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2006-003

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First draft: November 2004

Current draft: August 1, 2006

Acknowledgment: This paper has benefited from helpful comments and suggestions by Steve Buser, Mike Cooper, Steve Jones, Greg Kadlec, Javier Fernandez Navas, Raghu Rau, from presentations at the University of Michigan and Bern University, and from the capable research assistance of Gohar Stepanyan. Daily net mutual fund flow data used in this study are from the TrimTabs Financial Services database.

Equity Returns at the Turn of the Month

Abstract

A turn-of-the-month effect in U.S. equity returns was initially identified by Lakonishok and Smidt (1988) using the DJIA for the period 1897-1986. According to the turn-of-the-month effect, equity returns over the interval beginning with the last trading day of the month and ending three days later are significantly higher than over other days. Using CRSP daily returns, we find that the turn-of-the-month effect persists over the more recent interval of 1987-2005: in essence, over this 19-year period (and over the 109-year period of 1897-2005) all of the positive excess market return occurred during the four-day turn-of-the-month interval. Thus, during the other 16 trading days of the month, on average, investors received no reward for bearing market risk. We further find that the turn-of-the-month effect is not confined to small or low-priced stocks; it is not confined to the December-January turn-of-the-month; it is not confined to calendar-quarter-ends; it is not confined to the U.S.; and it is not due to market risk as traditionally measured: the standard deviation of returns at the turn-of-the-month is no higher than during other days. Additionally, the effect is not due to month-end buying pressure as measured by trading volume and net funds flow to equity mutual funds. This persistent peculiarity in equity returns poses a challenge to both "rational" and "behavioral" models of asset pricing.

Equity Returns at the Turn of the Month

Lakonishok and Smidt (L&S) (1988) appear to be the first to have reported a turn-of-the-month seasonal in equity returns wherein the turn-of-the-month is defined as beginning with the last trading day of the month and ending with the third trading day of the following month. Using the Dow Jones Industrial Average (DJIA), they find that, on average, the four days at the turn-of-the-month account for all of the positive return to the DJIA over the period of 1897-1986. More specifically, over this 90-year period, the average cumulative return over the four-day turn-of-the-month is 0.473% whereas the average cumulative return over the full month is 0.349%, indicating that returns were, on average, negative over the remaining days of the month. Given the relatively small sample encompassed by the DJIA, that includes only 12 to 30 stocks over the period considered, and given that the turn-of-the-month effect is not their primary concern, L&S do not explore this pattern in depth.

We take up the task of examining the turn-of-the-month effect in detail here. We use CRSP daily returns for the 80-year period of 1926-2005. As Schwert (2003) notes, return patterns that appear during a particular time period often disappear once they have been discovered or, upon closer scrutiny, turn out not to have existed to begin with. Given that admonition, and given that the L&S study ends with 1986, an obvious starting point for our analysis is the 19-year period that has transpired since the end of the period they examine.

The pattern in returns over the 1987-2005 period is remarkably similar to the pattern over the earlier time period. During this post-1986 period, the average daily value-weighted (VW) excess market return over the four-day turn-of-the-month interval is 0.14%. In comparison, the average daily VW excess market return over the other 16-trading days of the month is -0.01%.

With equal-weighted (EW) excess market returns, the average daily turn-of-the-month return is 0.24%. In comparison, the average daily EW excess market return over the other 16-trading days of the month is 0.04%. Thus, over the period 1987-2005, the turn-of-the-month effect is pronounced and, as we will show, highly statistically significant. Additionally, as is apparent, especially with VW returns, virtually all of the excess market return over this 19-year interval accrued during the four-day turn-of-the-month period such that investors received little or no reward for bearing market risk over the other 16 trading days of the month.

Having established that the turn-of-the-month pattern persists over the recent two decades, we investigate returns over the 80-year interval of 1926–2005 to determine whether it is attributable to certain sets of stocks. For example, we ask whether the turn-of-the-month effect is concentrated among small-cap or low-price stocks. It is not. Although the effect is more pronounced among small-cap and low-price stocks, it also exists for large-cap and for high-price stocks. We also ask whether the effect is due primarily to returns at the turn-of-the-year. It is not. The effect occurs at turns-of-the-month that coincide with turns-of-the-year, but it also occurs during other months. Likewise, the turn-of-the-month effect is not concentrated at calendar-year quarter-ends.

We then explore whether higher "risk" at the turn-of-the-month can explain this pattern. Using standard deviation of return as a measure of risk, we find that risk is no higher during the four turn-of-the-month days than over the other 16 trading days of the month: higher risk does not appear to explain the turn-of-the-month effect.

In a related analysis, we ask whether the size, book-to-market, and momentum factors identified by Fama and French (1993) and Carhart (1997) exhibit a turn-of-the-month pattern. We find a modest turn-of-the-month effect in the small minus big (SMB) factor such that the

returns to the SMB portfolio are especially high on the last trading day of the month, which is to say that, in comparison with large-cap stocks, small-cap stocks earn especially high returns on the last trading day of the month. However, we find no turn-of-the-month pattern at all in the book-to-market (HML) and momentum (UMD) factors.

We also ask whether treasury and corporate bonds exhibit a turn-of-the-month pattern. If so, it might be that the turn-of-the-month pattern is not due to a change in risk or to a change in the risk premium at the turn-of-the-month, but rather due to a more fundamental shift in economic activity. We examine daily t-bill returns (1954-2005), daily t-bond returns (1962-2005), daily returns on investment grade corporate bonds (1989-2005), and daily returns on high yield corporate bonds (1998-2005). Fixed income securities do not evidence a consistent turn-of-the-month pattern. A systematic month-end shift in interest rates does not appear to explain the turn-of-the-month pattern in equity returns.

We then look at other countries for hints as to whether the pattern is due to some peculiarity of the U.S. trading structure. We consider returns for 34 non-U.S. countries for which we have data from at least 1990 onward. The turn-of-the-month effect occurs in 30 of them. The effect is apparently not due to a factor unique to the U.S. market structure.

Ogden (1990) proposes that the turn-of-the-month effect is due to a "regularity in payment" dates in the U.S. The idea is that investors receive a preponderance of compensation from employment, dividends, and interest at month-ends. As investors seek to invest these funds, equity prices are pushed up. Ogden examines daily CRSP market returns over the period 1969-1986 and finds that the turn-of-the-month effect is concentrated in months with "tight" monetary policy as measured by the spread between the Fed funds rate and the yield of a 30-day

t-bill. He concludes that these results support the regularity in payments explanation of the turn-of-the-month effect. Henceforth, we refer to this as the "payday" hypothesis.

As a more direct test of the payday hypothesis, we examine net fund flows to a set of mutual funds tracked by TrimTabs over the period February 1998-December 2005. Our presumption is that, if the turn-of-the-month pattern is due to a net demand by individuals for equities at the turn-of-the-month, this will show up as a monthly pattern in net flows to equity mutual funds. We find that the turn-of-the-month effect in equity returns persists during 1998-December 2005, but we can find no corresponding pattern in net flows to equity mutual funds.

As a further test of the payday hypothesis, we consider daily aggregate NYSE trading volume over the period 1926-2005. We find that, unlike equity returns, equity trading volume is spread evenly throughout the month. Neither trading volume nor the net funds flow data support the payday hypothesis.

What explains the peculiar, long-lived and, apparently, global turn-of-the-month effect in equity returns? There are currently three extant explanations of security returns. The first is factor models of asset pricing. These include such models as the classic capital asset pricing model of Lintner (1965) and Sharpe (1964). Two prominent factors in such models are the risk-free rate and volatility of return. We find no monthly pattern in t-bill or t-bond returns nor in volatility of equity returns. Thus, turn-of-the-month returns do not seem to be related to these pricing factors.

The second class of models comprises characteristic models of asset pricing. According to characteristic models, returns are related to security characteristics. Two identified characteristics are market capitalization and stock price. We find that the turn-of-the-month

effect is not related to either of these characteristics. Thus, these security characteristics do not appear to be able to explain turn-of-the-month returns either.

The third class of models relies on irrational investors. These are labeled behavioral models of asset pricing. These include such models as Hong and Stein (1999) and Daniel, Hirshleifer and Subrahmanyam (1998). Under these models, investors repeat errors in assessing security payoffs. Such a model might be able to explain the turn-of-the-month effect in equity returns, but an explanation does not appear to lie in extant models.

The turn-of-the-month effect in equity returns presents a challenge to extant asset pricing models.

Historically, seasonalities in asset returns have been labeled "anomalies." At some point, a persistent anomaly becomes the norm. The turn-of-the-month effect in equity returns appears to have persisted for over 100 years, or for as long as we have reliable daily data to inspect it. Perhaps the turn-of-the-month is where scholars should be looking to find clues as to factors that explain security returns.

The remainder of the paper is organized as follows. Section I provides a brief review of prior studies. Section II documents the monthly seasonality in daily equity returns. Section III investigates (1) whether the seasonal pattern is related to security characteristics such as market capitalization and price, (2) whether the turn-of-the-month effect is merely a manifestation of the well-known turn-of-the-year effect in equity returns or of a calendar-year quarter-end effect that has been attributed to institutional investors dressing up their quarterly reports, and (3) whether there is a corresponding turn-of-the-month effect in daily volatility of returns. Section IV addresses other related questions including (1) whether the Fama-French-Carhart size (SMB), book-to-market (HML), and momentum (UMD) factors exhibit turn-of-the-month seasonalities,

(2) whether a turn-of-the-month seasonal in equity returns occurs in other countries, (3) whether there is a monthly seasonal in t-bill, t-bond and corporate bond returns, and (4) whether daily NYSE volume and net funds flow to mutual funds exhibit turn-of-the-month patterns. Section V concludes.

I. Prior studies

We are not the first to expand upon the L&S study. Hensel and Ziemba (1996) examine a trading strategy in which a portfolio is invested in the Standard & Poor's (S&P) 500 Index over the turn-of-the-month and invested in t-bills over other days. They report that this trading strategy outperformed a strategy of buying and holding the S&P 500 by roughly 0.63% per year over the period 1928-1993. Similarly, Kunkel and Compton (1998) report that a strategy of switching into the College Retirement Equities Fund (CREF) equity account during the turn-of-the-month and into a Teachers Insurance and Annuity Association (TIAA) money market fund during other days achieved a return of 2.1% per year greater than a simple buy-and-hold equities strategies.

Additionally, although he does not identify it as such, Ariel (1987) actually precedes L&S in finding a turn-of-the-month pattern in daily CRSP data for the period 1962-1986. Very likely he does not identify it as such because he motivates his study by citing the Wall Street adage that investors make "…planned purchases before the start of the month and [postpone] planned sales until after the middle of the calendar month …" to take advantage of the monthly pattern in stock returns (Ariel, 1987, p. 162). He attributes this wisdom to Merrill (1966), Fosback (1976) and Hirsch (1979). To find this pattern, he incongruously includes the last day trading day of the month with the first 9 trading days of the following month when calculating returns for the first half of each month. In fact, it is the last trading day of the month that

provides much of the "kick" to returns during the first half of the month. With this unusual classification in place, Ariel concludes that the data confirm Wall Street wisdom.

II. Aggregate market returns at the turn-of-the-month

A. Overview

For our analysis of the turn-of-the-month effect in U.S. equity returns, we use CRSP VW and EW market indices. The CRSP database includes New York Stock Exchange (NYSE) stocks beginning with 1926, American Stock Exchange (AMEX) stocks beginning with 1962 and Nasdaq stocks beginning with 1972. The data end with December 2005. Among other things, these data permit us to conduct our analysis over a holdout period not considered by prior studies and to conduct cross-sectional analyses for the full time period studied including those years considered by prior studies.

B. 1926-1986

For comparison purposes, we begin by examining returns over the period 1926-1986. This interval is encompassed by the time period studied by L&S and subsumes the time period considered by Ariel.

Figure 1 shows CRSP VW and EW average stock market returns for the period 1926-1986 by day of the month. Day –1 is the last trading day of the month, day +1 is the first trading day of the month, day +2 is the second trading day of the month and so on. As the figure illustrates, returns at the turn-of-the-month over this period are unusually high relative to other days.

