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Turn-of-Month Evaluations of Liquid Profits and Stock Returns: A Common Explanation for the Monthly and January Effects

JOSEPH P. OGDEN*

ABSTRACT

This paper presents and tests a hypothesis that the standardization of payments in the United States at the turn of each calendar month generally induces a surge in stock returns at the turn of each calendar month. The hypothesis also asserts that returns generally will be greater following the month of December and will vary inversely with the stringency of monetary policy. Empirical results using stock index returns for 1969–1986 support the hypothesis. This analysis provides an explanation for the previously documented monthly effect in stock returns and a partial explanation for the January effect.

IN A RECENT PAPER, Ariel (1987) documents an important empirical regularity in stock returns and terms it the "monthly effect." Using value-weighted and equally weighted daily stock index returns for the period 1963–1981, Ariel shows that virtually all of the cumulative return on these indexes is realized on ten consecutive trading days of the calendar month, beginning with the last trading day of the month and extending through the first nine trading days of the following month. Ariel considers various explanations for this phenomenon, "but none sufficed to explain the observed empirical regularity" (p. 174). More recently, Lakonishok and Smidt (1988) examine returns on the Dow Jones Industrial Average index for the period 1897–1986 and find that significant mean daily returns are realized consistently on only four consecutive trading days of the calendar month, beginning with the last trading day of the month. These trading days will henceforth be referred to as the turn-of-month trading days.

Ariel's and Lakonishok and Smidt's tests indicate that the monthly effect is not merely another manifestation of the previously documented "January effect." Rozeff and Kinney (1976) first documented that average stock index returns in January are higher than in any other month. Keim (1983) and others find that the surge in January returns is largely confined to stocks of small firms and to the first few trading days in January. Branch (1977) and others have suggested that the surge in January returns is due to year-end tax-loss selling and subsequent repurchases in January. Studies by Roll (1983), Reinganum (1983), Ritter (1988), and others provide evidence consistent with the tax-loss selling

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hypothesis. In contrast, Constantinides (1984) argues that year-end tax-loss selling cannot explain the January effect, and the empirical results of Pettengill (1986), Chan (1986), and Jones, Pearce, and Wilson (1987) are inconsistent with the tax-loss selling hypothesis.[1]

This paper presents and tests a hypothesis that the monthly and January effects are due, at least in part, to a standardization in the payments system in the United States, specifically, a concentration of cash flows at the turn of each calendar month. As a result of this standardization, investors realize substantial cash receipts at the turn of the month, and especially at the turn of the year, the reinvestment of which induces a surge in stock returns at the turn of the month. The magnitude of the surge for a given month depends on the magnitude of aggregate liquid profits realized in the month. These liquid profits, in turn, are affected by monetary policy. This hypothesis, which henceforth will be referred to as the turn-of-month liquidity hypothesis, is discussed in some detail and tested empirically.

The paper is organized as follows. The next section discusses the turn-of-month liquidity hypothesis and how it relates to the monthly and January effects. Section II describes the data used in empirical tests of the hypothesis. Empirical results are presented and discussed in Sections III, IV, and V. Section VI summarizes the analysis.

I. Turn-of-Month Liquid Profits and Stock Returns

A. Discussion of the Hypothesis

This paper argues that a standardization in the payments system in the U.S. causes a monthly regularity in stock returns and that this effect is related to monetary policy. The arguments are based on a recent paper by Ogden (1987), who argues that the end of each calendar month is a preferred habitat (in the Modigliani and Sutch (1966) sense) because, for major economic entities, the turn of each calendar month is a typical payoff date for accrued real wages, dividends, interest and principal payments, and other liabilities.[2] As a result, when these entities have short-term investable funds, they prefer securities maturing at the end of the calendar month to securities maturing either before or after that date, ceteris paribus, since shorter-term (longer-term) securities

[1] Haugen and Lakonishok (1988) provide an excellent review of the literature concerning the January effect and also posit an alternative explanation for it. They argue that the effect may be a result of year-end portfolio rebalancing by institutions, whose managers dump small stocks showing losses in the current year and reinvest the funds in selected stocks in early January. By doing so, their annual reports will appear stronger, leading to higher compensation for the managers.

