Journal of Banking & Finance 49 (2014) 56–68

Contents lists available at ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Institutions and the turn-of-the-year effect: Evidence from actual institutional trades

Andrew Lynch [a], Andy Puckett [b], Xuemin (Sterling) Yan [c,*]

[a] School of Management, Binghamton University, Binghamton, NY 13902, United States
[b] Department of Finance, University of Tennessee, Knoxvielle, TN 37996, United States
[c] Trulaske College of Business, University of Missouri, Columbia, MO 65211, United States

ARTICLE INFO

Article history:
Received 30 October 2012
Accepted 30 June 2014
Available online 28 August 2014

JEL classification:
G10
G12
G23

Keywords:
Institutions
Turn-of-the-year effect
Window dressing
Tax-loss selling

ABSTRACT

Using a large proprietary database of institutional trades, we investigate whether institutional investors drive the turn-of-the-year (TOY) effect. Institutions that engage in window dressing, tax-loss selling, or risk shifting will contribute to the TOY effect by selling small, poorly performing stocks at the end of December and/or buying those same stocks at the beginning of January. We find abnormal pension fund selling in small stocks with poor past performance during the final trading days in December, providing some support for the window dressing hypothesis. However, we find little evidence that institutional tax-loss selling or risk-shifting trading strategies contribute to TOY returns. Furthermore, stocks with no institutional trading around the year-end exhibit considerably stronger TOY return patterns than stocks in which institutions trade. Taken together, our results suggest that institutions play a limited role in driving the TOY effect.

1. Introduction

Small stocks with poor past performance earn significantly higher returns in January than in other months. This "turn-of-the-year" (hereafter TOY) or "January" effect is one of the longest studied and most persistent stock market anomalies in the field of finance.[1] While most anomalies weaken or dissipate after their initial discovery (Schwert, 2003; McLean and Pontiff, 2014), the TOY effect continues to persist more than three decades after it was originally documented by Rozeff and Kinney (1976) (Huag and Hirschey, 2006; Sias and Starks, 1997; Ng and Wang, 2004). The TOY effect occupies a prominent position in the finance literature because of its direct asset pricing implications as well as its interactions with numerous other cross-sectional return phenomena such as the momentum effect and the liquidity premium.[2]

Financial economists have yet to reach a consensus regarding the mechanism that drives these turn-of-the-year return patterns. Prevailing theories attempting to explain low returns in December and high returns in January hypothesize that market externalities incentivize investors – or more specifically, a subset of investors – to sell small, underperforming stocks in December and/or buy those same stocks in January. In the presence of inelastic demand curves for small stocks, such imbalances are likely to result in price pressures that drive the documented TOY returns.[3] Extant literature has offered a number of hypotheses to explain why such trading patterns may arise for individual and institutional investors.

The prevailing explanation for why individual investors might drive TOY return patterns is the tax-loss selling hypothesis (Dyl, 1977). This theory contends that individual investors systematically sell losing stocks in December in order to reduce their tax liabilities by realizing paper capital losses. While a number of

* Corresponding author.
E-mail addresses: lynch@binghamton.edu (A. Lynch), pucketta@utk.edu (A. Puckett), yanx@missouri.edu (X. (Sterling) Yan).

[1] The January effect was originally documented by Rozeff and Kinney (1976). Subsequent studies by Reinganum (1983), Roll (1983), and Keim (1983) find that this anomaly is concentrated in small capitalization stocks and those with poor prior performance (DeBondt and Thaler, 1985, 1987). Studies that confirm the existence of the January effect in longer and/or more recent time periods as well as in other countries include Huag and Hirschey (2006), Moller and Zilca (2008), Easterday et al. (2009), and Gultekin and Bulent Gultekin (1983).

[2] Jegadeesh and Titman (2001) show that momentum profits are significantly negative in January. Eleswarapu and Reinganum (1993) find that the liquidity premium is concentrated in January.

[3] Other explanations for the TOY effect include risk-return seasonalities (Sun and Tong, 2010), informed trading (Kang, 2010), and behavioral biases (Ciccone, 2011).

http://dx.doi.org/10.1016/j.jbankfin.2014.06.028
0378-4266/

empirical studies find varied support for the individual investor tax-loss selling hypothesis,[4] Reinganum (1983), Brown et al. (1983), and Kato and Schallheim (1985) find that trading by individual investors is insufficient to explain TOY returns and suggest institutional investors must be responsible.[5]

The three most prominent explanations for why institutional investors might drive TOY return patterns include tax-loss selling, window dressing, and risk shifting. Similar to tax incentives faced by individual investors, the institutional tax-loss selling hypothesis contends that tax-sensitive institutional investors systematically sell losing stocks in December in order to realize paper losses and reduce the tax liabilities of their constituent investors (Sikes, 2014). Alternatively, the window dressing and risk shifting hypotheses focus on agency problems that are unique to institutional investors. The window dressing hypothesis suggests institutional investors face agency problems that encourage them to "dress up" their portfolios prior to mandatory portfolio disclosure dates by selling underperforming stocks in December to make their portfolios look better (Haugen and Lakonishok, 1988; Lakonishok et al., 1991). The risk shifting hypothesis advocates that institutions increase the riskiness of their portfolios by purchasing small risky stocks in January in order to increase expected returns while avoiding investor scrutiny (Ng and Wang, 2004).

The primary purpose of this study is to investigate the role of institutional investor trading in the TOY anomaly by examining a proprietary database of actual institutional trades. Institutional investors own more than 68 percent of publicly traded U.S. common equity and are responsible for an even greater percentage of the total trading volume (Lewellen, 2011; Kaniel et al., 2008). Because of the dominant role of institutional trades, systematic institutional trading patterns clearly have the ability to impact market prices. While several studies have investigated the role of institutional investors in the TOY return anomaly (e.g., Sias and Starks, 1997; Ng and Wang, 2004; Sikes, 2014), they are constrained to infer trading patterns from quarterly institutional holdings data. This data limitation is particularly pertinent for TOY studies because the proposed abnormal trading behavior that drives the anomaly is confined to short windows (5–10 days) just before and after the end of the calendar year (Roll, 1983). Our study contributes to the TOY literature by using actual institutional trades obtained from Abel Noser Solutions to examine the trading activities of institutions immediately before and after the end of the year. We find no evidence that institutions in our sample engage in significant risk-shifting trading behavior, and only limited evidence of trading consistent with window dressing and/or tax-loss selling just prior to the year-end. Although window dressing and tax-loss selling might contribute to TOY returns, we find the strongest evidence of TOY returns in stocks where institutions abstain from trading. As such, our results are most consistent with the hypothesis that individual investors, motivated by tax considerations, are responsible for TOY returns.

We begin our study by investigating year-end return patterns during our 1999 to 2005 sample period, and consistent with prior literature, we find that abnormal stock returns are 3.9% (t = 22.31) higher during the first 10 trading days in January when compared to the last 10 trading days in December. The effect is stronger in smaller stocks (6.8%), and stocks with poorer past performance over the prior eleven months (14.0%). To test whether institutional trading drives the TOY effect through tax-loss selling, window dressing, or risk-shifting, we examine institutional trading behavior during the last 10 trading days in December and first 10 trading days in January. If tax-loss selling or window dressing incentives drive TOY returns, we expect to find evidence of abnormal institutional selling in small stocks with poor past performance during the final days in December. Alternatively, if institutional investors engage in risk-shifting behavior, we expect to observe abnormal institutional buying in small (riskier) stocks at the beginning of January.

To help disentangle tax-loss selling versus window dressing trading motivations, we partition our institutional investor sample into two groups: institutions that are tax insensitive and institutions that are more likely to be tax sensitive. Consistent with institutional categorization by Jin (2006), Blouin et al. (2011), and Sikes (2014), we classify pension plan sponsors as tax insensitive institutions since neither pension plan sponsors nor their underlying constituent investors are subject to taxation on realized portfolio gains. Since pension plan sponsors are not tax sensitive, their only logical motivation to abnormally sell past loser stocks during the final 10 days in December is to window dress their portfolios. Prudent man laws, which apply to pension plan sponsors but not to most money managers, may also provide window dressing motivations since plan sponsors have an additional legal incentive to avoid the appearance of improper investments (Del Guercio, 1996; Del Guercio and Tkac, 2002). Alternatively, money managers are likely to invest on behalf of some individuals or corporations who are subject to capital gains and ordinary income taxes.[6] Their end-of-the-year trading behavior is potentially driven by both tax-loss selling and window dressing motivations. Thus, if abnormal selling at year end is evident for money managers and is not evident for pension plan sponsors, one can reasonably conclude that tax-loss selling is the dominant effect.

Our investigation of institutional trading imbalances during the last 10 trading days in December provides only limited evidence that tax insensitive institutions (i.e., pension plan sponsors) sell small stocks with poor prior performance. The magnitude of this abnormal selling is 0.008% of shares outstanding for small stocks, and this selling is concentrated in small stocks with poor prior performance (0.061%). This evidence provides some support for the window dressing hypothesis. Tax sensitive institutions (i.e., money managers) do not sell small stocks with poor prior performance over this same period. However, if money manager institutions face greater incentives to tax-loss sell in particular years, then pooling all sample years may introduce noise that contributes to our inability to find evidence of abnormal selling in our sample.

