The Journal of Financial Research • Vol. XXIII, No. 4 • Pages 495–522 • Winter 2000

INTERNATIONAL EVIDENCE ON WEEKEND ANOMALIES

Wilson Tong
Hong Kong University of Science & Technology

Abstract

Recent studies on the U.S. market find that the Monday effect is observed mainly when the return on the previous Friday is negative or when the Monday falls within the last two weeks of the month. I look for international evidence and examine whether such properties of the Monday effect are related to another anomalous phenomenon—high weekend correlation. By examining twenty-three equity market indexes, I find that the negative Friday is, in general, important to the Monday effect. Furthermore, Monday returns tend to be lowest on the fourth week of the month. Although high weekend correlation is also common to these markets, it seems not related to the bad-Friday factor and shows no seasonality across weeks of the month.

JEL classification: G15, G10.

I. Introduction

Two different but related phenomena in the stock market attract great interest in the finance profession. They are the Monday effect, in which the mean Monday return is significantly lower than the non-Monday return, and the strong positive autocorrelation over the weekend, in which the Monday return tends to reinforce the Friday return.

According to Maberly (1995), Kelly (1930) first documented the Monday effect. Yet, attention to this phenomenon arose only after Cross (1973) and French (1980). Jaffe and Westerfield (1985) provide international evidence. Although studied widely, the Monday effect remains an anomaly. Lakonishok and Maberly (1990) find that relative to institutional investors, individual investors trade more on Monday predominantly by selling orders.[1] Abraham and Ikenberry (1994), moreover, find that the selling pressure on Monday that comes from individual investors is substantially heavier following a decline of the market on the previous

---

I would like to thank the anonymous referee for the valuable comments and suggestions, which substantially improved the quality of the paper. All remaining errors are mine.

[1]Later, Maberly (1995) acknowledges that Kelly (1931) had already suggested the selling behavior of individual investors as a possible reason for the Monday effect.

Friday.[2] Taking this "bad Friday" decline as a proxy for marketwide bad news, Abraham and Ikenberry (1994) suggest the Monday effect is probably a response of individual investors to bad news received on Friday. However, Sias and Starks (1995) challenge the individual investor argument, suggesting instead that the Monday effect is driven mainly by institutional investors. They find that stocks with higher institutional holdings exhibit significantly greater day-of-the-week conditional return patterns than do stocks with higher individual holdings. Wang, Li, and Erickson (1997) also challenge the individual investor argument, but from a different angle. They find that the Monday effect concentrates only in the fourth and fifth weeks of the month. Raw returns on Mondays of the first three weeks of the month are practically no different from zero. Abraham and Ikenberry (1994) would be right only if bad news occurs in the latter part of the month.

On the other hand, the linkage between bad Fridays and the Monday effect seem to be supported indirectly by another phenomenon. Cross (1973) documents a higher weekend correlation for the S&P 500 index return series. Keim, Rogalski, and Stambaugh (1984) confirm the result using thirty Dow Jones Industrial Average component stocks. Bessembinder and Hertzel (1993) systematically study weekend correlations on various markets. They find that higher return correlations around nontrading days such as weekends and holidays are a fairly general phenomenon.

These new results are based mainly on U.S. data. Given that the Monday effect is also found in foreign markets, I test whether these new findings are common to other markets or are sample specific. Furthermore, finding the linkage between bad Fridays and the Monday effect is robust internationally, I examine whether the linkage is the driving force behind high weekend correlation. On the other hand, if the Monday effect is concentrated in the last two weeks of the month, the weekend correlation may also be stronger over the last two weekends. In other words, I examine whether the Monday effect and the higher weekend correlation are related phenomena. By examining twenty-three equity market indexes, I test whether the bad-Friday factor is as important to foreign markets' Monday effect as it is to the U.S. Monday effect. Specifically, I construct a quantitative measure of the contribution of the bad-Friday factor to the Monday effect. I then compare the relative importance of the bad-Friday factor on the Monday effect across different equity markets. Finally, I examine the international evidence to see whether the lowest Monday returns occur during the fourth and the fifth weeks of the month.