[2] Based on recent Moody's *Manuals*, approximately 70 percent (90 percent) of the interest and principal payments on corporate debt (municipal debt) are payable on either the first or the last business days of given calendar months. Also, based on recent issues of Standard and Poor's (S&P's) *Stock Guide*, approximately 45 percent (65 percent) of the common stock (preferred stock) dividends of firms included in the S&P 500 index are payable on these dates. An analysis of Moody's *Manuals* dating back to 1900 indicates that payable dates for interest, principal, and dividend payments on corporate and municipal securities have been consistently concentrated on these dates throughout the century.

may have to be rolled over (sold prematurely) to provide the necessary liquidity to pay turn-of-month obligations and, thus, involve greater interest rate risk and transaction costs. The resulting increased demand for month-end securities causes their prices (yields) to be bid up (down) relative to adjacent-maturity securities. Ogden shows that the magnitude of this effect is related to the stringency of monetary policy. Greater stringency in monetary policy restricts aggregate liquidity and increases the expected cost of liquidity required to meet turn-of-the-month obligations, and this induces a greater preferred habitat effect.[3]

B. An Explanation for the Monthly Effect

An argument analogous to Ogden's can partially explain the observed intra-month returns in the stock market. To see this, assume that the bulk of expected monthly cash income for the representative investor is received at the turn of the month,[4] while expected cash expenditures are distributed uniformly throughout the month. Based on principles of working capital management (Elton and Gruber (1974)), also assume that the representative investor maintains a "layering" of liquidity in his or her investment portfolio. That is, the investor allocates fixed proportions (i.e., within a narrowly defined range) of investable wealth to cash, highly liquid securities such as Treasury securities, and less liquid investments such as stocks. In order to reduce transaction costs, the investor will add to his or her portfolio of stocks only if accumulated cash is sufficient to warrant further investment in relatively illiquid stocks. Since the representative investor's liquid profit position generally will be greatest at the turn of each calendar month, demand for stocks will generally be greatest at the turn of the month.[5]

The consequences of the above arguments for stock returns are clear: in months in which aggregate, economy-wide liquid profits are large, investors will commit new funds to the stock market at the turn of the month, causing a surge in returns. However, in months in which aggregate liquid profits are small, no turn-of-month surge in stock returns will be realized. Furthermore, these arguments suggest that the monetary policy of the Federal Reserve System (the Fed) may

[3] Ogden's analysis explains the empirical regularity in T-bills documented by Park and Reinganum (1986).

[4] Note that the date on which an investor actually receives payment on a security depends on whether the investor holds the security directly or in "street name" (i.e., using a broker as an intermediary). According to current practice, if an investor holds a security in street name, the payment is wired from the issuer to the broker and the investor generally receives immediate credit in his or her account (i.e., on the payable date). However, if the investor holds the security directly, the issuer mails a check to the investor. (Despite the delay, some investors prefer direct ownership for privacy reasons, etc.) Assuming a normal mailing delay of one to three days for investors holding directly, in the aggregate, substantial portions of the cash flows discussed in footnote 2 will be received on each of the four turn-of-month trading days.

[5] Of course, even though investors receive substantial cash flows at the turn of the month, they may have no compulsion to reinvest immediately. Note, however, that over 1000 firms presently have dividend reinvestment plans (Kinoshita (1989)), indicating that investors have a substantial interest in reinvesting investment income. Evidence from Ritter (1988) and Ziemba (1989) also suggests that investors often reinvest liquid profits quickly.

have an important effect on stock returns.[6] Since monetary policy affects the growth of liquidity (i.e., monetary aggregates) in the economy, monetary policy is likely to affect expected liquid profits, which in turn will affect turn-of-month stock returns. Thus, to the extent that monetary policy affects expected liquid profits, turn-of-month stock returns will be related to monetary policy. Specifically, an easy (stringent) monetary policy is expected to induce larger (smaller) liquid profits and thus larger (smaller) turn-of-month stock returns.[7] Furthermore, since an easy monetary policy in a given month is expected to induce higher stock returns for all of the turn-of-month trading days, the autocorrelation of turn-of-month stock returns in easy-money months should be relatively large, while in stringent-money months the absence of this common source of higher returns should be associated with smaller autocorrelation in turn-of-month returns.[8]

C. An Explanation for the January Effect

The turn-of-month liquidity hypothesis also may provide a partial explanation for the January effect. The argument here is threefold. First, the evidence noted earlier that positive January returns are concentrated in the first few trading days of the month is consistent with the hypothesis. Second, it is reasonable to suppose that liquid profits generally are greater in December than in other months because of the well known and substantial increase in business activity near the end of the calendar year, particularly at the retail level.[9] Since retail activity accounts for approximately two-thirds of total GNP, a surge in retail activity and consequent liquid profits in December is expected to induce a relatively large surge in stock returns early in January.

