The Controversial Contrarian Profits: A Study on Differential Returns Across Months

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This paper examines whether the calendar formation date makes a difference in contrarian profits. I compare the differential returns among contrarian portfolios that are formed in different months during the year. In addition, I divide a 36-month performance period into six half-year intervals to examine the speed of adjustment to equilibrium and the magnitude of the contrarian profits. Empirical evidence indicates that different formation periods result in statistically and economically significant differences in contrarian profits. Also, a noticeable January effect is detected across time and portfolios when the performance period includes the month of January.

Introduction

The predictability of short-horizon stock returns long has been the focus of debate regarding the profitability of a contrarian portfolio strategy. Contrarian strategies are investment strategies of purchasing securities that have performed poorly in the past and selling securities that have performed well.

DeBondt and Thaler (1985) were among the first to propose the existence of contrarian profits. They argue that the psychological aspect of individuals contributes to abnormal returns, suggesting naive investors tend to pay more attention to recent information and less attention to prior data. This causes stock prices to overreact and deviate from intrinsic values. Thus, DeBondt and Thaler (1985) hypothesize that extreme movements in stock prices will be followed by subsequent price movements in the opposite direction as stock prices return to intrinsic values and that the more extreme the initial price movement, the greater will be the subsequent adjustment.

Using a contrarian strategy that involves shorting a portfolio of extreme winners from a long-horizon formation period against a long position in a portfolio of extreme losers, DeBondt and Thaler (1985) provide evidence of contrarian profits almost 25 percent above the market average. Their findings suggest that the net or contrarian position earns large positive returns, on average, over the subsequent long-horizon test period. In addition, the empirical results are consistent with the

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overreaction hypothesis and the fact that the overreaction effect is asymmetric—it is much larger for loser stocks than winner stocks. The results also suggest that losers earn exceptionally large January returns while winners do not.

In a subsequent paper, DeBondt and Thaler (1987) re-examine the issue of contrarian strategies in the context of other studies' findings.[1] They suggest that the overreaction observed in their contrarian strategies is not due to a size effect or differences in risks. They also examine the seasonal pattern of returns related to January and find that January excess returns are related to both short-term and long-term past performance. Thus, evidence is provided that supports a contrarian investment strategy.

Some argue that the empirical evidence provided by DeBondt and Thaler (1985, 1987) indicates a violation of weak form market efficiency, while others disagree on how the anomaly survives the process of arbitrage. Fama and French (1988) conclude the overreaction effect is a rational market response to risk changes, implying an efficient market. The mean-reverting risk premium is proposed to be the cause. Reinganum (1983) offers the turn-of-the-year effect to explain contrarian profits. Keim (1983) argues that the winner-loser effect is another instance of the well-known size effect. Likewise, Zarowin (1990) attributes DeBondt and Thaler's (1985, 1987) evidence on stock market overreaction to the size phenomenon. He finds that while the poorest earners outperform the best earners, they are also significantly smaller in size at the time of portfolio formation. Zarowin suggests, however, that the overreaction anomaly still remains in the short-term horizon after accounting for the size effect.

Chan (1988) interprets the abnormal returns found by DeBondt and Thaler (1985, 1987) as being due to the nonconstant risk premium in loser and winner stocks. In addition, he argues that the estimated return is sensitive to the method used in measuring the performance of contrarian portfolios. Likewise, Ball and Kothari (1989) provide consistent evidence that also attributes contrarian profits to leverage-induced beta shifts.

On the contrary, DeBondt and Thaler (1987) estimate the beta shifts in their contrarian portfolios and find that the estimated beta is positive in up-markets but negative in down-markets, indicating that capital asset pricing model (CAPM) betas are inappropriate for risk adjusting the returns of these extreme performance portfolios. Their empirical evidence supports the existence of contrarian profits even after taking into account the concerns raised by other studies.

Jones (1993) suggests that the positive covariance between the contrarian beta and the risk premium can be explained by rational time-varying expected returns. Similar to Chan's (1988) idea, he argues that the observation period relative risk of

[1] See, for example, Keim (1983), Reinganum (1983), and Fama and French (1988).

extreme performers is conditional upon formation period market returns. Nevertheless, he cannot deny the possibility of contrarian profits that are detected by DeBondt and Thaler (1985, 1987).

Conrad and Kaul (1993) suggest that market overreaction claimed by DeBondt and Thaler (1985, 1987) is due to a bias in computations. They argue that calculating abnormal returns by cumulating single period returns over a long horizon includes upward biases because of measurement errors. Measurement errors in observed prices due to bid-ask errors, nonsynchronous trading, and/or price discreteness lead to substantial spurious returns to the long-term zero-investment contrarian strategies. In addition, Conrad and Kaul argue that rebalancing the loser and winner portfolios to equal weights each month is a conceptually incorrect measure. They propose a buy-and-hold return over long intervals as a proper measure of contrarian performances.

Chopra, Lakonishok, and Ritter (1992) offer a different perspective. They allow time variation in betas and do not use the restrictive assumptions of the Sharpe-Lintner to test the abnormal return related to the overreaction hypothesis. Consistent with DeBondt and Thaler's (1985, 1987) findings, their results suggest a substantial overreaction effect associated with contrarian strategies. They show that a substantial proportion of the overreaction (over 50 percent) occurs in months other than January.

Many have argued about the investment strategies used by DeBondt and Thaler (1985, 1987), but few can explain the detection of contrarian profits in DeBondt and Thaler's studies. A recent paper by Ball, Kothari, and Shanken (1995), however, offers a different explanation of the associated abnormal returns.

Ball, Kothari, and Shanken (1995) study problems in measuring the performance of contrarian portfolios. They raise two important concerns about contrarian strategies directly related to DeBondt and Thaler's (1985, 1987) studies. First, they argue that profits on contrarian portfolios are the result of errors in measuring raw and abnormal stock returns, similar to what Conrad and Kaul (1993) have suggested. Ball, Kothari and Shanken suggest that loser stocks picked by DeBondt and Thaler (1985, 1987) are low priced and exhibit positively skewed return distributions. These low priced loser stocks are extremely sensitive to microstructure/liquidity effects and the effect can be acute even in a long-horizon of five-year returns. For instance, an artificial price adjustment as small as $0.125 (as shown in Ball, Kothari, and Shanken) reduces 25 percent of the profits of the loser portfolio while it only decreases two percent of those of the winner portfolio. Thus, Ball, Kothari, and Shanken argue that the incorporation of microstructure factors such as firm size, price, book-to-market equity, and liquidity-related deviations increase the normal required return for the loser stocks and create an upward bias on contrarian returns.

Second, Ball, Kothari, and Shanken (1995) contradict the evidence by DeBondt and Thaler (1987, p. 800) that the abnormal returns are "insensitive to the choice of

December as the month of portfolio formation." Ball, Kothari, and Shanken (1995) report important differences in returns among portfolios that are formed at the end of June and August versus those initiated in December. They report that the average five-year loser stock return is 31 percent lower for June-end than December-end periods, even though they share 53.5 of their 54 years in common. The apparent difference in returns between June-end and December-end portfolios cast doubts on the robustness of DeBondt and Thaler's (1985, 1987) estimation of contrarian profits.

Whether contrarian profits are induced by market overreaction or measurement errors has not been answered. While DeBondt and Thaler (1985) suggest that the formation period does not matter in contrarian strategies, Ball, Kothari, and Shanken (1995) argue that changing the month in which trading is initiated drastically reduces both the raw and abnormal returns of the lower priced stocks. Nevertheless, Ball, Kothari, and Shanken claim that because June-end and August-end portfolios give "virtually indistinguishable" results (Ball, Kothari, and Shanken, 1995, p. 88), they conclude that the difference in contrarian returns is due to microstructure effects. By only examining contrarian portfolios that end in June, August, and December, they do not provide a complete understanding and a reliable explanation of the discrepancy between the two studies.

