{it+1} is significant at $p < 0.01$, using a two-tailed t (Wilcoxon) test.

TABLE 1 (continued)
Descriptive Statistics and Univariate Analysis of
The January Effect and Investment Advisers

Panel B: Pearson (Spearman) Correlations on the Upper (Lower) Diagonal

See Appendix 1 for variable definitions. All correlations are significant at the 0.10 level or better unless indicated in **bold**.

Variable	Return_Dec _{<i>it</i>}	Return_Jan _{<i>it</i>}	%Tax-Sensitive _{<i>it</i>}	Chg_Tax-Sensitive _{<i>it</i>}	%Tax-Exempt _{<i>it</i>}	Chg_Tax-Exempt _{<i>it</i>}
Return_Dec _{<i>it</i>}		-0.2157	-0.0084	0.0167	0.0004	-0.0234
Return_Jan _{<i>it</i>}	-0.2498		-0.0760	-0.0360	-0.0895	-0.0197
%Tax-Sensitive _{<i>it</i>}	0.0182	-0.1064		-0.1274	0.1865	0.0057
Chg_Tax-Sensitive _{<i>it</i>}	0.0156	-0.0420	-0.1016		0.0230	-0.0172
%Tax-Exempt _{<i>it</i>}	0.0300	-0.1067	0.4891	0.0409		-0.1409
Chg_Tax-Exempt _{<i>it</i>}	-0.0145	-0.0196	0.0197	0.0066	-0.0717	
%Individual _{<i>it</i>}	-0.0312	0.1419	-0.6484	-0.0299	-0.7022	-0.0204
Chg_Individual _{<i>it</i>}	0.0005	0.0585	-0.0260	-0.1273	-0.0246	-0.1411
Ln_Cap _{<i>it</i>}	-0.0069	-0.1352	0.5199	0.0734	0.6330	0.0577
Return _{<i>it</i>}	-0.0749	-0.2026	0.1384	0.0667	0.1293	0.0836
Book/Market _{<i>it</i>}	0.0096	0.0624	-0.0409	-0.0399	-0.0393	-0.0026

TABLE 1 (continued)
Descriptive Statistics and Univariate Analysis of
The January Effect and Investment Advisers

Panel B (continued):

Pearson (Spearman) Correlations on the Upper (Lower) Diagonal

See Appendix 1 for variable definitions. All correlations are significant at the 0.10 level or better unless indicated in **bold**.

Variable	% Individual _{it}	Chg_ Individual _{it}	Ln_Cap _{it}	Return _{it}	Book/ Market _{it}
Return_Dec _{it}	0.0139	0.0084	-0.0554	-0.1298	-0.0178
Return_Jan _{it}	0.1621	0.0389	-0.1545	-0.2649	0.0244
% Tax-Sensitive _{it}	-0.4331	-0.0042	0.2027	0.0983	-0.0663
Chg_Tax- Sensitive _{it}	-0.0036	-0.1237	0.0297	0.0483	-0.0104
% Tax-Exempt _{it}	-0.5726	0.0046	0.3327	0.0878	-0.0753
Chg_Tax- Exempt _{it}	0.0048	-0.1285	0.0383	0.0779	-0.0010
% Individual _{it}		-0.0135	-0.6220	-0.1798	0.1636
Chg_Individual _{it}	-0.0014		-0.0578	-0.1314	0.0260
Ln_Cap _{it}	-0.6495	-0.0727		0.2128	-0.1158
Return _{it}	-0.1604	-0.1599	0.2103		-0.0108
Book/Market _{it}	0.0661	-0.0011	-0.1700	-0.0310	

TABLE 2
Multivariate Analysis of The January Effect and Investment Advisers

Results of Estimating Equation (1a)

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	(1) Return_Dec _{it}	Predicted Sign	(2) Return_Jan _{it+1}
% Tax-Sensitive _{it}		0.0008 (0.27)		-0.0069 (1.97) **
Chg_Tax-Sensitive _{it}	+	0.0337 (2.88) ***	-	-0.0620 (4.62) ***
% Tax-Exempt _{it}		-0.0002 (0.04)		-0.0060 (1.30)
Chg_Tax-Exempt _{it}		-0.0160 (1.51)		-0.0027 (0.21)
% Individual _{it}		-0.0053 (7.07) ***		0.0050 (5.57) ***
Chg_Individual _{it}		-0.0021 (1.14)		-0.0008 (0.38)
Ln_Cap _{it}		-0.0007 (7.39) ***		-0.0009 (7.15) ***
Return _{it}		-0.0107 (14.15) ***		-0.0216 (24.72) ***
Book/Market _{it}		-0.0001 (2.41) **		0.0000 (1.67) *
Constant		0.0177 (7.79) ***		0.0092 (3.33) ***
Observations		22805		22805
R-squared		0.05		0.13

TABLE 3
Sensitivity Analysis of the January Effect and Investment Advisers:
Requiring Positive Percent Ownership by Tax-Sensitive Advisers

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+j} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}
%Tax-Sensitive _{it}		-0.00111 (0.36)		-0.00495 (1.38)
Chg_Tax-Sensitive _{it}	+	0.02651 (2.21) **	-	-0.05895 (4.19) ***
%Tax-Exempt _{it}		-0.00063 (0.15)		-0.00828 (1.72) *
Chg_Tax-Exempt _{it}		-0.01716 (1.59)		-0.00285 (0.22)
%Individual _{it}		-0.00546 (7.03) ***		0.00533 (5.52) ***
Chg_Individual _{it}		-0.00166 (0.82)		0.00089 (0.36)
Ln_Cap _{it}		-0.00097 (8.50) ***		-0.00047 (3.31) ***
Return _{it}		-0.00967 (11.29) ***		-0.01759 (17.02) ***
Book/Market _{it}		-0.00001 (0.29)		-0.00005 (1.47)
Constant		0.02217 (8.68) ***		0.00156 (0.49)
Observations		15445		15445
R-squared		0.08		0.13

TABLE 4
Sensitivity Analysis of the January Effect and Investment Advisers:
Replacing Change Variables with Sell Indicator Variables

Panel A: Frequency of Indicator Variables in Equation (1b)

See Appendix 1 for variable definitions. *, *** denotes significance of a chi-square test for equal proportions at $p < 0.10$, $p < 0.01$.

Variable	Count	Percent	
Sell_Tax-Sensitive _{it}	7,257	31.82	***
Sell_Tax-Exempt _{it}	6,165	27.03	***
Sell_Individual _{it}	11,272	49.43	*

Panel B: Descriptive Statistics for Continuous Variables in Equation (1b)

See Appendix 1 for variable definitions and Panel A of Table 2 for descriptive statistics of the remaining variables in equation (1b).

Variable	Mean	Std. Dev.	1st Quartile	Median	3rd Quartile
%Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}	0.0128	0.0357	0.0000	0.0000	0.0049
%Tax-Exempt _{it} *Sell_Tax-Exempt _{it}	0.0115	0.0304	0.0000	0.0000	0.0009
%Individual _{it} *Sell_Individual _{it}	0.3315	0.3851	0.0000	0.0000	0.7268

TABLE 4 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Replacing Change Variables with Sell Indicator Variables

Panel C: Results of Estimating Equation (1b)

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+j} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of the *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted		Predicted	
	Sign	Return_Dec _{it}	Sign	Return_Jan _{it}
% Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}	-	-0.0145 (2.62) ***	+	0.0098 (1.65) *
% Tax-Sensitive _{it}		0.0059 (1.40)		-0.0094 (2.06) **
Sell_Tax-Sensitive _{it}		0.0008 (2.05) **		0.0000 (0.08)
% Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		0.0068 (0.97)		0.0077 (0.97)
% Tax-Exempt _{it}		-0.0044 (0.86)		-0.0081 (1.40)
Sell_Tax-Exempt _{it}		0.0005 (1.12)		-0.0008 (1.66) *
% Individual _{it} *Sell_Individual _{it}		0.0006 (0.68)		-0.0032 (2.98) ***
% Individual _{it}		-0.0055 (6.32) ***		0.0068 (6.53) ***
Sell_Individual _{it}		0.0001 (0.24)		0.0007 (1.07)
Ln_Cap _{it}		-0.0008 (7.91) ***		-0.0008 (6.15) ***
Return _{it}		-0.0106 (13.91) ***		-0.0214 (24.29) ***
Book/Market _{it}		-0.0001 (2.56) ***		0.0000 (1.71) *
Constant		0.0188 (8.16) ***		0.0071 (2.53) **
Observations		22805		22805
R-squared		0.05		0.13