[6] The Fed's monetary policy should be distinguished from its operating regime. The Fed's operating regime refers to the focal target chosen by the Fed, that is, either monetary aggregates or the Fed funds rate. The Fed's monetary policy is a directive to control the chosen target variable to maintain either an expansive or a restrictive economic environment. Thus, under any given operating regime, the Fed may pursue either an easy or a stringent policy.

[7] Monetary policy is likely to affect real economic activity, and thus investors' liquid profits, with a lag (Laurent (1988)). Nevertheless, if a given monetary policy is allowed to persist long enough, then a given measure indicating stringent (easy) monetary policy should, over time, be associated with low (high) turn-of-month stock returns according to the above arguments. Furthermore, when the Fed switches from stringent (easy) to easy (stringent) monetary policy, investors may immediately decide that they need to hold a relatively smaller (larger) proportion of liquid assets in their portfolios because of the expectation of greater (smaller) liquid profits and, in the immediately following turn-of-month period, may (may not) increase their demand for stocks despite the fact that liquid profits have not (have) increased. If this is the case, then monetary policy may be observed to affect stock returns with little or no lag. (A positive association between contemporaneous changes in the money supply and stock returns is well documented (Sorenson (1982)). Thus, in this context it is reasonable to suppose that both monetary variables and stock returns would be "leading indicators" of real GNP.

[8] The analysis also suggests that trading volume may increase during the turn-of-month period, although prices may adjust to new equilibrium levels with a minimal increase in trading volume (Karpoff (1987)). A recent study by Pettengill and Jordan (1988) indicates that the volume of trading on the NYSE is significantly higher on the turn-of-month trading days.

[9] The Christmas season typically accounts for 35 to 55 percent of a retail store's annual sales and profits (Schwadel (1988)).

The third argument relates specifically to evidence indicating that the January effect is greater for the stocks of small firms. Evidence on the ownership of stocks in the U.S. indicates that individual investors hold proportionately more small-firm stocks while institutional investors hold proportionately more stocks of large firms (Ritter (1988)). Thus, if individual investors generally realize proportionately more liquid profits at the end of the calendar year than institutional investors, returns in January will generally be greater for small-firm stocks than for large-firm stocks. Two possible sources of large year-end liquid profits for individual investors are year-end profits realized by privately owned businesses and year-end salary bonuses. Of course, liquid profits from either source are likely to depend on overall aggregate liquid profits, which depend in part on the stringency of monetary policy, as argued above. Thus, the magnitude of the January effect may also depend on the stringency of monetary policy. Note also that, based on arguments stated earlier, return autocorrelation should be greater in easy-money Januaries than in stringent-money Januaries.

II. Data

The stock return data utilized in the empirical analysis are the Center for Research in Security Prices (CRSP) value-weighted and equally weighted daily stock index returns for the eighteen-year (216-month) period January 1969 through December 1986.[10] As in Ariel's analysis, the data include returns for the first nine trading days before and after the beginning of each month.

Tests of the effect of monetary policy on stock returns require a measure of monetary stringency. The measure used here is the Federal funds (Fed funds) spread, the difference of the Fed funds rate and the rate on short-term Treasury bills.[11] Ho and Saunders (1985) develop a theoretical model of the Fed funds market in which the Fed funds spread is a measure of monetary stringency, and Ogden (1987) uses the Fed funds spread as a measure of monetary stringency. The Fed funds spread is measured monthly as the difference of the median Fed funds rate and the median rate on Treasury bills maturing within one month, both based on rates quoted in *The Wall Street Journal* for the five business days prior to the last trading day of each month.[12] The spread measure in a given

[10] Although daily data are available on the CRSP index returns from July 2, 1962, the sample was initiated in 1969 in part because trading on the NYSE was suspended on Wednesdays throughout most of 1968. These trading suspensions disrupted the link between business days and trading days that is critical to the present analysis. Results for the period 1963–1967 are similar to those reported here.