In order to increase the power of our tests, we divide sample years into those where aggregate market returns are positive (UP years) from January to November, and those where aggregate market returns are negative (DOWN years). Brauer and Chang (1990), Ligon (1997), and Johnson and Cox (2002) suggest that tax-loss selling incentives are likely to be higher following DOWN market years.[7] In particular, Ligon (1997) states that "larger market declines in the previous (year) create greater potential for tax-loss selling."[8] Consistent with these prior studies, we find that TOY return patterns

[4] See Branch (1977), Banz (1981), Roll (1983), Ritter (1988), Sias and Starks (1997), Poterba and Weisbenner (2001), and Starks et al. (2006).

[5] The turn-of-the-year effect exists in countries with no capital gains taxes (Brown et al., 1983; Kato and Schallheim, 1985) and in the United States prior to the introduction of capital gains taxes (Jones et al., 1987). In addition, Musto (1997) and Maxwell (1998) find that the TOY effect exists in money market instruments and corporate bonds respectively, even though both are predominantly owned by institutions with no tax considerations.

[6] Institutions classified as money managers are likely to include mutual fund families, advisors who invest in separate accounts for high net worth individuals or corporate clients, and even banks, insurance companies, and hedge funds. While the Tax Reform Act of 1986 mandated an October tax year-end for all mutual funds, other money managers or their constituent investors have a December tax year-end.

[7] An alternate ex ante expectation is that tax sensitive institutions will be more likely to engage in tax loss selling after UP market years, when realized gains in their portfolios are likely to be high. Ultimately the question is empirical in nature as to whether rising or falling markets induce tax-loss selling.

[8] Both Ligon (1997) and Johnson and Cox (2002) investigate this hypothesis empirically and find a strong negative relationship between prior year returns and the January effect.

are concentrated in DOWN versus UP market years (7.4% versus 0.3%). However, money managers' trading imbalances reveal evidence of year-end selling of extreme losers only in UP markets. The lack of DOWN market selling pressure of extreme losers is inconsistent with institutional tax-loss selling being the mechanism that drives TOY returns.

In order to test the risk-shifting hypothesis we investigate institutional trading imbalances during the first ten trading days of January and find no evidence of abnormal buying or selling in any firm size group. Taken together, our results provide some support for the window dressing hypothesis, but are inconsistent with tax-loss selling or risk shifting. Our conclusions contrast with those of Ng and Wang (2004), who find that institutions are significant buyers of small stocks in the first quarter of the year; and with Sikes (2014), who finds that tax-loss selling by tax-sensitive institutions impact TOY returns. We continue to point out that one critical difference between the above studies and ours is that our study uses actual institutional trades, enabling us to more precisely determine the direction, timing, and magnitude of institutional trading around the turn of the year.

Our final empirical analyses examine the TOY effect across institutional trading portfolios. We sort all stocks according to institutional trading imbalances in either December or January and investigate the return patterns for each portfolio. Our findings provide some evidence that the TOY effect is stronger in portfolios with negative institutional trading imbalances in December and positive imbalances in January. However, we are cautious in drawing strong conclusions regarding the causality of this relationship. To the extent that institutional trading is positively correlated with contemporaneous stock returns, the above result is to be expected and could simply be driven by positive feedback trading. More interestingly, we find that the TOY effect is strongest for firms that have no institutional trading around the turn of the year. The portfolio of stocks with poor prior performance that do not have any institutional trading display TOY returns more than twice as large as any of the institutional trading portfolios (22.4% versus 10.5%). This result is consistent with our earlier results and suggests that individual investors are the primary driver of the TOY effect, while institutions play only a limited role.

The remainder of our paper proceeds as follows: The next section describes our data and methods. Section 3 develops our hypotheses. Section 4 presents our empirical results, and Section 5 concludes.

2. Data and methods

The institutional trading data that is used in our study is provided by Abel Noser Solutions, one of the premier transaction cost analysis (TCA) providers in the world. Abel Noser Solutions receives trading data from its client institutions in order to monitor their equity trading costs and provides the data for academic use under the condition that institutions in the database remain anonymous.[9] Institutions in the database are identified by a numeric clientcode that is unique in both the cross-section and time-series. In addition, Abel Noser Solutions identifies each clientcode as a pension plan sponsor, a money manager, or a broker.[10] Each institutional transaction reported in the database contains 107 different data fields that include the date of execution, the CUSIP and ticker of the stock traded, number of shares executed, execution price, and whether the execution is a buy or sell. CUSIP and ticker identifiers allow us to obtain relevant data from the CRSP database including stock returns and shares outstanding. We include only common stocks (i.e. securities with a CRSP sharecode of 10 or 11) in our sample. For a more detailed description of the Abel Noser Solutions database, we refer readers to Puckett and Yan (2011).

We utilize trading data for the period from January 1, 1999 to December 31, 2005 and present summary statistics for the Abel Noser Solutions trading data in Table 1. The trading database contains a total of 841 different institutions responsible for approximately 79 million common stock trades (reported executions) over our sample period. The total number of different common stocks traded varies from 4705 in 2002 to 6166 in 1999, while the average number of shares per trade varies from 6680 in 2005 to 11,046 in 2001. Over the entire sample period, Abel Noser Solutions' institutional clients traded more than 676 billion common shares, representing more than $20.6 trillion worth of stock trades. The institutions in our sample, on average, are responsible for approximately 8% of total CRSP daily dollar volume during the 1999–2005 sample period. Thus, while our data represents the activities of a subset of pension plan sponsors and money managers, it represents a significant fraction of total institutional trading volume.

The detail and richness of the Abel Noser trading data make it uniquely suited for investigating institutional investor trading activities around the turn of the year. If institutional trading drives the TOY effect, prevailing theories would suggest that abnormal institutional trading should be concentrated in the days just before or after the end of the year (Roll, 1983). However, because institutional trading data is not publicly available, previous studies that examine institutional trading around the turn of the year have used changes in quarterly institutional holdings to proxy for trading activity (see Sias and Starks, 1997; Ng and Wang, 2004; Sikes, 2014). Importantly, quarterly holdings do not identify the exact timing of trades, and therefore, studies that use institutional holdings must make assumptions regarding when trading within the quarter actually occurs.[11]

3. Hypotheses

3.1. Window dressing

A portfolio manager's ability to attract and retain outside capital is largely based on his performance and the attractiveness of his portfolio relative to other managers. This creates an incentive for managers to make their portfolios "look" better than similar institutions' portfolios immediately before public holdings disclosures. Portfolio managers can improve the appearance of their holdings by either buying stocks that have recently performed well or selling stocks which have performed poorly (Haugen and Lakonishok, 1988). Lakonishok et al. (1991) suggest that window dressing is likely to be observed in the portfolios of pension plan sponsors and that selling losers is the most effective form of window dressing. Alternatively, Meier and Schaumburg (2006) find evidence consistent with window dressing by equity mutual funds. If institutions systematically sell "losing" stocks immediately before year-end disclosure (Lakonishok et al., 1991; He et al., 2004; Meier and Schaumburg, 2006), it is reasonable to expect that this selling pressure would depress the returns of small loser stocks in

[9] Previous academic studies that have used Abel Noser Solutions data include Goldstein et al. (2009), Chemmanur et al. (2009), Busse et al. (2012), Goldstein et al. (2011), and Puckett and Yan (2011).

[10] The Abel Noser Solutions data contain trades for two institutions classified as "brokers". These two institutions are excluded from our analysis since we are unable to discern whether their trades represent market-making activities by the brokerage firm or proprietary trades for the brokerage firm's own account.

[11] Ng and Wang (2004) implicitly assume that changes in holdings from the third to fourth quarter occur in the days just before the end of the fourth quarter. In addition, to test their risk-shifting hypothesis, they assume that changes in holdings between the fourth and the first quarters are made in the days immediately following the beginning of the quarter.

Table 1
Descriptive statistics for Abel Noser Solutions institutional trading data.

	1999	2000	2001	2002	2003	2004	2005
Total number of institutions	380	372	400	426	403	406	376
Total number of stocks	6166	5920	5085	4705	4737	4909	4761
Total number of trades (millions)	5.26	7.02	8.38	11.26	11.13	19.09	16.68
Total share volume (billion)	47.0	66.69	92.55	120.59	99.47	138.37	111.42
Total dollar volume ($trillion)	2.10	2.93	2.80	2.93	2.48	3.97	3.46
Average share volume per trade	8922	9488	11,046	10,714	8937	7249	6680
Median share volume per trade	1700	1500	1400	1300	1030	700	500
Average dollar volume per trade	398,214	417,587	334,764	260,509	222,849	208,275	207,465
Median dollar volume per trade	59,981	54,238	39,040	30,200	27,214	21,049	14,827

Institutional trading data are obtained from Abel Noser Solutions, and the trades in the sample are placed by 841 institutions during the time period from January 1, 1999 to December 31, 2005. Table 1 presents descriptive statistics for the Abel Noser institutional trading data for each year of our sample period. We obtain share price, total shares outstanding, stock returns, and trading volume from the CRSP stock database. Summary statistics presented in the table exclude trades by institutions classified as "brokers" and also include only trades in common stocks (those with a sharecode of 10 or 11 in CRSP).

December. In order to investigate whether window dressing is the mechanism that drives the TOY effect, we first explore the presence of abnormal selling in small loser stocks at the end of the year.