TABLE 5
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel A: Results of Estimating Equation (1a) for Bad Market Years

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+j} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}
%Tax-Sensitive _{it}		0.00390 (0.61)		-0.01591 (2.59) ***
Chg_Tax-Sensitive _{it}	+	0.06853 (2.60) ***	-	-0.07835 (2.59) ***
%Tax-Exempt _{it}		-0.00113 (0.14)		-0.00685 (0.78)
Chg_Tax-Exempt _{it}		-0.06873 (2.65) ***		0.02915 (0.99)
%Individual _{it}		-0.00367 (2.40) **		0.00600 (3.34) ***
Chg_Individual _{it}		-0.00142 (0.40)		0.00220 (0.52)
Ln_Cap _{it}		-0.00092 (5.27) ***		-0.00069 (3.35) ***
Return _{it}		-0.01172 (9.64) ***		-0.02605 (18.70) ***
Book/Market _{it}		-0.00010 (3.18) ***		-0.00009 (2.24) **
Constant		0.02205 (5.30) ***		0.01330 (2.77) ***
Observations		7733		7733
R-squared		0.02		0.08

TABLE 5 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel B: Results of Estimating Equation (1a) for Good Market Years

The dependent variable is either Return_Dec_{*it*} (column 1) or Return_Jan_{*it+j*} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{<i>it</i>}	Predicted Sign	Return_Jan _{<i>it</i>}
%Tax-Sensitive _{<i>it</i>}		-0.0024883 (0.75)		-0.0011659 (0.27)
Chg_Tax-Sensitive _{<i>it</i>}	+	0.0310982 (2.42) **	-	-0.0462058 (3.10) ***
%Tax-Exempt _{<i>it</i>}		0.0055074 (1.19)		-0.0018819 (0.34)
Chg_Tax-Exempt _{<i>it</i>}		-0.0026451 (0.22)		-0.0185675 (1.32)
%Individual _{<i>it</i>}		-0.0025158 (3.11) ***		0.0080734 (8.21) ***
Chg_Individual _{<i>it</i>}		-0.0030311 (1.37)		-0.0025250 (1.01)
Ln_Cap _{<i>it</i>}		-0.0005021 (4.24) ***		-0.0009835 (6.94) ***
Return _{<i>it</i>}		-0.0116451 (12.04) ***		-0.0204123 (18.27) ***
Book/Market _{<i>it</i>}		-0.0000588 (2.10) **		-0.0000001 0.00
Constant		0.0137462 (5.12) ***		0.0132085 (4.13) ***
Observations		15072		15072
R-squared		0.02		0.07

TABLE 5 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel C: Results of Estimating Equation (1b) for Bad Market Years

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted		Predicted	
	Sign	Return_Dec _{it}	Sign	Return_Jan _{it}
% Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}	-	-0.0138 (1.16)	+	0.0164 (1.51) *
% Tax-Sensitive _{it}		0.0098 (1.10)		-0.0214 (2.74) ***
Sell_Tax-Sensitive _{it}		-0.0003 (0.42)		-0.0004 (0.46)
% Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		0.0092 (0.64)		0.0104 (0.71)
% Tax-Exempt _{it}		-0.0051 (0.50)		-0.0099 (0.90)
Sell_Tax-Exempt _{it}		0.0011 (1.38)		-0.0018 (1.81) *
% Individual _{it} *Sell_Individual _{it}		0.0012 (0.68)		-0.0055 (2.55) **
% Individual _{it}		-0.0040 (2.34) **		0.0083 (4.16) ***
Sell_Individual _{it}		-0.0002 (0.20)		0.0010 (0.74)
Ln_Cap _{it}		-0.0010 (5.42) ***		-0.0005 (2.38) **
Return _{it}		-0.0118 (9.68) ***		-0.0256 (18.32) ***
Book/Market _{it}		-0.0001 (3.29) ***		-0.0001 (2.12) **
Constant		0.0230 (5.43) ***		0.0102 (2.08) **
Observations		7733		7733
R-squared		0.02		0.08

TABLE 5 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel D: Results of Estimating Equation (1b) for Good Market Years

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted		Predicted	
	Sign	Return_Dec _{it}	Sign	Return_Jan _{it}
%Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}	-	-0.0146 (2.42) **	+	0.0083 (1.18)
%Tax-Sensitive _{it}		0.0025 (0.56)		-0.0038 (0.71)
Sell_Tax-Sensitive _{it}		0.0007 (1.76) *		0.0001 (0.13)
%Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		0.0028 (0.35)		0.0060 (0.61)
%Tax-Exempt _{it}		0.0026 (0.46)		-0.0043 (0.62)
Sell_Tax-Exempt _{it}		0.0004 (0.87)		0.0001 (0.11)
%Individual _{it} *Sell_Individual _{it}		0.0012 (1.11)		-0.0019 (1.55)
%Individual _{it}		-0.0032 (3.28) ***		0.0094 (7.86) ***
Sell_Individual _{it}		0.0001 (0.17)		0.0008 (1.07)
Ln_Cap _{it}		-0.0006 (4.75) ***		-0.0010 (6.62) ***
Return _{it}		-0.0115 (11.86) ***		-0.0204 (18.06) ***
Book/Market _{it}		-0.0001 (2.18) **		0.0000 (0.05)
Constant		0.0150 (5.54) ***		0.0121 (3.76) ***
Observations		15072		15072
R-squared		0.02		0.07

TABLE 5 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel E: Results of Estimating Equation (1a) with GoodYear Indicator Variable

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables are suppressed. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}
GoodYear _t *Chg_Tax-Sensitive _{it}		-0.0326 (1.12)		0.0269 (0.80)
GoodYear _t *Chg_Tax-Exempt _{it}		0.0654 (2.28) **		-0.0445 (1.38)
GoodYear _t *Chg_Individual _{it}		-0.0021 (0.50)		-0.0066 (1.36)
%Tax-Sensitive _{it}		-0.0002 (0.08)		-0.0064 (1.79) *
Chg_Tax-Sensitive _{it}	+	0.0656 (2.49) **	-	-0.0743 (2.47) **
%Tax-Exempt _{it}		0.0031 (0.73)		-0.0037 (0.79)
Chg_Tax-Exempt _{it}		-0.0682 (2.64) ***		0.0279 (0.96)
%Individual _{it}		-0.0030 (4.04) ***		0.0075 (8.40) ***
Chg_Individual _{it}		-0.0012 (0.33)		0.0037 (0.88)
GoodYear _t		0.0004 (1.12)		-0.0057 (14.90) ***
Ln_Cap _{it}		-0.0007 (6.75) ***		-0.0008 (6.74) ***
Return _{it}		-0.0116 (15.23) ***		-0.0229 (26.02) ***
Book/Market _{it}		-0.0001 (3.67) ***		-0.0001 (2.02) **
Constant		0.0171 (7.25) ***		0.0158 (5.64) ***
Observations		22805		22805
R-squared		0.02		0.10

TABLE 5 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) Separately for Good and Bad Market Years