[11] The growth in the money supply was considered as a measure of monetary stringency but was rejected because of measurement problems, particularly during the process of deregulation of depository institutions (Roth (1987)). Laurent's (1988) empirical evidence indicates that a similar spread variable is superior to three alternative variables (including money supply variable *M*2) as an indicator of monetary policy. Laurent's tests cover the period 1964–1986 and measure the ability of each variable to forecast percentage changes in real GNP. Furthermore, it can be shown that the Fed funds spread is a measure of monetary stringency under any given operating regime.

[12] Median values, rather than average values, are used primarily to reduce the impact of volatility in the Fed funds rate often observed on Wednesdays associated with the end of the biweekly reporting period for banks and at the end of the year. Similar results are obtained using a variety of alternative measures of the spread, including a measure obtained by updating the spread weekly.

month then applies to the last trading day of that month and all trading days of the following month, excluding the last trading day, that are included in the data.[13]

III. Initial Empirical Results

The initial empirical results focus on the average return for each of the nine trading days before and after the beginning of the calendar month. In subsequent discussion, the ith trading day before (after) the beginning of the month is denoted as $(-i, -i + 1)$ $((i - 1, i))$.

Initial results focus on the four trading days which Lakonishok and Smidt document as having high mean returns. For the value-weighted index, the percent mean daily returns (standard errors) for the turn-of-month trading days (−1, 0), (0, 1), (1, 2), and (2, 3) are 0.1674 (0.0527), 0.0466, (0.0650), 0.1267 (0.0566), and 0.1724 (0.0617), respectively. The mean return is significant at the 0.01 level for trading days (−1, 0) and (2, 3), significant at the 0.05 level for trading day (1, 2), and insignificant for all other trading days of the month. For the equally weighted index, the percent mean daily returns (standard errors) for the same trading days are 0.2940 (0.0506), 0.1701 (0.0659), 0.1768 (0.0588), and 0.2057 (0.0589), respectively. The mean return is significant at the 0.01 level for trading days (−1, 0), (1, 2), and (2, 3), significant at the 0.05 level for trading day (0, 1), and insignificant for all other trading days of the month. These results confirm Lakonishok and Smidt's (1988) finding of high returns on these trading days and are consistent with the turn-of-month liquidity hypothesis.[14, 15, 16]

[13] The mean, standard deviation, and range of the Fed funds spread over the full period are 1.22%, 1.10%, and 0.03–5.33%, respectively. The Fed funds spread tends to be greater during periods generally regarded as monetarily stringent, including portions of 1969–1970, 1973–1974, and 1979–1982. Interestingly, these periods correspond to acknowledged "bear" markets.

[14] Summarizing additional results, for both indexes the mean daily return for the (pooled) non-turn-of-month trading days of the month is insignificant. In addition, for the value-weighted (equally weighted) index, the difference of the mean daily returns for the turn-of-month trading days and the remaining trading days of the month is 0.1146 percent (0.1893 percent) and is significant at the 0.01 (0.01) level. For the two nine-year subperiods 1969–1977 and 1978–1986, the differences for the value-weighted (equally weighted) index are 0.1246 percent and 0.1047 percent (0.2303 percent and 0.1481 percent), respectively, and are significant at the 0.01 and 0.05 levels (0.01 and 0.01 levels), respectively.

[15] For the value-weighted index over the full period, the standard deviations of returns for the turn-of-month trading days and the remaining trading days are 0.8702 percent and 0.8409 percent, respectively. The corresponding standard deviations for the equally weighted index are 0.8641 and 0.8097, respectively. For both indexes, an F-test indicates that the variances of returns for turn-of-month trading days and the remaining trading days are not significantly different at the 0.01 level. Thus, greater turn-of-month mean returns do not appear to represent compensation for greater return volatility.

[16] Additional results by calendar month (not shown) indicate that, for the value-weighted (equally weighted) index, the mean return for the turn-of-month trading days is greater than the mean return for the remaining trading days in eight (eleven) of twelve months, and differences of these mean returns are at least marginally significant in five (six) months. However, for both indexes, the mean returns for turn-of-month trading days associated with the ends of calendar quarters other than the year-end quarter are not significant. Thus, the monthly effect does not appear to be a quarterly effect.

