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January reversal in the US weekend effect;

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JANUARY REVERSALS IN THE U.S. WEEKEND EFFECT

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JANUARY REVERSALS IN THE U.S. WEEKEND EFFECT

Abstract

Average returns for small firm size portfolios tend to decrease during the week in January, with Monday returns highest and Friday lowest. More striking are the results after controlling for Mondays and Fridays in the first and the last 3 weeks of January. Monday returns in this first week are significantly positive and inversely related to size. Monday returns are also significantly positive for the small firm size portfolio in the last 3 weeks of January. But returns on Friday are insignificantly different from zero after controlling for Fridays in the first week and the last three weeks of January. The first Monday in January is particularly critical to the reversal of the end-of-the-week effect at the turn-of-the-year, with abnormal demand for stocks following the first weekend of a new calendar year possibly responsible for this anomaly within an anomaly.

JANUARY REVERSALS IN THE U.S. WEEKEND EFFECT

1. Introduction

The asymmetric day-of-the-week common stock return distributions are one of the most anomalous empirical findings in finance. The early identification by Cross (1973), French (1980) and Gibbons and Hess (1981) that stock returns are higher (lower) than average on the last (first) trading day of the week spawned numerous studies searching for satisfactory explanations. Subsequent studies corroborate the persistency of the weekend effect in the U.S. and abroad [see Jaffe and Westerfield (1985), Solnik and Bousquet (1990) and Barone (1990), Dubois and Louvet (1996), Wang, Li and Erickson (1997), and Chang, Pingar and Ravichandran. (1998)].

Potential explanations have included market settlement procedures [(Gibbons and Hess (1981), and Lakonishok and Levi (1982)]; bid-ask-spread bias [Keim and Stambaugh (1984)]; measurement errors [(Gibbons and Hess (1981), Connolly (1989, 1991), Keim and Stambaugh (1984) and Rogalski (1984)]; new information at the market close (Damodaran (1989), Lakonishok and Maberly (1990), Patell and Wolfson (1982) and Penman (1987)]; and interaction with other seasonality hypotheses (Wang and Erickson, 1997). Further, Lakonishok and Maberly (1990), Sias and Starks (1995) and Kamara (1995) document that trading behavior, especially selling activity, tends to increase on Monday. Sias and Starks (1995) also report that the weekend effect's returns and volume patterns are more pronounced when institutional investors play a greater role, and Kamara (1995) assumes that increased institutional trading activity is responsible for the Monday seasonal returns.

This paper revisits this effect, adjusting for sample size, changing volatility of time-series shocks, autocorrelation, and/or fat tails in the distribution of average returns, and extends the time period to the last 30 years. It also re-explores the issues of measurement error and interaction of the weekend effect with other seasonal patterns. While the general conclusions are consistent with previous literature, unexpectedly, the Monday effect reverses in January, after controlling for January and size, with significantly positive average Monday returns the first week in January. Indeed, in this first week, Mondays have the highest and Fridays the lowest average returns. This result, not previously reported to our knowledge, contradicts Wang, Li and Erickson's (1997) result that the Monday effect occurs only in the last 14 days of the month.

The rest of this paper is organized as follows. Section 2 presents the sample and data, and Section 3 the methodology. Section 4 reports the results and Section 5 investigates a further explanation. Section 6 concludes the study.

2. Sample and Data

Value weighted stock returns come from the Center for Research in Security Prices (CRSP) portfolio returns overall and ranked by size, and the Standard and Poor's 500 (S&P500) index. The CRSP returns include returns for NYSE, AMEX and NASDAQ firms, and its equity-size decile rankings range from the smallest firm portfolio in decile 1 (Dec1) to the largest in decile 10 (Dec10), with the ranking recalculated each year. The January 2, 1970 to December 31, 2000 data set with 7,834 daily observations is sufficiently large for reliable parameter estimation in the seasonal sub-samples, including the day-of-the-week and end-of-the-year.

The data's 1970-2000 return time series properties for each decile, the small minus the large decile (SML) and the S&P500 are examined in Table 1. The null hypothesis of a Gaussian distribution is rejected, as estimates of kurtosis and skewness support the existence of conditional heteroskedasticity inducing a fat-tailed distribution for all portfolios. The Ljung-Box statistics for the twelfth and twenty-fourth serial correlations of the daily return series are significant at the one percent level for all the portfolios. Consistent with Engle, et. al. (1989,1990), the Ljung-Box statistics are more robust for small firms across the sample and show no evidence of temporal dependence. The results are also robust for the deciles, SML and S&P500, even for the 1970s, 1980s and 1990s subperiods (not shown in the table but available upon request). Jarque-Barra statistics are strongly significant at one percent for all portfolios, indicative of non-normality, and small firms earn higher returns than large ones.

Some preliminary unconditional and conditional on January descriptive statistics by weekdays appear in Table 2 for the full CRSP sample and in Table 3 for CRSP deciles 1 and 10. Table 2, Panel A shows a –0.019 percent unconditional Monday mean return for 1970 to 1979, consistent with earlier research. Over the sub-periods 1980-1989 and 1990-2000, periods not well reported in the literature, these returns are -0.015 percent and 0.026 percent, suggesting that the anomaly has diminished. The t-tests for the equality of means across days-of-the-week are statistically significant in all sub-periods, indicating statistical difference in daily mean returns. Table 2, Panel B reports the results conditional on January. Monday mean returns in January are positive, except for the 1990-2000 sub-period, and according to the t-tests, no statistical significance across weekdays exist in January.

Individual investors may have greater holdings in smaller firms, and if they account for the Monday effect, then its presence should be more pronounced in Dec1 portfolios. Table 3, Panel A shows a –0.009 percent Monday mean return for 1970-1979, –0.03 percent for 1980-1989 and –0.022 percent for 1990-2000 for the smallest (Dec1) size portfolios. Throughout, t-tests indicate that the weekday mean returns are not equal. Similar results are found for the largest (Dec10) size portfolios with a -0.02 percent Monday mean return for 1970-1979 and -0.018 percent for 1980-1989, both significant by the t-test. The Monday effect does not appear to be restricted to small firms, although it seems to disappear for large firms for 1990-2000. Table 2, Panel B reports the results conditioned on January. Monday mean returns are positive and statistically unequal across weekdays in January for the smallest (Dec1) size portfolios, and mixed with no statistical difference across weekdays in January for the largest (Dec10) size portfolios. Hence, while the Monday effect seems to hold for both small and large firms, its existence in January is problematical.

3. Methodology

A generalized autoregressive conditional heteroskedasticity in mean (GARCH-M) model is used to test for the simple weekend effect, adjusting for measurement errors by assuming a time-varying structure. With tractability and predictability as a major concern, we start with a univariate GARCH-M model applied individually to each of the CRSP deciles, the S&P 500 and SML returns. To test for the simple day-of-the-week effect for portfolio i (where i can represent the CRSP decile portfolios or S&P500 or SML), the model has the following form:

$$\tilde{R}_{it} = \alpha_{iwt} \sum_{t=1}^{5} d_{it} + \vartheta_{it} \sigma^2{}_{it} + \varepsilon_{it}, \varepsilon_{it} \sim N\left(0, \sigma_{it}^2\right)$$
$$\sigma_{it}^2 = \omega_i + \xi_{it} \varepsilon_{t-1} + \varphi_{it} \sigma_{it-1}^2 \text{...(1)}$$
$$t = 1,\ldots,5$$

where R_{it} is the return for portfolio i in time t, d_{it} is a dummy variable where d_{i1} equals 1 for Monday and zero otherwise, d_{i2} equals 1 for Tuesday and zero otherwise, and so on, and σ^2_{it} is the conditional variance for portfolio *i* at period *t*. The test concerns the hypothesis that for any portfolio i the day-of-the-week coefficients should be equal, such that $\alpha_{\text{iw1}} = \alpha_{\text{iw2}} = \ldots = \alpha_{\text{iw5}}$. If Monday's returns are significantly lower than other days of the week, then α_{iw1} should be significantly negative.