With VW market returns, days -1, +2, and +3 provide the highest average daily returns and the return on day +1 is also high but is a shade lower than the average return on days -2 and +4. With EW returns, days -1 through +3 provide average returns that are greater than any other

days of the month although days -2 and day +4 are close behind. Further, with EW returns, day –1 provides the highest return by far of any day of the month. As we move away from the turn-of-the-month, average returns diminish and some days have negative average returns. Arguably, the unusually high returns at the turn-of-the-month could be construed as beginning with day -2. For consistency with prior studies, we shall construe the turn-of-the-month as encompassing days –1 through day +3. Regardless of when the turn-of-the-month is determined to begin, it is clearly evident that daily returns are not evenly distributed across the month and that the turn-of-the-month receives more than its share of the equity returns during the period 1926-1986.

Table 1 gives the numerical values for the turn-of-the-month effect for three time periods: 1926-1986, 1987-2005, and 1926-2005. Because we use the format of table 1 throughout the paper, we describe it here in detail.

The first four columns of the table give the mean daily return for days –1, +1, +2 and +3. Column 5 gives the mean daily return for the entire four-day turn-of-the-month interval (denoted days [-1, +3]). Column 6 gives the mean daily return for all other days of the month (denoted "other days"). The final column of the table, labeled "difference" gives the difference between the mean daily return for the turn-of-the-month interval and the mean daily return for all other days.

The top row of each panel gives the mean daily return, the second row gives the t-statistic to test the hypothesis that the mean return is significantly different from zero, and the third row gives the percentage of days on which the mean return reported in the top row of the panel is positive. The t-statistic in the last column tests the hypothesis that the difference between the mean daily return over the turn-of-the-month is significantly different from the mean return over

all other days. This last statistic will be the focus of our attention in drawing inferences about the significance of the turn-of-the-month returns.

Panels A and D of table 1 give VW and EW returns, respectively, for the period 1926-1986. The mean VW daily return over the four-day turn-of-the-month interval is 16 times the mean daily return for all other days. Over the four-day turn-of-the-month interval, it is 0.16%; over the other 16 trading days of the month, it is 0.01%. With EW returns, the mean daily return over the turn-of-the-month is four times the mean return over all other days. The mean EW return over the four-day turn-of-the-month period is 0.22%; over the other 16 days it is 0.05%. With t-statistics of 8.50 and 9.98, both the VW and EW mean turn-of-the-month returns are statistically significantly greater than zero. With a t-statistic of 0.98, the VW mean return for all other days is not significantly different from zero. The EW mean return for all other days is significant with a t-statistic of 3.57. Importantly, with both VW and EW returns, the differences between the mean daily turn-of-the-month return and the mean daily return for all other days (given in the last column of the tables) are highly significant with t-statistics of 7.07 and 7.39, respectively.

Additionally, the mean return for each of the individual turn-of-the-month days is large in comparison with the mean return of all other days and each is statistically significantly different from zero. That is, the turn-of-the-month effect is not concentrated on a single turn-of-the-month day.

A further interesting statistic is the percentage of differences that is positive. This statistic gives the percentage of months in which the mean turn-of-the-month return is greater than the mean return for the nine preceding days and the seven following days. With VW returns, the difference is positive in 62% of the months (and negative in 38%); with EW returns,

the difference is positive in 75% of the months (and negative in 25%). Given a null hypothesis of 50% positive differences and using a binomial test, both of these percentages are statistically significant (z-statistics = 7.4 and 10.39, respectively).

The turn-of-the-month effect is powerful over the period 1926-1986. Given the prior studies by L&S, Ariel, and Hensel and Ziemba these results may not be especially surprising.

C. 1987-2005

The more interesting results are given in figure 2 and panels B and E of table 1. Figure 2 parallels figure 1 except that figure 2 gives returns for the period 1987-2005. What is remarkable is the similarity between figures 1 and 2. In both exhibits, the highest average daily returns occur at the turn-of-the-month. With both VW and EW returns, days –1 and +1 provide the highest average daily returns. Days +2 and +3 also provide high returns and, as with the period of 1926-1986, days –2 and +4 exhibit high returns. Further, as with the 1926-1986 interval, with EW returns, day -1 achieves by far the highest average return of any day of the month. What is most striking is that returns are clearly not spread evenly over the month.

Panels B and E of table 1 parallel panels A and D except that panels B and E report results for the 1987-2005 time period. A comparison of panels A and B and panels D and E shows that, with both VW and EW returns, the average daily turn-of-the-month returns and the average daily returns for all other days for the period 1987-2005 are nearly identical to the corresponding statistics for the period 1926-1986. This means, of course, that the difference between the average daily turn-of-the-month return and the average return for all other days of the month is nearly identical between the two periods. For example, with VW returns, the average daily return over the four-day turn-of-the-month interval is 0.15%, while it is -0.001

over all other days. With VW returns, the difference between the average daily turn-of-the-month return and the return for all other days is 0.15% for both 1926-1986 and for 1987-2005.

Further, for the 1987-2005 period, with both VW and EW returns the difference between the average daily turn-of-the-month return and the return for all other days is highly statistically significant with t-statistics of 3.78 and 6.01, respectively.

The final statistic from panels B and E to consider is the percentage of differences that is positive. Recall that this statistic in the last column of the table gives the percentage of months in which the mean turn-of-the-month return is greater than the mean return for all other days. With VW returns it is 61% and with EW returns it is 75%. Both of these are statistically significantly different from 50%.

Unlike many of the anomalies studied by Schwert (2003), the data in panels B and E indicate that the turn-of-the-month in U.S. equity returns did not disappear following its discovery 20 years ago. It persists over the recent two decades.

As an aside, we also split the 19-year 1987-2005 interval into two equal subperiods. The turn-of-the-month effect occurs in both of them with both VW and EW returns. With VW returns, the difference between the mean turn-of-the-month return and the mean return over all other days during 1987 through mid-1996 is 0.17% with a t-statistic of 3.63. During mid-1996 through 2005, it is 0.14% with a t-statistic of 2.00.

D. 1926-2005

To tie together the data, figure 3 and panels C and F of table 1 show the daily returns and summary statistics for the full 80-year period of 1926-2005. These data contain no surprises. We present them because, in subsequent sections, we conduct our analysis using the full time period rather than the individual subperiods. These provide a frame of reference.

E. Excess market returns

In comparison with table 1, table 2 gives excess market returns for the various time periods where the excess market return is the raw return minus the risk-free rate. Ideally, we would subtract the rate of a one-day treasury security that matures each day from the daily equity market return for that day to calculate the daily excess market return. Unfortunately, we do not have a sufficiently long time series of one-day risk-free rates to perform that calculation. Instead, we use t-bill yields from Ken French's website. French provides a daily risk-free rate for the period 1963-2005 by dividing the yield of the one-month t-bill by the number of days in the month. To create an equivalent daily return series for 1926-1962, we divide the monthly yields from French's website by the number of days in the month. With these daily risk-free rates, we calculate market excess returns by subtracting the daily t-bill yield from the corresponding daily VW and EW market returns.

Given the way in which the risk-free rate is constructed, the turn-of-the-month effect inevitably shows up in excess returns. The interesting statistics in table 2 are the excess returns over all other days. For example, over the period of 1926-2005, with VW returns, the excess market return over all other days is 0.001; with EW returns it is 0.04%. Thus, with VW returns, over the entire 80-year period of 1926-2005, on average, market participants essentially earned no premium for bearing market risk except during the four-day turn-of-the-month periods. With EW returns, investors did earn a small positive reward for bearing risk. This reward is due, of course, to the higher returns of small-cap stocks that are more prominent in EW returns. This phenomenon will also show up in subsequent analyses.

III. A closer look at turn-of-the-month returns

A. Overview

In this section, we examine the turn-of-the-month effect in stocks sorted by market capitalization and price. We then consider whether the effect is more pronounced either at turns-of-the-month that coincide with turns-of-the-year or at turns-of-the-month that coincide with turns-of-the-quarter. Finally, we study volatility (i.e., standard deviation) of returns by day of the month.

The first of these analyses is motivated by studies that report that small-cap stocks significantly outperform large-cap stocks (Banz (1981), Basu (1977), Chan, Chen, and Hsieh (1985), Reinganum (1981)). Perhaps small-cap stocks outperform large-cap stocks primarily at turns-of-the-month and the small-cap premium is the same as the turn-of-the-month effect.

Examinations of stocks sorted by price and by whether the turn-of-the-month coincides with the turn-of-the-year are motivated by studies that have shown that stocks in general perform well after the turn-of-the-year and that this superior performance is concentrated among low-price stocks (Jones, Lee and Apenbrink (1991), Conrad and Kaul (1993), Ball, Kothari and Shanken (1995), Baytas and Cakici (1999)). The analysis of calendar quarter-ends is motivated by studies that report exceptional performance by mutual funds at the turn-of-the-quarter and attribute this to last minute end-of-the-quarter trades that are designed to drive up prices and improve reported mark-to-market fund performance (Bernhardt and Davies (2005), Carhart, Kaniel, Musto and Reed (2002)).

The analysis of volatility of returns is motivated by traditional asset pricing theory that posits a positive relation between risk and return where risk is measured by standard deviation of return.

B. Stocks sorted by size

Panels A.1 and A.2 of table 3 report VW returns for the four-day turn-of-the-month and for all other days for indices composed of the smallest decile and the largest decile, respectively, by market capitalization of CRSP equities for the period 1926-2005. The turn-of-the-month effect occurs in both the small- and large-cap stocks, but it is more pronounced in the small-cap portfolio. With large-cap stocks, the average daily turn-of-the-month return is 0.15%, while the average return over all other days is 0.01%. The difference between the two is significant with a t-statistic of 7.81. With small-cap stocks, the mean turn-of-the-month return is 0.25%, while the mean return for all other days is 0.03%. This difference also is highly statistically significant with a t-statistic of 8.54. We do not replicate this analysis using an EW index because stocks within in each decile have similar market values such that the VW returns are essentially EW returns.

This analysis demonstrates that the turn-of-the-month effect is not just a variation of the high returns historically earned by small-cap stocks. Regardless of market capitalization, U.S. equities earn the bulk of their returns over the four days beginning one day prior to and ending three days after the end of the month.

C. Stocks sorted by price

Panels A.3 and A.4 of table 3 give VW returns for portfolios sorted by price as of December 31 of each year. Stocks with prices greater than $5.00 are placed into a high-price portfolio and stocks with prices of $5.00 or less are placed into a low-price portfolio. Panels B.3 and B.4 of table 3 give EW returns for the same sets of stocks.

The turn-of-the-month effect occurs among both high- and low-price stocks and with both VW and EW indices. Furthermore, given the correlation between stock price and total

market capitalization, it is perhaps not surprising that the effect is more pronounced among low-price stocks. Nevertheless, the effect is also strong among high-price stocks. For example, with VW returns, the mean daily turn-of-the-month return for high-price stocks is 0.19%, while the VW return for all other days is 0.04%. The t-statistic for the difference between the two is 8.22.

For low-price stocks, the mean VW turn-of-the-month return is 0.27%, while the mean return over all other days is 0.03%. This difference, too, is highly statistically significant (t-statistic = 7.53).

As shown in panels B.3 and B.4, with EW returns the results for high- and low-price stocks are quite similar to those calculated with VW returns in panels A.3 and A.4.

The clear conclusion is that the turn-of-the-month effect is different from the low-price effect documented elsewhere. If anything, the low-price effect may actually be a turn-of-the-month effect. Once the turn-of-the-month effect is accounted for there may be no low-price effect at the turn-of-the-year.

D. Returns at the turn-of-the-year

Panels A.5 and B.5 give VW and EW market returns, respectively, for all turns-of-the-month except those that encompass the January-December turn-of-the-month (i.e., these exclude the turn-of-the-year). Panels A.6 and B.6 present the results with VW and EW returns, respectively, for January-December turns-of-the-month (i.e., those that coincide with turns-of-the-year) only.

The turn-of-the-month effect is present in both non-December-January turns-of-the-month and in December-January turns-of-the-month. For example, with VW returns, the average daily turn-of-the-month return for all non-December-January turns is 0.15%, while the mean daily return for all other days of these months is 0.00%. The t-statistic for the difference is

7.86. The results with EW returns are quite similar. Given that most turns-of-the-month are non-December-January turns, it is perhaps not surprising that these results are similar to those for the overall sample. Clearly, the turn-of-the-month effect is not just due to unusual returns at the turn-of-the-year.

Even though there is a distinct turn-of-the-month effect at the January-December turn, the magnitude of the effect is different from non-January-December turns. First, consider the VW returns in panel A.6. For the December-January turn-of-the-month, the mean daily return is 0.23%. For all other days of these months, the mean return is 0.10%. The t-statistic for the difference is only 1.87. Thus, in general, returns during December and January are high, but they are even higher at the turn-of-the-month. These high returns are reflective of the well-known high January returns that have been documented previously (Rozeff and Kinney (1976), Roll (1983), Chan (1986), Haugen and Lakonishok (1988)).