While adjusting for any potential measurement errors is critical, two important issues remain. The first concerns whether the results given by Ball, Kothari, and Shanken (1995) provide a complete picture of the so-called deceiving contrarian profits. If choosing a particular portfolio formation month [December in DeBondt and Thaler's (1985) study] can alter the abnormal returns when using contrarian strategies, then the sensitivity of the initiated month suggests performance measurement problems and casts doubts on the evidence of contrarian profits. Differential returns among different formation months deserve attention because they can potentially explain the validity of contrarian strategies. The second issue concerns the explanation of the December-end contrarian profits. As claimed by DeBondt and Thaler (1987), contrarian profits and rational market behavior are not mutually exclusive. In other words, the detected overreaction could be due to a rational repricing behavior resulting in a mean-reverting pattern in stock prices. Thus, the observed December-end contrarian profits are temporary swings from fundamental value of stock returns before the market adjusts to the equilibrium. If this is the case, the existence of contrarian profits provides an opportunity to observe the speed of adjustment and the magnitude of the rational repricing to the ·ilibrium. The question is how long and in what amount do the contrarian profits

exist, and how quickly is the adjustment in contrarian returns to the long-run equilibrium given a three-year observation period.[2]

To provide a better understanding of the above two issues, I investigate whether the formation period makes a difference in contrarian profits. I compare the differential returns among contrarian portfolios that are formed in different months during the year to examine the robustness of Ball, Kothari, and Shanken's (1995) claim that December is a problematic month to form contrarian portfolios.

Also, to give further insight on how well the rational repricing behavior performs, I use a buy-and-hold strategy advocated by Conrad and Kaul (1993) to examine the speed of adjustment to equilibrium and the magnitude of contrarian profits. DeBondt and Thaler (1985, 1987) cumulate short-term monthly returns to loser and winner portfolios over three- and five-year periods. Their procedure suffers from a statistical drawback. As pointed out by Conrad and Kaul, cumulating short-term returns over longer period cumulates not only the true return but also upward bias in each of the single period returns. Instead of rebalancing the winner and loser portfolios to equal weights each month and cumulating single period return, I calculate the holding period return of each security in the contrarian portfolios and then average the security returns to obtain portfolio holding period returns. Unlike DeBondt and Thaler's (1985, 1987) compounding of the monthly equally weighted market return, I average the holding period returns of each security available for various holding periods. This evaluation procedure is more appealing because it minimizes the bias in measured returns[3] and ensures that the speed of adjustment and magnitude of contrarian profits are measured more precisely. While the speed of adjustment can be viewed as an analysis of how long the contrarian profits last before returning to normal, the magnitude of contrarian profits can be thought of as deviations from the fundamental value of stock returns in the market.

Data and Methodology

To measure the contrarian returns, I follow the method of previous studies [e.g., DeBondt and Thaler (1985, 1987), Conrad and Kaul (1993), and Ball, Kothari, and Shanken (1995)]. This portfolio construction technique uses three steps. First, over an initial portfolio formation period of three years I calculate the holding period return for every New York Stock Exchange (NYSE) stock on the Center of Research in Security Prices (CRSP) monthly file. This step is started in the year 1937 and

[2] I limit my analysis to a three-year period because it is not practical to extend the time for this study. To make meaningful comparison across all portfolios, I restrict my last winner and loser portfolios to end in the year of 1994. Although a longer period could be beneficial to understand the speed of adjustment, performance periods exhaust data dramatically which leads to unparalleled comparison among all portfolios.

[3] See Conrad and Kaul (1993).

repeated for all subsequent nonoverlapping three-year periods (i.e. beginning in 1937, 1940, 1943, ... , 1988). At the end of each of the formation periods all firms are ranked on the basis of their holding period returns. The bottom 35 stocks are assigned to a loser portfolio while the top 35 stocks are assigned to a winner portfolio. Each security is equally weighted in a portfolio. The last day of the portfolio formation period is called the day of *initiation*.

The second step involves an evaluation of the future performance of past losers and winners. The three-year periods following each of the portfolio formation periods are the performance periods (i.e., beginning in 1940, 1943, 1946, ... , 1991). For each of these performance periods I calculate the holding period returns of each security in the loser or winner portfolios. In addition, I assign the equally weighted CRSP index return to any missing months in the performance period.

The final step is to consider whether there are abnormal returns from these loser and winner portfolios. If loser portfolios outperform or winner portfolios underperform the market over the performance periods, contrarian profits are detected.

Ball, Kothari, and Shanken (1995) argue that contrarian portfolios initiated in December provide abnormal returns that are not detected in portfolios initiated in June and August. Their suggestion casts doubt on the validity of contrarian strategies. To determine if there is any differential return across months I first define portfolios with different initial months according to their formation and performance periods. January portfolios are defined as those that have formation periods that run from January of the first year to December of the third year prior to initiation and performance periods that run from January of the first year to December of the third year after the initiation. For instance, the first January portfolio has a formation period that runs from January 1938 to December 1940 and a performance period that runs from January 1941 to December 1943. The second January portfolio has a formation period that runs from January 1941 to December 1943 and a performance period that runs from January 1944 to December 1946. This process yields 18 January portfolios. December portfolios have everything backed up one month. For example, the first December portfolio is defined to have a three-year formation period from December 1937 to November 1940 and a three-year performance period from December 1940 to November 1943. I examine all 12 possible initiation months. Portfolios defined with different initiated months following the same procedure. This process gives 18 portfolios for each initiated month and a total of 216 portfolios for the period running from January 1937 to December 1994.

The procedure to evaluate the securities differs from that of DeBondt and Thaler (1985, 1987). I assume that investors hold the same portfolio throughout the whole three-year performance period instead of rebalancing the portfolio each year, as done by DeBondt and Thaler (1985, 1987). This method is employed to minimize the potential upward bias when cumulating single period returns over a long interval, as

suggested by Conrad and Kaul (1993). Thus, a buy-and-hold measurement procedure provides more precise evidence of overreaction, if any. The holding period return of a security over a 36-month interval for both the formation and performance periods is calculated by compounding single period returns,

(1) $HPR_i(36) = (1+R_1)(1+R_2) \ldots (1+R_{36}) - 1$

where:

$HPR_i(36)$ = The 36-month holding period return of security i; and

R = The monthly return on that security.

For each 36-month performance period, I calculate HPR_i for each security in the loser and winner portfolios and then average the security returns to obtain the holding period return for portfolio p (HPR_p),

(2) $HPR_p(36) = \sum_{i=1}^{35} HPR_i(36) / 35$

where:

35 = The number of stocks in both the loser and winner portfolios.

To calculate the abnormal performance of the loser and winner portfolios with respect to the market, I subtract the holding period returns of an equally weighted market portfolio from the holding period returns of the portfolios of losers and winners for each 36-month interval. That is

(3) $AHPR_p(36) = HPR_p(36) - \frac{1}{N} \sum_{j=1}^{N} HPR_j(36)$

where:

$AHPR_p$ = The portfolio holding period abnormal return;

N = The number of NYSE stocks available at the time of evaluation; and

$HPR_j(36)$ = A 36-month holding period return for security j.

The last term in equation (3) represents an equally weighted market holding period return.

In calculating security holding period returns to form an equally weighted market portfolio for the holding period, I do not compound the CRSP monthly NYSE equally weighted index return, but average the holding period returns of each NYSE security for each 36-month interval. A detailed theoretical implication of this procedure is discussed by Roll (1983). I next average portfolio abnormal returns for a given calendar month across the 18 observations available. Then I compute summary statistics to assess differences in abnormal returns across calendar formation months.