Regardless of the successful parameterizations of ARCH and GARCH, they cannot capture asymmetric news effects discovered by Black (1976), and confirmed by Engle and Ng (1993) and Nelson (1990), among others. The asymmetric (leverage) effect occurs when an unexpected decrease in price (bad news) increases predictable volatility more than an unexpected increase in price (good news) of similar magnitude. Engle and Ng (1993) and Pagan and Schwert (1990) argue that E-GARCH performs the best in forecasting stock volatility, even compared to other non-parametric models, both in and out-of-sample. Hence, to test for the weekend-January-size effect, an E-GARCH-M model with the following form is used (where i represents the CRSP decile portfolios):

$$\tilde{R}_{it} = \alpha_i + \alpha_{iwt} \sum_{t=1}^{5} d_{it} + \gamma_{iwj} \sum_{t=1}^{5} d_{it} djan_{it} + \vartheta_{it} \sigma^2{}_{it} + \varepsilon_{it}, \varepsilon_{it} \sim N\left(0, \sigma_{it}^2\right)$$

$$\log\left(\sigma_{it}^2\right) = \kappa + \delta \cdot \log\left(\sigma_{it-1}^2\right) + \aleph \cdot \frac{\varepsilon_{t-1}}{\sqrt{\sigma_{it}^2}} + \lambda \left[\frac{\varepsilon_{t-1}}{\sqrt{\sigma_{it-1}^2}} - \sqrt{2/\pi} \right] \text{......................(2)}$$

where *djan*$_{it}$ is a dummy variable equal to one when the month is January and zero otherwise, d_{it}*djan*$_{it}$ is an interaction dummy variable equal to 1 when the weekend is in January.and zero otherwise, and all other variables are defined as before. The test hypothesis is as before for the entire year, that is all α coefficients are equal, and that for the month of January for any portfolio i all γ are also equal across the days-of-the-week.

Results for the maximum likelihood use both Berndt-Hall-Hall-Hausman (BHHH) and Marquardt algorithms for maximization. GARCH assumes that the residuals are *iid*; however even if the distribution of the residuals is not normal, the estimates are still consistent under quasi-maximum likelihood (QML) assumptions.

4. Empirical Results

The GARCH-M results for the weekend and size effects are in Table 4, with the 1970s, 1980s and 1990s in Panels A, B and C, and the entire period in Panel D. Monday returns are consistently negative across all portfolios for the entire period, and decrease in absolute value as size increases. The results are robust across all sub-periods, although the weekend effect across the size portfolios is weakest in the 1970s. Average returns for all portfolios tend to increase as the week progresses, with Friday returns highest (compare α_1 to α_5). This result is robust across all sub-periods and consistent with Keim and Stambaugh (1984). The tendency for returns to increase during the week is more pronounced for smaller firms over all periods (compare Dec1 to Dec10), relating the weekend effect to the small firm effect.

The E-GARCH-M results for the weekend, size and January effects are in Table 5, with the 1970s, 1980s and 1990s in Panels A, B and C, and the entire period in Panel D. Again, Monday returns through the year are consistently negative across all size portfolios, except in the 1970s (the α coefficients). But Monday's returns *in January* are consistently significantly positive across small size portfolios and mostly insignificantly different from zero across large size portfolios (the γ_1 for Dec1 and Dec10) over all periods.

Average returns through the year for all portfolios tend to increase as the week progresses, and Monday and Friday returns seem strongly related to size. But average returns for small portfolios *in January* tend to decrease through the week. Monday returns *in January* are the largest returns of the week across small size portfolios, and Friday returns relatively small over all periods.

The SML portfolio results show significantly negative Monday returns for the year, but significantly positive Monday returns in January. Admittedly, the S&P500 results are insignificant, possibly because of its dominance by big firms insulated from price pressures in January owing to their size. The coefficient on the leverage dummy (λ) is significant and positive, indicating that, along with size, the conditional variance is higher whenever innovations (ε_{t-1}) to returns are negative rather than positive. This result provides evidence of non-linear dependence in return volatility as advocated by the theory of leverage effect.

5. A Further Explanation

Keim (1983) shows that nearly 50% of the size premium is due to January returns. This has been confirmed by subsequent research showing the effect confined to the last trading day of December and the first five trading days of January. Various explanations have been put forward to explain this, including tax loss selling. Most recently, Chen and Singal (2003) have added tax gain selling in January to tax loss selling in December in explaining the end-of-the-year effect. A January price pressure explanation seems necessary to account for the January reversal in Monday's average return and the monotonic decreasing pattern to the lowest return on Friday. Therefore, we focus the analysis to Mondays and Fridays in the first and last three weeks of January by estimating the following E-GARCH-M model.

$$\tilde{R}_{it} = \alpha_{i0}\beta_{i1}dmon + \beta_{i2}dfri + \beta_{i3}FWMJ_{it} + \beta_{i4}FWFJ + \beta_{i5}LHMJ_{it} + \beta_{i6}LHFJ\vartheta_{it} + \sigma^2{}_{it} + \varepsilon_{it}, \varepsilon_{it} \sim N\left(0, \sigma_{it}^2\right)$$
$$\sigma_{it}^2 = \omega_i + \xi_{it}\varepsilon_{t-1} + \varphi_{it}\sigma_{it-1}^2 \text{...}(3)$$

where *dmon* is equal to one if the weekday is Monday and zero otherwise, *dfri* is equal to one if the weekday is Friday and zero otherwise, $FWMJ_{1t}$ is the first week in January and equal to one if Monday and zero otherwise, $FWFJ_{1t}$ is the first week in January and equal to one if Friday and zero otherwise, $LHMJ_{1t}$ is the last three weeks in January and equal to one if Monday and zero otherwise, $LHFJ_{1t}$ is the last three weeks in January and equal to one if Friday and zero otherwise, and all other variables are as previously defined for the 10 decile portfolios.

A significantly negative (positive) β_{i1} and/or β_{i2} will indicate that the Monday and/or Friday returns are significantly lower (larger) than that of the other four and/or three days of the week. An insignificant β_{i3} and β_{i4} indicates that the returns for Monday and Friday in the first week of the month of January are not significantly different from those of the rest of the month. A significantly negative (positive) β_{i5} and/or β_{i6} indicates that the return on Mondays and/or Fridays during the rest of the month of January is significantly lower (larger) than that of the first week of the month.