Panel F: Results of Estimating Equation (1b) with GoodYear Indicator Variable

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. Year dummy variables, Ln_Cap_{it}, Return_{it}, Book/Market_{it}, and two-way interactions of GoodYear_t with percent ownership and sell indicator variables are suppressed. With the exception of GoodYear_t*%Tax-Sensitive_{it}, which positive and significant at the p < 0.05 level, all six of these two-way interactions are insignificant. *, ** and *** indicate significance of *t*-statistic at p < 0.10, p < 0.05 and p < 0.01, respectively, using robust standard errors clustered by firm for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}	
GoodYear _t *%Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}		-0.002871 (0.22)		-0.006404 (0.50)	
GoodYear _t *%Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		-0.011711 (0.71)		-0.000964 (0.06)	
GoodYear _t *%Individual _{it} *Sell_Individual _{it}		0.000001 (0.00)		0.003570 (1.44)	
%Tax-Sensitive _{it} *Sell_Tax-Sensitive _{it}	-	-0.012546 (1.06)	+	0.015212 (1.41)	
%Tax-Sensitive _{it}		0.010322 (1.15)		-0.022867 (2.92)	***
Sell_Tax-Sensitive _{it}		-0.000461 (0.63)		-0.000155 (0.19)	
%Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		0.012534 (0.87)		0.008321 (0.57)	
%Tax-Exempt _{it}		-0.005657 (0.56)		-0.010600 (0.97)	
Sell_Tax-Exempt _{it}		0.000827 (1.04)		-0.001448 (1.53)	
%Individual _{it} *Sell_Individual _{it}		0.001181 (0.67)		-0.005563 (2.59)	***
%Individual _{it}		-0.003004 (1.94)	*	0.007393 (4.04)	***
Sell_Individual _{it}		-0.000321 (0.29)		0.000981 (0.69)	
GoodYear _t		0.000407 (0.30)		-0.009248 (5.64)	***
Constant		0.018011 (6.81)	***	0.016509 (5.31)	***
Observations		22805		22805	
R-squared		0.02		0.10	

TABLE 6
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) with Standard Errors
Clustered by Year Rather than by Firm

Panel A: Results of Estimating Equation (1a)

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+1} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by year for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}
%Tax-Sensitive _{it}		-0.00018 (0.07)		-0.00517 (1.66)
Chg_Tax-Sensitive _{it}	+	0.04325 (1.97) *	-	-0.05381 (6.56) ***
%Tax-Exempt _{it}		0.00293 (0.43)		-0.00154 (0.22)
Chg_Tax-Exempt _{it}		-0.02149 (1.30)		-0.00012 (0.01)
%Individual _{it}		-0.00301 (1.40)		0.00783 (4.08) ***
Chg_Individual _{it}		-0.00260 (0.92)		0.00095 (0.45)
Ln_Cap _{it}		-0.00068 (5.14) ***		-0.00069 (1.35)
Return _{it}		-0.01149 (4.46) ***		-0.02560 (5.83) ***
Book/Market _{it}		-0.00008 (1.53)		0.00001 (0.12)
Constant		0.01747 (6.07) ***		0.00823 (0.85)
Observations		22805		22805
R-squared		0.02		0.09

TABLE 6 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) with Standard Errors
Clustered by Year Rather than by Firm

Panel B: Results of Estimating Equation (1b)

The dependent variable is either Return_Dec_{it} (column 1) or Return_Jan_{it+j} (column 2). See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using robust standard errors clustered by year for a two-tailed test. Absolute value of *t*-statistics in parentheses.

Variable	Predicted Sign	Return_Dec _{it}	Predicted Sign	Return_Jan _{it}
% Tax-Sensitive _{it} *				
Sell_Tax-Sensitive _{it}	-	-0.014447 (1.93) *	+	0.009730 (4.11) ***
% Tax-Sensitive _{it}		0.005089 (1.12)		-0.007601 (2.01) *
Sell_Tax-Sensitive _{it}		0.000400 (0.72)		-0.000234 (0.40)
% Tax-Exempt _{it} *Sell_Tax-Exempt _{it}		0.005382 (0.92)		0.005292 (0.51)
% Tax-Exempt _{it}		-0.000587 (0.10)		-0.002458 (0.29)
Sell_Tax-Exempt _{it}		0.000655 (1.50)		-0.000719 (1.66)
% Individual _{it} *Sell_Individual _{it}		0.001130 (1.29)		-0.003379 (1.65)
% Individual _{it}		-0.003558 (1.48)		0.009759 (4.56) ***
Sell_Individual _{it}		0.000064 (0.12)		0.000544 (0.38)
Ln_Cap _{it}		-0.000758 (5.59) ***		-0.000588 (1.17)
Return _{it}		-0.011485 (4.48) ***		-0.025308 (5.84) ***
Book/Market _{it}		-0.000086 (1.56)		0.000005 (0.07)
Constant		0.018589 (6.32) ***		0.006103 (0.68)
Observations		22805		22805
R-squared		0.02		0.09

TABLE 7
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) using Fama-MacBeth Regressions

Panel A: Results of Estimating Equation (1a) where the Dependent Variable is Return_Dec_{it}

See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively.

Variable	Predicted Sign	Average Coefficient (Fama MacBeth t-statistic)	# of Positive Estimates	# of Positive and Significant Estimates	# of Negative and Significant Estimates	Z1	Z2
%Tax-Sensitive _{it}		0.00 (0.09)	6	0	0	-0.03	-0.06
Chg_ Tax-Sensitive _{it}	+	0.02 (1.16)	8	2	1	1.48	1.08
%Tax-Exempt _{it}		0.00 (0.20)	6	1	2	-0.39	-0.32
Chg_ Tax-Exempt _{it}		-0.02 (1.19)	4	0	2	-1.49	-1.09
%Individual _{it}		-0.01 (2.48) **	2	0	6	-5.97	-2.88
Chg_ Individual _{it}		0.00 (1.66)	3	0	2	-1.98	-1.63
Ln_Cap _{it}		0.00 (3.92) ***	2	0	8	-8.54	-3.96
Return _{it}		-0.01 (4.65) ***	0	0	9	-17.52	-4.86
Book/Market _{it}		0.00 (1.84) *	2	0	2	-2.10	-2.12
Constant		0.02 (5.33) ***	10	9	0	9.80	5.51
Observations		2073					
Adjusted R-squared		0.04					

TABLE 7 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) using Fama-MacBeth Regressions

Panel B: Results of Estimating Equation (1a) where the Dependent Variable is
Return_Jan_{it+1}

See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively.

Variable	Predicted Sign	Average Coefficient (Fama MacBeth t-statistic)	# of Positive Estimates	# of Positive and Significant Estimates	# of Negative and Significant Estimates	Z1	Z2
% Tax-Sensitive _{it}		-0.01 (1.83) *	3	0	0	-1.34	-1.83
Chg_Tax-Sensitive _{it}	-	-0.04 (2.74) **	1	0	2	-2.92	-3.32
% Tax-Exempt _{it}		-0.01 (1.47)	3	1	2	-1.30	-0.90
Chg_Tax-Exempt _{it}		0.00 (0.36)	4	1	0	-0.51	-0.50
% Individual _{it}		0.01 (5.04) ***	10	6	0	5.98	5.21
Chg_Individual _{it}		0.00 (0.76)	5	0	1	-0.50	-0.48
Ln_Cap _{it}		0.00 (2.24) **	3	2	8	-7.85	-1.75
Return _{it}		-0.01 (2.63) **	3	2	8	-22.70	-2.93
Book/Market _{it}		0.00 (1.43)	4	1	3	-0.64	-0.34
Constant		0.02 (2.10) *	8	7	3	5.79	1.64
Observations		2073					
R-squared		0.07					

TABLE 7 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) using Fama-MacBeth Regressions

Panel C: Results of Estimating Equation (1b) where the Dependent Variable is Return_Dec_{it}

See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively.