To measure the speed of adjustment to equilibrium and the magnitude of contrarian profits, I employ a method similar to that discussed above. Instead of measuring holding period returns at the end of the three-year performance period, I measure each portfolio's performance every six months for three years. I examine how long it takes for contrarian profits to disappear.

The null hypothesis for the above tests is that for any given calendar formation month the average holding period abnormal return during the performance period for both the loser and winner portfolios is zero. The respective alternative hypotheses are

(4) $AAHPR_l(k) > 0$

(5) $AAHPR_w(k) < 0$

where:

$AAHPR_l$ = The average holding period abnormal return (across 18 observations) for the loser portfolios;

$AAHPR_w$ = The average holding period abnormal return for the winner portfolios; and

k = The length of the period considered in the evaluation.

I examine whether each portfolio's abnormal return differs from zero and also whether portfolios' abnormal returns differ across calendar formation months. Because contrarian strategies suggest buying loser stocks and selling winner stocks, the combined contrarian profits can be written as

(6) $DAAHPR(k) = AAHPR_l(k)—AAHPR_w(k)$

where:

DAAHPR(k) = The difference in returns between the loser and winner portfolios; and

k = The length of the period considered in the evaluation.

I examine whether this difference is different from zero for each calendar formation month and also whether these differences vary across formation months.

Results and Discussion

Descriptive Statistics

I present descriptive statistics for both loser and winner portfolio returns during the formation periods in Panel A and Panel B of Table 1. Panel A indicates that loser portfolios initiated in the months of January, February, November, and December have the smallest means among all portfolios. The fact that these months are at the turn of the year suggests there is a potential seasonality among the data. Second, all the medians across portfolios are smaller than the means, indicating that the distribution of the data is skewed to the right. Third, the largest maximum, 0.4413 (i.e., 44.13 percent), is found in the February portfolios.

Similar patterns are observed for winner portfolios in Panel B. First, the largest means fall in the portfolios initiated in January, February, and December which also are at the turn of the year. Second, with the exception of July portfolios, the means are larger than the medians across all portfolios. Third, the largest maximum, 10.4722, is detected in the February portfolios. Because most of the extreme values are observed in portfolios initiated at the turn of the year, it suggests that seasonality may persist in the data.

Table 1—Descriptive Statistics for Portfolio Returns in the Formation Period

	Max	Min	Mean	Median	Range	Std. Dev.	Skewness
Panel A: Descriptive Statistics for Loser Portfolios in the Formation Period							
Jan	-0.1100	-0.9044	-0.5395	-0.5636	0.7944	0.2185	0.1959
Feb	0.4413	-0.8873	-0.5302	-0.5835	1.3286	0.3057	1.9196
Mar	0.3127	-0.8773	-0.5233	-0.5787	1.1900	0.2904	1.4019
Apr	0.2537	-0.8801	-0.5275	-0.6173	1.1338	0.2780	1.2795
May	0.2537	-0.8690	-0.5237	-0.5922	1.1227	0.2821	1.2045
Jun	0.2236	-0.8692	-0.5110	-0.5805	1.1198	0.3043	0.8848
Jul	0.1802	-0.8878	-0.5173	-0.5932	1.0680	0.2903	0.8133
Aug	0.2110	-0.8965	-0.5153	-0.5740	1.1074	0.2876	0.8343
Sep	0.1224	-0.8856	-0.5208	-0.5735	1.0079	0.2688	0.6746
Oct	-0.0783	-0.8940	-0.5286	-0.5604	0.8158	0.2310	0.2764
Nov	-0.1120	-0.8988	-0.5354	-0.5501	0.7868	0.2122	0.1578
Dec	-0.0253	-0.8934	-0.5409	-0.5660	0.8681	0.2249	0.4860
Panel B: Descriptive Statistics for Winner Portfolios in the Formation Period							
Jan	5.5401	1.5315	3.0516	2.9543	4.0086	1.0363	0.9526
Feb	10.4722	0.8242	2.9641	2.7044	9.6481	2.0877	2.9051
Mar	6.9223	0.8789	2.8218	2.5610	6.0435	1.3921	1.3780
Apr	6.6816	0.8628	2.8284	2.6331	5.8188	1.3345	1.3486
May	6.4536	0.7764	2.8390	2.5475	5.6772	1.2966	1.2103
Jun	5.7069	0.6112	2.9164	2.7514	5.0957	1.2963	0.1932
Jul	5.1668	0.6242	2.9051	2.9359	4.5426	1.2186	-0.0934
Aug	5.5697	0.7349	2.8582	2.6945	4.8348	1.2398	0.3357
Sep	5.1231	0.9645	2.8536	2.6381	4.1586	1.1755	0.3376
Oct	5.0541	1.4074	2.8194	2.6836	3.6466	0.9374	0.5247
Nov	4.9052	1.3711	2.8485	2.7341	3.5341	0.8993	0.4555
Dec	5.1349	1.5134	2.9444	2.7766	3.6215	0.9388	0.5327

Table 2 gives the descriptive statistics for portfolio returns in the performance period. Panel A suggests that all loser portfolios, on average, have positive holding period returns. In addition, the right-skewed distribution persists in the loser portfolios. Consistent with the results provided for the formation period, the largest maximum, 6.1510, is found in the February portfolios.

Panel B also suggests a right-skewed distribution for the winner portfolios. With the exception of January and December portfolios, means are larger than the medians across all months, consistent with previous results. Likewise, the largest maximum is found in the February portfolios with a holding period return of 2.7961. The holding period returns are fairly similar among winners and losers. The finding is inconsistent with what is found by DeBondt and Thaler (1985, 1987), who find loser portfolios outperform the market by 19.6 percent while the winner portfolios underperform the market by five percent.

Combining the results in Panel A and B, it is plausible to conclude that both loser and winner portfolios tend to converge to some similar returns with loser portfolios moving more than the winner portfolios. Also, February portfolios, which

Table 2—Descriptive Statistics for Portfolio Returns in the Performance Period

	Max	Min	Mean	Median	Range	Std. Dev.	Skewness
Panel A: Descriptive Statistics for Loser Portfolios in the Performance Period							
Jan	3.2703	-0.3822	0.6711	0.5384	3.6525	0.8160	1.9139
Feb	6.1510	-0.3129	0.7393	0.4236	6.4640	1.4186	3.5935
Mar	3.3379	-0.1553	0.6118	0.4162	3.4931	0.7994	2.4758
Apr	3.2195	-0.2125	0.5722	0.3890	3.4320	0.7720	2.5138
May	2.5216	-0.2418	0.5594	0.3968	2.7634	0.6530	1.6865
Jun	2.9071	-0.1558	0.5967	0.4157	3.0630	0.7495	1.8473
Jul	2.3984	-0.2257	0.6614	0.4732	2.6241	0.7127	1.1122
Aug	2.0722	-0.2321	0.6223	0.3224	2.3043	0.7033	1.1522
Sep	2.0857	-0.2863	0.5978	0.2699	2.3720	0.7151	1.1151
Oct	2.6338	-0.3147	0.5957	0.4869	2.9485	0.6765	1.7004
Nov	2.7579	-0.2835	0.5990	0.3850	3.0414	0.6985	1.9007
Dec	2.1939	-0.3091	0.6563	0.5072	2.5029	0.6635	1.0918
Panel B: Descriptive Statistics for Winner Portfolios in the Performance Period							
Jan	1.1806	-0.3301	0.4953	0.5139	1.5107	0.4520	-0.2552
Feb	2.7961	-0.4088	0.5672	0.4498	3.2049	0.7396	1.6694
Mar	2.4093	-0.3481	0.5825	0.4148	2.7574	0.7243	1.1111
Apr	2.0961	-0.3142	0.5644	0.4385	2.4103	0.6726	1.0882
May	2.4682	-0.4032	0.5659	0.3613	2.8714	0.7252	1.2454
Jun	2.0565	-0.4578	0.5816	0.5272	2.5143	0.6576	0.6254
Jul	2.0690	-0.4747	0.5437	0.3677	2.5437	0.6545	0.6681
Aug	1.9801	-0.4218	0.5369	0.3987	2.4019	0.6284	0.5434
Sep	1.9340	-0.3261	0.5560	0.3745	2.2601	0.6072	0.5814
Oct	1.2912	-0.3006	0.5338	0.4149	1.5919	0.5130	0.0473
Nov	1.2313	-0.3997	0.5027	0.6040	1.6309	0.4562	-0.3917
Dec	1.4535	-0.4049	0.4903	0.5137	1.8584	0.4899	0.0544

are initiated in the month of February and end in the month of January, have the largest maximum in both formation and performance periods, which suggests a possible January effect.