The results are reported in Table 6, with the 1970s, 1980s and 1990s in Panels A, B and C, and the entire period in Panel D. The coefficients are negative on Mondays (β_{i1}<0) and positive on Fridays (β_{i2}>0) across all size portfolios, and robust across periods. Returns are significantly positive and strongly related to size on Mondays in the first week of January (β_{i3}), and positive across the smallest size deciles on Mondays in the rest of the month of January (β_{i5}) across all periods. Indeed, the positive Monday returns in the first week of January, among the lowest two decile portfolios, are at least 2.21, 2.30, 8.59, and 3.33 times those of the remaining three Mondays of January in the seventies, eighties, nineties, and the whole sample time specifications.[1] These results indicate that, after controlling for Mondays in the rest of January, the stock returns of the remaining weeks of January decline dramatically.

In contrast, returns are not significantly different from zero on Fridays in the first week of January (β_{i4}), except for the first two deciles when the eighties and the full sample time specification are considered, or on Fridays in the rest of January (β_{i6}), across all periods. These results indicate that, after controlling for the Fridays in the first week and the rest of January, Fridays returns, in 95% of the cases, no longer remain significant, regardless of the sub-periods used.

Lakonishok and Maberly (1990) find that individuals tend to trade more on Mondays, but not symmetrically with respect to buy and sell transactions. One hypothesis concerning the high positive and significant Monday returns in January is that individuals tend to increase the number of buy, relative to sell, transactions on those Mondays. Investors under time pressure delay some investment decisions until after the busy holiday time period, and find the most

[1] These multiples are not explicitly shown in the tables, but can be calculated by comparing the magnitudes

opportune time on Mondays after the first weekend in January, leading to a weekend-January-size price surge where the buy orders are more frequent on Mondays than sell orders (Miller, 1990).

6. Conclusions

This study finds reversals in January in the weekend effect, particularly for small firm size portfolios using CRSP deciles. The S&P500 results in January are insignificant, possibly owing to the preponderance of large firms in this portfolio. Average returns for small firm size portfolios tend to decrease during the week in January, such that their Monday returns are highest and Friday the lowest. For the rest of the year, the weekend effect results are consistent with existing literature, with negative Monday returns and increases in returns as the week progresses., across all size portfolios from 1970 to 2000, and the intervening decades.

The results are more striking after controlling for Mondays and Fridays in the first and the last 3 weeks of January, respectively. The returns on Monday in this first week are significantly positive and inversely related to size, and also significantly positive on Mondays for the small firm size portfolio in the last 3 weeks of January. But returns on Friday are insignificantly different from zero after controlling for Fridays in the first week and the last three weeks of January.

It appears the first Monday in January is particularly critical to the reversal of the end-of-the-week effect at the turn-of-the-year. This suggests that

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of the β_{i3} to β_{i5} coefficients (that is, β_{i3} / β_{i5}) in each period across the smallest two deciles.

abnormal demand for stocks following the first weekend of a new calendar year may be responsible for this anomaly within an anomaly.

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TABLE 1. SUMMARY STATISTICS FOR CRSP DECILE PORTFOLIOS, INCLUDING THE SMALL MINUS LARGE FIRM PORTFOLIO, AND THE S&P500,1970-2000

Portfolio	Annual Mean	S.D.	Skewness	Kurtosis	J-B-P	Q12	Q24
Ded1	0.0635	0.76	-0.24	13.9	0.00	3604.5^{A}	4326.3^{A}
Dec2	0.046	0.72	-0.94	17	0.00	2842.4^{A}	3411.2^{A}
Dec3	0.044	0.77	-1.10	21.2	0.00	1987.3^{A}	2295.8^{A}
Dec4	0.044	0.76	-1.46	21.5	0.00	1829.8^{A}	2101.4^{A}
Dec5	0.044	0.78	-1.34	21.2	0.00	1418.9^{A}	1595.3^{A}
Dec6	0.045	0.80	-1.24	18.8	0.00	1244.5^{A}	1371.6^{A}
Dec7	0.047	0.83	-1.06	17.7	0.00	973.8^{A}	1046.8^{A}
Dec8	0.051	0.83	-0.99	17.1	0.00	849.5^{A}	904.9^{A}
Dec9	0.050	0.85	-0.95	18.1	0.00	677.9^{A}	721.9^{A}
Dec10	0.050	0.94	-0.99	26	0.00	143.91^{A}	161.2^{A}
SML	0.013	0.92	-0.081	12.5	0.00	353.1^{A}	467.4^{A}
S&P500	0.053	0.66	-1.11	29	0.00	103.1^{A}	117.7^{A}

NOTES: The ten portfolio size deciles range between Dec1 for the smallest size and Dec10 for the largest size decile in CRSP, and SML is the small less large decile returns, measured by subtracting Dec10 from Dec1. The S.D. is the standard deviation of the returns and Q12 and Q24 are the twelfth and twenty-fourth lag Ljung-Box Q-Test for the serial correlation in the return series. The symbols a, b and c indicate significance at the 1%, 5% and 10% levels, respectively.

TABLE 2. WEEKLY CRSP VALUE-WEIGHTED RETURNS, UNCONDITIONED AND CONDITIONED ON JANUARY, BY DAYS OF THE WEEK, 1970-2000

		Mon.	Tues.	Wed.	Thurs.	Fri.	Wkd
PANEL A Unconditioned Mean Weekday Returns							
1970-1979	mean	-0.019	-0.00013	0.016	0.011	0.017	-0.0017
	t-statistic	2.69[a]					
	n	2526	2526	2526	2526	2526	2526
1980-1989	mean	-0.015	0.026	0.031	0.0001	0.021	0.006
	t-statistic	2.45[b]					
	n	2528	2528	2528	2528	2528	2528
1990-2000	mean	0.026	0.016	0.010	0.0004	0.0095	0.035
	t-statistic	2.03[b]					
	n	2780	2780	2780	2780	2780	2780
All years	mean	-0.002	0.014	0.019	0.006	0.016	0.014
	t-statistic	1.954[b]					
	n	7834	7834	7834	7834	7834	7834
PANEL B. Mean Weekday Returns Conditioned on January							
1970-1979	mean	4.75E-07	0.0002	0.00025	0.0033	0.0022	0.0022
	t-statistic	0.35					
	n	2526	2526	2526	2526	2526	2526
1980-1989	mean	0.006	0.0014	-0.0001	0.0053	0.0025	0.0083
	t-statistic	1.03					
	n	2528	2528	2528	2528	2528	2528
1990-2000	mean	-0.001	0.003	0.0015	0.0004	0.0018	0.001
	t-statistic	0.244					
	n	2780	2780	2780	2780	2780	2780
All years	mean	0.0015	0.0015	0.0004	0.003	0.0022	0.004
	t-statistic	0.56					
	n	7834	7834	7834	7834	7834	7834

NOTES: The symbols a, b and c indicate significance at the 1%, 5% and 10% levels, respectively. T-statistics test a null of equal mean return between the weekdays. Wkd refers to the weekend and n is the number of observations.