H1 (*Window Dressing Hypothesis*). Institutions sell stocks at the end of the year that performed poorly over the prior year. This selling of past loser stocks is more pronounced in small stocks.

3.2. Tax-loss selling

While many institutions are indifferent to tax considerations (i.e. pension funds), money managers with pass-through tax structures may be incentivized by their investors to maximize after-tax returns (Sikes, 2014; Jin, 2006). It is our understanding that money manager clients not only include mutual fund families, but also other institutions such as advisors who invest in separate accounts for high net worth individuals and corporate clients. While not all money managers are tax sensitive or have a tax-year end in December,[12] at least some institutions in the money manager sample face incentives to sell stocks with paper loses in December in order to offset realized capital gains. Empirically, this tax-loss selling would engender an end-of-year trading strategy that is almost identical to window dressing (selling of small loser stocks). To distinguish between the two hypotheses, we separately analyze institutions with tax-loss selling incentives (i.e. money managers) and those without tax-loss selling incentives (i.e. pension funds).[13]

H2 (*Institutional Tax-Loss Selling Hypothesis*). Institutions sell stocks at the end of the year that performed poorly during the prior year. This selling is concentrated in smaller stocks and is more pronounced for money managers than for pension plan sponsors.

[12] Mutual fund complexes serve both tax-sensitive and tax-insensitive clientele (e.g., mutual funds held within qualified retirement plans) and all mutual funds have an October 31 tax-year end (Huag and Hirschey, 2006). Other money manager types such as hedge funds have a tax-year end in December. In addition, advisors who invest in separate accounts for the benefit of high-net-worth individuals serve underlying investors who also have a December tax-year end. While the money manager group of institutions is heterogeneous with respect to their tax liabilities, we continue to stress that some of these institutions are likely to have a December 31 tax-year end and that this group is clearly tax-sensitive when compared to pension plan sponsors.

[13] Ideally, we should incorporate each fund's tax liabilities in our tests. Unfortunately, the coded identification for Abel Noser institutions and the lack of holdings data prevent us from estimating these tax liabilities. Instead, we use the performance of individual stock as an instrument for tax liabilities in our tests.

3.3. Risk-shifting

The separation of fund ownership and investment management creates agency problems. Fund manager compensation is a function of assets under management, and funds with high prior returns experience a disproportionate amount of capital inflows when compared with the outflows of poorly performing funds (Sirri and Tufano, 1998). This asymmetric flow-performance relationship creates an incentive for fund managers to invest in risky stocks. However, if fund managers persistently hold riskier stocks than investors prefer, investors may simply withdraw their capital from the funds.

Goetzmann et al. (2007) discuss fund managers' incentives to alter risk levels in order to inflate their performance numbers. Fund managers who wish to take advantage of the asymmetric flow-performance relationship while maintaining the appearance of a more conservative portfolio could accomplish this by trading around the turn of the year. Specifically, a fund manager would buy risky stocks in the period immediately following annual portfolio disclosure and sell them in the period immediately preceding annual disclosure (Ng and Wang, 2004). If institutions systematically purchase small risky stocks after the beginning of the year, this might contribute to high abnormal returns for small stocks in January.[14]

H3 (*Risk-Shifting Hypothesis*). Institutions purchase small risky stocks in January to a greater extent than in December.

3.4. Individual tax-loss selling hypothesis

The primary purpose of this paper is to use a large proprietary database of institutional trades to test the three prevailing institutional investor hypotheses for the TOY effect. Because we do not use individual trading data, we cannot speak directly to the individual tax-loss selling hypothesis. Nevertheless, we can provide indirect evidence on individual investors' role in the TOY effect by partitioning the sample of stocks into those that institutions trade and those that institutions do not trade. If individuals are primarily responsible for the TOY effect, then we would expect stocks that institutions abstain from trading to exhibit stronger TOY returns.

H4 (*Individual Tax-Loss Selling Hypothesis*). Stocks with no institutional trading around the turn-of-the-year exhibit a stronger turn-of-the-year effect than stocks in which institutions trade.

[14] This behavior would be consistent with Ritter (1988), who found the TOY effect associated with both abnormal selling pressure in December and abnormal buying pressure in January.

4. Empirical results

4.1. The turn-of-the-year effect

We begin by replicating extant results for the TOY effect during the sample period for which we have institutional trading data. In each year, for the period from December 1999 to January 2005, we cumulate abnormal returns for each stock during the last 10 trading days of December and first 10 trading days in January.[15] We calculate equally-weighted January minus December portfolio returns and present our results in Table 2. Consistent with prior literature, we find that the average January minus December return across all stocks is 3.9% (Roll, 1983; Sias and Starks, 1997; D'Mello et al., 2003).

Given that prior literature finds the TOY effect is concentrated in small underperforming stocks (Reinganum 1983; Roll, 1983; Keim, 1983), we divide the stocks in our sample into portfolios based on size and past returns. Size quintiles are constructed each November using NYSE size breakpoints. As reported in Table 2, we find that the TOY effect is almost entirely driven by small stocks. For the smallest size quintile, January minus December abnormal returns are 6.8%, and this difference is highly statistically significant (t-statistic = 25.33). In contrast, the difference between January and December returns for the three largest size quintiles are negative, ranging from −0.6% to −1.8%.

To investigate the relationship between the TOY effect and prior stock performance, we follow Ng and Wang (2004) and construct past return portfolios at the end of each year by first dividing stocks into those with positive ('winner') or negative ('loser') returns over the prior January to November period. We then split each of these two groups by the median value to get 'extreme winner' and 'extreme loser' portfolios. Across all size quintiles (Table 2), our findings indicate that the turn-of-the-year effect is almost exclusively in the extreme loser portfolios. January minus December returns are 14% for the extreme loser portfolio versus 0.5% for the extreme winner portfolio. This same general pattern holds for all size quintile portfolios. For example, the difference in January and December returns for extreme losers is 16.6% for the smallest size quintile and 8.8% for the largest size quintile. Among extreme winners, only for the smallest size portfolio do we find evidence of a significant TOY effect (2.4%, *t-statistic* = 7.41). Our results confirm previous empirical findings: the TOY effect exists, is stronger for smaller capitalization stocks, and is driven by stocks with poor prior performance.

Since Hypotheses 2 and 4 both involve tax incentives, we also examine TOY returns in years that are more or less likely to encourage tax-loss selling. One view espoused by existing literature is that investors face greater opportunities to harvest paper losses – that can be used to offset realized gains – following negative returns in the aggregate stock market (Brauer and Chang, 1990; Ligon, 1997; Johnson and Cox, 2002). Alternatively, it is also possible that tax-loss selling incentives are higher following positive returns in the aggregate market, since it is during these periods where one might expect an abundance of realized gains in most investors' portfolios (Porterba and Weisbenner, 2001). [16] In order to address this question empirically, we divide our sample into UP and DOWN years based on whether the value-weighted market return was positive or negative over the preceding January through November.[17] Results presented in Table 2 provide no evidence of a TOY effect during UP market years for small underperforming stocks. Alternatively, the TOY effect is extremely pronounced during DOWN years. January minus December returns following DOWN years are 7.4% for the overall sample and that effect is significantly magnified (26.4%) for small underperforming stocks. Our results for TOY returns following DOWN years are consistent with Ligon (1997) and Johnson and Cox (2002) who also find a strong negative relationship between prior-year market returns and the January effect. While prior studies suggest that this relationship supports the tax-loss selling hypothesis, they are unable to discern whether such trading originates from individual or institutional investors.

4.2. Institutional trading at the end of the year

To test whether institutional trading drives the TOY effect, we first investigate institutional trading behavior during the last 10 days in December.[18] If window dressing or tax-loss selling incentives guide institutional trading behavior, we expect to find evidence of abnormal institutional selling at the end of the year that is concentrated in small stocks with poor past performance. To test these hypotheses, we proceed as follows:

We aggregate all institutional buying and selling separately for each stock during the final 10 trading days of the year and normalize by shares outstanding.[19] To ensure consistency between end- and beginning-of-year tests, we require each stock in our sample to have at least one trade in the last ten trading days of December and first ten trading days of January. We then calculate the equal-weighted average of buying, selling, and the difference between the two across all stocks in each size and performance category and present our results in Table 3.

Our results show that, in aggregate, institutions are net buyers at the end of December. Across all stocks, buying activity exceeds selling activity by 0.06% of shares outstanding. This result is consistent across all size quintiles, although the imbalance for the largest size quintile is not statistically significant.[20] Panel A of Table 3 also reports net trading imbalances for extreme winner and loser portfolios, both for the aggregate sample and across each size quintile portfolio. Significant net buying is concentrated among extreme winner stocks, where we find an imbalance of 0.102% (t-statistic = 7.70). The imbalance is higher for the smallest size quintile (0.118%) when compared to the largest size quintile (0.067%).

As stated previously, if window dressing and tax-loss selling incentives drive the TOY effect, we expect institutional selling to exceed institutional buying for the extreme loser portfolio. Results presented in Table 3, Panel A provide limited support for this hypothesis. In particular, there is no discernible trading imbalance pattern for extreme loser stocks as a whole. In aggregate, buys are roughly equal to sells. Only in the smallest size quintile do we find some evidence of net selling in the last

[15] Abnormal returns are calculated using a CAPM market model to estimate expected returns. Stock betas are estimated using daily returns over the prior January to November period.