Variable	Predicted Sign	Average Coefficient (Fama MacBeth t-statistic)	# of Positive Estimates	# of Positive and Significant Estimates	# of Negative and Significant Estimates	Z1	Z2
%Tax-Sensitive _{it} *							
Sell_Tax-Sensitive _{it}	-	-0.01 (2.14) *	4	0	2	-2.07	-1.88
%Tax-Sensitive _{it}		0.01 (1.64)	6	0	0	1.04	1.55
Sell_Tax-Sensitive _{it}		0.00 (1.85) *	6	3	0	2.32	1.84
%Tax-Exempt _{it} *							
Sell_Tax-Exempt _{it}		0.01 (1.35)	7	0	0	0.91	1.25
%Tax-Exempt _{it}		0.00 (0.74)	4	0	0	-0.89	-1.20
Sell_Tax-Exempt _{it}		0.00 (0.99)	6	1	0	0.59	0.72
%Individual _{it} *							
Sell_Individual _{it}		0.00 (0.95)	8	1	2	0.34	0.17
%Individual _{it}		-0.01 (2.34) **	2	1	5	-4.91	-2.16
Sell_Individual _{it}		0.00 (0.74)	5	3	1	0.20	0.14
Ln_Cap _{it}		0.00 (4.39) ***	1	0	8	-8.73	-4.24
Return _{it}		-0.01 (4.47) ***	0	0	9	-16.98	-4.71
Book/Market _{it}		0.00 (2.04) *	2	0	3	-2.52	-2.11
Constant		0.02 (6.11) ***	11	9	0	9.91	6.09
Observations		2073					
R-squared		0.04					

TABLE 7 (continued)
Sensitivity Analysis of the January Effect and Investment Advisers:
Estimating Equations (1a) and (1b) using Fama-MacBeth Regressions

Panel D: Results of Estimating Equation (1b) where the Dependent Variable is Return_Jan_{it+1}

See Appendix 1 for variable definitions. Observations are firm-years for years 1996-2006. *, ** and *** indicate significance of *t*-statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively.

Variable	Predicted Sign	Average Coefficient (Fama MacBeth t-statistic)	# of Positive Estimates	# of Positive and Significant Estimates	# of Negative and Significant Estimates	Z1	Z2
%Tax-Sensitive _{it} *							
Sell_Tax-Sensitive _{it}	+	0.00 (0.27)	6	0	0	0.14	0.17
%Tax-Sensitive _{it}		0.00 (0.73)	4	1	0	-0.74	-0.77
Sell_Tax-Sensitive _{it}		0.00 (0.05)	6	2	2	0.25	0.17
%Tax-Exempt _{it} *							
Sell_Tax-Exempt _{it}		0.00 (0.46)	7	1	1	0.52	0.51
%Tax-Exempt _{it}		-0.01 (1.17)	4	1	1	-1.04	-0.83
Sell_Tax-Exempt _{it}		0.00 (1.64)	3	0	0	-1.32	-1.32
%Individual _{it} *							
Sell_Individual _{it}		0.00 (2.51) **	3	0	2	-2.76	-2.95
%Individual _{it}		0.01 (5.58) ***	11	8	0	6.98	6.12
Sell_Individual _{it}		0.00 (1.09)	6	0	0	0.70	0.91
Ln_Cap _{it}		0.00 (2.10) *	3	2	7	-6.83	-1.61
Return _{it}		-0.01 (2.55) **	3	2	8	-22.13	-2.85
Book/Market _{it}		0.00 (1.37)	4	1	3	-0.50	-0.27
Constant		0.02 (1.93) *	8	7	2	4.93	1.48
Observations		2073					
R-squared		0.07					

TABLE 8
Statutory Capital Gains Tax Rates
Years 1993-2006

Date of Sale	Holding Period	Statutory Tax Rate for Gains on Sales of Shares Held Equal To or Shorter Than Holding Period (A)	Statutory Tax Rate for Gains on Sales of Shares Held Longer Than Holding Period $Ltcg_t$ (B)	Drate _t (A) - (B)
1/1/1993-5/6/97	12	39.6	28	11.6
5/7/97-7/28/97	12	39.6	20	19.6
7/29/97-12/31/97	18	39.6	20	19.6
1998-2000	12	39.6	20	19.6
2001	12	39.1	20	19.1
2002	12	38.6	20	18.6
2003-2006	12	35	15	20

TABLE 9
Descriptive Statistics and Univariate Analysis of Investment Advisers’
Response to Holding Period Incentives

Panel A: Frequency of Indicator Variables in Equation (2)

See Appendix 2 for variable definitions. *** denotes significance of chi-square test for equal proportions at $p < 0.01$.

Variable	Count	Percentage	
Probability of Selling _{jit}	63,899	44.69	***
ShortTerm _{jit}	89,364	62.49	***
Transient _{jt}	53,635	37.51	***

Panel B: Descriptive Statistics for Continuous Variables in Equation (2)

See Appendix 2 for variable definitions.

Variable	Mean	Std. Dev.	1st Quartile	Median	3rd Quartile
Drate _t	0.1861	0.0239	0.1860	0.1960	0.2000
BaseChange _{it}	-0.1445	0.2829	-0.3020	-0.1346	0.0174
Drate _t *BaseChange _{it}	-0.0269	0.0535	-0.0561	-0.0241	0.0031
Drate _t *Short-Term _{jit}	0.1160	0.0920	0.0000	0.1860	0.1960
BaseChange _{it} *Short-Term _{jit}	-0.0940	0.2347	-0.1981	0.0000	0.0000
Drate _t *BaseChange _{it} *Short-Term _{jit}	-0.0174	0.0443	-0.0360	0.0000	0.0000
Ltcg _t	0.1951	0.0356	0.1500	0.2000	0.2000
Ltcg _t *BaseChange _{it}	-0.0290	0.0566	-0.0594	-0.0250	0.0035
Recommend _{it}	2.3414	0.7323	2.0000	2.0000	3.0000

TABLE 9 (continued)
Descriptive Statistics and Univariate Analysis of Investment Advisers’
Response to Holding Period Incentives

Panel C: Pearson (Spearman) Correlations on the Upper (Lower) Diagonal

See Appendix 2 for variable definitions. Subscripts are suppressed. All correlations are significant at $p < 0.01$, with the exception of the two **bold** correlations, which are significant at $p < 0.05$, and the ***bold italics correlation***, which is significant at $p < 0.10$ level.

Variable	Prob. of Selling	Drate* Base_ Change* Short- Term	Ltcg* Base_ Change	Recommend	Transient	Base_ Change	Ltcg	Drate	Drate* Base_ Change	Short- Term	Base_ Change* Short- Term	Drate* Short- Term
Prob. of Selling		-0.0190	-0.0355	0.0366	-0.0084	-0.0361	0.0067	-0.0066	-0.0360	-0.0336	-0.0185	-0.0341
Drate*Base_ Change*Short- Term	-0.0123		0.7536	-0.1219	-0.0560	0.7672	-0.0362	-0.0304	0.7712	-0.3039	0.9942	-0.3068
Ltcg*Base_ Change	-0.0323	0.7047		-0.1711	-0.0361	0.9907	-0.1423	0.0676	0.9731	-0.0225	0.7670	-0.0098
Recommend	0.0375	-0.1094	-0.1763		-0.0277	-0.1844	-0.1605	0.0569	-0.1837	-0.0455	-0.1220	-0.0347
Transient	-0.0084	-0.0510	-0.0490	-0.0237		-0.0427	-0.0134	0.1184	-0.0511	0.0823	-0.0491	0.1035
Base_Change	-0.0326	0.7095	0.9932	-0.1906	-0.0531		-0.0845	0.0108	0.9942	-0.0204	0.7704	-0.0181
Ltcg	0.0088	-0.0855	-0.2129	-0.1587	0.0539	-0.1456		-0.8725	-0.0421	0.0390	-0.0729	-0.1095
Drate	-0.0251	0.0840	0.2257	0.0151	-0.0979	0.1672	-0.8695		-0.0413	-0.0228	0.0145	0.1491

TABLE 9 (continued)
Descriptive Statistics and Univariate Analysis of Investment Advisers’
Response to Holding Period Incentives

Panel C (continued): Pearson (Spearman) Correlations on the Upper (Lower) Diagonal

See Appendix 2 for variable definitions. Subscripts are suppressed. All correlations are significant at $p < 0.01$, with the exception of the two **bold** correlations, which are significant at $p < 0.05$, and the *bold italics correlation*, which is significant at $p < 0.10$ level.