To study the possible linkage between the Monday effect and the high weekend correlation, I divide the weekend correlation into two parts. The weekend correlation conditional on the Friday return's being positive is the "conditional positive weekend correlation." The weekend correlation conditional on the Friday return's being negative is the "conditional negative weekend correlation." If high

[2]In an earlier paper, Jaffe, Westerfield, and Ma (1989) find that returns are abnormally low on Mondays following market declines. They also find that the Monday effect virtually disappears when the market has previously risen.

weekend correlation is due to the bad-Friday/Monday-effect relation, the conditional negative weekend correlation should be significantly higher than the nonweekend correlation and the conditional positive weekend correlation. Furthermore, if the bad-Friday/Monday-effect relation and the high weekend correlation are related, the uniqueness of the fourth and fifth weeks of the month in relation to the Monday effect should carry through to the higher weekend correlation. That is, the weekend correlation should also be greatest over the last two weekends of the month.

In general, my results confirm the findings on the weekend anomalies in the U.S. market. Specifically, the bad Friday factor is important to the Monday effect. Of the fifteen markets that exhibit the Monday effect, the bad Friday factor explains more than 70 percent of the Monday effect in ten markets. To a lesser extent, the findings of Wang, Li, and Erickson (1997) are also common to other markets. That is, the Monday return on the fourth week of the month tends to be the lowest among all Monday returns of the month. The international evidence suggests the Monday effect is not only common to many markets, but the driving factors behind it seem to be, as well. Hence, it may be some common market practices and behaviors that cause this "anomalous" phenomenon.

Although high weekend correlation is as common as the Monday effect in the international equity markets, no strong evidence suggests the two phenomena are related. First, the high weekend correlation is not solely driven by the bad-Friday/Monday-effect relation. Second, the uniqueness of the fourth week of the month is more pervasive to the Monday effect than to the weekend correlation. Last, only mild evidence shows that higher correlation on the fourth weekend is related to the bad-Friday factor.

II. The Monday Effect and the Conditional Monday Effects

Consider the following two regressions:

$$R_t = a + b\text{MON}_t + e_t \tag{1}$$

$$R_t = a_0 + a_1\text{CNEG}_t + b_0\text{MON}_t + b_1\text{CNMON}_t + e_t \tag{2}$$

where R_t is the return on day t. Equation (1) is the standard regression test on the Monday effect. MON is the Monday dummy and its coefficient b captures the difference between the mean Monday return with the mean non-Monday return. A significant and negative b suggests returns are lower, on average, on Mondays than on other days of the week.

Equation (2) splits equation (1) into two parts: the conditional positive and the conditional negative. CNEG is a dummy variable that equals one if the return of the previous trading day is negative, and zero otherwise. CNMON is a special Monday dummy that equals one only when the previous Friday return is negative.

In such a manner, the mean non-Monday return of equation (1), captured by a, is split into a_0 and a_1, where a_0 gives the mean daily, non-Monday return if the previous trading day return is positive, and $(a_0 + a_1)$ gives the mean daily, non-Monday return if the previous trading day return is negative. This approach helps split the Monday effect into two parts for examination: the Monday effect conditional on the previous Friday return's being positive (the "conditional positive Monday effect") and the Monday effect conditional on the previous Friday return's being negative (the "conditional negative Monday effect"). Specifically, the conditional positive Monday effect, b_0, is the difference between the mean Monday return conditional on the previous Friday return's positive and the mean non-Monday return conditional on the prior-day return's being positive. Similarly, the conditional negative Monday effect, $(b_0 + b_1)$, is the difference between the mean Monday return conditional on the previous Friday return's being negative and the mean non-Monday return conditional on the prior-day return's being negative.

Such a dichotomy highlights an important point commonly overlooked—the Monday effect occurs because the Monday return is below the returns of the other days rather than because it is negative.[3] Even when the conditional positive Monday return is positive, the Monday effect persists as long as it is significantly below the normal (conditional positive non-Monday) return. If the Monday effect is triggered only by the down market on Friday, b_1 will be significantly negative and the conditional positive Monday effect will not be important; that is, b_0 will not differ significantly from zero. More important, by explicitly separating the portion of the Monday effect in such a way, it is possible to analyze how much negative Fridays contribute to the overall Monday effect. To see how important this bad-Friday factor is, the Monday effect, as the mean excess return of Monday returns over non-Monday returns, is expressed as follows:

$$\begin{aligned}(R_m - R_{nm}) &= (P_m^+ R_m^+ + P_m^- R_m^-) - (P_{nm}^+ R_{nm}^+ + R_{nm}^- R_{nm}^-) \\ &= (P_m^+ R_m^+ - P_{nm}^+ R_{nm}^+) + (P_m^- R_m^- - P_{nm}^- R_{nm}^-), \end{aligned} \tag{3}$$

where R_m and R_{nm} are the mean Monday and non-Monday returns, respectively. R_m^+ is the mean conditional positive Monday return and P_m^+ is the associated probability. R_{nm}^+ is the mean conditional positive non-Monday return and P_{nm}^+ is the associated probability. R_m^-, R_{nm}^-, P_m^-, and P_{nm}^- are the conditional negative counterparts of R_m^+, R_{nm}^+, P_m^+, and P_{nm}^+, respectively.