Does the Formation Period Make a Difference in Contrarian Profits?

Results of analyses of 36-month performances between loser portfolios and the market, between winner portfolios and the market, and between contrarian portfolios and the market are presented in Table 3. Because my goal is to compare different formation periods, each group of initiated month portfolios is limited in size to 18. None of the test statistics is significant. Due to the limitation of the sample size, more emphasis is placed on the estimated mean instead of the t-statistics.[4]

[4] It is well-known in statistics that small sample size is associated with more uncertainties. The small sample size decreases the width of interval estimates and directly drives the standard error of the mean higher.

Table 3—Holding Period Returns for the 36-month Performance Period

	Max	Min	Mean	Median	Range	Std. Dev.	Skewness
Panel A: Statistics for Loser Portfolios Mean Differences From the Market							
Jan	2.4128	-0.8081	0.15568	0.1272	0.6667	2.2785	0.9907
Feb	3.6185	-0.5886	0.1812	-0.0234	0.9048	3.5307	0.8497
Mar	1.4727	-0.5294	0.0823	-0.0177	0.4827	1.4939	0.7234
Apr	1.5040	-0.5531	0.05711	-0.0471	0.4632	1.8633	0.5231
May	0.7695	-0.5811	0.03852	-0.0105	0.3736	0.6786	0.4374
Jun	1.6851	-0.5554	0.0237	-0.1023	0.5168	2.1254	0.1943
Jul	1.3006	-0.5088	0.1100	-0.0218	0.4373	1.6064	1.0675
Aug	1.1087	-0.5688	0.0770	-0.0204	0.4452	1.1717	0.7340
Sep	1.2245	-0.6862	0.0645	-0.0652	0.4679	1.1324	0.5852
Oct	1.7645	-0.6766	0.0853	-0.0173	0.5141	2.0459	0.7042
Nov	1.9625	-0.6467	0.0957	-0.0569	0.5616	2.2396	0.7231
Dec	1.5594	-0.6532	0.1568	0.0050	0.5138	1.1827	1.2946
Panel B: Statistics for Winner Portfolios Mean Differences From the Market							
Jan	0.5018	-0.5986	-0.0201	-0.0266	0.3169	0.0908	-0.2696
Feb	0.7572	-0.4011	0.0091	0.0359	0.2900	0.7345	0.1326
Mar	0.8898	-0.4447	0.0531	0.0780	0.3390	0.7315	0.6639
Apr	1.0403	-0.3926	0.0488	0.0652	0.3259	1.5249	0.6322
May	0.9822	-0.3348	0.0450	0.0331	0.3511	1.4202	0.5438
Jun	0.8577	-0.7275	0.0180	0.0832	0.3358	0.2126	0.2269
Jul	0.6724	-0.7289	-0.0077	-0.0160	0.3245	0.1882	-0.1002
Aug	0.7005	-0.6037	-0.0083	0.0326	0.3095	0.3030	-0.1140
Sep	0.5947	-0.5389	0.0227	-0.0140	0.3172	0.3613	0.3038
Oct	0.7246	-0.5606	0.02348	0.0191	0.3244	0.3464	0.3071
Nov	0.4741	-0.5540	-0.0005	0.0847	0.2815	-0.3570	-0.0080
Dec	0.3943	-0.4981	-0.0187	0.0534	0.2879	-0.2344	-0.2753
Panel C: Statistics for Contrarian Portfolios							
Jan	2.8410	-1.1845	0.1758	0.1067	0.8734	1.5110	0.8541
Feb	3.3550	-0.8742	0.1721	0.0366	0.9251	2.4945	0.7895
Mar	1.0334	-0.8785	0.0292	-0.0768	0.5566	0.3730	0.2229
Apr	1.1234	-1.0758	0.0083	-0.0679	0.5459	0.0090	0.0644
May	0.9810	-1.0890	-0.0065	-0.0693	0.5092	-0.1249	-0.0541
Jun	2.4126	-1.0232	0.0057	-0.1386	0.7607	1.8195	0.0319
Jul	2.0295	-0.8113	0.1177	-0.0007	0.6508	1.4956	0.7673
Aug	1.7124	-1.1241	0.0853	-0.0211	0.6451	0.6758	0.5612
Sep	1.7634	-1.0128	0.0418	-0.0053	0.6217	1.0821	0.2855
Oct	2.3251	-1.1639	0.0619	0.1221	0.7326	1.4783	0.3582
Nov	2.5165	-0.8735	0.0963	0.1249	0.7398	2.0114	0.5520
Dec	1.9881	-0.9362	0.1755	0.1384	0.6699	0.8317	1.1113

Compared to the market holding period returns, column 3 of Panel A in Table 3 shows that January, February, and December portfolios have means of 0.1557, 0.1812, and 0.1568, respectively, which are higher than those of other initiated month portfolios. February portfolios have the highest means, consistent with previous results. Similar to those that are found in the formation period, with the exception of July portfolios, Panel A demonstrates a pattern that all the higher

returns are observed at the turn of the year. Panel B gives statistics for winner portfolios and does not show the turn-of-the-year pattern. There are five initiated month portfolios that have, on average, negative holding period returns. This finding indicates that winner portfolios initiated in January, July, August, November, and December tend to underperform the market. Panel C combines the results given in Panel A and Panel B to demonstrate the performance of contrarian portfolios. The turn-of-the-year pattern emerges once again. The highest means are in the January, February, and December portfolios, 0.1758, 0.1721, and 0.1755, respectively. This re-emerged turn-of-the-year pattern suggests that the losers tend to have more influence in the performance of the contrarian portfolios than do the winners. In addition, this turn-of-the-year pattern of the contrarian profits is consistent with Reinganum's (1983) explanation that investors tend to sell small firm stocks at the turn of the year, creating the artifact of contrarian profits.

To validate Ball, Kothari, and Shanken's (1995) argument that the formation month makes a difference in contrarian profits, I also provide Figure 1a and 1b to illustrate the issue. Consistent with the empirical evidence provided in Tables 1, 2, and 3, both Figures 1a and 1b indicate that the formation period matters in the performance of the contrarian portfolios. In general, there are extreme performances at the turn of the year. Figure 1a shows that there is a big contrast in performances between the loser and winner portfolios across different initiated months. For instance, there is a large divergence (about 15 percent to 18 percent) in holding period returns for the January and February portfolios while the difference is minimal for the April, May, and June portfolios. The difference between loser and winner portfolios is observed again for July-, August-, September-, and October-initiated months, with the degree of divergence increasing for November- and December-initiated months.

Hence, if DeBondt and Thaler's (1985, 1987) choice of the month of December to form their contrarian portfolios is arbitrary, they are just fortunate to detect the contrarian profits. In other words, if they had picked April, May, or June as the initiated month, they should not observe their reported contrarian profits. According to the findings here, they should not detect any contrarian profits. Similarly, Ball, Kothari, and Shanken (1995) argue that no such contrarian profits are detected if the portfolios are initiated in the months of July and September, which they refer to as *June and August portfolios*, respectively. The reported results tend to support and justify their claim.