Variable	Prob. of Selling	Drate* Base_ Change* Short- Term	Ltcg* Base_ Change	Recommend	Transient	Base_ Change	Ltcg	Drate	Drate* Base_ Change	Short- Term	Base_ Change* Short- Term	Drate* Short- Term
Drate	-0.0251	0.0840	0.2257	0.0151	-0.0979	0.1672	-0.8695		-0.0413	-0.0228	0.0145	0.1491
Drate* Base_Change	-0.0325	0.7096	0.9783	-0.1902	-0.0622	0.9944	-0.0994	0.1221		-0.0186	0.7647	-0.0261
Short-Term	-0.0336	-0.3762	-0.0263	-0.0482	0.0823	-0.0248	0.0391	<i>-0.0045</i>	-0.0219		-0.3102	0.9774
Base_Change* Short-Term	-0.0122	0.9984	0.7113	-0.1095	-0.0466	0.7120	-0.1058	0.1037	0.7070	-0.3762		-0.3013
Drate*Short- Term	-0.0424	-0.2740	0.0618	-0.0317	0.0342	0.0389	-0.3066	0.3866	0.0221	0.8673	-0.2617	

TABLE 10
Multivariate Analysis of Investment Advisers' Response to Holding Period Incentives

Dependent variable is Probability of Selling_{jit}. Observations are tax-sensitive investment adviser *j*-firm *i*-year *t* for years 1993-2006. Standard errors are clustered by tax-sensitive investment adviser. *, **, *** indicates significance of *z*-statistic at $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively, for a two-tailed test except for the variable with a directional prediction. See Appendix 2 for variable definitions. Absolute value of *z*-statistics in parentheses.

Variable	Predicted Sign		
Drate _{<i>t</i>} *Base_Change _{<i>it</i>} *Short-Term _{<i>jit</i>}	-	-4.5744	
		(1.66)	**
Ltcg _{<i>t</i>} *Base_Change _{<i>it</i>}		-0.4630	
		(0.27)	
Recommend _{<i>it</i>}		0.0545	
		(5.46)	***
Base_Change _{<i>it</i>}		-0.2660	
		(0.33)	
Ltcg _{<i>t</i>}		0.4462	
		(0.59)	
Drate _{<i>t</i>}		0.3373	
		(0.25)	
Drate _{<i>t</i>} *Base_Change _{<i>it</i>}		1.2422	
		(0.43)	
Short-Term _{<i>jit</i>}		0.0158	
		(0.14)	
Drate _{<i>t</i>} *Short-Term _{<i>jit</i>}		-0.5440	
		(0.65)	
Base_Change _{<i>it</i>} *Short-Term _{<i>jit</i>}		0.8441	
		(1.71)	*
Transient _{<i>jit</i>}		-0.0164	
		(0.21)	
Constant		-0.3706	
		(0.98)	
Observations		142996	
Pseudo R-squared		0.0026	

TABLE 11

Sensitivity Analysis of Investment Advisers' Response to Holding Period Incentives

Dependent variable is Probability of Selling_{jit}. Observations are tax-sensitive investment adviser *j*-firm *i*-year *t* for years 1993-2006. Standard errors are clustered by tax-sensitive investment adviser. *, **, *** indicates significance of *z*-statistic at $p < 0.10$, $p < 0.05$, and $p < 0.01$, respectively, for a two-tailed test except for the variable with a directional prediction. See Appendix 2 for variable definitions. Absolute value of *z*-statistics in parentheses.

Variable	Predicted Sign	(1)	(2)
Drate _{<i>t</i>} *Base_Change _{<i>it</i>} *Short-Term _{<i>jit</i>}	-	-4.4650 (1.62) *	-4.36962 (1.60) *
Ltcg _{<i>t</i>} *Base_Change _{<i>it</i>}		-0.64809 (0.38)	-1.16239 (0.66)
Recommend _{<i>it</i>}		0.0504 (5.13) ***	0.052603 (5.36) ***
Base_Change _{<i>it</i>}		-0.15777 (0.19)	0.0942 (0.11)
Ltcg _{<i>t</i>}		0.2383 (0.33)	-0.32077 (0.41)
Drate _{<i>t</i>}		0.0826 (0.06)	-0.81119 (0.63)
Drate _{<i>t</i>} *Base_Change _{<i>it</i>}		0.9493 (0.33)	0.0649 (0.02)
Short-Term _{<i>jit</i>}		0.0146 (0.12)	0.0225 (0.19)
Drate _{<i>t</i>} *Short-Term _{<i>jit</i>}		-0.52247 (0.62)	-0.54381 (0.66)
Base_Change _{<i>it</i>} *Short-Term _{<i>jit</i>}		0.822705 (1.67) *	0.8056 (1.64)
Transient _{<i>jt</i>}		-0.02683 (0.36)	-0.0156 (0.23)
SP500Return _{<i>t</i>}		-0.16176 (1.57)	
Portfolio_Return _{<i>jt</i>}			-1.27854 (1.73) *
Portfolio_Turnover _{<i>jt</i>}			-0.02378 (0.06)
Portfolio_Return _{<i>jt</i>} *Portfolio_Turnover _{<i>jt</i>}			6.7039 (0.66)
Constant		-0.2690 (0.75)	-0.01817 (0.05)
Observations		142996	142514
Pseudo R-squared		0.0029	0.0034

TABLE 12
Descriptive Statistics and Univariate Analysis of
Investment Advisers' Realizations of Winners and Losers

Panel A: Descriptive Statistics for Continuous Variables in Equation (3)

See Appendix 3 for variable definitions.

Variable	Tax-Sensitive					Tax-Insensitive				
	N	Mean	1st Quartile	Median	3rd Quartile	N	Mean	1st Quartile	Median	3rd Quartile
Portfolio_Return _{jq} ^{a,b}	1,362,801	0.0093	-0.0092	0.0160	0.0347	1,624,953	0.0108	-0.0079	0.0183	0.0371
Turnover _{iq} ^{a,b}	1,362,801	0.0692	0.0267	0.0509	0.0954	1,624,953	0.0767	0.0384	0.0688	0.1077

Notes: ^{a(b)} indicates that the difference in the means (medians) between the tax-sensitive advisers and the tax-insensitive advisers is significant at $p < 0.01$ using a two-tailed t (Wilcoxon) test.

Panel B: Frequency of Indicator Variables in Equation (3)

See Appendix 3 for variable definitions. *** indicates that the difference in the frequency between tax-sensitive advisers and tax-insensitive advisers is significant at $p < 0.01$ using a two-tailed *Chi Square* test.

Variable	Tax-Sensitive		Tax-Insensitive		Chi-square	
	Count	Percentage	Count	Percentage		
Realize _{jq}	713,534	23.88	856,151	28.66	32.34	***
Loser _{iq}	494,061	16.54	574,107	19.22	274.70	***

TABLE 12 (continued)
Descriptive Statistics and Univariate Analysis of
Investment Advisers' Realizations of Winners and Losers

Panel C: Pearson (Spearman) Correlations on the Upper (Lower) Diagonal

See Appendix 3 for variable definitions. All correlations are significant at $p < 0.01$.

Variable	Realize _{iq}	Tax-Sensitive _{iq}	Loser _{iq}	Tax-Sensitive _{iq} * Loser _{iq}	Portfolio_Return _{iq}	Portfolio_Turnover _{iq}
Realize _{iq}		-0.0033	-0.0033	0.0033	-0.0064	0.0790
Tax-Sensitive _{iq}	-0.0033		0.0096	0.4860	-0.0146	-0.0708
Loser _{iq}	-0.0033	0.0096		0.5967	-0.1148	-0.0176
Tax-Sensitive _{iq} *Loser _{iq}	0.0033	0.4860	0.5967		-0.0780	-0.0420
Portfolio_Return _{iq}	-0.0061	-0.0293	-0.1142	-0.0832		0.0431
Portfolio_Turnover _{iq}	0.0877	-0.1265	-0.0223	-0.0715	0.0730	

TABLE 13
Multivariate Analysis Comparing Realizations of Winners and Losers
Within and Between Tax-Sensitive and Tax-Insensitive Advisers

Panel A: Results of Estimating Regression (3)

The dependent variable is $Realize_{jq}$. See Appendix 3 for variable definitions. Observations are investment adviser j -firm i -quarter q over the years 1996-2006. Standard errors are clustered by firm. *** indicates statistical significance of z -statistic at $p < 0.01$, using a two-tailed test. Absolute value of z -statistics in parentheses.