Based on the arguments presented above, the existence of a reliable turn-of-month surge in stock returns does not necessarily imply that the stock market is informationally inefficient. Speculators will limit the size of any disparities in expected returns across the calendar month, but only to the point at which expected profits, net of transaction costs, are eliminated. Consider a speculator who attempts to earn profits by purchasing a representative stock near the end of the month and selling it shortly after the beginning of the following month. The investor thereby incurs per-dollar transaction costs of a on each transaction. In order to profit, the speculator must realize an excess return greater than $2a$, which therefore represents a rough upper limit to the disparity in expected returns that can exist between any two adjacent periods in equilibrium. Thus, while speculators may limit the magnitude of disparities in intramonth mean daily returns, it is unlikely that they can eliminate them entirely, especially if the disparities are due to a pervasive phenomenon such as concentrated aggregate turn-of-month cash flows.

Berkowitz, Logue, and Noser (1988) estimate the cost of a transaction on the New York Stock Exchange (NYSE) to be 0.23 percent. Based on this estimate, a speculator who purchases a representative NYSE stock just prior to the turn-of-month trading days and sells the stock just after the turn-of-month trading days will incur transaction costs totalling $2 \times 0.23 = 0.46$ percent. For the value-weighted index, the mean cumulative return for the four turn-of-month trading days is 0.5132 percent. Thus, the surge in mean returns on the turn-of-month trading days appears to be insufficient to provide substantial profits. For the equally weighted index, the corresponding mean four-day return is 0.8468 percent. However, since the equally weighted index reflects the returns on smaller stocks which have greater transaction costs, it is unlikely that profits are possible for smaller stocks, either.[17]

IV. Monetary Policy and Intramonth Stock Returns

If, as argued, the surge in turn-of-month returns is due to the investment of liquid profits realized by investors each month, then turn-of-month returns should vary directly with the expected liquid profits. Expected liquid profits, in turn, are likely to be inversely related to the stringency of monetary policy. Thus, turn-of-month returns are expected to be inversely related to the stringency of monetary policy. This section provides several tests of this assertion.

A. Regression Analysis

The initial test involves regressions of stock index returns on variables representing the turn-of-month trading days and the Fed funds spread. Specifically,

[17] It should also be noted that transaction costs were higher before the elimination of fixed commissions on the NYSE on May 1, 1975. Interestingly, for both indexes the difference of the mean returns for the turn-of-month trading days and the remaining trading days is smaller in the second nine-year subperiod than in the first (see footnote 14), a possible reflection of enhanced arbitrage activity brought about by lower transaction costs. However, the reduction in the difference of mean returns is statistically insignificant for both indexes.

Table I

Parameter Estimates and Summary Statistics for Regressions of Value-Weighted and Equally Weighted Stock Index Returns (in Percent) on Several Explanatory Variables, 1969–1986

TOMTD is a zero-one variable that takes on a value of 1(0) for turn-of-month (remaining) trading days. FFS is the Fed funds spread, defined for a given month as the difference of the median Fed funds rate and the median rate on short-term Treasury bills calculated over the five business days prior to the last trading day of the previous month. *TOMTDFFS* is the product of *TOMTD* and *FFS*. (Standard errors are shown in parentheses.)

Index	Obs.	Intercept	*TOMTD*	*FFS*	*TOMTDFFS*	Adj. R^2
Value-Weighted	3888	0.0146	0.2159***	−0.0008	−0.0828***	0.005
		(0.0230)	(0.0489)	(0.0140)	(0.0297)	
Equally Weighted	3888	0.0385*	0.2583***	−0.0131	−0.0565**	0.011
		(0.0224)	(0.0474)	(0.0136)	(0.0288)	

* Significant at the 0.10 level.
** Significant at the 0.05 level.
*** Significant at the 0.01 level.

TOMTD is a zero-one variable that takes on a value of 1(0) for the turn-of-month (remaining) trading days and is used as a control variable. *FFS* is the Fed funds spread (defined in Section II), and *TOMTDFFS* is the product of *TOMTD* and *FFS*. According to the arguments outlined above, the coefficients on *FFS* and *TOMTDFFS* are expected to be zero and negative, respectively, reflecting the point that monetary policy should affect returns only on the turn-of-month trading days. Regression results for both indexes are shown in Table I.

For both indexes, the regression results are consistent with the predictions noted above. The coefficient of *FFS* is insignificant for both indexes, while the coefficient of *TOMTDFFS* is negative and significant at the 0.01 (0.05) level for the value-weighted (equally weighted) index. These results indicate that stock returns on turn-of-month trading days are inversely related to the stringency of monetary policy and, therefore, support the turn-of-month liquidity hypothesis.