[16] In unreported analyses we investigate the correlation between the aggregate realized (net) capital gains of mutual funds (using data from the Investment Company Institute Factbook) and value-weighted market returns over the period from 1995 to 2011. Our findings indicate DOWN market years are associated with lower realized capital gains. While our analysis is limited in scope, it is consistent with the view that mutual fund managers realize more capital gains, and therefore have greater incentives for tax-loss selling, following UP market years.

[17] During our sample period 1999, 2003 and 2004 are classified as UP years and 2000, 2001, and 2002 are classified as DOWN years.

[18] We find qualitatively similar results if we use a five-day window (last five days of December).

[19] In untabulated results we repeat our analysis using institutional trading imbalance scaled by average monthly CRSP trading volume over the previous January through November. Using this alternate scaling metric, we find qualitatively similar results to those reported in the paper.

[20] Our findings of net purchases at the end of the calendar year are consistent with the possibility that institutional investors are receiving and investing flows into their funds during this period. Since Abel Noser Solutions data does not contain institutional holdings or total assets, we are unable to calculate flows in our sample. However, in untabulated results, we do explore whether equity mutual funds in the CRSP mutual fund database receive abnormal flows in December when compared to other months. We find little evidence that December flows are different.

Table 2
Turn-of-the-year return patterns.

	Full sample period			UP market			DOWN market		
	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers
All stocks	**0.039**	**0.005**	**0.140**	0.003	**0.013**	0.001	**0.074**	−0.006	**0.224**
	(22.31)	(2.27)	(23.20)	(1.48)	(4.21)	(0.07)	(24.88)	(−1.59)	(25.41)
Smallest stocks	**0.068**	**0.024**	**0.166**	**0.009**	**0.020**	0.008	**0.124**	**0.028**	**0.264**
	(25.33)	(7.41)	(21.53)	(3.23)	(4.67)	(1.08)	(27.52)	(6.09)	(23.45)
Quintile 2	**0.009**	−0.002	**0.065**	−0.006	0.008	**−0.028**	**0.022**	−0.014	**0.116**
	(2.75)	(−0.31)	(5.46)	(−1.61)	(0.93)	(−2.70)	(4.32)	(−1.82)	(6.73)
Quintile 3	**−0.012**	**−0.028**	**0.048**	**−0.009**	−0.002	−0.021	**−0.015**	**−0.063**	**0.086**
	(−4.07)	(−4.66)	(3.82)	(−2.59)	(−0.34)	(−1.56)	(−3.17)	(−6.36)	(4.94)
Quintile 4	**−0.018**	**−0.041**	**0.056**	**−0.010**	−0.005	**−0.023**	**−0.026**	**−0.097**	**0.113**
	(−6.10)	(−6.39)	(3.94)	(−3.35)	(−0.69)	(−2.21)	(−5.12)	(−8.38)	(5.07)
Largest stocks	**−0.006**	**−0.031**	**0.088**	0.001	0.009	−0.014	**−0.013**	**−0.094**	**0.141**
	(−2.08)	(−4.37)	(5.54)	(0.44)	(1.12)	(−1.25)	(−2.73)	(−7.76)	(6.43)

Table 2 presents the abnormal returns during the first 10 trading days of January minus abnormal returns during the last 10 trading days in December (i.e., turn-of-the-year return patterns) for all sample stocks and by size portfolios. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. At the end of each November, all stocks are formed into five size quintiles based on the NYSE breakpoints. All stocks are divided into winner and loser categories based on whether January to November returns are greater or less than zero, respectively. Within the winner (or loser) category, stocks are divided into two equal-size portfolios. Stocks with lower returns in the loser category are termed extreme losers and stocks with higher returns in winner category are termed extreme winners. The turn-of-the-year return is defined as the difference between the cumulative market model-adjusted return over the last ten trading days of the year and the cumulative market model-adjusted return over the first ten trading days of the year. We estimate market beta from daily regressions of stock returns on market returns during the previous January to November. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

10 days of the year, where net imbalances are −0.062% (*t*-statistic = −2.47). While this result is consistent with both the window dressing and tax-loss selling hypotheses, we note that the magnitude of extreme loser selling is much lower than the magnitude of extreme winner buying.

In order to increase the power of our tests and to help disentangle the tax-loss selling and window dressing hypotheses, we separately analyze institutional trading imbalances in UP and DOWN years and present our results in Panels B and C of Table 3. Apart from some evidence of net selling for the smallest extreme losers in DOWN markets, we find few differences in the trading imbalances between UP and DOWN years. In general, institutions are net buyers during both periods, and buying activity is concentrated in the extreme winner portfolios.

In contrast to our weak evidence that window dressing and/or tax-loss selling by institutional investors drive the TOY effect, Ng and Wang (2004) find strong evidence that institutions are significant net sellers of loser stocks at the end of the year.[21] There are two reasons why we believe that our findings more accurately characterize the trading activities of institutions during the final days of the calendar year. First, we use actual institutional trades during the last ten trading days of the year, whereas Ng and Wang (2004) rely on changes in quarterly institutional ownership to gauge institutional trading at the end of the year. Second, Ng and Wang (2004) categorize winner and loser stocks using January to November returns (identical to our study), but measure trades as the change in quarterly holdings from the end of September to the end of December. The overlap of trading and return windows induces a mechanical positive correlation between institutional trading and stock returns (see, for example, Sias et al., 2006).

4.3. Window dressing versus tax-loss selling

Our empirical tests thus far provide little, if any, evidence that institutional trading drives the TOY effect. However, institutions are heterogeneous and different types of institutional investors face different incentives to trade. By pooling all institutional trading together, it is possible that our tests mask the true relationship between the trading of certain subsets of institutional investors and TOY returns. Our Abel Noser trading data allows us to group each institution in the database into either money manager or pension plan sponsor groups. Using this identification, we repeat our primary empirical analyses presented in Table 3 separately for pension plan sponsors and money managers.

Our segmented analysis helps us to dig deeper into the window dressing and tax-loss selling incentives that might drive institutional trading around the turn of the year. Specifically, neither pension funds nor their underlying constituent investors (i.e., pension plan participants) pay taxes on gains that are realized in the portfolio.[22] In this respect, pension plans do not face any tax incentive to sell before the end of the calendar year. Alternatively, money management firms typically pass through both short- and long-term realized gains to their underlying constituent investors. As such, gains are taxed according to the type of account in which the assets are held (i.e., IRA or taxable investment account) and the marginal tax rate of the underlying investor. Consequently, money managers are often sensitive to the amount of realized gains that they distribute to investors, providing incentive to minimize this gain by selling losing stocks prior to the end of the year.

In order to capture an institutional investor cohort with window dressing incentives but not tax-loss selling incentives, we first investigate pension fund trading at the end of the year. Our results, presented in Panel A of Table 4, show that pension fund trading imbalances are slightly positive at the end of the year (0.015%,

[21] We replicate the end-of-the-year analysis conducted by Ng and Wang (2004) using institutions' quarterly 13F filings during our 1999 to 2005 sample period and find results consistent with those reported in their paper. Given this evidence, we conclude that the difference in inference is driven by our ability to more precisely identify institutional trading at the end of the year and not because of differences in the sample periods examined.

[22] As illustrated by Tepper (1981), corporations pay no taxes on earnings generated from pension fund holdings or on contributions to the pension fund. Pension fund returns are only taxed when they are distributed, and at that point they are taxed on an individual basis. Therefore, pension fund managers gain no tax benefits by realizing paper loses at the end of the year.

Table 3
Institutional trading at the end of the year.

	All			Extreme winners			Extreme losers		
	Buy	Sell	Buy–sell	Buy	Sell	Buy–sell	Buy	Sell	Buy–sell
Panel A: Full sample period									
All stocks	0.468	0.408	**0.060** (5.92)	0.531	0.429	**0.102** (7.70)	0.477	0.477	0.000 (0.01)
Smallest stocks	0.353	0.303	**0.050** (3.36)	0.396	0.278	**0.118** (5.26)	0.319	0.382	**−0.062** (−2.47)
Quintile 2	0.486	0.400	**0.086** (2.75)	0.558	0.433	**0.124** (4.38)	0.609	0.517	0.092 (0.62)
Quintile 3	0.563	0.486	**0.076** (3.47)	0.621	0.533	**0.087** (2.63)	0.617	0.587	0.030 (0.47)
Quintile 4	0.580	0.520	**0.060** (3.31)	0.655	0.595	0.060 (1.82)	0.717	0.651	0.066 (0.84)
Largest stocks	0.487	0.472	0.015 (1.07)	0.624	0.557	0.067 (1.89)	0.680	0.673	0.008 (0.13)
Panel B: UP market									
All stocks	0.458	0.410	**0.048** (4.11)	0.551	0.444	**0.107** (5.90)	0.412	0.477	−0.065 (−1.86)
Smallest stocks	0.418	0.337	**0.081** (3.52)	0.445	0.307	**0.138** (4.70)	0.403	0.461	−0.057 (−1.25)
Quintile 2	0.449	0.426	0.023 (0.97)	0.573	0.477	**0.096** (2.38)	0.400	0.539	−0.139 (−1.40)
Quintile 3	0.510	0.465	0.045 (1.72)	0.625	0.542	0.083 (1.72)	0.495	0.457	0.038 (0.39)
Quintile 4	0.529	0.491	0.038 (1.44)	0.659	0.590	0.069 (1.57)	0.418	0.456	−0.038 (−0.49)
Largest Stocks	0.452	0.447	0.004 (0.21)	0.674	0.573	0.101 (1.93)	0.364	0.483	−0.119 (−1.45)
Panel C: DOWN Market									
All stocks	0.478	0.405	**0.073** (4.33)	0.497	0.404	**0.093** (5.15)	0.518	0.477	0.041 (0.68)
Smallest stocks	0.268	0.259	0.009 (0.54)	0.277	0.207	**0.070** (2.41)	0.261	0.327	**−0.066** (−2.28)
Quintile 2	0.518	0.378	**0.140** (2.57)	0.539	0.378	**0.161** (4.10)	0.716	0.506	0.209 (0.96)
Quintile 3	0.612	0.506	**0.106** (3.03)	0.614	0.521	**0.093** (2.24)	0.685	0.660	0.025 (0.31)
Quintile 4	0.631	0.549	**0.082** (3.25)	0.648	0.602	0.046 (0.93)	0.930	0.790	0.140 (1.15)
Largest stocks	0.522	0.496	0.026 (1.40)	0.545	0.532	0.013 (0.33)	0.845	0.772	0.073 (0.94)