TABLE 3. WEEKLY CRSP VALUE-WEIGHTED RETURNS, UNCONDITIONED AND CONDITIONED ON JANUARY, BY DAYS OF THE WEEK FOR SMALL AND LARGE DECILE PORTFOLIOS, 1970-2000

		SIZE DECILES											
		Dec1						Dec10					
PANEL A. Mean Weekday Returns Given Firm's Size		Mon	Tue	Wed.	Thur	Fri.	Wkd.	Mon	Tue	Wed	Thur	Fri.	Wkd
1970-1979	mean	-0.009	-0.013	0.01	0.02	0.05	0.04	-0.02	-0.001	0.015	0.012	0.018	-0.002
	t-stat	11.2[a]						3.1[a]					
	n	2525											
1980-1989	mean	-0.03	-0.02	0.017	0.023	0.065	0.04	-0.018	0.024	0.03	0.008	0.02	0.002
	t-stat	32.1[a]						3.1 [a]					
	n	2528											
1990-2000	mean	-0.022	-0.03	0.017	0.033	0.074	0.051	0.021	0.014	0.011	0.002	0.012	0.032
	t-stat	28.9 [a]						1.33					
	n	2780											
All years	mean	-0.064	0.026	0.01	0.026	0.064	0.044	-0.005	0.012	0.02	0.007	0.016	0.011
	t-stat	65.9[a]						2.67[a]					
	n	7834											
PANEL B. Mean Weekday Returns Given Firm's Size Conditioned on January													
1970-1979	mean	0.013	0.014	0.01	0.014	0.016	0.03	-0.0004	-1.2E5	8.5E5	0.003	0.0022	0.002
	t-stat	2.65[b]						0.44					
	n	2525											
1980-1989	mean	0.008	0.006	0.007	0.009	0.001	0.002	0.005	0.0012	-0.0005	0.005	0.0025	0.007
	t-stat	4.77 [a]						0.92					
	n	2528											
1990-2000	mean	0.008	0.007	0.0087	0.009	0.011	0.019	-0.0009	0.002	0.0015	0.0004	0.002	0.001
	t-stat	2.5[b]						0.22					
	n	2780											
All years	mean	0.009	0.009	0.008	0.01	0.013	0.02	0.001	0.001	0.0004	0.003	0.002	0.003
	t-stat	8.7[a]						0.57					
	n	7834											

NOTES: Dec 1 (10) refers to the smallest (largest) decile portfolio and n is the number of observations. The symbols a, b and c indicate significance at the 1%, 5% and 10% levels, respectively. T-statistics test a null of equal mean return between the weekdays. Wkd refers to the weekend.

TABLE 4: TEST FOR THE WEEKEND EFFECT ACROSS SIZE FOR CRSP DECILE PORTFOLIOS, INCLUDING THE SMALL MINUS LARGE FIRM PORTFOLIO, AND THE S&P500 BY DAYS OF THE WEEK USING GARCH (1,1)-M

	GARCH (1,1)-M									
	Mean equation						Variance equation			
Panel A Size /coef 1970-1979	α_1	α_2	α_3	α_4	α_5	ϑ	ω	ξ_1	ξ_1	φ
Dec1	-0.0005	-0.0007	0.0003	0.0009	0.002	7.2	9.00E-07	0.36	-0.25	0.87
	(0.07)	(0.01)	(0.25)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
De2	-0.0003	-0.00034	0.0004	0.001	0.0025	2.43	6.9E-07	0.48	-0.37	0.89
	(0.40)	(0.17)	(0.05)	(0.00)	(0.00)	(0.35)	(0.00)	(0.00)	(0.00)	(0.00)
Dec3	-0.0002	-0.0003	0.0006	0.0016	0.003	1.16	5.7E-07	0.43	-0.34	0.90
	(0.52)	(0.15)	(0.01)	(0.00)	(0.00)	(0.66)	(0.00)	(0.00)	(0.00)	(0.00)
Dec4	-0.0006	-0.0005	0.0008	0.0014	0.002	5.78	7.13E-03	0.39	-0.31	0.90
	(0.06)	(0.08)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
Dec5	-0.0004	-0.0001	0.0011	0.0015	0.003	0.095	5.12E-07	0.41	-0.35	0.92
	(0.16)	(0.69)	(0.00)	(0.00)	(0.00)	(0.79)	(0.00)	(0.00)	(0.00)	(0.00)
Dec6	-0.0004	0.0002	0.0013	0.0016	0.003	-0.92	6.1E-07	0.37	-0.29	0.92
	(0.28)	(0.44)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dec7	-0.0005	0.0001	0.0011	0.0014	0.0024	1.05	8.0E-0.7	0.32	-0.25	0.92
	(0.16)	(0.79)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dec8	-0.0002	0.0004	0.0013	0.0015	0.0022	-0.95	6.3E-07	0.28	-0.22	0.95
	(0.56)	(0.28)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dec9	-0.0006	0.0003	0.0011	0.001	0.0018	2.73	5.3E-07	0.27	-0.21	0.92
	(0.05)	(0.38)	(0.00)	(0.00)	(0.00)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)
Dec10	-0.0011	-0.0001	0.0003	0.00004	0.0006	9.4	6.5E-07	0.10	-0.04	0.93
	(0.00)	(0.82)	(0.38)	(0.90)	(0.09)	(0.02)	(0.00)	(0.00)	(0.17)	(0.00)
SML	-0.001	-0.002	-0.0015	-0.001	0.0002	19.8	1.6E-06	0.19	-0.09	0.87
	(0.008)	(0.00)	(0.00)	(0.00)	(0.54)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
S&P500	-0.0008	0.0002	0.0005	0.0002	0.0008	5.1	6.5E-07	0.09	-0.03	0.93
	(0.03)	(0.64)	(0.14)	(0.52)	(0.03)	(0.23)	(0.00)	(0.00)	(0.23)	(0.00)
Panel B Size /coeff 1980-1989	α_1	α_2	α_3	α_4	α_5	ϑ	ω	ξ_1	ξ_1	φ
Dec1	-0.0015	-0.0013	0.00011	0.0007	0.003	6.3	1.5E-06	0.33	-0.19	0.82
	(0.00)	(0.00)	(0.67)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
De2	-0.0018	-0.0012	0.0002	0.001	0.002	6.5	1.17E-06	0.39	-0.24	0.83
	(0.00)	(0.00)	(0.22)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Dec3	-0.0017	-0.0008	0.0007	0.0014	0.0025	2.1	9.6E-07	0.43	-0.28	0.84
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)
Dec4	-0.0019	-0.0008	0.0009	0.001	0.002	3.2	1.4E-06	0.38	-0.21	0.81
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.26)	(0.00)	(0.00)	(0.00)	(0.00)
Dec5	-0.0017	-0.0003	0.0012	0.0013	0.0022	1.95	1.56E-06	0.34	-0.17	0.80
	(0.00)	(0.19)	(0.00)	(0.00)	(0.00)	(0.51)	(0.01)	(0.00)	(0.02)	(0.00)
Dec6	-0.0016	0.00003	0.0011	0.0015	0.0022	2.37	1.6E-06	0.35	-0.21	0.82
	(0.00)	(0.88)	(0.00)	(0.00)	(0.00)	(0.47)	(0.00)	(0.00)	(0.00)	(0.00)
Dec7	-0.0014	0.00033	0.0016	0.0016	0.0021	0.75	1.5E-06	0.33	-0.19	0.84
	(0.00)	(0.15)	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)	(0.00)	(0.00)	(0.00)
Dec8	-0.0014	0.0005	0.0016	0.0017	0.0019	1.19	1.8E-06	0.32	-0.20	0.85
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.66)	(0.00)	(0.00)	(0.00)	(0.00)
Dec9	-0.0012	0.0007	0.0016	0.0016	0.0018	0.95	1.73E-06	0.27	-0.18	0.88
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.77)	(0.00)	(0.00)	(0.00)	(0.00)
Dec10	-0.0006	0.0009	0.0012	0.0008	0.0013	1.59	1.8E-06	0.15	-0.10	0.93
	(0.15)	(0.06)	(0.00)	(0.07)	(0.01)	(0.65)	(0.01)	(0.25)	(0.38)	(0.00)
SML	-0.0009	-0.0022	-0.0008	0.0003	0.0017	0.66	1.5E-06	0.15	-0.11	0.94
	(0.05)	(0.00)	(0.07)	(0.45)	(0.00)	(0.87)	(0.03)	(0.09)	(0.16)	(0.00)