B. Comparisons of Mean Returns

Additional tests of the effect of monetary policy on turn-of-month stock returns are conducted using two subsamples of the data. The first (second) subsample, referred to as the easy (stringent) money subsample, includes 170 months (46 months) in which the Fed funds spread is less than (greater than or equal to) 2.0 percent.[18] According to the hypothesis, a surge in returns for the turn-of-month trading days should occur only in the easy-money subsample. Mean daily returns are calculated for the turn-of-month trading days and the remaining trading days in both subsamples. Results for the value-weighted and equally weighted indexes are displayed in Table II, Panels A and B, respectively.

[18] The results do not depend crucially on the cutoff value chosen, provided that some segregation of easy- and stringent-money months is effected. The value of 2.0 is chosen arbitrarily under the assumption that the Fed is likely to pursue an easy monetary policy more often than a stringent monetary policy.

Consider initially the full-period results for the value-weighted index, shown in the first block of Table II, Panel A. For easy-money months, the mean daily return for turn-of-month trading days is 0.1794 percent and is significant at the 0.01 level, while, for stringent-money months, the mean daily return for turn-of-month trading days is −0.0607 percent and is insignificant. The difference of these mean returns is 0.2401 percent and is significant at the 0.01 level. In contrast, the mean return for the remaining trading days is insignificant in both easy- and stringent-money months, and the difference of these mean returns also is insignificant. Note also that the difference of the mean returns for the turn-of-month trading days and the remaining trading days is positive and significant

Table II

The Effect of Monetary Policy on Percent Mean Daily Returns on the *CRSP* Value-Weighted and Equally Weighted Stock Indexes for Turn-of-Month Trading Days and Remaining Trading Days, 1969–1986

Easy- (stringent-) money months are those in which the Fed funds spread in the prior week is less than (greater than or equal to) 2.0 percent. The Fed funds spread for a given month is defined as the difference of the median Fed funds rate and the median rate on short-term Treasury bills, calculated over the five business days prior to the last trading day of the previous month. (Standard errors are shown in parentheses.)

Panel A: Value-Weighted Index

Period		Easy-Money Months	Stringent-Money Months	Difference [*t*-Statistic]
1969–1986	Turn-of Month Trading Days	0.1794***	−0.0607	0.2401***
		(0.0315)	(0.0743)	[2.98]
	Obs.	680	184	
	Remaining Trading Days	0.0213	−0.0147	0.0360
		(0.0156)	(0.0427)	[0.79]
	Obs.	2380	644	
	Difference	0.1581***	−0.0460	
	[*t*-Statistic]	[4.49]	[−0.54]	
1969–1977	Turn-of Month Trading Days	0.1603***	−0.1553	0.3156**
		(0.0415)	(0.1358)	[2.22]
	Obs.	360	72	
	Remaining Trading Days	0.0074	−0.1382*	0.1456*
		(0.0213)	(0.0786)	[1.79]
	Obs.	1260	252	
	Difference	0.1529***	−0.0171	
	[*t*-Statistic]	[3.28]	[−0.11]	
1978–1986	Turn-of Month Trading Days	0.2009***	0.0002	0.2007**
		(0.0482)	(0.0853)	[2.05]
	Obs.	320	112	
	Remaining Trading Days	0.0370	0.0647	−0.0277
		(0.0230)	(0.0482)	[−0.52]
	Obs.	1120	392	
	Difference	0.1639***	−0.0645	
	[*t*-Statistic]	[3.07]	[−0.66]	