Figures 1a and 1b indicate that portfolios initiated in July and September, in general, underperform those initiated in the months around the turn of the year. Contrarian portfolios initiated in the month of January (i.e., Ball, Kothari, and Shanken's December portfolios) have the highest mean holding period, suggesting

Figure 1a—Loser and Winner Mean Return Differences From the Market

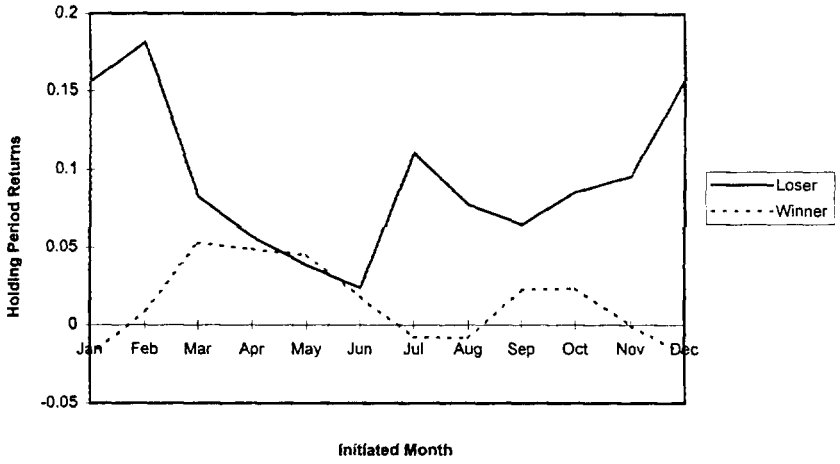

Figure 1a compares the 36-month holding period returns of loser and winner portfolios initiated in different months

Figure 1b—Contrarian Portfolios' Mean Returns

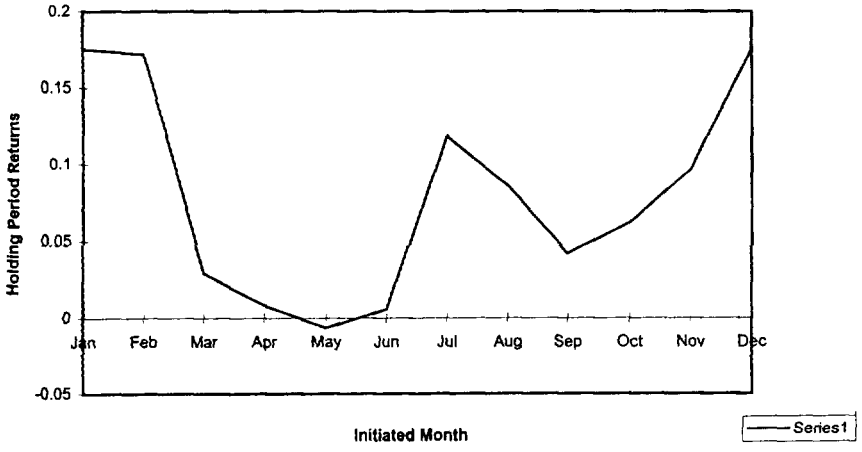

Figure 1b illustrates the 36-month holding period returns for contrarian portfolios initiated in different months

that January is a problematic month to form contrarian portfolios.[5] Both Table 3 and the two figures confirm what Ball, Kothari, and Shanken (1995) suggest: the formation period does matter in estimating the performance of the contrarian portfolios. Thus, if Ball, Kothari, and Shanken are correct, the existence of contrarian profits only reflects the errors of measurement and microstructure effects.

Speed of Adjustment and Magnitude of Contrarian Profits

A secondary objective of this paper is to investigate the speed of adjustment and the magnitude of rational repricing to equilibrium within a three-year performance period, assuming contrarian profits exist.[6] In an attempt to answer how long and in what amount the contrarian profits exist and how quickly the adjustment in contrarian returns is to the long-run equilibrium, I divide each 36-month performance period into six six-month intervals. Instead of measuring holding period returns at the end of each 36-month performance, I measure each portfolio's performance at the end of each six-month interval to examine whether contrarian profits disappear within the three year performance period. Table 4 gives the mean holding period return differences between loser portfolios and the market and between winner portfolios and the market. There are two patterns observed in Panel A for the loser portfolios. First, holding the initiated month constant, more significant results are detected within the third, fourth, and fifth intervals. Second, holding the interval constant, January portfolios have more significant holding period returns than other portfolios. In addition, more significant results are observed in the middle of the year; April, May, June, and July portfolios have more deviations from the mean than other initiated month portfolios.

Panel B provides results on the mean differences between winner portfolios and the market. Contrary to Panel A results, few significant t-statistics are detected. Holding the initiated month constant, significant results tend to cluster within the fifth and the sixth intervals. Holding the interval constant, significant results are observed in the May, June, July, August, and December portfolios. Generally, there are more deviations from the zero mean in the loser portfolios than in the winner portfolios.

Figures 2a to 2l represent the loser and winner performance when compared to the market. These graphs illustrate the path of the contrarian profits across intervals.

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[5] Because portfolios initiated in the month of January have the highest mean holding period return among all portfolios, they should not be regarded as the typical portfolios. In addition, the highly publicized January effect also may affect the return on the portfolios initiated in January. For evidence on the January effect see Keim and Stambaugh (1986), Ariel (1987), Lakonishok and Smidt (1989), and Jaffe, Keim and Westerfield (1989)

[6] This is the limitation of the study. In order to make uniform and meaningful comparison among all portfolios, the examination of portfolio performances stops at the end of 1994.