Variable	Coefficient (z-statistic)
Tax-Sensitive $_{jq}$	-0.0215 (4.42) ***
Loser $_{iq}$	-0.0526 (10.44) ***
Tax-Sensitive $_{jq}$ *Loser $_{iq}$	0.0870 14.30 ***
Portfolio_Return $_{jq}$	-0.4061 (9.00) ***
Portfolio_Turnover $_{jq}$	3.0489 62.17 ***
Constant	-0.1025 (16.03) ***
Observations	2,987,754
Wald chi-square	5050.88
p-value	0.0047

Panel B: Comparison of Realizations of Losers vs. Winners Within & Between Tax-Sensitive Investment Advisers and Tax-Insensitive Investment Advisers

*** indicates statistical significance of F -statistic at $p < 0.01$, using a two-tailed test.

	Tax- Sensitive		Tax- Insensitive	<i>Difference</i>
Loser	-0.0896		-0.1552	0.0655 ***
Winner	-0.1241		-0.1025	-0.0215 ***
<i>Difference</i>	0.0344 ***		-0.0526 ***	

TABLE 14
Multivariate Analysis Comparing Realizations of Winners and Losers by
Tax-Sensitive Advisers by Calendar Quarter

Panel A: Results of Estimating Equation (4) for Tax-Sensitive Advisers

The dependent variable is $Realize_{jiq}$. Observations are tax-sensitive investment adviser j -firm i -quarter q over the years 1996-2006. See Appendix 3 for variable definitions. Standard errors are clustered by firm. *, ** and *** indicate statistical significance of z -statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using a two-tailed test. Absolute value of z -statistics in parentheses.

Variable	Coefficient (z-statistic)
Q2	-0.1508 (13.41) ***
Q3	-0.1533 (15.69) ***
Q4	-0.1138 (11.88) ***
Loser _{iq}	0.0038 (0.31)
Q2*Loser _{iq}	0.0360 (1.85) *
Q3*Loser _{iq}	0.0120 (0.67)
Q4*Loser _{iq}	0.0524 (3.36) ***
Portfolio_Return _{jq}	-0.4453 (6.83) ***
Portfolio_Turnover _{jq}	2.9461 (45.52) ***
Constant	-0.0103 (0.89)
Observations	1,362,801
Wald chi-square	2850.59
p-value	0.0058

TABLE 14 (continued)
Multivariate Analysis Comparing Realizations of Winners and Losers by
Tax-Sensitive Advisers by Calendar Quarter

Panel B: Comparison of Quarterly Realizations of Winners and Losers by
Tax-Sensitive Investment Advisers

*** indicate statistical significance of F -statistic at $p < 0.01$, respectively, using a two-tailed test.

	Winner	Loser	Difference	
Q1	-0.0103	-0.0065	0.0038	
Q2	-0.1611	-0.1212	0.0399	***
Q3	-0.1636	-0.1478	0.0159	
Q4	-0.1241	-0.0679	0.0562	***

TABLE 15
Multivariate Analysis Comparing Realizations of Winners and Losers by
Tax-Insensitive Advisers by Calendar Quarter

Panel A: Results of Estimating Equation (4) for Tax-Insensitive Advisers

The dependent variable is $Realize_{jiq}$. Observations are tax-insensitive investment adviser j -firm i -quarter q over the years 1996-2006. See Appendix 3 for variable definitions. Standard errors are clustered by firm. *, ** and *** indicate statistical significance of z -statistic at $p < 0.10$, $p < 0.05$ and $p < 0.01$, respectively, using a two-tailed test. Absolute value of z -statistics in parentheses.

Variable	Coefficient (z-statistic)
Q2	-0.0669 (8.04)
Q3	-0.0657 (8.83)
Q4	-0.0861 (11.71)
Loser _{iq}	-0.0901 (10.59)
Q2*Loser _{iq}	0.0204 (1.53)
Q3*Loser _{iq}	0.0695 (5.56)
Q4*Loser _{iq}	0.0663 (5.72)
Portfolio_Return _{jq}	-0.3610 (8.21)
Portfolio_Turnover _{jq}	3.1574 (61.87)
Constant	-0.0566 (7.10)
Observations	1,624,953
Wald chi-square	4308.64
p-value	0.0045

TABLE 15 (continued)
Multivariate Analysis Comparing Realizations of Winners and Losers by
Tax-Insensitive Advisers by Calendar Quarter

Panel B: Comparison of Quarterly Realizations of Winners and Losers by
Tax-Insensitive Investment Advisers

*** indicate statistical significance of F -statistic at $p < 0.01$, respectively, using a two-tailed test.

	Winner	Loser	<i>Difference</i>	
Q1	-0.0566	-0.1467	-0.0901	***
Q2	-0.1235	-0.1932	-0.0697	***
Q3	-0.1223	-0.1429	-0.0206	**
Q4	-0.1427	-0.1665	-0.0238	***

TABLE 16
Multivariate Analysis Comparing Realizations of Winners and Losers
Within and Between Tax-Sensitive and Tax-Insensitive Advisers,
Controlling for Portfolio Rebalancing

Panel A: Results of Estimating Regression (3) Eliminating Observations Associated with Partial Sales

The dependent variable is $Realize_{jq}$. See Appendix 3 for variable definitions. Observations are investment adviser j -firm i -quarter q over the years 1996-2006. Standard errors are clustered by firm. *** indicates statistical significance of z -statistic at $p < 0.01$, using a two-tailed test. Absolute value of z -statistics in parentheses.

Variable	Coefficient (z-statistic)
Tax-Sensitive _{jq}	-0.1060 (13.51) ***
Loser _{iq}	-0.0760 (8.09) ***
Tax-Sensitive _{jq} *Loser _{iq}	0.0724 (7.74) ***
Portfolio_Return _{jq}	0.2798 (3.26) ***
Portfolio_Turnover _{jq}	5.6201 (68.96) ***
Constant	-1.4197 (94.69) ***
Observations	1,915,979
Wald chi-square	7369.00
p-value	0.0000

Panel B: Comparison of Realizations of Losers vs. Winners Within & Between Tax-Sensitive Investment Advisers and Tax-Insensitive Investment Advisers

*** indicates statistical significance of F -statistic at $p < 0.01$, using a two-tailed test.

	Tax- Sensitive	Tax- Insensitive	<i>Difference</i>	
Loser	-1.5292	-1.4956	-0.0336	***
Winner	-1.5257	-1.4197	-0.1060	***
<i>Difference</i>	-0.0036	-0.0760	***	

TABLE 17
Comparison of Performance of Losers Held versus Performance of Winners Sold

The excess buy-and-hold return equals the return of stocks in excess of the CRSP value-weighted buy-and-hold return over the six-month or 12-month period following the quarter in which an adviser chooses to sell a winner or to hold a loser. *** indicates that the difference in the means (medians) between the excess buy-and-hold returns for Hold Loser and Sell Winner are significant at $p < 0.01$, using a two-tailed t (Wilcoxon) test.

Panel A: Tax-Insensitive Advisers				
	Mean		Median	
<i>6 month Excess Buy-and-Hold Return</i>				
Hold Loser	0.0220		-0.0078	
Sell Winner	0.0115		-0.0039	
Difference	0.0105	***	-0.0039	
<i>12 month Excess Buy-and-Hold Return</i>				
Hold Loser	0.0534		-0.0118	
Sell Winner	0.0147		-0.0270	
Difference	0.0387	***	0.0152	***

Panel A: Tax-Sensitive Advisers				
	Mean		Median	
<i>6 month Excess Buy-and-Hold Return</i>				
Hold Loser	0.0244		-0.0052	
Sell Winner	0.0114		-0.0036	
Difference	0.0131	***	-0.0015	***
<i>12 month Excess Buy-and-Hold Return</i>				
Hold Loser	0.0529		-0.0077	
Sell Winner	0.0139		-0.0256	
Difference	0.0389	***	0.0179	***