Table II—*Continued*

Panel B: Equally Weighted Index

Period		Easy-Money Months	Stringent-Money Months	Difference [*t*-Statistic]
1969–1986	Turn-of Month Trading Days	0.2609***	0.0297	0.2312***
		(0.0324)	(0.0671)	[3.10]
	Obs.	680	184	
	Remaining Trading Days	0.0383**	−0.0362	0.0745*
		(0.0156)	(0.0380)	[1.81]
	Obs.	2380	644	
	Difference	0.2226***	0.0659	
	[*t*-Statistic]	[6.19]	[0.85]	
1969–1977	Turn-of Month Trading Days	0.2754***	−0.1112	0.3866***
		(0.0493)	(0.1298)	[2.78]
	Obs.	360	72	
	Remaining Trading Days	0.0200	−0.2167***	0.2367***
		(0.0226)	(0.0707)	[3.19]
	Obs.	1260	252	
	Difference	0.2554***	0.1055	
	[*t*-Statistic]	[4.71]	[0.71]	
1978–1986	Turn-of Month Trading Days	0.2447***	0.1202	0.1245
		(0.0409)	(0.0712)	[1.52]
	Obs.	320	112	
	Remaining Trading Days	0.0588***	0.0799*	−0.0211
		(0.0213)	(0.0419)	[−0.45]
	Obs.	1120	392	
	Difference	0.1859***	0.0403	
	[*t*-Statistic]	[4.03]	[0.49]	

* Significant at the 0.10 level.
** Significant at the 0.05 level.
*** Significant at the 0.01 level.

at the 0.01 level for easy-money months, while this difference is negative and insignificant for stringent-money months. These results can be stated succinctly: mean returns on the value-weighted index are significantly positive only for turn-of-month trading days in easy-money months. Thus, the results are consistent with the turn-of-month liquidity hypothesis.

Results similar to those noted above are obtained for the two nine-year subperiods, as shown in the second and third blocks of Panel A. Similar results also are obtained for the equally weighted index, as shown in Panel B, showing that the relationship between monetary policy and turn-of-month stock returns has been stable.

C. Return Autocorrelation

According to the discussion in Section I, monetary policy also should affect the autocorrelation of turn-of-month stock returns; specifically, the

autocorrelation of turn-of-month stock returns should be greater (smaller) in easy- (stringent-) money months. This assertion is tested by calculating and comparing the one-day lag autocorrelations of turn-of-month returns on the value-weighted and equally weighted indexes for the easy- and stringent-money subsamples. For the value-weighted index, the autocorrelation of returns for the easy-money subsample is 0.2509 and is significant at the 0.01 level (t-value of 5.67), while in stringent-money months the autocorrelation is 0.0436 and is insignificant (t-value of 0.51). The difference of these autocorrelations is significant at the 0.05 level (t-value of 2.15). For the equally weighted index, the autocorrelations for the easy- and stringent-money subsamples are 0.4517 and 0.330, respectively, and are both significant at the 0.01 level (t-values of 10.20 and 3.88, respectively), and the difference of these autocorrelations is insignificant (t-value of 1.23). Thus, at least for the value-weighted index, the evidence is consistent with the turn-of-month liquidity hypothesis and, specifically, the argument that monetary policy affects turn-of-month stock returns.

V. Monetary Policy and the January Effect

This section focuses on the behavior of January returns on the CRSP equally weighted index for the period 1969–1986. Mean returns are calculated for all trading days, turn-of-month trading days and remaining trading days, and for every January as well as for those associated with easy and stringent monetary policies, as previously defined, and these means are compared. However, the assumption that daily small firm January returns are independent is probably false since Keim (1983), Reinganum (1983), Ritter (1988), and others show that high January returns are associated with high tax-loss selling years. Consequently, for all tests the mean return for given trading days each January is considered as one observation for the purpose of calculating standard errors of the means. The results are presented in Table III.

The mean daily return for all January trading days is 0.3669 percent and is significant at the 0.01 level. Note, though, that the mean return for January trading days associated with an easy monetary policy is positive and highly significant, while the mean return for January trading days associated with a stringent monetary policy is insignificant. The difference of these mean returns is positive and significant at the 0.05 level. These results indicate that monetary policy has an important effect on January returns on the equally weighted index.

The effect of monetary policy on January returns also can be tested by comparing the autocorrelations of January returns on the equally weighted index for the easy- and stringent-money subsamples. Based on earlier discussion, this autocorrelation is expected to be greater in the easy-money subsample. The one-day lag autocorrelation is 0.6001 and significant at the 0.01 level (t-value of 8.65) for the easy-money subsample and is 0.2808 and significant at the 0.05 level (t-value of 2.51) for the stringent-money subsample. The difference of these autocorrelations is significant at the 0.05 level (t-value of 2.43). Thus, this evidence also indicates that monetary policy has an important effect on January returns on the equally weighted index.