Figure 2a—Loser and Winner Return Performances for January Portfolios

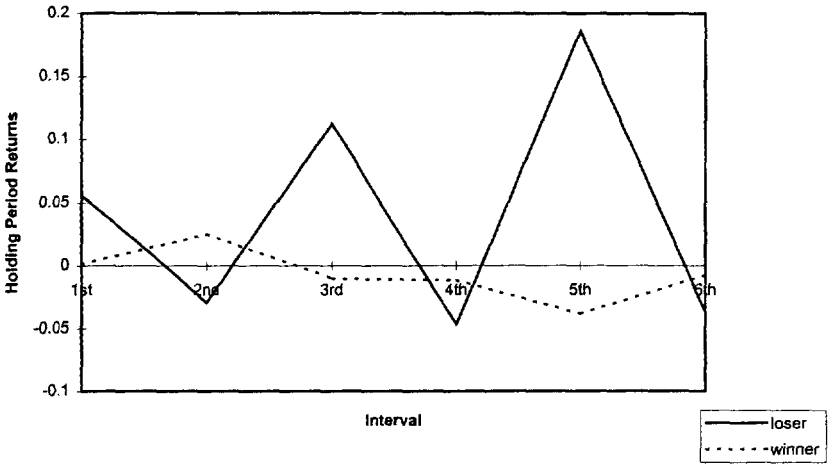

Figure 2b—Loser and Winner Return Performances for February Portfolios

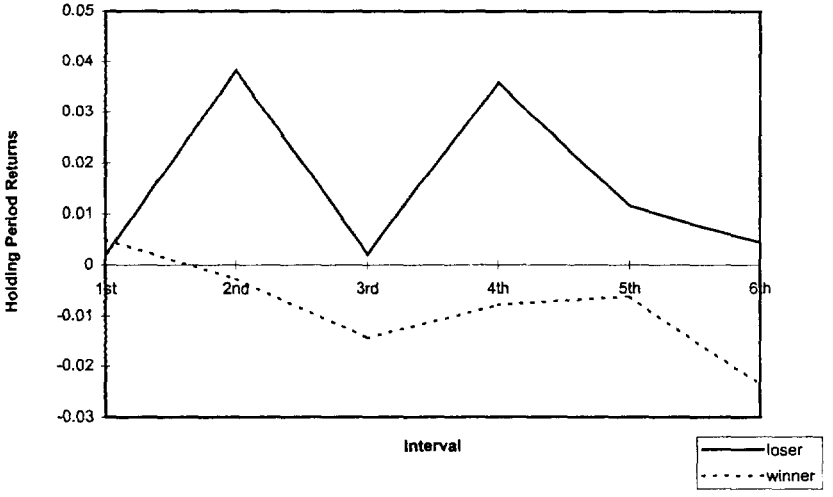

Figure 2c—Loser and Winner Return Performances for March Portfolios

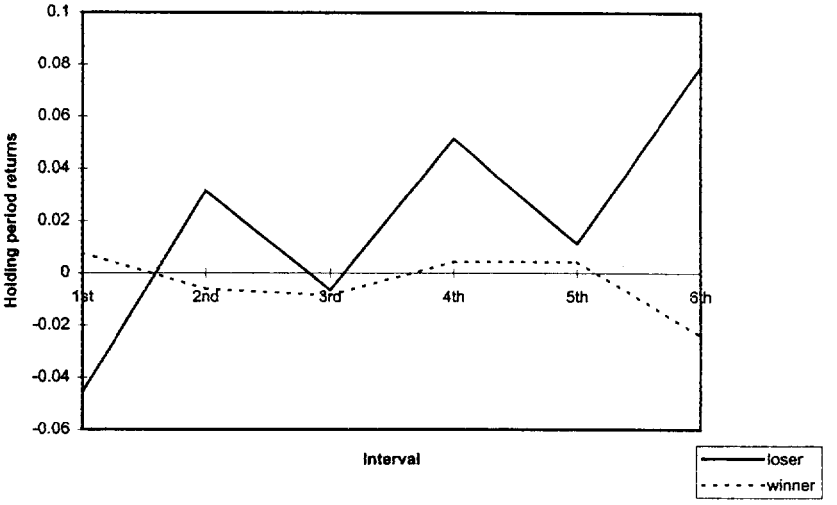

Figure 2d—Loser and Winner Performances for April Portfolios

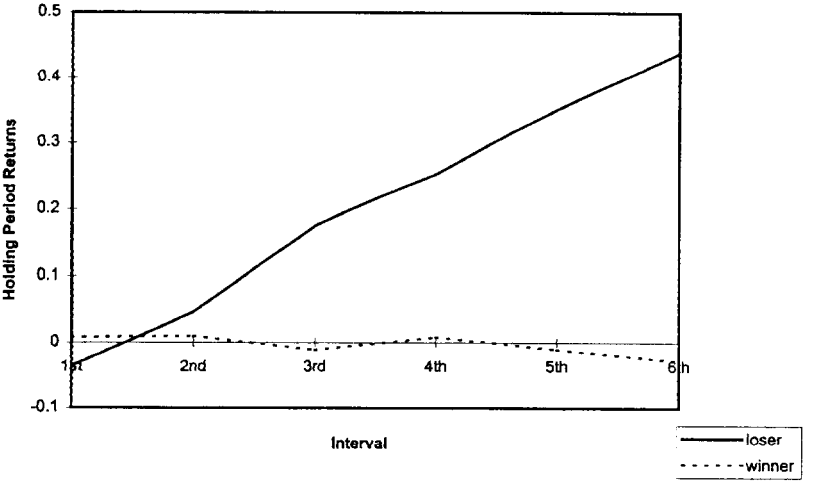

Figure 2e—Loser and Winner Performances for May Portfolios

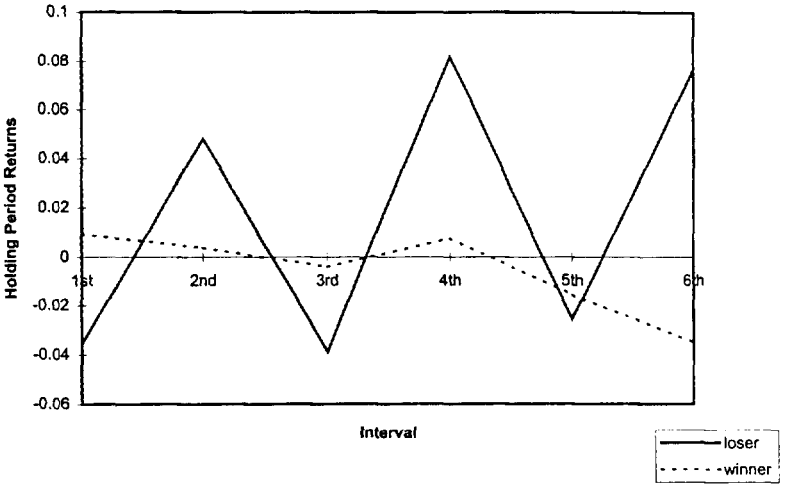

Figure 2f—Loser and Winner Performances for June Portfolios

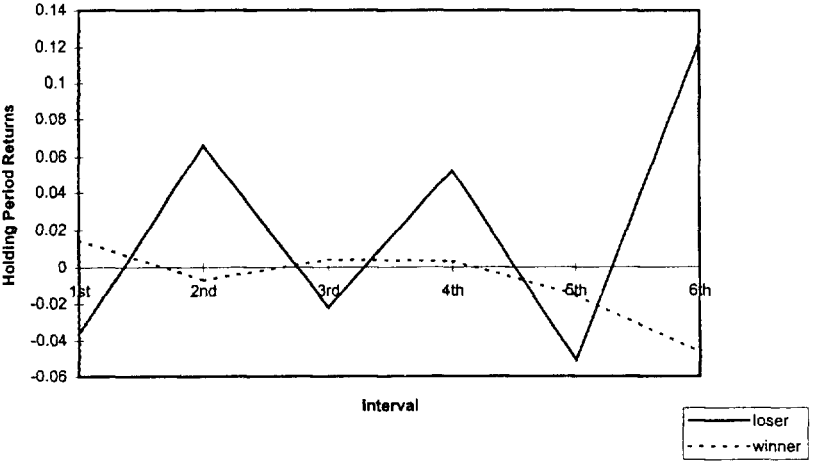

Figure 2g—Loser and Winner Performances for July Portfolios