High January returns have historically been concentrated among low-cap stocks. This factor is manifest in the EW returns of panel B.6. With EW returns, the mean return for the December-January turn-of-the-month is 0.81%, while it is 0.20% over the other days of these months. The t-statistic for the difference is 7.41. (As an aside, it is interesting to note that a major component of the high turn-of-the-year effect occurs on day -1 with an extraordinarily high mean EW return of 1.06% over the 1926-2005 interval.)

E. Returns at calendar quarter-ends

Bernhardt and Davies (2005) and Carhart, Kaniel, Musto and Reed (2002) report that calendar quarter-ends often have high daily returns. They attribute this to fund managers who deliberately trade at above market prices near the close of the market at calendar-year quarter-ends so as to boost the mark-to-market performance of their funds. They report that calendar

quarter-ends have especially high returns and conclude that this evidence is consistent with their argument. Perhaps the turn-of-the-month effect is merely a manifestation of this artificial price-boosting by fund managers at the end of reporting quarters. If so, the turn-of-the-month effect should be more pronounced among turns-of-the-month that occur at calendar-year quarter-ends.

To explore this possibility, we sort turns-of-the-month into calendar quarter-ends and non-quarter-ends and repeat our analyses. The results with VW returns are given in panels A.7 and A.8 of table 3. The results with EW returns are given in panels B.7 and B.8. The turn-of-the-month effect certainly occurs at quarter-ends, but it is not just a quarter-end phenomenon. Indeed, with VW returns, the average turn-of-the-month return for non-quarter-ends is actually larger than it is for quarter-ends. Further, with VW returns, the difference between the mean turn-of-the-month return at non-quarter-ends and all other days and the difference between the mean turn-of-the-month return at non-quarter-ends are nearly identical at 0.14% and 0.16%, respectively, and both are highly statistically significant.

With EW returns, the results are a bit different. The turn-of-the-month effect definitely occurs at both quarter-ends and non-quarter-ends and for both it is highly statistically significant. However, the difference between the mean turn-of-the-month return and the mean return over all other days is much larger at quarter-ends than at non-quarter-ends. Much, but not all, of this difference can be traced to the very high return that occurs on the last trading day of the year that shows up in panel B.6.

Overall, the evidence does not indicate that the turn-of-the-month effect is attributable to fund managers dressing up their quarter-end returns.

F. "Risk" at the turn-of-the-month

Traditional finance theory posits a positive relation between risk and return. One often used measure of risk is standard deviation of returns. Perhaps higher risk at the turn-of-the-month explains the high turn-of-the-month returns. To examine that possibility, we calculate the standard deviation of returns by day of the month using both VW and EW returns. That is, we calculate the standard deviation of returns for all day –10 returns, all day –9 returns and so on for each day of the month for the 1926-2005 time period.

The standard deviations of returns are shown in figure 4. As the figure shows, volatility is not unusually high at the turn-of-the-month. Indeed, if anything, volatility of returns is somewhat lower across the 4-day turn-of-the-month period than across other days. For example, with VW returns, the average daily standard deviation of returns over the four-day turn-of-the-month is 0.98%. This compares with the average standard deviation of returns of 1.02% across all other days.

Higher volatility of returns does not appear to explain higher turn-of-the-month returns.

IV. Other considerations

A. Fama-French-Carhart factors

As a matter of curiosity, we examine the other three Fama-French-Carhart pricing factors to determine whether they also exhibit a turn-of-the-month effect. We use the daily factors from Ken French's website. The results are given in table 4. There is a modest turn-of-the-month effect in the SMB factor. The difference between the turn-of-the-month return to the SMB factor and the return to the SMB factor over all other days is statistically significant with a t-statistic of 2.81 but the value of the difference is only 0.03% and this is due exclusively to the return on days -1. That is, as we have seen in other analyses, the return to small-cap stocks is unusually

high on the last trading day of the month and most of this is due to the last trading day of the year. The HML and the UMD factors exhibit no turn-of-the-month effect.

B. Returns at the turn-of-the-month in other countries

Given that the turn-of-the-month is pervasive across various categories of stocks and given that the phenomenon does not appear to be explained by volatility of returns, the possibility that the effect is due to some peculiarity of U.S. trading mechanics arises. Such mechanics might be considered part of a micro-structure explanation. One way to address the possibility of whether it is due to market mechanics unique to U.S. markets is to consider other countries.

To consider returns in other countries, we use data from *Datastream***.** In order for a country to be included in our analysis, we require that *Datastream* have a reliable daily market index for the country beginning no later than January 1, 1990. The 34 countries listed in table 5 satisfy that criterion.[1] With each country index, we use all available daily data to calculate day-of-the-month returns. The beginning date for each country is given in the corresponding panel of table 5. The ending date of the data for each country is January 31, 2006.

We should note that we are not the first to explore a turn-of-the-month effect in non-U.S. returns. Cadsby and Ratner (1992) examine data for nine countries with data covering various time intervals but all ending in 1987 or 1988. They report a turn-of-the-month effect for Canada, the U.K., Australia, Switzerland, and West Germany, but not for Japan, Hong Kong, France or Italy.

[1] *Datastream* lists 39 countries (including the U.S.) with daily index data starting on or before January 1, 1990. Of these, we delete the following four: Bangladesh because the index has the same level each day during 2002-2004, Jordan because of infrequent trading, Nigeria because the data stop with 1996, and India for infrequent trading in years before 1994.

We will not go through the details of each country here, but, arguably, a turn-of-the-month effect occurs in every country but one in that, in every country but one, the average daily turn-of-the-month return is higher than the average return over all other days. That happening is itself remarkable. Using a stiffer standard, the t-statistic for the difference between the mean turn-of-the-month return and the mean return for all other days is greater than 1.95 in 28 of them. In an additional two countries, the t-statistic is greater than 1.50 and for both of these, the numerical value of the difference is large even if not statistically significant. For example, with Taiwan, the mean turn-of-the-month return is 0.12%, while the mean return over all other days is 0.00%, but the t-statistic for the difference is only 1.59. It is easier to list those countries that do not exhibit a meaningful turn-of-the-month effect than to list those that do. These include Argentina, Colombia, Italy, and Malaysia.

The turn-of-the-month effect is not just a U.S. phenomenon.

C. T-bill and bond returns

Equity returns are often thought of as being determined by a risk-free rate plus a spread to compensate for risk. Our analysis of standard deviation of returns indicates that the turn-of-the-month effect is not due to higher "risk" as measured by this traditional metric. Perhaps it is due to an increase in interest rates at the turn-of-the-month. To consider that possibility, we examine returns for 90-day t-bills, 10-year t-bonds, investment grade corporate bonds, and high yield corporate bonds. Our analysis is similar in spirit to the analysis of Jordan and Jordan (1991) who find no daily pattern across months in returns to the Dow Jones Composite Bond Index over the period 1963-1986.

To calculate daily returns for t-bills and t-bonds, we use data from the Federal Reserve website. To calculate daily realized returns on the 90-day t-bill, the daily yields of the constant

maturity 90-day (CMT) t-bill are converted to prices. The realized return for day t is calculated as the change in price from the closing price on day t-1 to the closing price on day t divided by the closing price on day t-1. An equivalent calculation is used to calculate daily returns for the 10-year CMT bond. For t-bills, data are available for 1954-2005. For 10-year t-bonds, data are available for 1962-2005. Realized returns for investment grade corporate bonds are calculated using the Lehman U.S. Corporate Investment Grade Bond Index from *Datastream*. Realized returns for high yield corporate bonds are calculated using the Lehman U.S. Universal High Yield Corporate Bond Index also from *Datastream*. For corporate bonds, the realized return for day t is calculated as the change in the index from the close on day t-1 to the close on day t divided by the close of the index on day t-1. For investment grade bonds, data are available for 1989-2005. For high yield bonds, data are available for 1998-2005.

Table 6 gives turn-of-the-month returns and returns for all other days for bills and bonds. The results with bills and bonds are, at best, ambiguous. As shown in panel A, realized returns for the 90-day t-bill evidence a negative turn-of-the-month effect. That is, the mean return over the four-day turn-of-the-month interval is mildly negative but statistically significantly less than the mean return for all other days. Specifically, the mean daily turn-of-the-month return is -0.0012% while the mean return for all other days is 0.0002%. The t-statistic for the difference is -2.54.

Contrarily, as shown in panel B, 10-year t-bonds exhibit a positive turn-of-the-month effect although it is not quite significant at traditionally accepted levels of significance. The mean daily turn-of-the-month return is 0.034%, while the mean return for all other days is -0.011%. The t-statistic for the difference is 1.57.

Investment grade corporate bonds (panel C) evidence a reasonably strong positive turn-of-the-month effect. The mean daily turn-of-the-month return is 0.025%. In comparison, the mean daily return over all other days is -0.005. This difference is statistically significant (t-statistic = 2.16). High yield corporate bonds exhibit a mild positive turn-of-the-month effect in which the mean daily return over the turn-of-the-month is 0.016% in comparison with a mean return over all other days of 0.000%, but the t-statistic here is only 0.65. We should note, however, that the time series for the high yield index encompasses only 1998-2005. The data for the other interest rate series all begin prior to 1989 and the t-bill data extend back to 1954.

Thus, there is some evidence of a turn-of-the-month effect in interest rates. However, given that the security with the longest time series, t-bills, shows a negative turn-of-the-month effect, and given that the t-bill rate is most typically thought of as the closest to a short-term risk-free rate, it is difficult to make the case that the turn-of-the-month effect in equities is due to a market-wide increase in investors' base-rate required return at the turn-of-the-month.

D. The payday hypothesis

D.1. Overview

Ogden (1990) proposes that the turn-of-the-month effect occurs because investors, at least in the U.S., receive the bulk of their compensation from wages, dividends, and interest earnings at month-ends. He refers to these as "liquid" profits. He proposes that the turn-of-the-month effect occurs as investors attempt to become invested at the turn-of-the-month. He further argues that liquid profits are likely to be higher when Federal Reserve monetary policy is "loose." If so, he argues, the turn-of-the-month effect should be more pronounced when Fed monetary policy is loose.

To test his hypothesis, among other things, Ogden regresses daily CRSP market returns against the spread between the Fed funds rate and the 30-day t-bill yield using data for the period 1969-1986. He finds a positive relationship and concludes that the evidence supports his hypothesis. That is, the turn-of-the-month effect is more pronounced when monetary policy is loose.

Ogden's proposed explanation of the turn-of-the-month effect has a certain intuitive appeal for a general turn-of-the-month pattern. However, the cash that investors use to purchase stocks must come from somewhere. Presumably firms that are paying wages, dividends and interest are selling bills and bonds (or even equity) to obtain funds. If so, we should observe an offsetting effect in bills and bonds. We do observe a negative turn-of-the-month effect in 90-day t-bill returns, but we observe a strong positive turn-of-the-month effect in t-bonds and a mild positive effect in corporate bonds. These results weaken support for Ogden's argument.

Nevertheless, we undertake two tests that we believe are more direct tests of Ogden's proposed explanation that we have labeled the payday hypothesis. The first involves daily NYSE trading volume. The second involves the daily net flow of funds to or from mutual funds.

D.2. Daily volume

It is reasonable to expect that, if the payday hypothesis explains the turn-of-the-month effect, trading volume would be higher, at least on average, over the turn-of-the-month than over all other days.

To determine whether trading volume is higher at the turn-of-the-month, we study daily NYSE trading volume in shares and in dollars using CRSP data.[2] For this analysis, we calculate daily standardized volume. To do so, for each 20-day period that surrounds the end of each month over the period 1926-2005, we calculate average NYSE volume in shares and in dollars.

We then divide the daily volume for each of these 20 days by the average volume of the 20-day interval to get the standardized volume for that day. For each day relative to the turn-of-the-month, we calculate the average of these standardized volumes for the entire 1926-2005 time period. That is, we calculate the average standardized volume for day -10, day -9 and so forth.

The mean standardized volumes by day of the month are shown in figure 5. The figure shows no evidence of higher volume at the turn-of-the-month. If anything, turn-of-the-month volume is lower than volume on other days. The mean standardized daily volume both in shares and in dollars during the turn-of-the-month interval is 0.98, while it is 1.02 over all other days. Indeed, day -1, which regularly provides the biggest "kick" to the turn-of-the-month return, has the lowest standardized volume of all trading days.