Table III

The Effect of Monetary Policy on January Percent Mean Daily Returns on the *CRSP* Equally Weighted Stock Index, 1969–1986

Easy- (stringent-) money months are those in which the Fed funds spread in the prior week is less than (greater than or equal to) 2.0 percent. The Fed funds spread for a given January is defined as the difference of the median Fed funds rate and the median rate on short-term Treasury bills, calculated over the five business days prior to the last trading day of the previous December. Returns include the last trading day of the previous December and exclude the last trading day of January. The mean return for the indicated trading days each January is considered as one observation for the purpose of calculating standard errors, due to evidence indicating that daily returns are not independent (see text). (Standard errors are shown in parentheses.)

	All Januaries	Easy-Money Januaries	Stringent-Money Januaries	Difference [*t*-Statistic]
All Trading Days	0.3669***	0.4760***	0.0830	0.3930**
	(0.1170)	(0.1475)	(0.1090)	[2.14]
Obs.	18	13	5	
Turn-of-Month Trading Days	0.9889***	1.1401***	0.5956*	0.5445
	(0.2361)	(0.3564)	(0.2762)	[1.32]
Obs.	18	13	5	
Remaining Trading Days	0.1891*	0.2863**	−0.0634	0.3497
	(0.1074)	(0.1251)	(0.1801)	[1.59]
Obs.	18	13	5	
Difference	0.7998***	0.8538**	0.6590*	
[*t*-Statistic]	[3.08]	[2.59]	[2.00]	

* Significant at the 0.10 level.
** Significant at the 0.05 level.
*** Significant at the 0.01 level.

However, the turn-of-month liquidity hypothesis asserts that monetary policy affects only turn-of-month returns. Indeed, the difference of the mean daily returns for turn-of-month trading days associated with easy and stringent monetary policies is relatively large (0.5445 percent), though the difference is not statistically significant due in part to the small number of observations.[19] However, several results associated with January returns on the equally weighted index appear to be inconsistent with the turn-of-month liquidity hypothesis. First, while the difference of the mean returns for turn-of-month trading days and remaining trading days associated with an easy monetary policy is relatively large (0.8538 percent) and is significant at the 0.05 level, the corresponding difference associated with a stringent monetary policy is almost as large (0.6590 percent) and is marginally significant. Second, the mean return for the remaining trading days associated with an easy monetary policy is positive and significant. Third, the mean return for turn-of-month trading days associated with a stringent monetary policy is significant. Although the turn-of-month liquidity hypothesis

[19] Similarly, the autocorrelation of returns for January turn-of-month trading days is 0.6837 and significant at the 0.01 level (*t*-value of 4.27) for the easy-money subsample and is 0.2776 and insignificant (*t*-value of 1.08) for the stringent-money subsample. However, due to the small sample sizes, the difference of these autocorrelations is insignificant (*t*-value of 1.34).

provides no direct explanation for these results, earlier discussion suggests several possible explanations.

Consider first the evidence indicating significant mean returns on the remaining trading days associated with easy monetary policy. As noted earlier, the representative investor for this index is likely the individual investor. Thus, the results may suggest that more time is required for many individual investors to realize a portion of their liquid profits following the month of December than other months, perhaps in part because of delays in realizing liquid profits from December retail business activity.[20] Also note that many executives do not receive their yearly salary bonuses until late January or, in some cases, February. Finally, the noted surge in returns on the equally weighted index for January turn-of-month trading days associated with a stringent monetary policy suggests that other factors, most notably tax-loss selling or institutional portfolio rebalancing, also may affect returns.

VI. Summary

The turn-of-month liquidity hypothesis asserts that a standardization in the payments system in the United States generally induces a surge in stock returns around the turn of each calendar month and especially at the turn of the year. The surge occurs because investors, who have substantial cash receipts at the turn of the month (or year), will at that time increase their demand for stocks. The hypothesis also asserts that expected liquid profits, and thus turn-of-month (and turn-of-year) stock returns, will vary inversely with the stringency of monetary policy. The hypothesis is tested using stock index returns for the period 1969–1986. Empirical results support the hypothesis. This analysis provides an explanation for the previously documented monthly effect in stock returns and a partial explanation for the January effect. The results also are consistent with a previously documented empirical regularity in the Treasury bill market. Finally, the analysis provides additional insight on the effect of monetary policy on stock returns.

[20] As an alternative explanation, Lakonishok and Smidt (1986) argue that, due to thin trading, the turn-of-the-year surge in returns on small stocks appears to extend beyond the first few trading days in January.

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