Table 3 presents the institutional trading in the last ten trading days of the year for all sample stocks and by size portfolios. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. Institutional trading data are from Abel Noser Solutions. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. At the end of each November, all stocks are formed into five size quintiles based on the NYSE breakpoints. All stocks are divided into winner and loser categories based on whether January to November returns are greater or less than zero, respectively. Within the winner (or loser) category, stocks are divided into two equal-size portfolios. Stocks with lower returns in the loser category are termed extreme losers and stocks with higher returns in winner category are termed extreme winners. For a stock-year to be included in our sample, we require at least one trade in the last ten trading days of December and at least one trade in the first ten trading days of January of the following year. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

t-statistic = 1.66) for the overall sample of stocks. Among the smallest quintile of stocks, pension fund imbalances are 0.051% (*t*-statistic = 3.47) for extreme winners and −0.061% (*t*-statistic = −3.75) for extreme losers. This selling of small losers appears to be concentrated during DOWN years, −0.083% (*t*-statistic = −5.26), which is precisely where we find the strongest evidence of TOY return patterns (Table 2). Our findings that pension funds sell small loser stocks during the final 10 days in December is consistent with window dressing activities presented in Hypothesis 1.

We next investigate the end-of-year trading patterns for money managers. Since money managers are subject to both window dressing and tax-loss selling incentives, evidence of abnormal selling at the end of the year for money managers would inhibit our ability to distinguish between these two trading motivations. Alternatively, if money managers do not display evidence of abnormal year-end selling, such a result would provide reasonable evidence against the tax-loss selling hypothesis (Hypothesis 2). [23] Results presented in Panel B of Table 4 show that overall money

[23] Ex ante, we do not have strong priors as to whether pension plan sponsors or money managers face stronger incentives to window dress their portfolios. While Lakonishok et al. (1991) contend that sophisticated pension plan sponsors "may look to actual portfolio holdings" to assess investment skill since "stock returns...are noisy", other researchers find evidence of window dressing in mutual funds.

Table 4
Institutional trading at the end of the year – pension plan sponsors versus money managers.

	Full sample period			UP market			DOWN market		
	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers
Panel A: Pension plan sponsors									
All stocks	0.015	**0.024**	0.021	**0.014**	**0.028**	−0.010	0.017	**0.017**	0.039
	(1.66)	(3.87)	(0.46)	(2.78)	(3.16)	(−0.54)	(0.92)	(2.37)	(0.54)
Smallest stocks	−0.008	**0.051**	**−0.061**	**0.025**	**0.064**	−0.029	**−0.056**	0.005	**−0.083**
	(−0.87)	(3.47)	(−3.75)	(2.02)	(3.64)	(−0.86)	(−4.96)	(0.20)	(−5.26)
Panel B: Money managers									
All stocks	**0.054**	**0.088**	−0.009	**0.036**	**0.086**	**−0.067**	**0.072**	**0.091**	0.028
	(8.22)	(7.76)	(−0.51)	(3.72)	(5.90)	(−2.25)	(8.42)	(5.09)	(1.22)
Smallest stocks	**0.071**	**0.100**	−0.014	**0.069**	**0.103**	−0.047	**0.073**	**0.094**	0.013
	(4.79)	(5.05)	(−0.52)	(3.23)	(4.11)	(−1.26)	(4.03)	(3.12)	(0.36)

Table 4 presents the institutional trading by pension plan sponsors and money managers during the last ten trading days of the year for all sample stocks and the smallest size quintile. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. Institutional trading data are from Abel Noser Solutions. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. At the end of each November, all stocks are formed into five size quintiles based on the NYSE breakpoints. All stocks are divided into winner and loser categories based on whether January to November returns are greater or less than zero, respectively. Within the winner (or loser) category, stocks are divided into two equal-size portfolios. Stocks with lower returns in the loser category are termed extreme losers and stocks with higher returns in winner category are termed extreme winners. For a stock-year to be included in our sample, we require at least one trade in the last ten trading days of December and at least one trade in the first ten trading days of January of the following year. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

managers are net purchasers of stocks during the final 10 days of December. The buying imbalance is 0.054% of shares outstanding for the overall sample, and 0.088% for extreme winners. Results for the smallest quintile of stocks are consistent with overall sample results, where we find imbalances of 0.071% for all small stocks and 0.1% for extreme winners. This trading pattern continues to hold in DOWN markets. In UP markets, we find some evidence of money manager selling of extreme losers (−0.067%, *t*-statistic = −2.25). However, if money manager tax-loss selling or window dressing is responsible for the turn-of-the-year effect, we would expect this selling to be stronger in DOWN markets than in UP markets and stronger among the smallest stocks than the overall sample. Neither of these predictions are supported by the data.

4.4. Institutional trading at the beginning of the year

Risk-shifting is a beginning-of-the-year counterpart to window dressing. The risk-shifting hypothesis contends that institutions shift their portfolios into small, risky stocks after the first of the year (Ng and Wang, 2004). Extant literature often considers a more general form of risk-shifting behavior by institutional investors (Goetzmann et al., 2007). For example, Brown, Harlow, and Starks (1996) find evidence that underperforming mutual funds alter the riskiness of their portfolios at mid-year in order to try and inflate their performance numbers. Alternatively, Busse (2001) suggests that these risk-shifting findings are a statistical artifact of the data employed.

If institutions do engage in risk-shifting behavior at the turn of the year, such trading would result in upward pressure on small firm prices, thereby contributing to the TOY effect. To test whether institutional trading in our sample is consistent with the risk-shifting hypothesis, we repeat the analysis in Table 3, this time concentrating on the first ten trading days in January.

Results from these tests are presented in Table 5. Our results show that institutional trading imbalances are neither significantly positive nor negative in the first ten days of the year. In particular, we find a buy minus sell imbalance of 0.033% (*t*-statistic = 1.40) for the aggregate sample. Imbalances range from 0.011% to 0.062% across size quintiles, and none are statistically significant. In fact, the only subsample to experience statistically significant trading imbalances is the smallest size quintile. There is net buying of extreme winner stocks in the smallest size quintile (0.138%, *t*-statistic = 3.47) while the extreme loser stocks in the smallest size quintile actually experience net selling (−0.062%, *t*-statistic = −2.12). Panels B and C again break our sample into UP and DOWN years. While we do find a significant buy imbalance for small stocks during UP years, the buying is only evident for small extreme winners. As in Panel A, during DOWN years we find net selling of small extreme losers (−0.115%, *t*-statics = −2.91). To the extent that the TOY effect is driven by small loser stocks, these results do not support the risk-shifting hypothesis (Hypothesis 3). Our inference contrasts with that of Ng and Wang (2004), who find evidence of institutional buying pressure in small stocks during the first quarter of the year.[24]

While aggregate results are not generally supportive of risk-shifting behavior, we again emphasize that such aggregation may mask the dynamic trading strategies of different types of institutional investors. As such, we again separate the sample into pension plan sponsors and money managers and repeat the empirical analysis presented in Table 5. Panel A of Table 6 presents our results for the pension fund sample. Our results show that pension fund imbalances are insignificantly different from zero at the beginning of the year, and −0.014% (*t*-statistic = −2.33) for the smallest quintile of stocks. This abnormal negative imbalance is most pronounced in the extreme loser portfolio (−0.047%, *t*-statistic = −4.46) and is concentrated in DOWN years at −0.060% (*t*-statistic = −4.24). The observed trading behavior is inconsistent with the risk-shifting hypothesis which suggests that institutions buy small, risky stocks at the beginning of the year and is more consistent with positive feedback trading strategies as documented by Nofsinger and Sias (1999).

We next examine the money manager sample and present results in Panel B of Table 6. We find that money managers are net purchasers of stocks during the first 10 days in January (imbal-

[24] We again replicate the analysis conducted by Ng and Wang (2004) using institutions' quarterly 13F filings during our 1999 to 2005 sample period, this time for beginning-of-the-year institutional trading. Inconsistent with their results, we do not find evidence of buying for small stocks during the first quarter. However, we are able to replicate their findings for their sample period 1986–1998. Taken together, these findings suggest that Ng and Wang's (2004) risk-shifting results are sample specific.