D.3 Daily net mutual fund flows

Many individuals hold shares indirectly through institutional investment funds. Many individuals also have a fraction of their compensation directly deposited into a retirement account with an institutional investor. If wages, dividends and interest payments are concentrated at month-ends and if it is the net flow of these that causes the turn-of-the-month effect in equity returns, it would seem reasonable to expect that net flows to equity mutual funds would also exhibit a turn-of-the-month pattern. To consider whether the data support this expectation, we examine daily net flows to equity funds by day of the month.

We use daily net funds flow from TrimTabs Daily Mutual Fund Flow data for the period February 1998 (the month in which the data begin) through December 2005. Currently TrimTabs tracks daily net flows for 1,694 individual funds from 86 fund families that represent approximately 20% of total dollars invested in mutual funds. Edelen and Warner (2001) describe the algorithm used by TrimTabs to calculate the daily net flow. Edelen and Warner

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[2] We do not include Nasdaq volume because Nasdaq double counts some or all volume.

(2001), Goetzman, Ivkovic, and Rouwenhorst (2001), and Greene and Hodges (2002) discuss potential errors and error rates in TrimTabs data. Perhaps the most severe of these is late reporting by some funds. Late reporting could cause a one-day lag in reporting by some funds. It is unclear whether one-day lags in reported flows for some funds would affect our analysis. Assuming that each fund consistently reports its flows, if there is a turn-of-the-month pattern in net funds flows during the four-day turn-of-the-month interval, the pattern should show up anyway, albeit with a lag.

We first consider whether the turn-of-the-month effect occurs in equity returns during the time period for which we have TrimTabs data. Table 7 gives turn-of-the-month VW and EW market returns for the period February 1998-December 2005. The data do exhibit a turn-of-the-month pattern with both VW and EW returns. In general, the difference between the average daily turn-of-the-month return and the return for all other days is similar to those for the full 1926-2005 time period. With VW returns the difference is 0.15% for the 1926-2005 period, while it is 0.12 for the 1998-2005 period. With EW returns, the difference is 0.16 for both the full time period and for the 1998-2005 period. One difference between the full time period returns and the 1998-2005 returns is that the t-statistic with VW returns is only 1.50 for 1997-2005. However, with EW returns, the t-statistic is 2.59. Thus there is a turn-of-the-month effect in 1997-2005, but it is less statistically, though not less economically, significant with VW returns than during 1926-2005.

We now consider net funds flow into equity funds. We classify equity fund by the funds' asset allocation. Mutual funds allocate their assets into four broad categories: cash, equity, bonds and other (including REITS, commodities and derivatives). Our TrimTabs data do not identify the funds by category. We use *MorningStar* to determine the asset allocation of each

fund. We classify a fund as an equity fund if 50% or more of its asset are allocated to equity. With this criterion, 951 of the 1695 TrimTab funds are classified as equity funds.[3]

Figure 6 gives the dollar amount of daily net equity funds flow by day of the month for the period February 1998-December 2005 for the equity funds. As we have argued, if it is a payday effect that is causing the turn-of-the-month effect in equity returns, net equity funds flow should be high at the turn-of-the-month. Given that cash deposited with a mutual fund is received throughout the day and may not be invested until the following day, it is not clear whether the net flow should be contemporaneous with or lead turn-of-the-month returns. Regardless, we would expect to observe three or four consecutive days with a large positive net funds flow. That is not what we see. Rather, the net flow on day -2 is negative; the net flow on day -1 is positive; it is negative on day +1, and positive on days +2 and +3. It is difficult to discern any pattern in net funds flow to equity mutual funds that supports the payday hypothesis.

D.4 The payday hypothesis: In sum

In sum, neither of our tests can rule out that the turn-of-the-month pattern is due to a payday effect in equity returns, but clearly neither of them provide any support for the hypothesis. The turn-of-the-month pattern appears to not be due to a rush by investors to become invested in equities at the turn-of-the-month.

V. Summary and conclusions

Lakonishok and Smidt (1988) coined the phrase the "turn-of-the-month effect" to describe the unusually high returns earned by DJIA equities over the four-day interval beginning with the last trading day of the month and ending three days later. Their study covers the years 1897-1986. We find that the turn-of-the-month effect is pronounced over the recent two decades

[3] Our search of *Morningstar* does not return any result for 408 or 24% of TrimTab funds. We find that the net flow of funds into these funds is small and generally negative on each of the turn-of-the-month trading days. Therefore,

such that, when we combine our findings with those of Lakonishok and Smidt, the result is that over the 109-year interval of 1897-2005, on average, all of the positive return to equities occurred during the turn-of-the-month interval. Thus, on average, over the other 16 trading days of the month investors received no reward for bearing market risk.

We explore this turn-of-the-month effect in detail using CRSP data for the period 1926-2005. We find that the turn-of-the-month effect is not confined to small and low-price stocks; it is not confined to calendar year-ends or calendar quarter-ends; it is not due to higher volatility of returns at the turn-of-the-month; it is not related to an increase in the risk-free rate or interest rates in general at the turn-of-the-month; and it is not confined to the U.S. We further find that it does not appear to be due to a concentration of buying of shares at the turn-of-the-month in that trading volume is no higher at the turn-of-the-month than on other trading days and the net flows of funds to equity funds is not systematically higher at the turn-of-the-month than during other days of the month.

The turn-of-the-month effect in equity returns poses a challenge to both "rational" and "behavioral" models of security pricing.

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our conclusion is not likely to be altered by inclusion of these funds.

REFERENCES

Ariel, Robert A., 1987, A monthly effect in stock returns, Journal of Financial Economics 18, 161-174.

Ball, Ray, S. P. Kothari, and Jay Shanken, 1995, Problems in measuring portfolio performance: An application to contrarian investment strategies, Journal of Financial Economics 38, 79-107.

Banz, Rolf W., 1981, The relationship between return and market value of common stocks, Journal of Financial Economics 9, 3-18.

Basu, Sanjoy, 1977, Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis, Journal of Finance 32, 663-682.

Baytas, Ahmet, and Nusret Cakici, 1999, Do markets overreact: International evidence, Journal of Banking & Finance 23, 1121-1144.

Bernhardt, Dan, and Ryan J. Davies, 2005, Painting the tape: Aggregate evidence, working paper, Department of Economics, University of Illinois.

Cadsby, Charles B., and Mitchell Ratner, 1992, Turn-of-month and pre-holiday effects on stock returns: Some international evidence, Journal of Banking and Finance 16, 497-509.

Carhart, Mark M., 1997, On persistence in mutual fund performance, Journal of Finance 52, 57-82.

Carhart, Mark M., Ron Kaniel, David K. Musto, and Adam V. Reed, 2002, Leaning for the tape: Evidence of gaming behavior in equity mutual funds, Journal of Finance 57(2), 661-693.

Chan, K. C., 1986, Can tax-loss selling explain the January seasonal in stock returns? Journal of Finance 41, 1115-1128.

Chan, K. C., Nai-fu Chen, and David A. Hsieh, 1985, An exploratory investigation of the firm size effect, Journal of Financial Economics 14, 451-471.

Conrad, Jennifer, and Gautam Kaul, 1993, Long-term market overreaction or biases in computed returns? Journal of Finance, 48, 39-63.

Daniel, Kent, David Hirshleifer, and Avanidhar Subrahmanyam, 1998, Investor psychology and security market under- and over- reactions, Journal of Finance 53(6), 1839-1885.

Edelen, Roger M., and Jerold B. Warner, 2001, Aggregate price effects of institutional trading: A study of mutual fund flow and market returns, Journal of Financial Economics 59, 195-220.

Fama, Eugene F., and Kenneth R. French, 1993, Common risk factors in the returns on stocks and bonds, Journal of Financial Economics 33, 3-56.

Fosback, Norman, 1976, Stock market logic (The Institute for Econometric Research, Fort Lauderdale, FL).

Goetzmann, William N., Zoran Ivković, and K. Geert Rouwenhorst, 2001, Day trading international mutual funds: Evidence and policy solutions, Journal of Financial and Quantitative Analysis 36(3), 287-309.

Greene, Jason T., and Charles W. Hodges, 2002, The dilution impact of daily fund flows on open-end mutual funds, Journal of Financial Economics 65, 131-158.

Haugen, Robert A., and Josef Lakonishok, 1988, The incredible January effect: The stock market's unsolved mystery (Dow-Jones Irwin, Homewood, IL).

Hensel, Chris R., and William T. Ziemba, 1996, Investment results from exploiting turn-of-the-month effects, Journal of Portfolio Management 22(3), 17-23.

Hirsch, Yale, 1979, Stock trader's almanac (The Hirsch Organization, Old Tappen, NJ).

Hong, Harrison, and Jeremy C. Stein, 1999, A unified theory of underreaction, momentum trading, and overreaction in asset markets, Journal of Finance 54(6), 2143-2184.

Jordan, Susan D. and Bradford D. Jordan, 1991, Seasonality in daily bond returns, The Journal of Financial and Quantitative Analysis 26 (2), 269-285.

Jones, Steven L., Winson Lee and Rudolf Apenbrink, 1991, New evidence on the January effect before personal income taxes, Journal of Finance 46, 1909-1924.

Kunkel, Robert A., and William S. Compton, 1998, A tax-free exploitation of the turn-of-the-month effect: C.R.E.F., Financial Services Review 7(1), 11-23.

Lakonishok, Josef, and Seymour Smidt, 1988, Are seasonal anomalies real? A ninety-year perspective, Review of Financial Studies 1(4), 403-425.

Lintner, J., 1965, The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets, Review of Economics and Statistics 47, 13-37.

Merrill, Arthur A., 1966, Behavior of prices on Wall Street (The Analysis Press, Chappaqua, NY).

Ogden, Joseph P., 1990, Turn-of-month evaluations of liquid profits and stock returns: A common explanation for the monthly and January effects, Journal of Finance 45(4), 1259-1272.

Reinganum, Marc R., 1981, Misspecification of capital asset pricing: Empirical anomalies based on earnings' yields and market values, Journal of Financial Economics 9, 19-46.

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.

Rozeff, Michael S., and William R. Kinney, 1976, Capital market seasonality: The case of stock returns, Journal of Financial Economics 3, 379-402.

Schwert, G. William, 2003, Anomalies and market efficiency, in G. M. Constantinides, M. Harris, and R. Stulz, eds.: Handbook of the Economics of Finance (Elsevier North-Holland).

Sharpe, William F., 1964, Capital asset prices: A theory of market equilibrium under conditions of risk, Journal of Finance 19(3), 425-442.