APPENDIX 1
Variable Definitions-Chapter 2

Variable	Definition
Return_Dec _{<i>it</i>}	= firm <i>i</i> 's average return over the last four trading days of year <i>t</i> . [†]
Return_Jan _{<i>it+1</i>}	firm <i>i</i> 's average return over the first four trading days of year <i>t+1</i> . [†]
Chg_Tax-Sensitive _{<i>it</i>}	= change in the number of shares of firm <i>i</i> owned by investment advisers whose clients are primarily high net-worth individuals from the end of quarter three to the end of quarter four of year <i>t</i> , divided by the number of shares outstanding of firm <i>i</i> at the end of quarter three. [†]
%Tax-Sensitive _{<i>it</i>}	= percent of firm <i>i</i> 's outstanding shares owned by investment advisers whose clients are primarily high net-worth individuals at the end of quarter three of year <i>t</i> . [†]
Chg_Tax-Exempt _{<i>it</i>}	= change in the number of shares of firm <i>i</i> owned by investment advisers whose clients are primarily tax-exempt entities from the end of quarter three to the end of quarter four of year <i>t</i> , divided by the number of shares outstanding of firm <i>i</i> at the end of quarter three. [†]
%Tax-Exempt _{<i>it</i>}	= percent of firm <i>i</i> 's outstanding shares owned by investment advisers whose clients are primarily tax-exempt entities at the end of quarter three of year <i>t</i> . [†]
Chg_Individual _{<i>it</i>}	= change in the number of shares of firm <i>i</i> owned by individual investors from the end of quarter three to the end of quarter four of year <i>t</i> , divided by the number of shares outstanding of firm <i>i</i> at the end of quarter three. [†]
%Individual _{<i>it</i>}	= percent of firm <i>i</i> 's outstanding shares owned by individual investors at the end of quarter three of year <i>t</i> , measured as one minus the percent of firm <i>i</i> 's outstanding shares owned by institutional investors at the end of quarter three of year <i>t</i> . [†]
Return _{<i>it</i>}	= firm <i>i</i> 's cumulative return measured over year <i>t</i> , excluding the last four trading days of year <i>t</i> . [†]
Ln_Cap _{<i>it</i>}	= natural log of the average monthly market capitalization of firm <i>i</i> measured over year <i>t</i> . [†]
Book/Market _{<i>it</i>}	= book value of common equity plus balance sheet deferred taxes for firm <i>i</i> 's latest fiscal year ending before July 1 of year <i>t</i> , divided by firm <i>i</i> 's market value of equity at June 30 of year <i>t</i> . [†]
Sell_Tax-Sensitive _{<i>it</i>}	= one if ownership in firm <i>i</i> by investment advisers whose clients are primarily high net-worth individuals declines in quarter four; zero otherwise.
Sell_Tax-Exempt _{<i>it</i>}	= one if ownership in firm <i>i</i> by investment advisers whose clients are primarily tax-exempt entities declines in quarter four; zero otherwise.
Sell_Individual _{<i>it</i>}	= one if ownership in firm <i>i</i> by individual investors declines in quarter four; zero otherwise.

[†] denotes winsorized at 1st and 99th percentiles.

APPENDIX 2
Variable Definitions-Chapter 3

Variable	Definition
Probability of Selling _{jit}	= one if investment adviser <i>j</i> sells shares of firm <i>i</i> during quarter four of year <i>t</i> ; zero otherwise.
Drate _t	= difference between the long-term and short-term capital gains rates in year <i>t</i> ; see Table 4 for capital gains tax rates over the sample period.
Base_Change _{it}	= price appreciation (depreciation) over the holding period required for long-term capital gains tax treatment, assuming the holding period ends five trading days prior to the calendar year-end. [†]
Short-Term _{jit}	= one if investment adviser <i>j</i> did not own shares of firm <i>i</i> at the end of year <i>t</i> - 1 or if the number of shares of firm <i>i</i> owned by investment adviser <i>j</i> increased from the end of year <i>t</i> - 1 to the end of quarter three of year <i>t</i> .
Ltcg _t	= statutory long-term capital gains tax rate in year <i>t</i> ; see Table 4 for capital gains tax rates over the sample period.
Transient _{jt}	= one if investment adviser <i>j</i> is classified as a “transient” institutional investor in year <i>t</i> (Bushee 2001); zero otherwise.
Recommend _{it}	= latest median buy/sell/hold recommendation made by analysts in either November or December of year <i>t</i> , where 1=Strong Buy, 2=Buy, 3=Hold, 4=Underperform, and 5=Sell.
SP500Return _t	= cumulative return of S&P 500 Index over year <i>t</i> .
Portfolio_Return _{jt}	= portfolio return earned by investment adviser <i>j</i> over the first nine months of year <i>t</i> .
Portfolio_Turnover _{jt}	= investment adviser <i>j</i> 's average portfolio turnover over the first three quarters of year <i>t</i> , where quarterly turnover is calculated as the smaller of investment adviser <i>j</i> 's quarterly purchases and sales divided by the market value of the portfolio at the beginning of the quarter.

[†] denotes winsorized at 1st and 99th percentiles.

APPENDIX 3
Variable Definitions-Chapter 4

Variable	Definition
$Realize_{jq}$	= one if the number of shares of firm i owned by investment adviser j declines in quarter q ; zero otherwise.
$Tax-Sensitive_{jq}$	= one if over 50 percent of investment adviser j 's clients are high net-worth individuals and zero if over 50 percent of investment adviser j 's clients are tax-exempt entities or individuals with tax-deferred accounts.
$Loser_{iq}$	= one if stock i 's cumulative return over the nine months prior to quarter q is negative; zero if stock i 's cumulative return over the nine months prior to quarter q is positive.
$Portfolio_Return_{jq}$	= investment adviser j 's calendar year-to-date portfolio return as of the end of quarter q .
$Portfolio_Turnover_{jq}$	= The smaller of investment adviser j 's quarterly purchases and sales divided by the market value of the portfolio at the beginning of the quarter.

† denotes winsorized at 1st and 99th percentiles.

REFERENCES

- Abarbanell, Jeffrey, Brian Bushee, and Jana Raedy, 2003, Institutional investor preferences and price pressure: The case of corporate spin-offs, *Journal of Business* 76: 233-261.
- Ali, Ashiq, Cindy Durtschi, Baruch Lev, Mark Trombley, 2004, Changes in institutional ownership and subsequent earnings announcement abnormal returns, *Journal of Accounting, Auditing and Finance* 19(3): 221-248.
- Athanassakos, George. 1992, Portfolio rebalancing and the January effect in Canada, *Financial Analysts Journal* 48: 67-78.
- Auerbach, A.J., L. Burman, and J. Siegel, 2000, Capital gains taxation and tax avoidance: new evidence from panel data, in: J. Slemrod (ed.), *Does Atlas Shrug?*, Russell Sage Foundation, New York, 355-388.
- Ayers, Benjamin, C. Bryan Cloyd, and John Robinson, 2002, The effect of shareholder-level dividend taxes on stock prices: Evidence from the Revenue Reconciliation Act of 1993, *The Accounting Review* 77: 933-947.
- Ayers, Benjamin, Craig Lefanowicz, and John Robinson, 2003, Shareholder taxes in acquisition premiums: The effect of capital gains taxation, *Journal of Finance* 58(6): 2783-2801.
- Badrinath, S.G., and Wilbur Lewellen, 1991, Evidence of tax-motivated securities trading behavior, *Journal of Finance* 46(1): 369-382.
- Barber, Brad, and Terrance Odean, 2003, Are individual investors tax savvy? Evidence from retail and discount brokerage accounts, *Journal of Public Economics* 88: 419-442.
- Blouin, Jennifer, Jana Raedy, and Douglas Shackelford, 2003, Capital gains taxes and equity trading: empirical trading. *Journal of Accounting Research* 41(4): 611-651.
- Bushee, Brian, 1998, The influence of institutional investors on myopic R&D investment behavior, *The Accounting Review* 73(3): 305-333.
- Bushee, Brian, 2001, Do institutional investors prefer near-term earnings over long-run value?, *Contemporary Accounting Research* 18(2): 207-246.
- Carhart, Mark, 1997, On persistence in mutual fund performance, *Journal of Finance* 52 (1): 57-82.