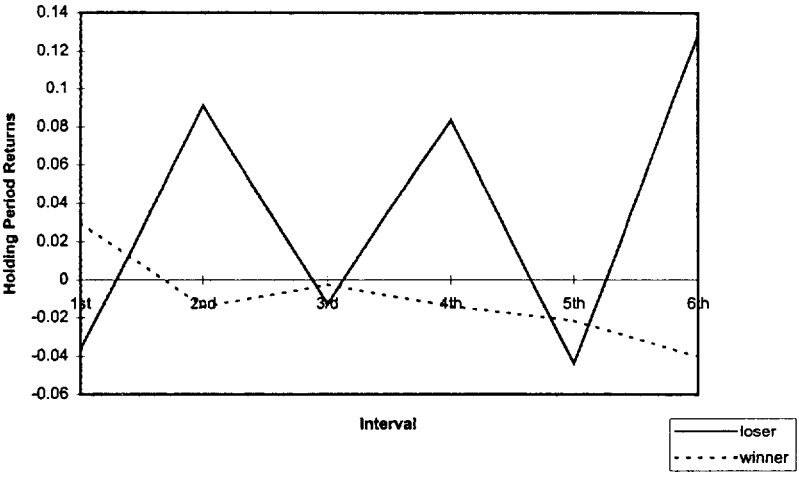

Figure 2h—Loser and Winner Performances for August Portfolios

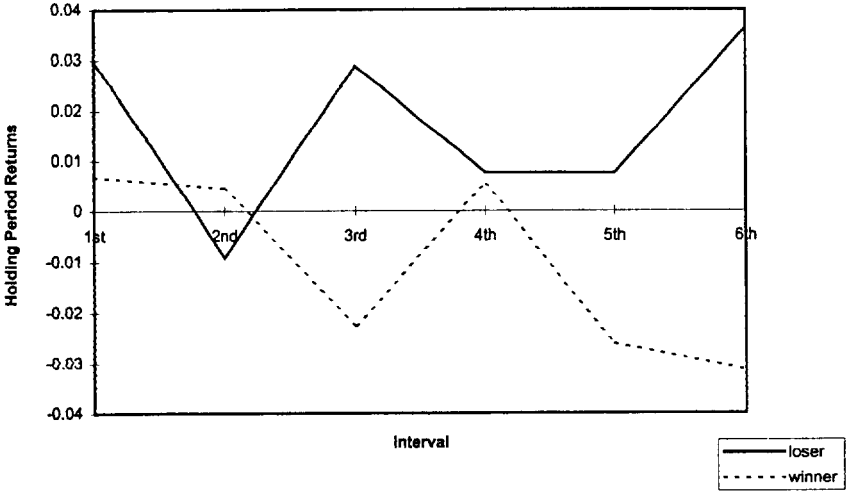

Figure 2i—Loser and Winner Performances for September Portfolios

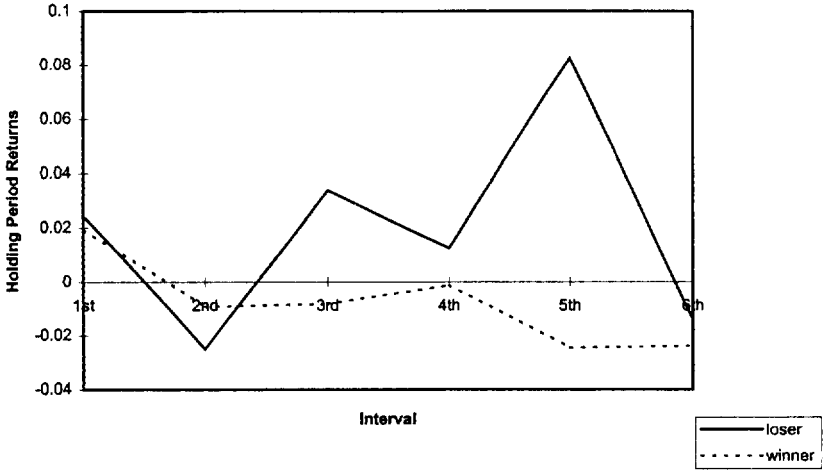

Figure 2j—Loser and Winner Performances for October Portfolios

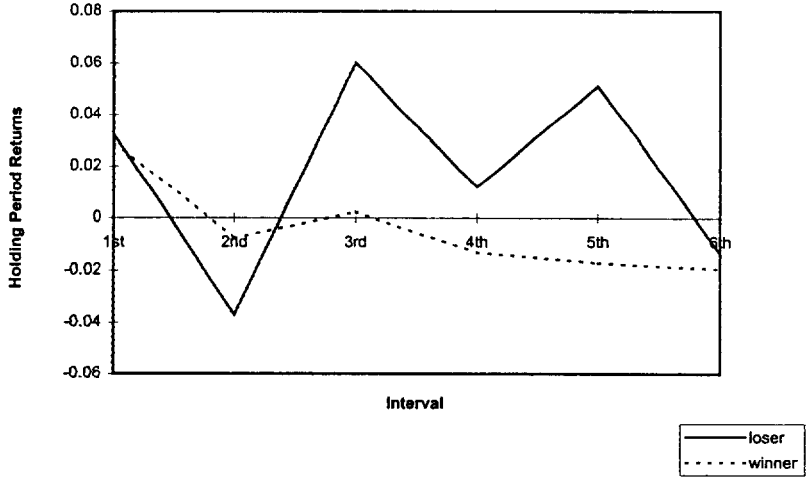

Figure 2k—Loser and Winner Performances for November Portfolios

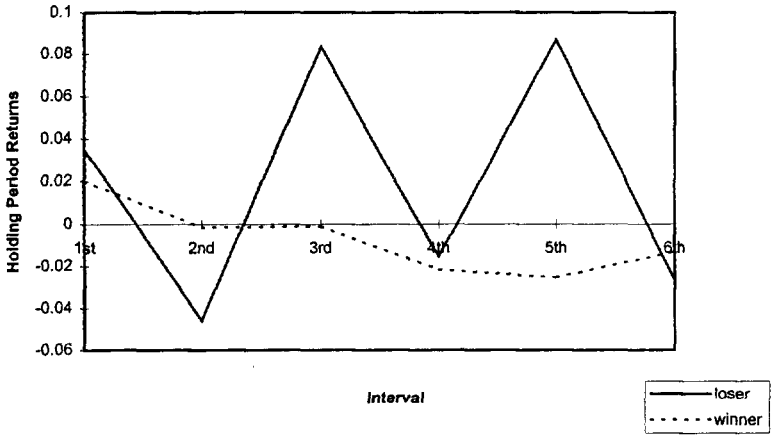

Figure 2l—Loser and Winner Performances for December Portfolios

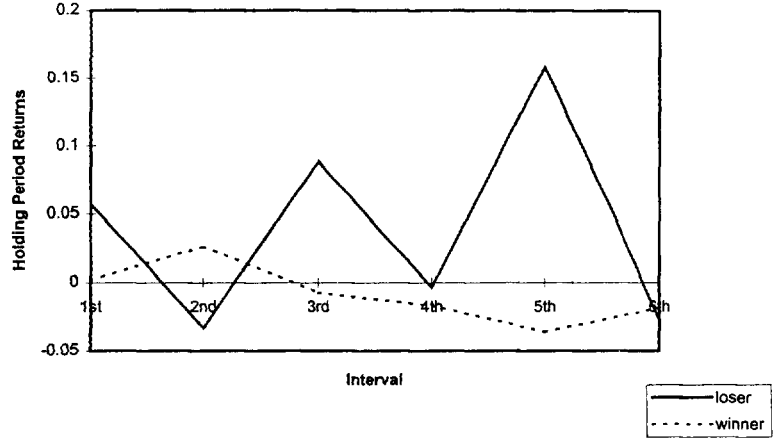

Table 4—Holding Period Return Differences From the Market for the Portfolios Within Six Six-Month Intervals