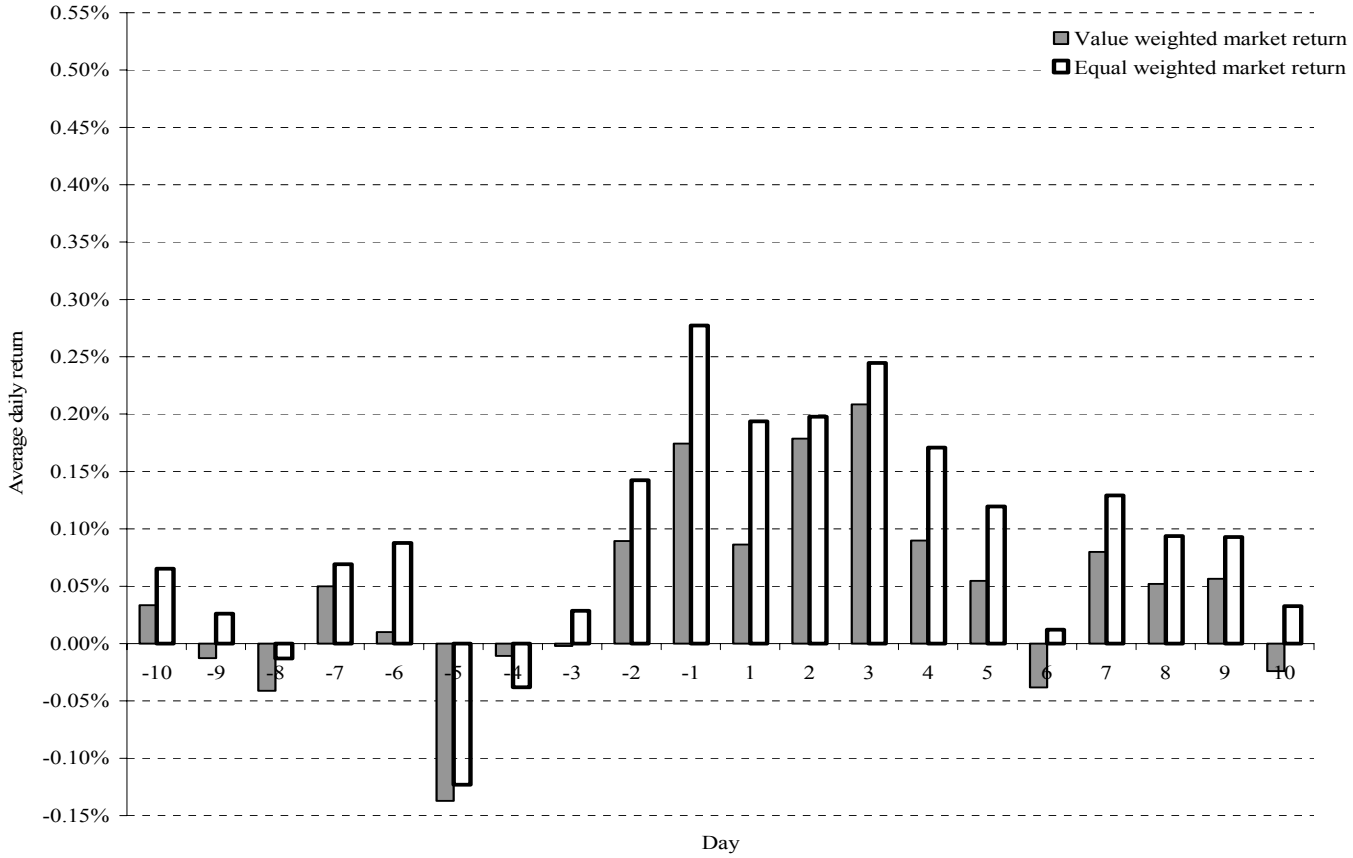

Figure 1. Average daily value-weighted and equal-weighted market returns for the last 10 trading days and the first 10 trading days of the month, 1926-1986. Returns are calculated with the Center for Research in Security Prices (CRSP) U.S. stock market indices. Shaded bars represent value-weighted returns. Non-shaded bars represent equal-weighted returns. The vertical axis gives the average percentage daily return. The horizontal axis gives the day of the month relative to the turn-of-the-month. Day -1 is the last trading day of the month. Day +1 is the first trading day of the month and so on.

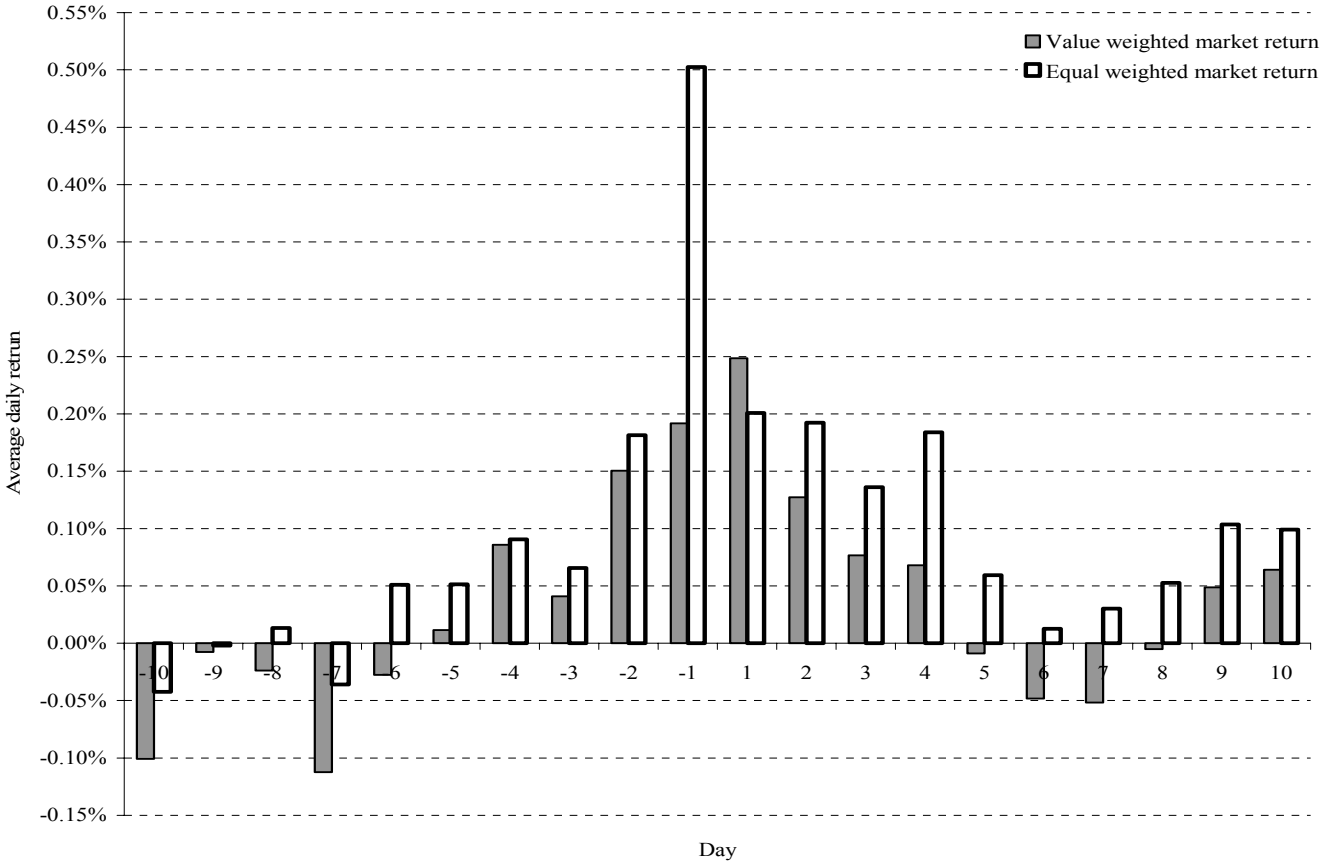

Figure 2. Average daily value-weighted and equal-weighted market returns for the last 10 trading days and the first 10 trading days of the month, 1987-2005. Returns are calculated with the Center for Research in Security Prices (CRSP) U.S. stock market indices. Shaded bars represent value-weighted returns. Non-shaded bars represent equal-weighted returns. The vertical axis gives the average percentage daily return. The horizontal axis gives the day of the month relative to the turn-of-the-month. Day -1 is the last trading day of the month. Day +1 is the first trading day of the month and so on.

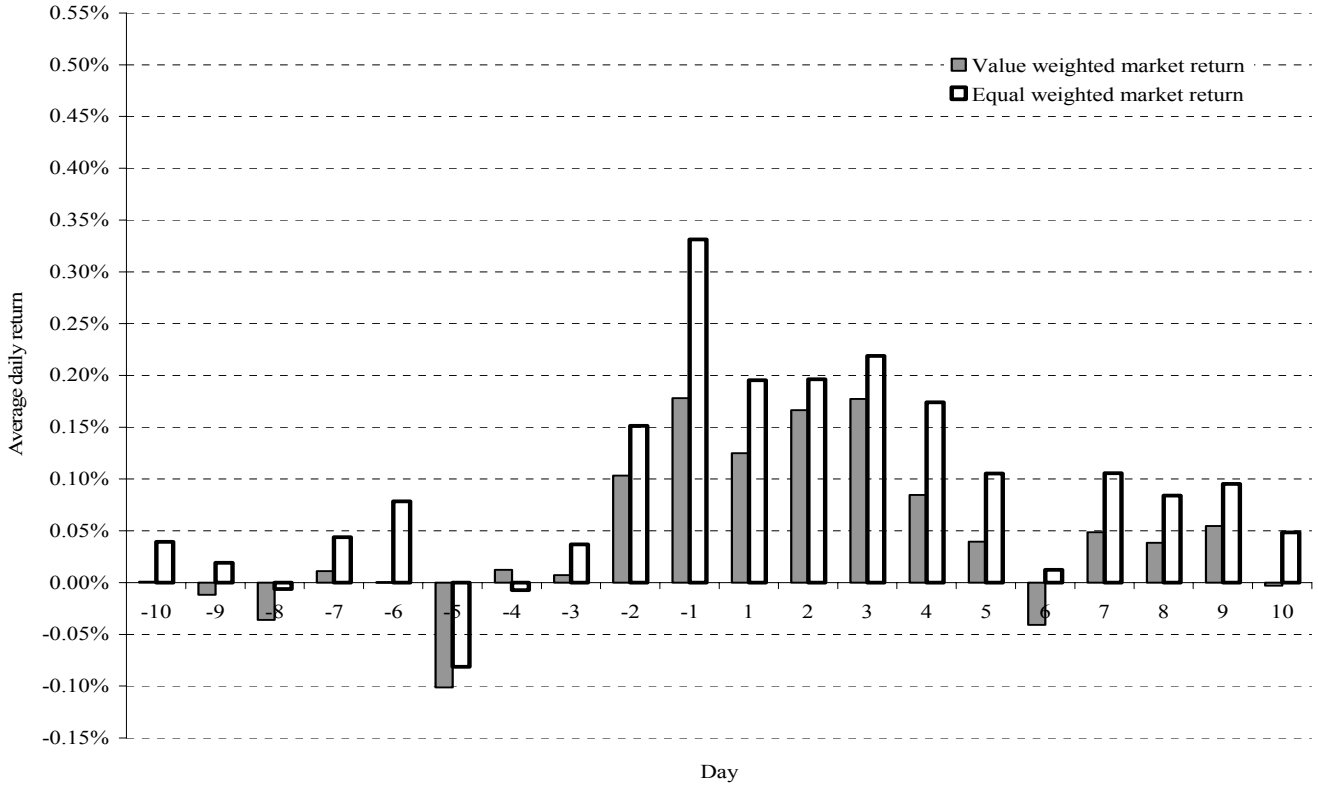

Figure 3. Average daily value-weighted and equal-weighted market returns for the last 10 trading days and the first 10 trading days of the month, 1926-2005. Returns are calculated with the Center for Research in Security Prices (CRSP) U.S. stock market indices. Shaded bars represent value-weighted returns. Non-shaded bars represent equal-weighted returns. The vertical axis gives the average percentage daily return. The horizontal axis gives the day of the month relative to the turn-of-the-month. Day -1 is the last trading day of the month. Day +1 is the first trading day of the month and so on.