Table 5
Institutional trading at the beginning of the year.

	All			Extreme winners			Extreme losers		
	Buy	Sell	Buy–sell	Buy	Sell	Buy–sell	Buy	Sell	Buy–sell
Panel A: Full sample period									
All stocks	0.639	0.607	0.033 (1.40)	0.855	0.722	0.132 (1.92)	0.581	0.607	−0.025 (−0.91)
Smallest stocks	0.399	0.368	0.031 (1.76)	0.525	0.387	**0.138** (3.47)	0.362	0.424	**−0.062** (−2.12)
Quintile 2	0.640	0.608	0.031 (0.77)	0.850	0.698	0.152 (1.87)	0.623	0.646	−0.023 (−0.50)
Quintile 3	0.823	0.761	0.062 (0.67)	1.150	0.883	0.267 (0.93)	0.834	0.872	−0.038 (−0.61)
Quintile 4	0.910	0.899	0.011 (0.14)	1.278	1.299	−0.021 (−0.07)	1.014	1.009	0.006 (0.05)
Largest stocks	0.737	0.715	0.021 (0.40)	0.974	0.965	0.009 (0.05)	1.202	0.922	0.279 (0.90)
Panel B: UP market									
All stocks	0.662	0.619	0.043 (1.24)	0.880	0.734	0.146 (1.61)	0.562	0.587	−0.025 (−0.80)
Smallest stocks	0.493	0.428	**0.065** (2.46)	0.597	0.438	**0.158** (3.07)	0.520	0.505	0.015 (0.35)
Quintile 2	0.756	0.689	0.067 (0.98)	1.010	0.856	0.153 (1.10)	0.593	0.663	−0.070 (−0.88)
Quintile 3	0.885	0.750	0.135 (0.77)	1.334	0.837	0.496 (1.02)	0.635	0.684	−0.050 (−0.52)
Quintile 4	0.750	0.863	−0.113 (−1.81)	0.950	1.235	−0.284 (−1.55)	0.646	0.783	−0.137 (−1.48)
Largest stocks	0.620	0.640	−0.020 (−0.69)	0.865	0.848	0.017 (0.28)	0.562	0.575	−0.013 (−0.18)
Panel C: DOWN market									
All stocks	0.616	0.594	0.022 (0.70)	0.813	0.703	0.110 (1.05)	0.593	0.619	−0.026 (−0.63)
Smallest stocks	0.276	0.288	−0.013 (−0.59)	0.353	0.262	0.091 (1.64)	0.252	0.368	**−0.115** (−2.91)
Quintile 2	0.540	0.539	0.001 (0.02)	0.646	0.495	**0.151** (3.14)	0.639	0.638	0.001 (0.02)
Quintile 3	0.765	0.771	−0.006 (−0.08)	0.893	0.948	−0.055 (−0.47)	0.945	0.976	−0.032 (−0.39)
Quintile 4	1.067	0.935	0.132 (0.92)	1.780	1.400	0.382 (0.56)	1.277	1.170	0.107 (0.55)
Largest stocks	0.856	0.792	0.064 (0.61)	1.148	1.152	−0.004 (−0.01)	1.534	1.103	0.431 (0.92)

Table 5 presents the institutional trading during the first ten trading days of the year for all sample stocks and by size portfolios. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. Institutional trading data are from Abel Noser Solutions. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. At the end of each November, all stocks are formed into five size quintiles based on the NYSE breakpoints. All stocks are divided into winner and loser categories based on whether January to November returns are greater or less than zero, respectively. Within the winner (or loser) category, stocks are divided into two equal-size portfolios. Stocks with lower returns in the loser category are termed extreme losers and stocks with higher returns in winner category are termed extreme winners. For a stock-year to be included in our sample, we require at least one trade in the last ten trading days of December and at least one trade in the first ten trading days of January of the following year. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). The institutional trading is normalized by shares outstanding and is expressed in percent. Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

ance = 0.041%). The abnormal imbalance is concentrated in the winner portfolio (0.139%); for extreme losers we actually find evidence of a negative (−0.036%), but statistically insignificant imbalance. This trading behavior is qualitatively similar during both UP and DOWN markets. Results for the smallest quintile of stocks are consistent with overall sample results, where we find imbalances of 0.158% for extreme winners and −0.026% for extreme losers. Overall, our results are contrary to the risk-shifting hypothesis – instead of finding January buying of small losers, we find that institutions tend to either sell these stocks in the first ten days of January or, at most, they are not net buyers.

4.5. Institutional trading and TOY returns

The previous subsections investigate institutional trading imbalances around the turn of the year for stock portfolios sorted on size and prior returns. In this subsection, we provide another test of the prevailing hypotheses by investigating TOY returns for four different institutional trading portfolios: stocks with no institutional trading, stocks with institutional trading, stocks with positive institutional trading imbalances, and stocks with negative institutional trading imbalances. If institutional trading drives the TOY effect, we expect the TOY effect to be stronger for stocks with

Table 6
Institutional trading at the beginning of the year – pension plan sponsors versus money managers.

	Full sample period			UP market			DOWN market		
	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers
Panel A: Pension plan sponsors									
All stocks	−0.000	−0.001	0.017	**−0.017**	**−0.018**	−0.013	0.017	0.029	0.034
	(−0.03)	(−0.02)	(0.69)	(−4.36)	(−2.00)	(−1.64)	(0.52)	(0.23)	(0.88)
Smallest stocks	**−0.014**	−0.008	**−0.047**	−0.009	−0.013	−0.028	**−0.022**	0.010	**−0.060**
	(−2.33)	(−0.58)	(−4.46)	(−1.04)	(−0.76)	(−1.77)	(−2.68)	(0.47)	(−4.24)
Panel B: Money managers									
All stocks	**0.041**	**0.139**	−0.036	0.059	0.169	−0.016	0.022	**0.090**	−0.049
	(2.07)	(2.27)	(−1.65)	(1.60)	(1.75)	(−0.46)	(1.91)	(3.27)	(−1.75)
Smallest stocks	**0.047**	**0.158**	−0.026	**0.076**	**0.183**	0.036	0.003	0.093	**−0.076**
	(2.34)	(3.59)	(−0.85)	(2.59)	(3.27)	(0.73)	(0.11)	(1.48)	(−2.00)

Table 6 presents the institutional trading by pension plan sponsors and money managers during first ten trading days of the year for all sample stocks and the smallest size quintile. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. Institutional trading data are from Abel Noser Solutions. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. At the end of each November, all stocks are formed into five size quintiles based on the NYSE breakpoints. All stocks are divided into winner and loser categories based on whether January to November returns are greater or less than zero, respectively. Within the winner (or loser) category, stocks are divided into two equal-size portfolios. Stocks with lower returns in the loser category are termed extreme losers and stocks with higher returns in winner category are termed extreme winners. For a stock-year to be included in our sample, we require at least one trade in the last ten trading days of December and at least one trade in the first ten trading days of January of the following year. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

Table 7
Turn-of-the-year effect and institutional trading at the end of the year.

	Full sample period			UP market			DOWN market		
	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers
Panel A: All stocks									
No trading	**0.092**	**0.031**	**0.224**	**0.019**	**0.025**	**0.034**	**0.150**	**0.037**	**0.331**
	(24.39)	(6.91)	(20.18)	(4.72)	(3.66)	(3.02)	(25.39)	(6.44)	(21.13)
Trading	**0.008**	**−0.008**	**0.070**	**−0.006**	**0.008**	**−0.026**	**0.022**	**−0.034**	**0.132**
	(4.76)	(−3.06)	(11.65)	(−3.17)	(2.39)	(−4.43)	(7.73)	(−8.00)	(14.75)
Buy	**−0.004**	**−0.011**	**0.035**	**−0.007**	0.007	**−0.029**	−0.001	**−0.042**	**0.078**
	(−2.06)	(−3.52)	(5.19)	(−3.09)	(1.89)	(−3.79)	(−0.27)	(−7.74)	(7.86)
Sell	**0.023**	−0.003	**0.105**	−0.004	0.009	**−0.023**	**0.050**	**−0.023**	**0.184**
	(7.93)	(−0.77)	(10.62)	(−1.39)	(1.50)	(−2.55)	(10.05)	(−3.37)	(12.61)
Panel B: Smallest size quintiles									
No trading	**0.094**	**0.033**	**0.225**	**0.020**	**0.028**	**0.034**	**0.153**	**0.038**	**0.333**
	(24.38)	(7.32)	(20.02)	(4.85)	(4.06)	(2.94)	(25.30)	(6.56)	(20.99)
Trading	**0.029**	**0.011**	**0.078**	−0.004	**0.013**	**−0.025**	**0.069**	0.007	**0.152**
	(8.57)	(2.55)	(8.62)	(−1.34)	(2.40)	(−2.80)	(11.28)	(0.99)	(10.92)
Buy	**0.013**	**0.016**	**0.031**	−0.001	**0.018**	**−0.022**	**0.034**	0.012	**0.075**
	(3.64)	(3.04)	(3.09)	(−0.35)	(2.80)	(−1.98)	(5.14)	(1.23)	(4.76)
Sell	**0.049**	0.003	**0.120**	−0.009	0.004	**−0.028**	**0.106**	0.002	**0.210**
	(8.00)	(0.45)	(8.26)	(−1.55)	(0.43)	(−2.00)	(10.19)	(0.16)	(9.97)

Table 7 presents the turn-of-the-year return patterns for all sample stocks and by size portfolios conditional on year-end trading. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. Institutional trading data are from Abel Noser Solutions. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). The turn-of-the-year return is defined as the difference between the cumulative market model-adjusted return over the last ten trading days of the year and the cumulative market model-adjusted return over the first ten trading days of the year. The December trading is the cumulative institutional trading over the last ten trading days of the year. Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

negative institutional trading imbalances during the final 10 days of December and stocks with positive institutional trading imbalances during the first 10 days of January. Alternatively, if individual investors are responsible for TOY returns, we would expect to find evidence of significant January minus December abnormal returns in the portfolio of stocks that institutions abstain from trading.