Interval[a]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Panel A: Loser Portfolios												
1	0.05578*	0.0019	-0.0455**	-0.0353	-0.0356	-0.03619	-0.0368	0.0297	0.0243	0.03189	0.0349*	0.0568**
	(0.03601)	(0.0378)	(0.0219)	(0.0290)	(0.0273)	(0.02753)	(0.0279)	(0.0243)	(0.0279)	(0.0328)	(0.0258)	(0.0283)
2	-0.0295	0.0381*	0.0314	0.0458	0.0481*	0.0659**	0.0909***	-0.0092	-0.0249	-0.0371	-0.0459*	-0.0332
	(0.0318)	(0.0272)	(0.0273)	(0.0638)	(0.0279)	(0.0265)	(0.0340)	(0.0300)	(0.0285)	(0.0240)	(0.0212)	(0.0274)
3	0.1123**	0.002	-0.0066	0.1758**	-0.0389*	-0.0221	-0.0129	0.0288	0.0337*	0.0601	0.0834***	0.0890***
	(0.0441)	(0.0283)	(0.0297)	(0.1010)	(0.0245)	(0.0263)	(0.0300)	(0.0256)	(0.0244)	(0.0244)	(0.0294)	(0.0318)
4	-0.0465**	0.0358*	0.0514**	0.2541**	0.0819***	0.0521**	0.0835**	0.0077	0.0125	0.0118	-0.0154	-0.0336
	(0.0262)	(0.0261)	(0.0239)	(0.1154)	(0.0294)	(0.0248)	(0.0368)	(0.0302)	(0.0224)	(0.0236)	(0.0298)	(0.0264)
5	0.1855**	0.0114	0.0113	0.3532***	-0.0255	-0.0509***	-0.0438**	0.0076	0.0826	0.0508	0.0867**	0.1588*
	(0.1067)	(0.0290)	(0.0217)	(0.1224)	(0.0241)	(0.0195)	(-0.0199)	(0.0351)	(0.0879)	(0.0507)	(0.0443)	(0.1010)
6	-0.0369*	0.0043	0.079	0.4395**	0.0768**	0.1224*	0.1282**	0.0363	-0.0142	-0.0138	-0.0269	-0.0276
	(0.0213)	(0.0332)	(0.0903)	(0.1729)	(0.0440)	(0.0826)	(0.0695)	(0.0307)	(0.0188)	(0.0200)	(0.0224)	(0.0233)
Panel B: Winner Portfolios												
1	0.0011	0.0049	0.0075	0.0081	0.0093	0.0247	0.0299*	0.0069	0.0195	0.0289	0.02	0.0019
	(0.0213)	(0.0127)	(0.0108)	(0.0077)	(0.0095)	(0.0139)	(0.0179)	(0.0153)	(0.0165)	(0.0184)	(0.0161)	(0.0168)
2	0.0252	-0.0028	-0.0062	0.0097	0.0039	-0.0073	-0.0144	0.0045	-0.0093	-0.0077	-0.0016	0.0263*
	(0.0187)	(0.0190)	(0.0233)	(0.0212)	(0.0160)	(0.0150)	(0.0169)	(0.0144)	(0.0128)	(0.0177)	(0.0163)	(0.0183)
3	-0.0102	-0.0144	-0.0086	-0.0116	-0.0043	0.0042	-0.0026	-0.0225**	-0.0083	0.0023	-0.0011	-0.0073
	(0.0179)	(0.0126)	(0.0152)	(0.0162)	(0.0145)	(0.0142)	(0.0170)	(0.0168)	(0.0165)	(0.0190)	(0.0181)	(0.0180)
4	-0.0114	-0.0079	-0.0022	0.0085	0.0076	0.0033	-0.014	0.0053	-0.0013	-0.0133	-0.0217**	-0.0168
	(0.0137)	(0.0091)	(0.0140)	(0.0146)	(0.0152)	(0.0166)	(0.0150)	(0.0162)	(0.0114)	(0.0123)	(0.0091)	(0.0137)
5	-0.0382**	-0.0063	0.0043	-0.0109	-0.0156*	-0.0155*	-0.0216**	-0.0261**	-0.0244	-0.0172	-0.0254	-0.0361*
	(0.0220)	(0.0137)	(0.0134)	(0.0109)	(0.0102)	(0.0104)	(0.01147)	(0.0148)	(0.0219)	(0.0244)	(0.0230)	(0.0249)
6	-0.0072	-0.0236*	-0.0241	-0.0281	-0.0351*	-0.0467**	-0.0403*	-0.0314**	-0.0237	-0.0195**	-0.0131	-0.0182*
	(0.0134)	(0.0153)	(0.0229)	(0.0236)	(0.0238)	(0.0264)	(0.0269)	(0.0163)	(0.0115)	(0.0092)	(0.0107)	(0.0134)

* Significant at the 10 percent level; ** Significant at the 5 percent level; *** Significant at the 1 percent level

Standard errors in parentheses

[a]Each portfolio's 36-month performance period is divided into six six-month intervals to measure the speed of adjustment and the magnitude of the contrarian profits

For example, the darker line in Figure 2a shows the loser portfolios' holding period returns within the six six-month intervals while the lighter line shows those of the winner portfolios. Focusing on the January loser portfolios, the graph indicates that there is about 5 percent (i.e., 0.05 on the graph) holding period return within the first interval and a -2 percent within the second interval. The loser portfolios take 12 percent holding period returns within the third interval, decline to -4 percent within the fourth interval, peak at 19 percent within the fifth interval, and end with a -5 percent by the sixth interval.

An interesting pattern is detected among these 12 graphs. While winner portfolios tend to follow the market closely, the performance of the loser portfolios tells a different story. With the exception of April portfolios, losers demonstrate a "W" curve in all initiated month portfolios. Because of the way these portfolios are formed for each six-month period, loser portfolios peak when the interval consists of the month of January. For instance, because the first, third, and fifth intervals in January portfolios are the ones that consist of the month of January in calculating the holding period returns, the curve peaks at those intervals, but not others. Similarly, the second, fourth, and sixth intervals in March portfolios are the ones that include the month of January in estimating the holding period returns; the performance of the loser portfolios reaches its peak at those intervals. In general, the 12 graphs confirm the abnormal contrarian profits found in the month of January, consistent with previous studies [DeBondt and Thaler (1985, 1987), Chopra, Lakonishok, and Ritter (1993), etc.]. Finally, the pattern observed in April portfolios is mysterious. I do not obtain any result within the 36-month performance period for April portfolios that is significantly different from the others.

The results provide answers to several issues. First, different formation months result in economic and statistical differences in contrarian profits. Second, measuring six-month intervals within a 36-month performance period illustrates the fact that contrarian profits do not all adjust to equilibrium within a three-year period. Third, a January effect is observed not only in the 36-month performance period, but also in the six six-month performance intervals whenever the interval includes the month of January.

Conclusion

Despite the mounting research on the predictability of stock returns, many controversies remain unsolved around the formation and performance measurement of contrarian strategies. Among all the inconclusive results, Ball, Kothari, and Shanken (1995) suggest that the formation period picked by DeBondt and Thaler (1985, 1987) is suspicious. They argue that the month to form contrarian portfolios makes a difference in the performance of this investment strategy. Nevertheless, Ball, Kothari, and Shanken only provide results with contrarian portfolios formed in the months of December, June, and August.

In an attempt to reconcile the different results given by DeBondt and Thaler (1985, 1987) and Ball, Kothari, and Shanken (1995), I examine contrarian portfolios initiated in different months in the year. Empirical results suggest that the formation period matters in the performance of the contrarian portfolios in a 36-month performance period and six six-month intervals within the 36-month period, justifying the claim of Ball, Kothari, and Shanken. In addition, dividing the 36-month performance period into six intervals presents a convenient measurement of the speed of adjustment of the contrarian profits to the equilibrium while providing an opportunity to observe how long and in what amount contrarian profits exist. The subperiod performances show that the contrarian portfolios do not adjust, at least within six six-month intervals, to the equilibrium in a swift manner and that the associated abnormal holding period returns do not die by the end of the sixth interval.

When the results for the 36-month and six six-month performance periods are combined, a noticeable January effect is detected. Whenever the month of January is included in the calculation of the holding period returns for both the loser and the winner portfolios, abnormal returns are observed with losers having abnormal positive holding period returns and winners having abnormal negative holding period returns. The finding is consistent with previous studies that show that January is a problematic month to measure the performance of contrarian portfolios and that seasonality persists across time.

Even though the paper clarifies some mysteries about contrarian strategies, one issue remains. The time horizon picked to examine the speed of adjustment may not be long enough to investigate the core of the question. A 36-month performance period may be too short to detect an adjustment of contrarian profits to equilibrium. An extension of the time interval to measure the performance of the contrarian portfolios should provide more insight on this issue. Similarly, because the prime goal of this study is to measure the differential contrarian profits across different initiated months, each group is constrained to a relatively small sample size.

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