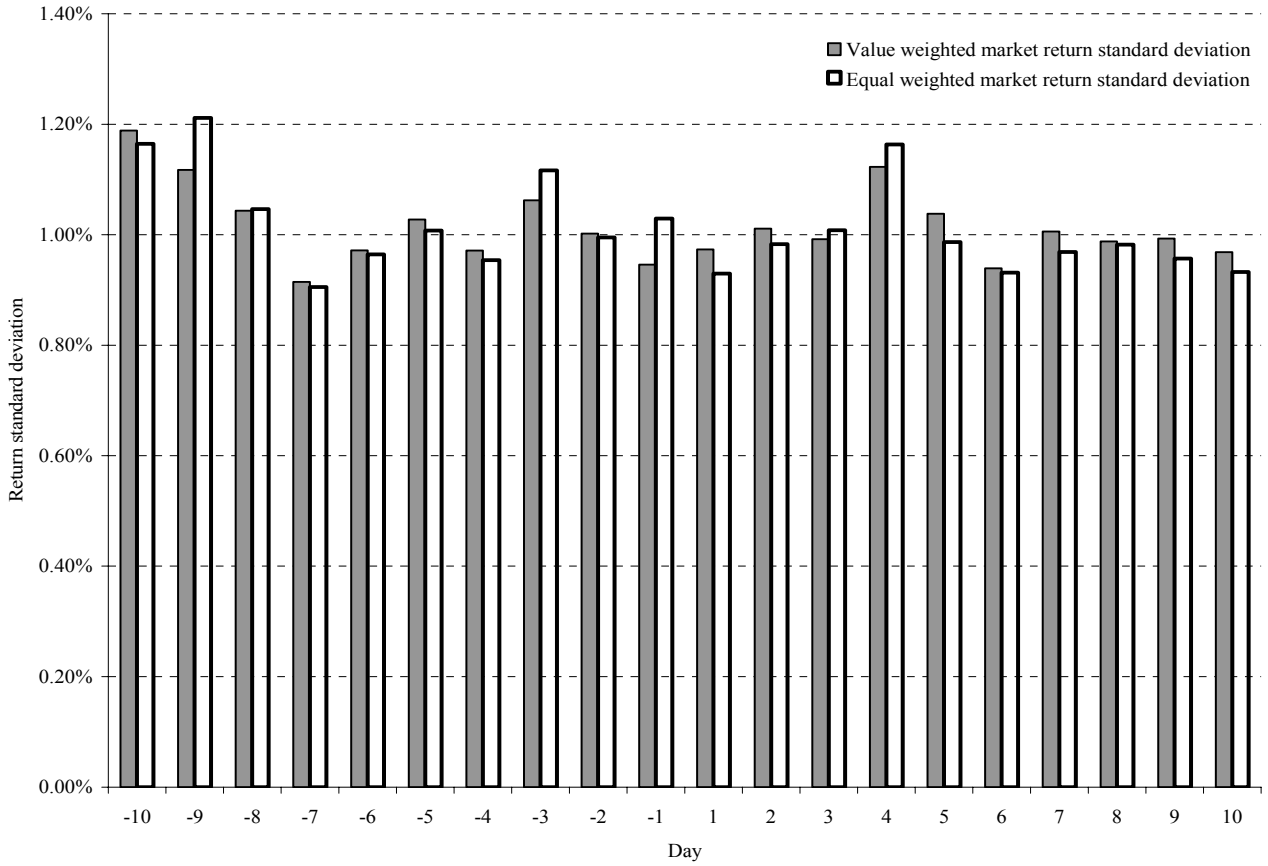

Figure 4. Daily volatility for value-weighted and equal-weighted U.S. stock market returns for the last 10 trading days and the first 10 trading days of the month, 1926-2005. Volatility is calculated as the standard deviation of daily returns using the Center for Research in Security Prices (CRSP) U.S. stock market indices. Shaded bars represent standard deviations calculated with value-weighted returns. Non-shaded bars represent standard deviations calculated with equal-weighted returns. The vertical axis gives the daily standard deviation of return in percent. The horizontal axis gives the day of the month relative to the turn-of-the-month. Day -1 is the last trading day of the month. Day +1 is the first trading day of the month and so on.

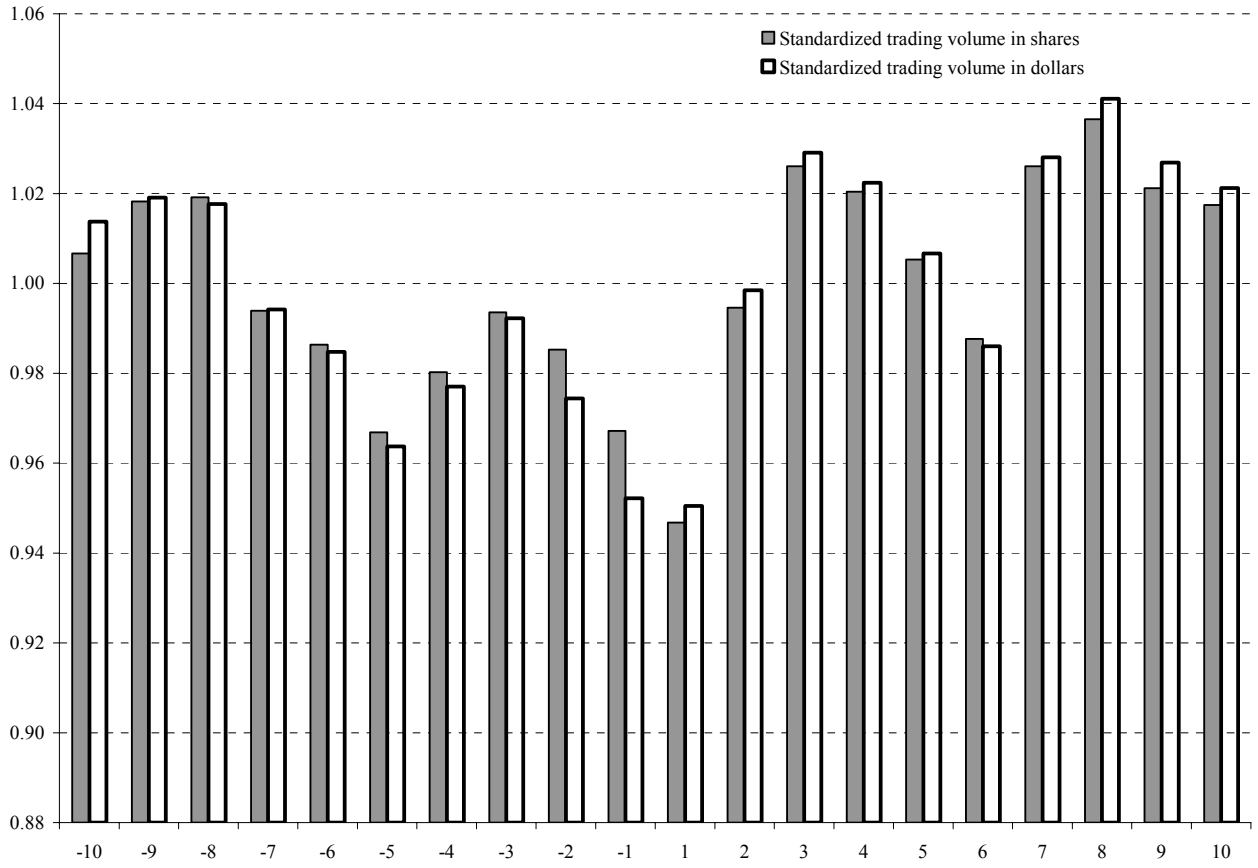

Figure 5. Average Daily New York Stock Exchange (NYSE) Trading Volume, 1926-2005. The vertical axis of this figure gives the standardized average daily NYSE trading volume in number of shares and in dollar value traded for the period 1926-2005. The volume data are from the Center for Research in Security Prices (CRSP) database. Standardized volume is calculated for the 20-day period surrounding the turn-of-the-month. We first calculate the average trading volume for each 20-day period. The trading volume for each day of the 20-day interval is divided by the average volume to obtain the standardized daily volume. The average of these standardized volumes is calculated for each day beginning with day -10 through day +10. The vertical axis gives the mean standardized volume. Standardized volume in number of shares is represented by the shaded bars. Standardized volume in dollars is represented by the unshaded bars. The horizontal axis gives the day of the month relative to the turn-of-the-month. Day -1 is the last trading day of the month, day +1 is the first trading day of the month, day +2 is the second trading day of the month, and so on.

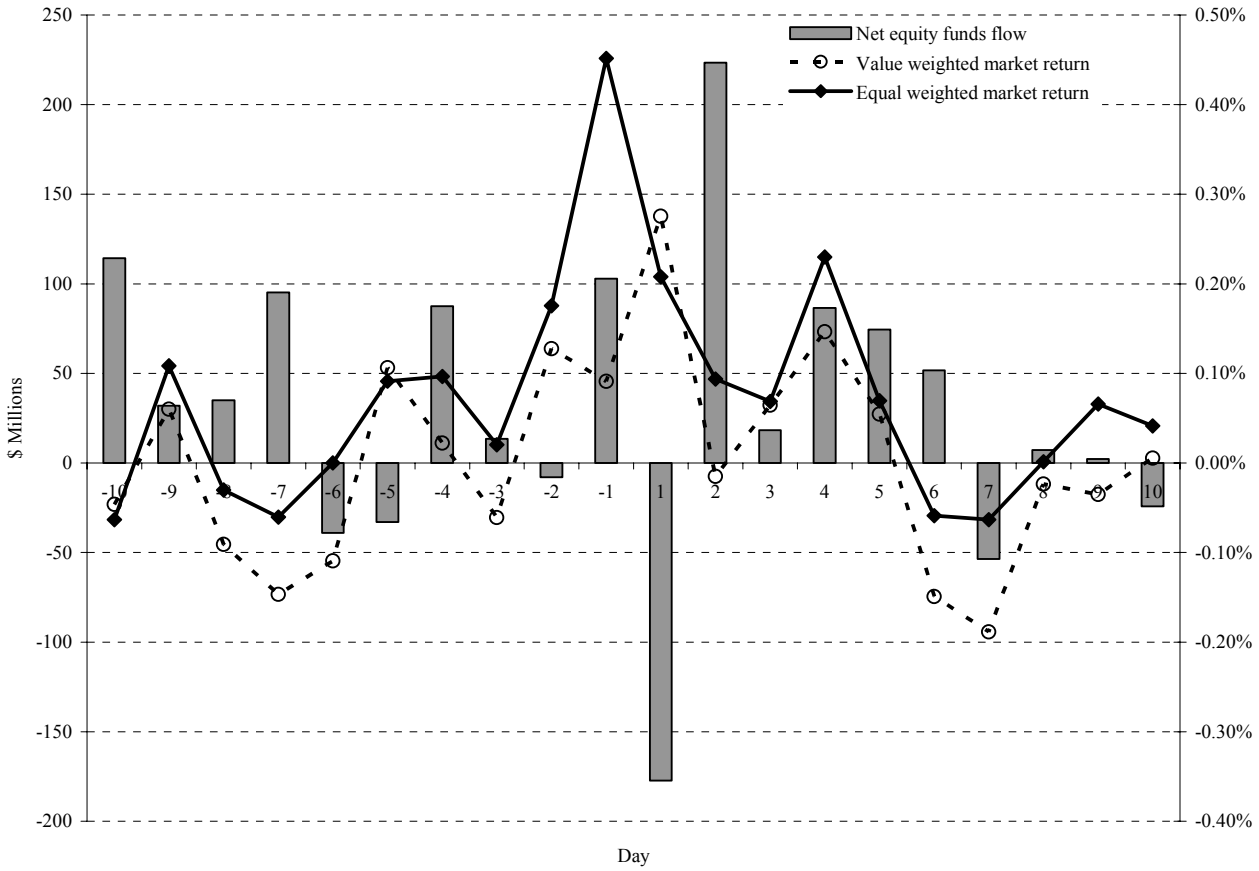

Figure 6. Daily Net Funds Flow to Equity Mutual Funds Tracked by TrimTabs, February 1998-December 2005. This figure gives daily net funds flow to 951 equity funds tracked by TrimTabs for the period February 1998-December 2005. Equity funds are defined as funds with equity assets of no less than 50% of total assets according to *Morningstar* asset allocation data. Day -1 is the last trading day of the month, day +1 is the first trading day of the month, day +2 is the second trading day of the month, and so on. The horizontal axis gives the day of the month relative to the turn-of-the-month. The right-hand vertical axis gives the average daily return. The right vertical axis gives the average daily dollar amount of the net funds flow in millions of dollars.

Table 1
Daily Value-Weighted and Equal-Weighted U.S. Stock Market Returns at the Turn-of-the-Month, 1926-2005

This table gives average daily value-weighted and equal-weighted U.S. stock market returns calculated with the Center for Research in Security Prices (CRSP) market indices for the years 1926-2005 and for two subperiods. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the month. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" is trading day -10 through -2 before the end of the month and trading day +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel (or subpanel) is greater than zero. The calculations in panels A, B, and C use value-weighted market returns. The calculations in panels D, E, and F use equal-weighted market returns.