Panel C Size /coeff 1990-2000	α_1	α_2	α_3	α_4	α_5	ϑ	ω	ξ_1	ξ_1	φ
Dec1	-0.0016	-0.0016	0.00044	0.0014	0.003	6.5	3.7E-06	0.25		0.70
	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
De2	-0.0014	-0.0009	0.0008	0.0012	0.003	4.9	3.7E-06	0.28		0.64
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
Dec3	-0.0009	-0.0004	0.00097	0.0017	0.003	0.08	2.6E-06	0.28		0.69
	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.97)	(0.00)	(0.00)		(0.00)
Dec4	-0.0006	-0.00015	0.001	0.0015	0.0025	0.84	3.1E-06	0.26		0.69
	(0.00)	(0.51)	(0.00)	(0.00)	(0.00)	(0.75)	(0.00)	(0.00)		(0.00)
Dec5	-0.0003	0.00012	0.001	0.0016	0.0022	2.3	3.3E-06	0.27		0.68
	(0.23)	(0.63)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
Dec6	-0.0003	-0.00006	0.0013	0.0015	0.002	1.1	3.5E-06	0.21		0.74
	(0.35)	(0.83)	(0.00)	(0.00)	(0.00)	(0.72)	(0.00)	(0.00)		(0.00)
Dec7	-0.0002	0.00002	0.0013	0.0012	0.0015	3.9	3.1E-06	0.21		0.75
	(0.44)	(0.94)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)		(0.00)
Dec8	-0.00003	0.00003	0.0013	0.001	0.0011	4.5	3.1E-06	0.17		0.78
	(0.92)	(0.92)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)		(0.00)
Dec9	0.00002	0.00011	0.001	0.0007	0.0007	6.1	2.1E-06	0.15		0.83
	(0.94)	(0.72)	(0.00)	(0.02)	(0.04)	(0.03)	(0.00)	(0.00)		(0.00)
Dec10	0.0007	0.00007	0.0006	0.00011	0.00019	6.1	5.9E-07	0.06		0.93
	(0.05)	(0.84)	(0.06)	(0.76)	(0.62)	(0.05)	(0.01)	(0.00)		(0.00)
SML	-0.004	-0.004	-0.0017	-0.0018	0.0013	23.3	8.4E-07	0.09	-0.06	0.95
	(0.00)	(0.00)	(0.00)	(0.65)	(0.00)	(0.00)	(0.59)	(0.01)	(0.11)	(0.00)
S&P500	0.0009	0.00012	0.00053	0.00006	0.00013	5.9	4.8E-07	0.05		0.94
	(0.01)	(0.74)	(0.11)	(0.86)	(0.74)	(0.06)	(0.02)	(0.00)		(0.00)

Panel D Size /coeff 1970-2000	α_1	α_2	α_3	α_4	α_5	ϑ	ω	ξ_1	ξ_1	φ
Dec1	-0.0013	-0.0012	0.00022	0.0009	0.003	7.3	1.3E-06	0.34	-0.21	0.85
	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
De2	-0.0013	-0.001	0.0004	0.0011	0.0025	5.0	1.3E-06	0.40	-0.25	0.83
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dec3	-0.001	-0.0006	0.0007	0.0015	0.003	1.9	13.2E-06	0.40	-0.24	0.83
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
Dec4	-0.0011	-0.0005	0.0009	0.0014	0.002	2.3	1.5E-06	0.37	-0.21	0.82
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)
Dec5	-0.0009	-0.0001	0.0011	0.001	0.002	1.7	1.6E-06	0.35	-0.20	0.83
	(0.00)	(0.29)	(0.00)	(0.00)	(0.00)	(0.31)	(0.00)	(0.00)	(0.00)	(0.00)
Dec6	-0.0009	0.00006	0.0012	0.0015	0.002	1.5	1.6E-06	0.32	-0.19	0.85
	(0.00)	(0.97)	(0.00)	(0.00)	(0.00)	(0.39)	(0.00)	(0.00)	(0.00)	(0.00)
Dec7	-0.0007	0.0001	0.001	0.0014	0.002	1.8	1.3E-06	0.32	-0.20	0.86
	(0.00)	(0.37)	(0.00)	(0.00)	(0.00)	(0.27)	(0.00)	(0.00)	(0.00)	(0.00)
Dec8	-0.0005	0.0003	0.0014	0.001	0.0018	1.8	1.5E-06	0.28	-0.17	0.87
	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.29)	(0.00)	(0.00)	(0.00)	(0.00)
Dec9	-0.0006	0.0004	0.0013	0.0011	0.0015	2.4	1.2E-06	0.25	-0.15	0.89
	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)
Dec10	-0.0003	0.0002	0.0007	0.0003	0.0006	5.7	7.2E-06	0.10	-0.048	0.94
	(0.21)	(0.29)	(0.00)	(0.20)	(0.01)	(0.00)	(0.00)	(0.03)	(0.28)	(0.00)
S&P	-0.00013	0.0003	0.0007	0.0003	0.0006	4.5	6.4E-07	0.10	-0.05	0.94
500	(0.58)	(0.14)	(0.00)	(0.21)	(0.01)	(0.00)	(0.00)	(0.00)	(0.26)	
SML	-0.0005	-0.0013	0.00002	0.0010	0.0023	-6.4	1.0E-06	0.14	-0.09	0.94
	(0.02)	(0.00)	(0.93)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

NOTES: The ten portfolio size deciles range between Dec1 for the smallest size and Dec10 for the largest size decile in CRSP, and SML is the small less large decile returns, measured by subtracting Dec10 from Dec1. The p-value are in parenthesis, α_i and ϑ are the coefficients for the mean equation in GARCH-M, and ω, ξ_i, φ are the coefficients for the garch variance equation, from equation (1).

TABLE 5: TEST FOR THE WEEKEND EFFECT ACROSS SIZE IN JANUARY FOR CRSP DECILE PORTFOLIOS, INCLUDING THE SMALL MINUS LARGE FIRM PORTFOLIO, AND THE S&P500 BY DAYS OF THE WEEK USING E-GARCH (1,1)-M.