- Chan, K.C., 1986, Can tax-loss selling explain the January seasonal in stock returns?, *Journal of Finance* 41(5): 1115-1128.
- Chen, Hsiu-Lang, Narasimhan Jegadeesh, and Russ Wermers, 2000, The value of active mutual fund management: An examination of the stockholdings and trades of fund managers, *Journal of Financial and Quantitative Analysis* 35: 343-368.
- Constantinides, George, 1984, Optimal stock trading with personal taxes: Implications for prices and abnormal January returns, *Journal of Financial Economics* 13: 65-89.
- Daniel, Ken, Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997, Measuring mutual fund performance with characteristic-based benchmarks, *Journal of Finance* 52: 1035-1058.
- Desai, M.A., and D. Dharmapala, 2007, Taxes and portfolio choice: Evidence from JGTRRA's Treatment of International Dividends, Working paper, Harvard University.
- Dhaliwal, Dan, Oliver Li, and Robert Trezevant, 2003, Is a dividend tax penalty incorporated into the return on a firm's common stock?, *Journal of Accounting and Economics* 35: 155-178.
- Dyl, Edward, 1977, Capital gains taxation and year-end stock market behavior, *Journal of Finance* 32: 165-175.
- Dyl, Edward, and Edwin Maberly, 1992, Odd-lot transactions around the turn of the year and the January effect, *Journal of Financial and Quantitative Analysis* 27: 591-604.
- Fama, Eugene, and Kenneth French, 1992, The cross-section of expected stock returns, *Journal of Finance* 47(2): 427-465.
- Fama, E.R., and J.D. MacBeth, 1973, Risk, return and equilibrium: Empirical tests, *The Journal of Political Economy* 71 (May/June): 607-636.
- Feng, Lei, and Mark Seasholes, 2005, Do investor sophistication and trading experience eliminate behavioral biases in financial markets?, Working paper, U.C. Berkeley.
- Frazzini, Andrea, 2006, The disposition effect and underreaction to news, *Journal of Finance* 61(4): 2017-2046.
- Garvey, Ryan, and Anthony Murphy, 2004, Are professional traders too slow to realize their losses?, *Financial Analysts Journal* 60(4): 35-43.

- Gibson, Scott, Assem Safieddine, and Sheridan Titman, 2000, Tax-motivated trading and price pressure: An analysis of mutual fund holdings, *Journal of Financial and Quantitative Analysis* 35(3): 369-386.
- Givoly, Dan, and Arie Ovadia, 1983, Year-end induced sales and stock market seasonality, *Journal of Finance* 38: 171-185.
- Griffiths, Mark, and Robert White, 1993, Tax-induced trading and the turn of the year anomaly: An intraday study, *Journal of Finance* 48: 575-598.
- Grinblatt, Mark and Matti Keloharju, 2001, What makes investors trade?, *Journal of Finance* 56(2): 589-616.
- Grinblatt, Mark, and Tobias Moskowitz, 2004, Predicting stock price movements from past returns: The role of consistency and tax-loss selling, *Journal of Financial Economics* 71: 541-579.
- Harris, Lawrence, 1988, Predicting contemporary volume with historic volume at differential price levels: Evidence supporting the disposition effect: Discussion, *Journal of Finance* 43 (3): 698-699.
- Huddart, Steven, and V.G. Narayanan, 2002, An empirical examination of tax factors and mutual funds' stock sale decisions, *Review of Accounting Studies* 7: 319-342.
- Hurt, David, and Jim Seida, 2004, Do holding period tax incentives affect earnings release period selling activity of individual investors?, *Journal of the American Taxation Association* 26(2): 43-64.
- Ivkovic, Zoran, James Poterba, and Scott Weisbenner, 2004, Tax-motivated trading by individual investors (NBER Working Paper #10275).
- Jensen, Michael, 1968, The performance of mutual funds in the period 1945-64, *Journal of Finance* 23(2): 389-416.
- Jin, Li, 2006, Capital gains tax overhang and price pressure, *Journal of Finance* 61(3): 1399-1431.
- Jin, Li, and Anna Scherbina, 2006, Inheriting losers, Working Paper, Harvard Business School.
- Kahneman, Daniel, and Amos Tversky, 1979, Prospect theory: An analysis of decision under risk, *Econometrica* 47(2): 263-292.

- Ke, Bin, and Kathy Petroni, 2004, How informed are actively trading institutional investors? Evidence from their trading behavior before a break in a string of consecutive earnings increases, *Journal of Accounting Research* 42(5): 895-927.
- Koogler, Paul, and Edwin Maberly, 1994, Additional evidence of year-end tax-motivated trading by individual investors, 1962-1986, *Journal of the American Taxation Association* 16: 122-137.
- Lakonishok, Josef, Andrei Shleifer, Richard Thaler, and Robert Vishny, 1991, Window dressing by pension fund managers, *American Economic Review* 81(2): 227-231.
- Lakonishok, Josef and Seymour Smidt, 1986, Volume for winners and losers: Taxation and other motives for stock trading, *Journal of Finance* 41(4): 951-974.
- Locke, Peter, and Steven Mann, 2005, Professional trader discipline and trade disposition, *Journal of Financial Economics* 76: 401-444.
- Odean, Terrance, 1998, Are investors reluctant to realize their losses?, *Journal of Finance* 53(5): 1775-1798.
- Parrino, R., R.W. Sias, and L.T. Starks, 2003, Voting with their feet: institutional ownership changes around forced CEO turnover, *Journal of Financial Economics* 68: 3-46.
- Petersen, Mitchell A., 2008, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies*, forthcoming.
- Poterba, J.M., 1987, How burdensome are capital gains taxes?, *Journal of Public Economics* 33: 153-172.
- Poterba, J.M., 2002, Taxation, risk-taking, and portfolio behavior” in A. Auerbach and M.Feldstein, *Handbook of Public Economics*, Volume 3 (Amsterdam: North Holland), 1109-1171.
- Poterba, James, and Scott Weisbenner, 2001, Capital gains tax rules, tax-loss trading, and turn-of-the-year returns, *Journal of Finance* 56(1): 353-368.
- Reinganum, Marc, 1983, The anomalous stock market behavior of small firms in January, *Journal of Financial Economics* 12: 89-104.
- Ritter, Jay, 1988, The buying and selling behavior of individual investors at the turn of the year, *Journal of Finance* 43: 701-717.

- Rozeff, Michael, and William Kinney, 1976, Capital market seasonality: The case of stock returns, *Journal of Financial Economics* 3: 379-402.
- Scholz, J.K., 1994, Tax progressivity and household portfolios: Descriptive evidence from the surveys of consumer finances, in: J.Slemrod (ed.), *Tax Progressivity and Income Inequality*, Cambridge University Press, New York, 219-267.
- Seyhun, H.N., and D.J. Skinner, 1994, How do taxes affect investors' stock market realizations? Evidence from tax-return panel data, *Journal of Business* 67(2): 231-262.
- Shapira, Zur, and Itzhak Venezia, 2001, Patterns of behavior of professionally managed and independent investors, *Journal of Banking and Finance* 25: 1573-1587.
- Shefrin, Hersh, and Meir Statman, 1985, The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40(3): 777-790.
- Sias, Richard, and Laura Starks, 1997, Institutions and individuals at the turn-of-the-year, *Journal of Finance* 52(4): 1543-1562.
- Sias, R.W., Laura T. Starks, and Sheridan Titman, 2006, Changes in institutional ownership and stock returns: Assessment and methodology, *Journal of Business* 79(6): 2869-2910.
- Starks, Laura, Li Yong, and Lu Zheng, 2006, Tax-loss selling and the January effect: Evidence from municipal bond closed-end funds, *Journal of Finance* 61(6): 3049-3067.
- Thaler, Richard, 1985, Mental accounting and consumer choice, *Marketing Science* 4(3): 199-214.
- Tinic, Seha, Giovanni Barone-Adesi, and Richard West, 1987, Seasonality in Canadian stock prices: A test of the "tax-loss-selling hypothesis", *Journal of Financial and Quantitative Analysis* 22: 51-64.
- Wermers, Russ, 2000, Mutual fund performance: An empirical decomposition into stock-picking talent, style, transaction costs, and expenses, *Journal of Finance* 55: 1655-1703.

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