CRSP value-weighted market returns							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Panel A. January 1926 - December 1986							
Mean daily return (%)	0.17	0.09	0.18	0.21	0.16	0.01	0.15
t-statistic	5.01	2.43	4.83	5.62	8.50	0.98	7.07
Positive (%)	63	59	65	62	68	55	62
Panel B. January 1987 - December 2005							
Mean daily return (%)	0.19	0.25	0.13	0.08	0.15	-0.00	0.15
t-statistic	2.99	3.73	1.84	1.21	4.35	-0.07	3.78
Positive (%)	63	63	59	55	66	58	61
Panel C. January 1926 - December 2005							
Mean daily return (%)	0.18	0.12	0.17	0.18	0.16	0.01	0.15
t-statistic	5.83	3.97	5.10	5.53	9.60	0.87	8.06
Positive (%)	63	60	64	60	68	56	62
CRSP equal-weighted market returns							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Panel D. January 1926 - December 1986							
Mean daily return (%)	0.28	0.19	0.20	0.24	0.22	0.05	0.17
t-statistic	6.91	5.35	5.21	6.11	9.98	3.57	7.39
Positive (%)	69	62	64	65	72	61	64
Panel E. January 1987 - December 2005							
Mean daily return (%)	0.50	0.20	0.19	0.14	0.25	0.05	0.20
t-statistic	9.34	4.02	3.48	2.89	7.58	2.84	6.01
Positive (%)	85	68	67	62	79	65	75
Panel F. January 1926 - December 2005							
Mean daily return (%)	0.33	0.20	0.20	0.22	0.23	0.05	0.18
t-statistic	9.96	6.51	6.19	6.73	12.29	4.40	9.23
Positive (%)	73	63	65	64	73	62	67

Table 2
Excess Daily Value-Weighted and Equal-Weighted U.S. Stock Market Returns at the Turn-of-the-Month, 1926-2005

This table gives average excess daily value-weighted and equal-weighted U.S. stock market returns calculated with the Center for Research in Security Prices (CRSP) market indices for the years 1926-2005. The excess return is calculated as the daily stock market return less the daily yield of the 30-day U.S. treasury-bill (t-bill). The daily yield is calculated by dividing the monthly yield as of the start of the month by the number of days in the month. The yield data are from Ken French's website. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the months. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third trading day of the following month. "Other days" is trading day -10 through -2 before the end of the month and trading day +4 through +10 after the beginning of the month. "Difference" is the average daily excess return for the interval day [-1, +3] less the average daily excess return for other days. The t-statistic tests the hypothesis that the average excess return in the row above it is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel is positive. The calculations in panels A, B and C use value-weighted U.S. stock market returns. The calculations in panel D, E, and F use equal-weighted U.S stock market returns.

Value-weighted market return less return on 30-day t-bill							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Panel A. January 1926 - December 1986							
Mean daily return (%)	0.14	0.08	0.19	0.19	0.15	0.01	0.14
t-statistic	4.23	2.18	5.35	5.11	8.05	0.53	6.89
Positive (%)	62	58	64	61	67	55	63
Panel B. January 1987 - December 2005							
Mean daily return (%)	0.17	0.23	0.11	0.06	0.14	-0.01	0.16
t-statistic	2.69	3.47	1.59	0.94	4.03	-0.78	3.92
Positive (%)	62	61	57	54	65	55	64
Panel C. January 1926 - December 2005							
Mean daily return (%)	0.15	0.11	0.17	0.16	0.15	0.00	0.15
t-statistic	5.02	3.64	5.37	4.94	8.98	0.15	7.93
Positive (%)	62	58	63	59	67	55	63
Equal-weighted market return less return on 30-day t-bill							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Panel D. January 1926 - December 1986							
Mean daily return (%)	0.25	0.18	0.20	0.23	0.22	0.04	0.17
t-statistic	6.44	4.96	5.63	5.75	9.52	3.01	7.30
Positive (%)	67	61	64	64	71	59	63
Panel E. January 1987 - December 2005							
Mean daily return (%)	0.48	0.18	0.17	0.12	0.24	0.04	0.20
t-statistic	9.03	3.67	3.17	2.53	7.25	2.17	6.22
Positive (%)	85	68	66	60	78	63	75
Panel F. January 1926 - December 2005							
Mean daily return (%)	0.30	0.18	0.20	0.20	0.22	0.04	0.18
t-statistic	9.50	6.02	6.45	6.26	11.68	3.61	9.16
Positive (%)	71	63	65	63	73	60	66

Table 3
Daily Value-Weighted and Equal-Weighted U.S. Stock Market Returns at the Turn-of-the-Month for Various Categories of Common Stocks, 1926-2005

This table gives average daily value-weighted and equal-weighted returns for various categories of U.S. common stocks calculated with the Center for Research in Security Prices (CRSP) indices for the years 1926-2005. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the month. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" are days -10 through -2 before the end of the month and days +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel is greater than zero. The calculations in panel A use value-weighted returns. The calculations in panel B use equal-weighted returns. Panel A.1 gives returns for the CRSP index of large-cap stocks (i.e., decile 10 of the CRSP size portfolios). Panel A.2 gives returns for the CRSP index of small-cap stocks (i.e., decile 1 of the CRSP size portfolios). Panels A.3 and B.3 give returns for stocks with prices greater than $5.00. Panels A.4 and B.4 give returns for stocks with prices less than or equal to $5.00. Panels A.5 and B.5 give market returns for the December-January turn-of-the-month only. Panels A.6 and B.6 give market returns for all turns-of-the-month excluding the December-January turn-of-the-month. Panels A.7 and B.7 give market returns for the calendar year quarter-ends only. Panels A.8 and B.8 give market returns for turns-of-the-month that are not calendar-year quarter-ends.

Table 3 -- continued

Panel A: CRSP value-weighted return indices	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other days	Difference
Panel A.1: Large-cap portfolio (largest decile of stocks by market capitalization)							
Mean daily return (%)	0.16	0.12	0.17	0.18	0.15	0.01	0.15
t-statistic	5.15	3.73	5.21	5.46	9.35	0.81	7.81
Positive (%)	61	59	62	60	66	55	61
Panel A.2: Small-cap portfolio (smallest decile of stocks by market capitalization)							
Mean daily return (%)	0.33	0.32	0.16	0.23	0.25	0.03	0.23
t-statistic	8.23	7.29	3.96	4.76	9.35	1.81	8.54
Positive (%)	66	58	56	59	65	55	61
Panel A.3: Stocks with prices greater than $5.00							
Mean daily return (%)	0.21	0.16	0.21	0.21	0.19	0.04	0.15
t-statistic	6.87	5.25	6.35	6.50	11.73	4.55	8.22
Positive (%)	64	60	66	62	71	61	62
Panel A.4: Stocks with prices less than or equal to $5.00							
Mean daily return (%)	0.41	0.28	0.15	0.29	0.27	0.03	0.24
t-statistic	7.46	5.09	2.73	5.26	8.82	1.94	7.53
Positive (%)	64	56	55	58	63	54	60
Panel A.5: Market returns excluding the December-January turns-of-the-month							
Mean daily return (%)	0.16	0.13	0.14	0.19	0.15	0.00	0.15
t-statistic	5.01	4.14	4.11	5.51	8.84	0.01	7.86
Positive (%)	62	61	63	61	68	55	63
Panel A.6: Market returns for December-January turns-of-the-month only							
Mean daily return (%)	0.34	0.03	0.51	0.06	0.23	0.10	0.13
t-statistic	4.90	0.24	3.53	0.70	3.90	3.84	1.87
Positive (%)	75	49	74	53	65	65	56
Panel A.7: Market returns for quarter-end turns-of-the-month							
Mean daily return (%)	0.12	0.11	0.27	0.14	0.16	0.02	0.14
t-statistic	2.48	1.94	4.83	2.86	5.41	1.18	4.12
Positive (%)	61	57	67	58	64	57	61
Panel A.8: Market returns for non-quarter-end turns-of-the-month							
Mean daily return (%)	0.21	0.13	0.11	0.20	0.16	0.00	0.16
t-statistic	5.33	3.51	2.84	4.73	7.93	0.27	6.99
Positive (%)	64	61	63	61	70	55	62

Table 3 – continued

Panel B: CRSP equal-weighted market return indices	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other days	Difference
Panel B.3: Stocks with prices greater than $5.00							
Mean daily return (%)	0.30	0.18	0.21	0.22	0.23	0.06	0.17
t-statistic	9.56	6.12	6.62	7.00	12.94	5.39	8.83
Positive (%)	73	63	67	65	74	64	65
Panel B.4: Stocks with prices less than or equal to $5.00							
Mean daily return (%)	0.37	0.30	0.17	0.19	0.25	0.01	0.24
t-statistic	7.52	5.83	3.84	4.17	8.26	0.44	8.22
Positive (%)	65	56	55	57	61	51	58
Panel B.5: Market returns excluding the December-January turns-of-the-month							
Mean daily return (%)	0.27	0.13	0.14	0.20	0.18	0.04	0.14
t-statistic	7.96	4.49	4.35	5.71	9.86	3.11	7.27
Positive (%)	71	62	64	64	72	61	65
Panel B.6: Market returns for December-January turns-of-the-month only							
Mean daily return (%)	1.06	0.87	0.84	0.47	0.81	0.20	0.61
t-statistic	7.91	6.98	6.18	4.92	9.96	6.12	7.43
Positive (%)	93	80	79	69	90	76	86
Panel B.7: Market returns for quarter-end turns-of-the-month							
Mean daily return (%)	0.43	0.29	0.36	0.25	0.33	0.06	0.27
t-statistic	6.94	4.93	6.33	5.15	8.91	3.41	7.04
Positive (%)	73	64	68	63	75	63	71
Panel B.8: Market returns for non-quarter-end turns-of-the-month							
Mean daily return (%)	0.28	0.15	0.11	0.20	0.18	0.05	0.14
t-statistic	7.22	4.36	3.03	4.78	8.64	3.06	6.19
Positive (%)	73	63	63	64	73	61	65

Table 4
Returns to the Fama-French-Carhart Size, Book-to-Market and Momentum Factors of U.S. Stock Returns, 1963-2005

This table gives average daily returns to the Fama-French-Carhart size (i.e., small-cap minus large-cap stocks, SMB), book-to-market (i.e., high minus low book-to-market stocks, HML), and momentum (up minus down market lagged market returns, UMD) factors for U.S. stock market returns. The factors are from Ken French's website and are calculated with the Center for Research in Security Prices (CRSP) stock returns from July 1, 1963 to December 31, 2005. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the months. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" is days -10 through -2 before the end of the month and days +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel is greater than zero. Panel A gives returns to the SMB factor. Panel B gives returns to the HML factor. Panel C gives returns to the UMD factor.

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other days	Difference
Panel A. Returns to Fama-French-Carhart HML factor							
Mean daily return (%)	0.02	0.07	0.02	0.01	0.03	0.02	0.01
t-statistic	0.84	3.15	0.86	0.27	2.11	3.20	0.43
Positive (%)	51	54	49	51	53	55	55
Panel B. Returns to Fama-French-Carhart SMB factor							
Mean daily return (%)	0.16	-0.03	0.02	0.00	0.04	0.00	0.04
t-statistic	6.67	-1.12	0.96	0.20	3.49	0.08	3.02
Positive (%)	66	48	53	53	55	49	55
Panel C. Returns to Fama-French-Carhart UMD factor							
Mean daily return (%)	0.04	0.00	-0.01	0.04	0.01	0.04	-0.03
t-statistic	2.03	-0.09	-0.42	1.27	0.74	5.13	-1.47
Positive (%)	56	53	52	57	57	64	51

Table 5
Daily Stock Market Returns for 34 non-U.S. Countries at the Turn-of-the-Month

This table gives average daily stock market returns for 34 non-U.S. countries for which reliable market indices are available on *Datastream* beginning no later than January 1990. Daily returns are calculated beginning with the earliest available date and ending with January 2006. The beginning date of the data for each country is given in the heading of the panel. The data for each country end with January 31, 2006. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the months. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" is days -10 through -2 before the end of the month and days +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the row above it is greater than zero.