E-GARCH (1,1)-M

		Mean equation											Leverage effect
Panel A	Size	α_1	α_2	α_3	α_4	α_5	γ_1	γ_2	γ_3	γ_4	γ_5	ϑ	λ
1970-	Dec1	-0.023	-0.05	0.04	0.13	0.26	0.32	0.65	0.55	0.59	0.54	-15.8	0.975
1979*		(0.38)	(0.06)	(0.14)	(0.00)	(0.00)	(0.0)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
	De2	-0.011	-0.050	0.04	0.14	0.27	0.35	0.45	0.26	0.46	0.26	-14.7	0.982
		(0.69)	(0.06)	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec3	-0.012	-0.053	0.049	0.15	0.29	0.43	0.43	0.31	0.45	0.25	-23.2	0.981
		(0.64)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
	Dec4	-0.0001	-0.04	0.11	0.18	0.34	0.25	0.41	0.35	0.39	0.16	-28.2	0.977
		(0.75)	(0.23)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)	(0.00)
	Dec5	0.00015	0.003	0.13	0.19	0.36	0.31	0.32	0.16	0.39	0.18	-31.9	0.973
		(0.64)	(0.92)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.10)	(0.00)	(0.00)
	Dec6	0.0004	0.00004	0.13	0.18	0.34	0.24	0.33	0.19	0.29	0.07	-24.9	0.980
		(0.91)	(0.99)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.09)	(0.02)	(0.52)	(0.00)	(0.00)
	Dec7	0.012	0.011	0.13	0.16	0.29	0.14	0.27	0.13	0.33	0.07	-24.1	0.977
		(0.73)	(0.75)	(0.00)	(0.00)	(0.00)	(0.21)	(0.04)	(0.24)	(0.02)	(0.49)	(0.00)	(0.00)
	Dec8	0.014	0.015	0.13	0.14	0.26	0.09	0.18	0.12	0.19	-0.016	-17.9	0.984
		(0.71)	(0.69)	(0.00)	(0.00)	(0.00)	(0.43)	(0.16)	(0.26)	(0.10)	(0.88)	(0.00)	(0.00)
	Dec9	-0.03	0.01	0.099	0.08	0.19	-0.04	0.09	0.0003	0.11	-0.05	-9.6	0.988
		(0.43)	(0.76)	(0.00)	(0.00)	(0.00)	(0.70)	(0.49)	(0.97)	(0.35)	(0.60)	(0.06)	(0.00)
	Dec1	-0.07	-0.0003	0.05	0.022	0.092	-0.11	-0.01	-0.17	0.07	-0.07	2.2	0.988
	0	(0.07)	(0.94)	(0.13)	(0.52)	(0.01)	(0.29)	(0.92)	(0.11)	(0.52)	(0.45)	(.65)	(0.00)
	SML	-0.06	-0.16	-0.092	-0.044	0.083	0.66	0.77	0.53	0.51	0.52	5.1	0.980
		(0.10)	(0.00)	(0.01)	(0.26)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.36)	(0.00)
	S&P	-0.07	0.003	0.06	0.021	0.083	-0.10	-0.00013	-0.0017	0.07	-0.072	2.4	0.987
		(0.07)	(0.92)	(0.12)	(0.55)	(0.02)	(0.35)	(0.99)	(0.12)	(0.54)	(0.46)	(0.64)	(0.00)

Panel B	Size	α_1	α_2	α_3	α_4	α_5	γ_1	γ_2	γ_3	γ_4	γ_5	ϑ	λ
1980-1989	Dec1	-0.21	-0.18	-0.025	0.026	0.25	0.48	0.42	0.26	0.32	0.35	15.1	0.963
		(0.00)	(0.00)	(0.37)	(0.31)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	De2	-0.20	-0.14	0.004	0.072	0.23	0.36	0.21	0.24	0.39	0.28	7.6	0.967
		(0.00)	(0.00)	(0.86)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)
	Dec3	-0.19	-0.097	0.067	0.13	0.24	0.28	0.22	0.23	0.27	0.27	1.9	0.974
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.62)	(0.00)
	Dec4	-0.21	-0.11	0.077	0.10	0.24	0.32	0.13	0.22	0.25	0.08	1.96	0.962
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.03)	(0.00)	(0.33)	(0.62)	(0.00)
	Dec5	-0.18	-0.04	0.12	0.14	0.20	0.21	-0.03	0.18	0.25	0.30	-0.64	0.956
		(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.08)	(0.81)	(0.12)	(0.00)	(0.00)	(0.88)	(0.00)
	Dec6	-0.17	0.019	0.13	0.15	0.22	0.24	-0.06	0.04	0.18	0.24	-2.14	0.931
		(0.00)	(0.44)	(0.00)	(0.00)	(0.00)	(0.04)	(0.58)	(0.73)	(0.04)	(0.04)	(0.61)	(0.00)
	Dec7	-0.13	0.03	0.16	0.15	0.21	0.25	0.01	0.09	0.23	0.16	-4.7	0.968
		(0.00)	(0.21)	(0.00)	(0.00)	(0.00)	(0.02)	(0.87)	(0.43)	(0.00)	(0.09)	(0.23)	(0.00)
	Dec8	-0.13	0.067	0.19	0.18	0.21	0.27	-0.04	0.009	0.15	0.11	-6.8	0.957
		(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.67)	(0.94)	(0.07)	(0.29)	(0.09)	(0.00)
	Dec9	-0.08	0.09	0.20	0.19	0.23	0.30	-0.022	0.005	0.15	0.13	-10.1	0.965
		(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.84)	(0.96)	(0.12)	(0.17)	(0.04)	(0.965)
	Dec10	-0.05	0.09	0.14	0.09	0.13	0.33	-0.004	-0.077	0.19	0.015	-1.9	0.970
		(0.35)	(0.08)	(0.00)	(0.09)	(0.03)	(0.02)	(0.98)	(0.64)	(0.15)	(0.90)	(0.65)	(0.00)
	SML	-0.16	-0.33	-0.17	-0.05	0.08	0.23	0.54	0.47	0.20	0.41	11.2	0.980
		(0.00)	(0.00)	(0.00)	(0.39)	(0.14)	(0.10)	(0.00)	(0.00)	(0.16)	(0.00)	(0.08)	(0.00)
	S&P	-0.05	0.07	0.11	0.06	0.12	0.33	-0.00002	-0.09	0.18	-0.01	0.32	0.976
		(0.31)	(0.17)	(0.02)	(0.27)	(0.09)	(0.03)	(0.99)	(0.57)	(0.20)	(0.94)	(0.94)	(0.00)