Table 7 presents the results conditional on December institutional trading while Table 8 presents the results conditional on January trading. Specifically, we present the difference between January and December abnormal returns for all four institutional trading portfolios in Panel A of Table 7. Overall, the TOY effect is strongest for firms that have no institutional trading during the last 10 days of December. The average January minus December abnormal return for this subsample is 9.2% (*t*-statistic = 24.39). The TOY effect is negative for the institutional buying portfolio, and slightly positive for the institutional trading (0.8%) and institutional selling (2.3%) portfolios.

Table 8
Turn-of-the-year effect and institutional trading at the beginning of the year.

	Full sample period			UP market			DOWN market		
	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers	All	Extreme winners	Extreme losers
Panel A: All stocks									
No trading	**0.091**	**0.029**	**0.218**	**0.016**	**0.024**	**0.030**	**0.147**	**0.034**	**0.328**
	(23.60)	(6.45)	(19.52)	(4.01)	(3.49)	(2.61)	(24.82)	(5.74)	(20.68)
Trading	**0.010**	**−0.006**	**0.075**	**−0.004**	**0.009**	**−0.024**	**0.024**	**−0.031**	**0.136**
	(5.90)	(−2.23)	(12.59)	(−2.28)	(2.67)	(−4.51)	(8.54)	(−7.42)	(15.37)
Buy	**0.012**	0.004	**0.063**	**0.005**	**0.018**	−0.012	**0.018**	**−0.020**	**0.109**
	(6.11)	(1.03)	(9.25)	(2.36)	(4.08)	(−1.68)	(5.88)	(−3.65)	(11.08)
Sell	**0.007**	**−0.019**	**0.088**	**−0.016**	−0.003	**−0.036**	**0.031**	**−0.047**	**0.166**
	(2.46)	(−4.68)	(8.85)	(−5.98)	(−0.62)	(−4.66)	(6.23)	(−7.36)	(11.05)
Panel B: Smallest size quintiles									
No trading	**0.093**	**0.031**	**0.220**	**0.017**	**0.027**	**0.030**	**0.149**	**0.034**	**0.329**
	(23.57)	(6.71)	(19.45)	(4.07)	(3.78)	(2.56)	(24.76)	(5.80)	(20.62)
Trading	**0.032**	**0.015**	**0.086**	−0.001	**0.015**	**−0.021**	**0.076**	**0.015**	**0.159**
	(9.97)	(3.51)	(9.57)	(−0.20)	(2.81)	(−2.80)	(12.23)	(2.16)	(11.54)
Buy	**0.025**	**0.024**	**0.054**	**0.008**	**0.022**	−0.010	**0.048**	**0.029**	**0.101**
	(7.11)	(4.27)	(5.57)	(2.04)	(3.05)	(−0.98)	(7.76)	(3.47)	(6.85)
Sell	**0.044**	0.000	**0.119**	**−0.014**	0.004	**−0.035**	**0.114**	−0.007	**0.216**
	(7.07)	(0.05)	(7.82)	(−2.76)	(0.47)	(−2.99)	(9.56)	(−0.60)	(9.41)

Table 8 presents the turn-of-the-year return patterns for all sample stocks and by size portfolios conditional on beginning-of-the-year trading. Institutional trading data are from Abel Noser Solutions. Stock data are from the CRSP database. Only stocks with a sharecode of 10 or 11 are included in the sample. The trades in the sample are placed by 841 different institutional clients of Abel Noser during the time period from January 1, 1999 to December 31, 2005. Institutional trading is normalized by shares outstanding and is expressed in percent. UP market includes all years during which the cumulative value-weighted market return is positive from January to November (i.e., 1999, 2003, and 2004). DOWN market includes all years during which the cumulative value-weighted market return is negative from January to November (i.e., 2000, 2001, and 2002). The turn-of-the-year return is defined as the difference between the cumulative market model-adjusted return over the last ten trading days of the year and the cumulative market model-adjusted return over the first ten trading days of the year. The January trading is the cumulative institutional trading over the first ten trading days of the year. Numbers in parentheses are *t*-statistics. Bold coefficients are statistically significant at a 5 percent level or better.

Results in Panel A of Table 7 also include turn-of-the-year returns for extreme winner and extreme loser categories across all four institutional trading portfolios. Consistent with previous findings, our results show that the TOY effect is concentrated in the extreme loser portfolios. January minus December returns are 10.5% for the extreme loser portfolio with negative institutional trading imbalance. While this result is consistent with institutional selling pressure driving stocks below their fundamental values in December, we are cautious in our interpretation because it is well-known that institutional trading and contemporaneous stock returns are positively correlated. Moreover, the TOY returns for the portfolio of stocks with no institutional trading are more than twice this magnitude (22.4%). As in Table 2 we find the TOY effect strongest during DOWN years.

If institutional selling pressure drives TOY returns we might expect the relationship to be more evident in smaller stocks where the price impact of institutional trades is more dramatic. We investigate this possibility in Panel B of Table 7 and find some evidence to support this hypothesis. Specifically, we now find that stocks with negative institutional trading imbalances have significant TOY returns of 4.9% (January minus December), while stocks with positive net institutional buying pressure have turn-of-the-year returns that are 1.3%. However, consistent with results from the full sample, we continue to find the strongest evidence of the TOY effect in the portfolio of stocks without any institutional trading during the final 10 days in December (9.4%).

While institutional trading during the last 10 days of the year provides little explanatory power for TOY returns, it is possible that institutional trading after the first of the year influences these return patterns. We investigate this possibility in Table 8, which is constructed in an identical manner to Table 7, except that institutional trading portfolios are constructed using the first 10 trading days in January. Our analysis provides insights into how institutional risk-shifting might impact the TOY effect.

Panel A of Table 8 presents results for the full sample. Our results provide little evidence that January minus December returns are different from zero for any of the institutional trading portfolios. Once again, the TOY effect is concentrated in the portfolio of stocks that have no institutional trading during the first 10 days in January. By examining winners and losers separately, we do find some evidence of the TOY effect for extreme losers in the institutional trading portfolios. However, the TOY returns for extreme losers are very similar across institutional buying and institutional selling portfolios, which is inconsistent with institutions driving the TOY effect.

Because the risk-shifting hypothesis is centered on small (risky) stocks, we repeat our analysis in Panel A for stocks in the smallest NYSE size quintile and present results for that analysis in Panel B of Table 8. We concentrate our discussion on portfolios with positive and negative institutional trading imbalances, since these are most relevant for testing the risk shifting hypothesis. Our results show that small stocks purchased by institutions in January have turn-of-the-year returns of 2.5%. The effect is stronger for extreme losers (5.4%) than for extreme winners (2.4%). However, TOY returns continue to be most pronounced (9.3%) in the portfolio where institutions abstain from trading.

Overall, we find modest evidence that the small loser stocks that institutions sell in December and buy in January exhibit a stronger TOY effect. To the extent that institutional trading is positively correlated with contemporaneous stock returns (Sias et al., 2006), the above result is to be expected and could simply be driven by institutional positive feedback trading. Perhaps most revealing, we find strong evidence that the TOY effect is substantially stronger among stocks that institutions do not trade around

the end of the year. This result suggests that individuals, not institutions, are the primary driver of the TOY effect.

5. Conclusions

Considerable effort has been expended in the finance literature to isolate explanations of the turn-of-the-year effect. Previous attempts to account separately for individual and institutional trading, while informative, have not been complete. We are the first paper to test institutional explanations of the TOY effect with transaction-level data. This precision allows us to not only separately test the three leading institutional hypotheses (window dressing, institutional tax-loss selling and risk-shifting), but also separate out stocks with no institutional trading in order to examine the impact of individual trading on turn-of-the-year returns (individual tax-loss selling).

We find limited evidence that institutional trading impacts TOY returns through window dressing, and little evidence for the tax-loss selling or risk-shifting hypothesis. Specifically, our results show abnormal pension plan sponsor selling in small stocks with poor past performance during the final trading days in December, providing some support for the hypothesis that window dressing activities contribute to TOY returns. However, we find little evidence that institutions engage in tax-loss selling or risk-shifting trading strategies. We also find smaller turn-of-the-year returns for stocks with institutional trading than those without.

Although our analyses represent a marked improvement in measuring institutional trading patterns during the days surrounding the turn of the year, we recognize that this data represents a subsample of the trading activities of institutional investors. To the extent that our trading data is not representative of the overall institutional investor population, our ability to generalize our findings is limited. However, this subsample represents a significant fraction of institutional trading during our sample period and we believe the benefits of using this sample outweigh the costs of using infrequent quarterly holdings data.