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other Days	Difference
			Panel A: Across 34 non-U.S. countries				
Mean daily return (%)	0.21	0.18	0.17	0.12	0.16	0.02	0.14
t-statistic	2.71	1.99	2.28	1.50	3.64	0.57	3.08
Positive (%)	58	55	56	54	61	53	59
			Panel B: Argentina-DS Market, January 1988				
Mean daily return (%)	0.64	0.46	0.11	0.28	0.35	0.23	0.11
t-statistic	2.10	2.33	0.44	1.37	2.72	3.43	0.98
Positive (%)	50	50	52	53	53	59	55
			Panel C: Australia-DS Market, January 1973				
Mean daily return (%)	0.19	0.04	0.17	0.10	0.12	0.01	0.11
t-statistic	4.08	0.86	3.59	1.91	4.89	0.60	3.97
Positive (%)	60	51	56	57	59	52	57
			Panel D: Austria-DS Market, January 1973				
Mean daily return (%)	0.09	0.17	0.16	0.09	0.12	0.01	0.10
t-statistic	1.67	3.58	3.82	2.10	4.44	0.43	3.80
Positive (%)	61	57	58	55	60	46	61
			Panel E: Belgium-DS Market, January 1973				
Mean daily return (%)	0.13	0.05	0.10	0.09	0.09	0.01	0.08
t-statistic	3.39	1.21	2.41	2.29	3.94	0.74	3.26
Positive (%)	57	55	58	54	60	54	58
			Panel F: Canada-DS Market, January 1973				
Mean daily return (%)	0.16	0.14	0.17	0.10	0.14	0.00	0.13
t-statistic	3.99	3.41	4.04	2.51	6.20	0.21	5.34
Positive (%)	63	56	60	55	65	51	61
			Panel G: Chile-DS Market, July 1989				
Mean daily return (%)	0.26	0.17	0.20	0.27	0.22	0.04	0.19
t-statistic	4.48	2.42	2.64	3.92	4.86	1.48	4.24
Positive (%)	66	57	62	61	65	52	64

Table 5 -- continued

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other Days	Difference
Panel H: Colombia all share, January 1985							
Mean daily return (%)	0.17	-0.03	0.05	0.03	0.05	0.07	-0.02
t-statistic	3.25	-0.52	0.85	0.32	1.08	2.65	-0.42
Positive (%)	58	52	51	55	52	56	53
Panel I: Denmark-DS Market, January 1974							
Mean daily return (%)	0.19	0.12	0.23	0.05	0.14	0.01	0.13
t-statistic	1.62	2.91	5.47	1.19	3.97	1.09	3.50
Positive (%)	56	61	61	55	64	52	62
Panel J: Finland-DS Market, March 1988							
Mean daily return (%)	0.45	0.13	0.17	0.20	0.22	0.00	0.23
t-statistic	4.11	1.16	1.19	1.52	3.74	-0.13	3.39
Positive (%)	64	52	56	56	62	55	60
Panel K: France-DS Market, January 1973							
Mean daily return (%)	0.08	0.04	0.09	0.11	0.07	0.03	0.05
t-statistic	1.59	0.78	1.53	1.77	2.42	1.65	1.46
Positive (%)	53	53	56	52	59	57	54
Panel L: Germany-DS Market, January 1973							
Mean daily return (%)	0.15	0.15	0.21	0.14	0.16	-0.01	0.17
t-statistic	3.20	2.86	3.84	2.83	5.95	-1.01	5.76
Positive (%)	55	59	63	59	65	51	64
Panel M: Greece-DS Market, January 1988							
Mean daily return (%)	0.27	0.56	0.42	0.17	0.34	0.00	0.34
t-statistic	2.46	3.40	3.47	1.48	4.82	-0.15	5.06
Positive (%)	59	60	57	51	66	50	68
Panel N: Hong Kong-DS Market, January 1973							
Mean daily return (%)	0.21	0.11	0.16	0.05	0.12	0.01	0.11
t-statistic	2.70	1.18	1.89	0.44	2.32	0.22	2.21
Positive (%)	60	55	59	54	64	55	60
Panel O: Indonesia-DS Market, April 1990							
Mean daily return (%)	0.13	0.10	0.15	0.16	0.13	-0.02	0.15
t-statistic	1.26	0.75	1.22	1.27	2.00	-0.62	2.17
Positive (%)	54	51	52	54	57	52	54
Panel P: Ireland-DS Market, January 1973							
Mean daily return (%)	0.12	0.10	0.08	0.09	0.09	0.02	0.07
t-statistic	2.21	1.72	1.48	1.64	2.75	1.36	1.97
Positive (%)	55	53	54	55	57	53	57
Panel Q: Italy-DS Market, January 1973							
Mean daily return (%)	0.29	0.09	-0.05	-0.08	0.06	0.04	0.02
t-statistic	5.52	1.39	-0.70	-1.31	1.72	1.93	0.55
Positive (%)	62	51	47	49	57	53	52

Table 5 -- continued

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other Days	Difference
Panel R: Japan-DS Market, January 1973							
Mean daily return (%)	0.25	0.07	0.08	-0.05	0.08	0.00	0.08
t-statistic	4.89	1.10	1.47	-0.93	2.77	0.22	2.33
Positive (%)	65	51	54	49	59	52	57
Panel S: Korea-DS Market, September 1987							
Mean daily return (%)	0.38	0.69	0.05	0.09	0.29	-0.04	0.33
t-statistic	2.67	4.68	0.46	0.69	3.86	-1.23	3.98
Positive (%)	59	62	53	55	60	46	61
Panel T: Malaysia-DS Market, January 1986							
Mean daily return (%)	0.14	0.05	0.17	0.10	0.11	0.02	0.08
t-statistic	2.15	0.37	1.76	1.11	1.87	0.82	1.41
Positive (%)	60	52	58	58	54	58	51
Panel U: Mexico-DS Market, January 1988							
Mean daily return (%)	0.19	0.19	0.14	0.29	0.22	0.07	0.14
t-statistic	1.77	1.75	1.37	2.97	3.90	2.25	2.27
Positive (%)	54	53	55	56	63	58	58
Panel V: Netherland-DS Market, January 1973							
Mean daily return (%)	0.11	0.18	0.18	0.05	0.12	0.01	0.12
t-statistic	2.13	3.18	3.33	0.93	4.63	0.50	4.04
Positive (%)	57	56	58	55	61	52	59
Panel W: New Zealand-DS Market, January 1988							
Mean daily return (%)	0.14	0.02	0.27	0.07	0.11	-0.02	0.13
t-statistic	2.22	0.27	3.57	0.98	3.32	-0.98	3.63
Positive (%)	59	50	60	50	62	53	57
Panel X: Norway-DS Market, January 1980							
Mean daily return (%)	0.19	0.23	0.11	0.10	0.15	0.01	0.13
t-statistic	2.74	3.10	1.30	1.27	3.64	0.72	3.07
Positive (%)	56	58	55	52	61	56	60
Panel Y: Philippine-DS Market, September 1987							
Mean daily return (%)	0.35	0.20	0.06	0.18	0.19	0.02	0.18
t-statistic	3.68	1.54	0.64	1.93	3.46	0.51	3.05
Positive (%)	60	53	53	57	57	53	55
Panel Z: Portugal-DS Market, January 1990							
Mean daily return (%)	0.06	0.07	0.08	0.15	0.09	0.00	0.09
t-statistic	1.01	0.87	1.26	2.54	2.35	-0.22	2.38
Positive (%)	58	50	56	53	60	54	60
Panel AA: Singapore-DS Market, January 1973							
Mean daily return (%)	0.18	0.15	0.15	0.06	0.12	-0.01	0.13
t-statistic	2.78	1.88	2.21	0.93	3.35	-0.47	3.39
Positive (%)	63	52	51	52	57	49	59

Table 5 -- continued

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other Days	Difference
Panel BB: South Africa-DS Market, January 1973							
Mean daily return (%)	0.22	0.12	0.26	0.23	0.20	0.02	0.18
t-statistic	3.65	1.76	4.41	3.21	5.94	1.01	4.97
Positive (%)	60	53	60	60	63	58	58
Panel CC: Spain-DS Market, March 1987							
Mean daily return (%)	0.14	0.22	0.17	0.02	0.14	0.01	0.13
t-statistic	2.01	2.29	2.13	0.30	3.21	0.27	2.53
Positive (%)	54	61	60	51	62	55	58
Panel DD: Sweden-DS Market, January 1982							
Mean daily return (%)	0.20	0.30	0.29	0.18	0.24	0.01	0.23
t-statistic	2.68	3.72	3.71	2.01	5.55	0.31	4.97
Positive (%)	56	61	61	54	66	53	64
Panel EE: Switzerland-DS Market, January 1973							
Mean daily return (%)	0.07	0.21	0.16	0.04	0.12	0.00	0.12
t-statistic	1.77	4.34	3.75	0.99	4.94	0.21	4.40
Positive (%)	54	62	59	58	65	52	64
Panel FF: Taiwan-DS Market, September 1987							
Mean daily return (%)	0.29	0.04	0.10	0.16	0.12	0.00	0.12
t-statistic	2.29	0.22	0.79	0.97	1.59	-0.11	1.59
Positive (%)	55	52	52	54	57	48	55
Panel GG: Thailand-DS Market, January 1987							
Mean daily return (%)	0.10	0.43	0.33	0.09	0.22	-0.02	0.25
t-statistic	0.89	2.98	2.38	0.66	2.85	-0.58	2.81
Positive (%)	54	53	57	52	60	52	60
Panel HH: Turkey-DS Market, January 1988							
Mean daily return (%)	0.61	0.40	0.62	0.44	0.49	0.10	0.38
t-statistic	3.45	1.95	3.11	2.12	4.48	1.94	3.17
Positive (%)	56	52	56	56	61	55	59
Panel II: United Kingdom-DS Market, January 1969							
Mean daily return (%)	0.07	0.11	0.12	0.15	0.11	0.01	0.10
t-statistic	1.55	2.13	2.75	3.18	4.35	0.41	3.38
Positive (%)	55	54	57	56	63	49	60

Table 6
Average Daily U.S. Interest Rates at the Turn-of-the-Month over Various Time Periods Ending with December 2005

This table gives average daily returns for various fixed rate securities over various time periods ending with 2005. The 90-day treasury bill (t-bill) rates are the realized returns for a 90-day constant maturity 90-day treasury (CMT) bill. The 10-year treasury bond (t-bond) rates are the realized returns for a 10-year CMT-bond. Realized returns for the CMT t-bills and t-bonds are calculated by converting daily yields for the relevant CMT bill or bond to prices. The CMT yields are from the Federal Reserve website. Prices are used to calculate daily realized return as the change in price divided by beginning price. Realized returns for investment grade corporate bonds are calculated using the Lehman US Corporate Investment Grade Bond Index. The daily return is calculated as the change in the index divided by the beginning level of the index. Realized returns for high yield corporate bonds are calculated using the Lehman US Universal High Yield Corporate Bond Index. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the months. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" is days -10 through -2 before the end of the month and days +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel is greater than zero.

	Day -1	Day +1	Day +2	Day +3	Day [-1, +3]	Other days	Difference
Panel A. Returns on 3-month U.S. treasury bill, 1954-2005							
Mean daily return (%)	-0.000	-0.004	-0.002	0.001	-0.001	0.000	-0.001
t-statistic	-0.61	-3.72	-1.64	1.31	-2.45	0.57	-2.54
Positive (%)	43	41	44	49	49	47	48
Panel B. Returns on 10-year U.S. treasury bond, 1962-2005							
Mean daily return (%)	0.057	0.013	0.027	0.029	0.034	-0.011	0.045
t-statistic	3.26	0.12	1.36	1.56	1.19	-2.08	1.57
Positive (%)	48	43	48	45	54	45	55
Panel C. Returns on Lehman US Corporate Investment Grade Bond Index, 1989-2005							
Mean daily return (%)	0.079	-0.023	0.044	-0.002	0.025	-0.005	0.030
t-statistic	2.83	-0.83	2.06	-0.11	1.91	-0.92	2.16
Positive (%)	57	48	59	48	56	47	56
Panel D. Returns on Lehman US Universal High Yield Corporate Bond Index, 1998-2005							
Mean daily return (%)	-0.064	0.054	0.042	0.032	0.016	0.000	0.014
t-statistic	-1.21	0.91	1.97	1.49	0.67	0.00	0.65
Positive (%)	42	47	52	55	54	50	49

Table 7
Average Daily Value-Weighted and Equal-Weighted U.S. Stock Market Returns at the Turn-of-the-Month, February 1998-December 2005

This table gives average daily value-weighted and equal-weighted U.S. stock market returns calculated with the Center for Research in Security Prices (CRSP) market indices for the time period February 1998-December 2005. Day -1 is the last trading day of the month. Days +1, +2, and +3 are the first three trading days of the month. Day [-1, +3] is the interval beginning with the last trading day of the month and ending with the third day of the following month. "Other days" is trading day -10 through -2 before the end of the month and trading day +4 through +10 after the beginning of the month. "Difference" is the average daily return for the interval day [-1, +3] less the average daily return for other days. The t-statistic tests the hypothesis that the average return in the row above the t-statistic is not significantly different from zero. Positive (%) is the percentage of observations in which the daily return in the top row of the panel is greater than zero. The calculations in panel A use value-weighted market returns. The calculations in panel B use equal-weighted market returns.

Panel A: Value-weighted market returns							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Mean daily return (%)	0.09	0.27	-0.03	0.06	0.09	-0.03	0.12
t-statistic	0.69	2.00	-0.21	0.51	1.23	-1.08	1.50
Positive (%)	60	65	54	48	60	52	59
Panel B: Equal-weighted market returns							
	Day -1	**Day +1**	**Day +2**	**Day +3**	**Day [-1, +3]**	**Other days**	**Difference**
Mean daily return (%)	0.45	0.20	0.08	0.07	0.19	0.03	0.16
t-statistic	4.35	1.98	0.69	0.72	2.86	0.96	2.59
Positive (%)	76	66	55	53	66	58	70