Panel C	Size	α_1	α_2	α_3	α_4	α_5	γ_1	γ_2	γ_3	γ_4	γ_5	ϑ	λ
1990-2000	Dec1	-0.16	-0.15	0.02	0.11	0.29	0.46	0.46	0.27	0.29	0.31	4.6	0.969
		(0.00)	(0.00)	(0.19)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
	De2	-0.16	-0.12	0.04	0.10	0.26	0.27	0.26	0.20	0.23	0.20	5.8	0.958
		(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec3	-0.11	-0.06	0.09	0.15	0.28	0.23	0.20	0.16	0.24	0.15	-0.61	0.962
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec4	-0.12	-0.04	0.12	0.16	0.27	0.28	0.18	0.17	0.22	0.12	-5.11	0.942
		(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)	(0.04)	(0.04)	(0.00)
	Dec5	-0.07	-0.0001	0.14	0.19	0.27	0.16	0.17	0.09	0.19	0.19	-7.12	0.939
		(0.00)	(0.96)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec6	-0.05	0.03	0.19	0.19	0.27	0.16	0.10	-0.02	0.16	0.18	-10.3	0.946
		(0.00)	(0.10)	(0.00)	(0.00)	(0.00)	(0.02)	(0.10)	(0.79)	(0.02)	(0.01)	(0.00)	(0.00)
	Dec7	-0.05	0.03	0.17	0.17	0.21	0.14	0.11	-0.016	0.17	0.09	-5.0	0.968
		(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.05)	(0.07)	(0.84)	(0.01)	(0.14)	(0.03)	(0.00)
	Dec8	-0.0005	0.07	0.21	0.20	0.23	0.09	0.04	-0.08	0.08	0.03	-10.2	0.963
		(0.81)	(0.00)	(0.00)	(0.00)	(0.00)	(0.19)	(0.50)	(0.31)	(0.18)	(0.58)	(0.00)	(0.00)
	Dec9	-0.0001	0.08	0.19	0.19	0.20	0.09	0.04	-0.07	0.06	0.02	-8.3	0.975
		(0.97)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)	(0.55)	(0.35)	(0.35)	(0.71)	(0.00)	(0.00)
	Dec10	0.04	0.02	0.09	0.05	0.07	0.08	0.08	-0.03	0.08	0.07	0.85	0.982
		(0.18)	(0.52)	(0.00)	(0.06)	(0.04)	(0.33)	(0.32)	(0.76)	(0.35)	(0.32)	(0.74)	(0.00)
	SML	-0.19	-0.024	-0.07	0.06	0.19	0.41	0.45	0.39	0.19	0.28	3.7	0.992
		(0.00)	(0.00)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.19)	(0.00)
	S&P	0.04	0.012	0.07	0.035	0.05	0.07	0.09	-0.03	0.08	0.076	2.5	0.983
		(0.16)	(0.68)	(0.01)	(0.27)	(0.17)	(0.41)	(0.32)	(0.72)	(0.37)	(0.34)	(0.34)	(0.00)
Panel D	Size	α_1	α_2	α_3	α_4	α_5	γ_1	γ_2	γ_3	γ_4	γ_5	ϑ	λ
1970-2000	Dec1	-0.19	-0.18	-0.02	0.05	0.23	0.45	0.17	0.29	0.31	0.32	15.4	0.966
		(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	De2	-0.14	-0.11	0.03	0.10	0.25	0.29	0.31	0.22	0.26	0.20	3.51	0.961
		(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec3	-0.10	-0.06	0.08	0.14	0.27	0.29	0.26	0.19	0.28	0.18	-3.01	0.966
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec4	-0.11	-0.04	0.11	0.15	0.27	0.30	0.25	0.21	0.25	0.14	-6.6	0.955
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
	Dec5	-0.07	-0.0007	0.13	0.17	0.27	0.21	0.19	0.11	0.22	0.19	-6.9	0.950
		(0.00)	(0.64)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec6	-0.05	0.03	0.17	0.19	0.28	0.21	0.15	0.03	0.20	0.18	-11.5	0.963
		(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.57)	(0.00)	(0.00)	(0.00)	(0.00)
	Dec7	-0.04	0.04	0.17	0.17	0.23	0.17	0.14	0.01	0.21	0.11	-8.7	0.974
		(0.04)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.87)	(0.00)	(0.06)	(0.00)	(0.00)
	Dec8	0.015	0.08	0.20	0.19	0.25	0.12	0.08	0.03	0.14	0.06	-13.1	0.973
		(0.45)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.16)	(0.65)	(0.02)	(0.31)	(0.00)	(0.00)
	Dec9	0.0007	0.09	0.19	0.17	0.21	0.09	0.05	-0.06	0.08	0.03	-10.5	0.981
		(0.71)	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.41)	(0.32)	(0.20)	(0.53)	(0.00)	(0.00)
	Dec10	0.02	0.03	0.09	0.05	0.09	0.02	0.06	0.08	0.06	0.03	-0.75	0.987
		(0.45)	(0.15)	(0.00)	(0.02)	(0.00)	(0.75)	(0.34)	(0.28)	(0.35)	(0.59)	(0.73)	(0.00)
	SML	-0.17	-0.24	-0.10	0.0002	0.12	0.48	0.56	0.042	0.31	0.35	6.8	0.989
		(0.00)	(0.00)	(0.00)	(0.91)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	S&P	0.02	0.03	0.08	0.04	0.07	0.02	0.07	-0.09	0.06	0.04	0.47	0.988
		(0.41)	(0.17)	(0.00)	(0.09)	(0.00)	(0.82)	(0.34)	(0.22)	(0.39)	(0.50)	(0.83)	(0.00)

NOTES: The ten portfolio size deciles range between Dec1 for the smallest size and Dec10 for the largest size decile in CRSP, and SML is the small less large decile returns, measured by subtracting Dec10 from Dec1. The P-values are in parenthesis, α, γ, ϑ are the coefficients for the mean equation in E-GARCH, and λ is the coefficient of leverage effect in the variance equation, from equation (2). The symbol * indicates the use of a moving average E-GARCH.

TABLE 6: TEST FOR THE WEEKEND EFFECT ACROSS SIZE IN JANUARY FOR CRSP DECILE PORTFOLIOS AFTER CONTROLLING FOR MONDAYS AND FRIDAYS IN THE FIRST AND LAST THREE WEEKS OF JANUARY USING GARCH (2,1)-M

		GARCH (2,1)-M									
		Mean equation									
Panel A	Size /coefficients	α_0	β_1	β_2	β_3	β_4	β_5	β_6	ARCH LM TEST	L-B(24)	J-B P-value
1970-1979	Dec1	0.02	-0.077	0.19	1.04	0.97	0.27	0.15	0.43	9.1	0.00
		(0.20)	(0.02)	(0.00)	(0.01)	(0.12)	(0.00)	(0.14)			
	De2	0.04	-0.086	0.19	0.53	0.44	0.24	0.07	0.053	18.7	0.00
		(0.01)	(0.04)	(0.00)	(0.02)	(0.37)	(0.00)	(0.50)			
	Dec3	0.06	-0.08	0.19	0.76	0.31	0.25	0.08	0.323	20.8	0.00
		(0.00)	(0.01)	(0.00)	(0.00)	(0.49)	(0.00)	(0.41)			
	Dec4	0.066	-0.13	0.17	0.54	0.11	0.08	-0.03	0.52	24.4	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.78)	(0.46)	(0.78)			
	Dec5	0.06	-0.13	0.20	0.59	0.14	0.16	0.01	1.4	23.1	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.70)	(0.15)	(0.94)			
	Dec6	0.087	-0.15	0.17	0.49	0.093	0.091	-0.06	1.97	0.16	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.77)	(0.43)	(0.64)			
	Dec7	0.09	-0.14	0.15	0.33	0.093	0.027	-0.07	0.83	19.1	0.00
		(0.00)	(0.00)	(0.00)	(0.08)	(0.72)	(0.83)	(0.63)			
	Dec8	0.11	-0.12	0.12	0.026	0.055	-0.06	-0.12	0.41	19.2	0.00
		(0.00)	(0.00)	(0.00)	(0.16)	(0.80)	(0.61)	(0.40)			
	Dec9	0.08	-0.14	0.10	0.13	0.06	-0.041	-0.093	0.81	22.8	0.00
		(0.00)	(0.00)	(0.00)	(0.45)	(0.73)	(0.71)	(0.48)			
	Dec10	0.011	-0.11	0.05	-0.23	-0.12	-0.016	0.033	0.024	19.6	0.00
		(0.68)	(0.00)	(0.15)	(0.41)	(0.50)	(0.89)	(0.75)			