Perhaps most revealing in our study is the fact that stocks with no institutional trading around the end of the year experience TOY returns that are more than twice as large as that of the overall sample. Taken together, our results suggest that individual investors, not institutions, are most likely responsible for turn-of-the-year return patterns.

Acknowledgements

We would like to thank Judy Maiorca, Allison Keane, and Abel Noser Solutions for providing institutional trading data. We thank Vladimir Kotomin, an anonymous referee, and participants at the 2010 Financial Management Association Conference for helpful comments.

References

Banz, Rolf W., 1981. The relationship between return and market value of common stocks. Journal of Financial Economics 9, 3–18.
Blouin, Jennifer L., Bushee, Brian J., Sikes, Stephanie A., 2011. Tax-sensitive institutional investors. Working paper. University of Pennsylvania.
Branch, Ben, 1977. A tax loss trading rule. Journal of Business 50, 198–207.
Brauer, Greggory A., Chang, Eric C., 1990. Return seasonality in stocks and their underlying assets: tax-loss selling versus information explanations. Review of Financial Studies 3, 255–280.
Brown, Philip, Keim, Donald B., Kleidon, Allan W., Marsh, Terry A., 1983. Stock return seasonalities and the tax-loss selling hypothesis: analysis of the arguments and Australian evidence. Journal of Financial Economics 12, 105–127.
Brown, Keith C., Harlow, W.V., Starks, Laura T., 1996. Of tournaments and temptations: an analysis of managerial incentives in the mutual fund industry. Journal of Finance 51, 85–110.
Busse, Jeffery A., 2001. Another look at mutual fund tournaments. Journal of Financial and Quantitative Analysis 36, 53–73.
Busse, Jeffery A., Green, T. .Clifton., Jegadeesh, Narasimahn., 2012. Buy-side trades and sell-side recommendations: interactions and information content. Journal of Financial Markets 15, 207–232.
Chemmanur, Thomas J., Je, Shan, Gang, Hu, 2009. The role of institutional investors in seasoned equity offerings. Journal of Financial Economics 94, 384–411.
Ciccone, Stephen J., 2011. Investor optimism, false hopes and the January effect. Journal of Behavioral Finance 12, 158–168.
DeBondt, Werner F.M., Thaler, Richard., 1985. Does the stock market overreact? Journal of Finance 40, 193–805.
DeBondt, Werner F.M., Thaler, Richard, 1987. Further evidence on investor overreaction and stock market seasonality. Journal of Finance 42, 557–581.
Del Guercio, Diane, 1996. The distorting effect of the prudent-man laws on institutional equity investments. Journal of Financial Economics 40, 31–62.
Del Guercio, Diane, Tkac, Paula A., 2002. The determinants of the flow of funds of managed portfolios: Mutual funds vs. pension funds. Journal of Financial and Quantitative Analysis 37, 523–557.
D'Mello, Ranjan, Ferris, Stephen P., Hwang, Chuan Yang, 2003. The tax-loss selling hypothesis, market liquidity, and price pressure around the turn-of-the-year. Journal of Financial Markets 6, 73–98.
Dyl, Edward A., 1977. Capital gains taxation and year-end stock market behavior. Journal of Finance 32, 165–175.
Easterday, Kathryn E., Sen, Pradyot K., Stephan, Jens A., 2009. The persistence of the small firm/January effect: is the consistent with investors' learning and arbitrage efforts? Quarterly Review of Economics and Finance 49, 1172–1193.
Eleswarapu, Venkat R., Reinganum, Marc R., 1993. The seasonality behavior of the liquidity premium in asset pricing. Journal of Financial Economics 34, 373–386.
Goldstein, Michael A., Irvine, Paul, Kandel, Eugene, Wiener, Zvi, 2009. Brokerage commissions and institutional trading patterns. Review of Financial Studies 22, 5175–5212.
Goldstein, Michael, Irvine, Paul, Puckett, Andy, 2011. Purchasing IPOs with commissions. Journal of Financial and Quantitative Analysis 46, 1193–1225.
Goetzmann, William, Ingersoll, Jonathan, Spiegel, Matthew, Welch, Ivo, 2007. Portfolio performance manipulation and manipulation-proof performance measures. Review of Financial Studies 20, 1503–1546.
Gultekin, Mustafa N., Bulent Gultekin, N., 1983. Stock market seasonality: International evidence. Journal of Financial Economics 12, 469–481.
Haugen, Robert, Lakonishok, Josef, 1988. The Incredible January Effect: The Stock Market's Unsolved Mystery. Dow-Jones-Irwin, Homewood, Ill.
He, Jia, Ng, Lilian, Wang, Qinghai, 2004. Quarterly trading patterns of financial institutions. Journal of Business 77, 493–509.
Huag, Mark, Hirschey, Mark, 2006. The January effect. Financial Analyst Journal 62, 78–88.
Jegadeesh, N., Titman, S., 2001. Profitability of momentum strategies: an evaluation of alternative explanations. Journal of Finance 56, 699–720.
Jin, Li, 2006. Capital gain tax overhang and price pressure. Journal of Finance 61, 1399–1430.
Johnson, Ken, Cox, Don R., 2002. Market index returns, macroeconomic variables, and tax-loss selling. Journal of Economics and Finance 26, 297–308.
Jones, Charles P., Peirce, Douglas K., Wilson, Jack W., 1987. Can tax-loss selling explain the January effect? A note. Journal of Finance 42, 453–461.
Kang, Moonsoo, 2010. Probability of information-based trading and the January effect. Journal of Banking and Finance 34, 2985–2994.
Kaniel, Ron, Saar, Gideon, Titman, Sheridan, 2008. Individual investor trading and stock returns. Journal of Finance 63, 273–310.
Kato, Kiyoshi, Schallheim, James S., 1985. Seasonal and size anomalies in the Japanese stock market. Journal of Financial and Quantitative Analysis 20, 243–260.
Keim, Donald, 1983. Size-related anomalies and stock return seasonality: Further empirical evidence. Journal of Financial Economics 12, 13–32.
Lakonishok, Josef, Shleifer, Andrei, Thaler, Richard, Vishy, Robert, 1991. Window dressing by pension fund managers. American Economic Review 81, 227–231.
Lewellen, Jonathan, 2011. Institutional investors and the limits of arbitrage. Journal of Financial Economics 105, 62–80.
Ligon, James A., 1997. A simultaneous test of the competing theories regarding the January effect. Journal of Financial Research 20, 13–32.
Maxwell, William F., 1998. The January effect in the corporate bond market: a systematic examination. Financial Management 27, 18–30.
McLean, D., Pontiff, J., 2014. Does academic research destroy stock return predictability? Working paper. University of Alberta and Boston College.
Meier, Iwan, Schaumburg, Ernst, 2006. Do funds window dress? Evidence for U.S. domestic equity mutual funds. Working paper. Northwestern University.
Moller, Nicholas, Zilca, Shlomo, 2008. The evolution of the January effect. Journal of Banking and Finance 32, 447–457.
Musto, David, 1997. Portfolio disclosures and year-end price shifts. The Journal of Finance 52, 1563–1588.
Ng, Lilian, Wang, Qinghai, 2004. Institutional trading and the turn-of-the-year effect. Journal of Financial Economics 74, 343–366.
Nofsinger, J., Sias, R., 1999. Herding and feedback trading by institutional and individual investors. Journal of Finance 54, 2263–2295.
Poterba, James M., Weisbenner, Scott J., 2001. Capital gains tax rules, tax-loss trading, and turn-of-the-year returns. Journal of Finance 56, 353–368.
Puckett, Andy, Yan, Xuemin (Sterling), 2011. The interim trading skills of institutional investors. Journal of Finance 66, 601–633.

Reinganum, Marc R., 1983. The anomalous stock market behavior of small firms in January. Journal of Financial Economics 12, 89–107.
Ritter, Jay R., 1988. The buying and selling behavior of individual investors at the turn of the year. Journal of Finance 43, 701–717.
Rozeff, Michael, Kinney, William, 1976. Capital market seasonality: the case of stock returns. Journal of Financial Economics 3, 379–402.
Roll, Richard, 1983. Vas ist das? The turn-of-the-year effect and the return premia of small firms. Journal of Portfolio Management 9, 18–28.
Schwert, G.W., 2003. Anomalies and market efficiency. Handbook of the Economics of Finance, 937–972 (Chapter 15).
Sias, Richard W., Starks, Laura T., 1997. Institutions and individuals at the turn-of-the-year. Journal of Finance 52, 1543–1562.
Sias, Richard, Starks, Laura, Titman, Sheridan, 2006. Changes in institutional ownership and stock returns: Assessment and methodology. Journal of Business 79, 2869–2910.
Sikes, Stephanie A., 2014. The turn-of-the-year effect and tax-loss-selling by institutional investors. Journal of Accounting and Economics 57 (1), 22–42.
Sirri, Erik R., Tufano, Peter, 1998. Costly search and mutual fund flows. Journal of Finance 53, 1589–1622.
Starks, Laura T., Yong, Li, Zheng, Lu, 2006. Tax-loss selling and the January effect: evidence from municipal bond closed-end funds. Journal of Finance 61, 3049–3066.
Sun, Qian, Tong, Wilson H.S., 2010. Risk and the January effect. Journal of Banking and Finance 34, 965–974.
Tepper, Irwin, 1981. Taxation and corporate pension policy. Journal of Finance 36, 1–13.