		GARCH (2,1)-M									
		Mean equation									
Panel B	Size /coefficients	α_0	β_1	β_2	β_3	β_4	β_5	β_6	ARCH LM TEST	L-B(24)	J-B P-value
1980-1989	Dec1	-0.001	-0.16	0.28	0.72	0.59	0.31	0.25	0.99	18.9	0.00
		(0.58)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)			
	De2	0.0007	-0.19	0.22	0.97	0.61	0.18	0.23	0.93	17.1	0.00
		(0.55)	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)			
	Dec3	0.04	-0.02	0.19	0.81	0.32	0.15	0.22	1.48	13.9	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.18)	(0.01)			
	Dec4	0.04	-0.24	0.19	0.68	0.26	0.25	0.12	2.25	16.4	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.20)	(0.03)	(0.22)			
	Dec5	0.07	-0.25	0.13	0.02	0.51	0.17	0.17	0.80	12.0	0.00
		(0.00)	(0.00)	(0.00)	(0.95)	(0.05)	(0.22)	(0.10)			
	Dec6	0.89	-0.26	0.12	0.13	0.35	0.16	0.13	0.55	7.5	0.00
		(0.00)	(0.00)	(0.00)	(0.69)	(0.16)	(0.20)	(0.26)			
	Dec7	0.11	-0.26	0.08	0.13	0.28	0.22	0.12	0.045	7.9	0.00
		(0.00)	(0.00)	(0.01)	(0.64)	(0.33)	(0.11)	(0.32)			
	Dec8	0.12	-0.27	0.06	0.15	0.17	0.24	0.11	0.19	7.9	0.00
		(0.00)	(0.00)	(0.07)	(0.52)	(0.56)	(0.11)	(0.37)			
	Dec9	0.13	-0.26	0.045	0.58	0.03	0.21	0.11	0.12	9.1	0.00
		(0.00)	(0.00)	(0.21)	(0.02)	(0.92)	(0.14)	(0.32)			
	Dec10	0.09	-0.18	0.03	0.46	0.05	0.27	0.032	0.34	7.9	0.00
		(0.00)	(0.00)	(0.56)	(0.06)	(0.90)	(0.13)	(0.78)			

		GARCH (2,1)-M									
		Mean equation									
Panel C	Size /coefficients	α_0	β_1	β_2	β_3	β_4	β_5	β_6	ARCH LM TEST	L-B(24)	J-B P-value
1990-2000	Dec1	0.001	-0.20	0.28	0.14	0.22	0.18	0.15	0.90	38.5[a]	0.00
		(0.63)	(0.00)	(0.00)	(0.00)	(0.35)	(0.07)	(0.12)			
	De2	0.03	-0.19	0.22	0.49	0.00006	0.057	0.12	0.54	10.4	0.00
		(0.01)	(0.00)	(0.00)	0.00)	(0.98)	(0.56)	(0.18)			
	Dec3	0.07	-0.18	0.19	0.40	0.11	0.096	-0.06	0.83	17.1	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.73)	(0.26)	(0.47)			
	Dec4	0.08	-0.14	0.17	0.35	0.17	0.09	-0.017	1.13	14.9	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.48)	(0.43)	(0.86)			
	Dec5	0.09	-0.12	0.13	0.075	0.0005	0.0008	-0.031	0.78	12.4	0.00
		(0.00)	(0.00)	(0.00)	(0.74)	(0.98)	(0.94)	(0.75)			
	Dec6	0.09	-0.11	0.12	0.19	0.07	-0.06	-0.03	0.73	10.2	0.00
		(0.00)	(0.00)	(0.00)	(0.34)	(0.76)	(0.66)	(0.81)			
	Dec7	0.08	-0.09	0.074	0.73	0.081	-0.14	-0.08	0.99	15.1	0.00
		(0.00)	(0.00)	(0.05)	(0.71)	(0.73)	(0.32)	(0.48)			
	Dec8	0.08	-0.066	0.04	-0.0006	-0.023	-0.17	-0.099	0.45	12.6	0.00
		(0.00)	(0.06)	(0.24)	(0.97)	(0.92)	(0.18)	(0.39)			
	Dec9	0.06	-0.042	0.021	-0.12	-0.036	-0.017	-0.11	0.21	12.7	0.00
		(0.00)	(0.25)	(0.55)	(0.56)	(0.86)	(0.22)	(0.32)			
	Dec10	-0.0001	-0.055	-0.012	0.10	0.065	-0.15	0.073	0.34	7.9	0.00
		(0.96)	(0.18)	(0.75)	(0.68)	(0.78)	(0.25)	(0.53)			

		GARCH (2,1)-M									
		Mean equation									
Panel D	Size /coefficients	α_0	β_1	β_2	β_3	β_4	β_5	β_6	ARCH LM TEST	L-B(24)	J-B P-value
1970-2000	Dec1	-0.0002	-0.15	0.25	1.03	0.65	0.26	0.19	0.32	22.5	0.00
		(0.79)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)			
	De2	0.024	-0.16	0.21	0.59	0.34	0.15	0.14	0.08	18.5	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)			
	Dec3	0.056	-0.17	0.19	0.52	0.25	0.15	0.07	0.09	26.5	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.01)	(0.24)			
	Dec4	0.06	-0.17	0.18	0.50	0.19	0.15	0.03	0.38	24.7	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.29)	(0.03)	(0.62)			
	Dec5	0.07	-0.17	0.15	0.19	0.20	0.12	0.032	0.07	15.3	0.00
		(0.00)	(0.00)	(0.00)	(0.22)	(0.27)	(0.09)	(0.60)			
	Dec6	0.086	-0.18	0.14	0.33	0.20	0.062	0.013	0.17	15.4	0.00
		(0.00)	(0.00)	(0.00)	(0.01)	(0.20)	(0.41)	(0.84)			
	Dec7	0.09	-0.17	0.10	0.18	0.17	0.025	0.033	0.03	16.9	0.00
		(0.00)	(0.00)	(0.00)	(0.16)	(0.25)	(0.75)	(0.65)			
	Dec8	0.12	-0.16	0.077	0.19	0.11	-0.0002	-0.052	0.14	14.7	0.00
		(0.00)	(0.00)	(0.00)	(0.09)	(0.45)	(0.97)	(0.48)			
	Dec9	0.11	-0.15	0.056	0.14	0.065	-0.001	-0.04	0.20	14.2	0.00
		(0.00)	(0.00)	(0.00)	(0.22)	(0.61)	(0.89)	(0.52)			
	Dec10	-0.012	-0.08	0.016	0.10	0.14	-0.03	-0.012	0.37	14.6	0.00
		(0.45)	(0.00)	(0.53)	(0.42)	(0.31)	(0.73)	(0.86)			

NOTES: The ten portfolio size deciles range between Dec1 for the smallest size and Dec10 for the largest size decile in CRSP. Results are based on the GARCH(2,1)-M equation (3). The P-values are in parenthesis.