From equation (3), it can be seen that the Monday effect is not the sum of the conditional positive Monday effect (i.e., $R_m^+ - R_{nm}^+$) and the conditional negative Monday effect (i.e., $R_m^- - R_{nm}^-$). It needs to be adjusted for the probabilities of

[3]Wang, Li, and Erickson (1997) and some other studies look at the Monday effect as occurring because the mean Monday return is negative. However, equilibrium pricing models suggest risky assets should earn positive risk premia; a mean Monday return of, say, zero should be viewed as anomalous.

realization, or, equivalently, the frequencies of occurrence. As such, equation (3) reveals that the importance of the negative Friday return to the overall Monday effect does not depend solely on how big the drop in the mean conditional negative Monday return (R_m^-) is relative to the mean conditional negative non-Monday return (R_{nm}^-) (i.e., the magnitude of the conditional negative Monday effect); it also depends on the probability of a Monday being preceded by a bad Friday versus the probability of a non-Monday being preceded by a bad trading day. Hence, based on the finding by Abraham and Ikenberry (1994) that investors tend to sell aggressively on Mondays after bad Fridays, one can infer that R_m^- might be negative relative to R_{nm}^-. But if Friday returns are frequently positive—that is, P_m^+ is relatively large and P_m^- is relatively small—the contribution of a large, negative R_m^- to the overall Monday effect will be diminished, whereas the contribution of a low, positive R_m^+ to the overall Monday effect will be magnified. That is, if the frequency of positive Fridays is sufficiently large, the contribution of a bad-Friday-induced Monday effect to the overall Monday effect need not be important even if the mean return of conditional negative Mondays is negative. Hence, equation (3) is useful for evaluating the relative contribution of each component to the overall Monday effect. Specifically, the first term on the right-hand side of equation (3) divided by the left-hand side of equation (3) gives the contribution of a conditional positive Monday. The second term on the right-hand side of equation (3) divided by the left-hand side of equation (3) gives the contribution of a conditional negative Monday.

III. The Contribution of the Bad-Friday Factor

Daily data from twenty-three market indexes are used in the analysis. For the U.S. market, the daily equally weighted return series from the Center for Research in Security Prices NYSE/AMEX data tape spanning from 1962 to 1995 are used. Fifteen indexes are from Datastream and seven South East Asian market indexes are from the Pacific-Basin Capital Market database. The indexes are listed in the Appendix. As a first step, equations (1) and (2) are performed on individual market indexes to detect the Monday effect and the conditional Monday effects. Results are presented in Table 1.

Results in Panel A indicate the Monday effect is an international phenomenon. Fifteen of the twenty-two non-U.S. markets exhibit the Monday effect, as indicated by the significant t-values at the 5 percent level or better of the Monday dummy coefficients. When the Monday effect is split into two components, as in equation (2), the regression coefficient of MON, b_0, which measures the importance of the conditional positive Monday effect, is significant and negative in the U.S. market. This means if attention focuses only on the conditional positive group, the mean return on Monday is still significantly lower than the mean return on the other days of the week. This is not to say the mean Monday return following a positive Friday is negative. For instance, the mean Monday return following a

TABLE 1. Regression Results on Testing the Monday Effect and Conditional Monday Effects.

		Panel A. $R_t = a + b^{*}MON_t + e_t$		Panel B. $R_t = a_0 + a_1 CNEG_t + b_0{*}MON_t + b_1 CNMON_t + e_t$			
Country	Obs.	Constant	MON	Constant	CNEG	MON	CNMON
U.S.	8661	0.1269	-0.2241	0.2876	-0.3869	-0.2060	-0.2628
		(11.6470)***	(-13.3156)***	(28.8956)***	(-23.6398)***	(-11.1447)***	(-6.0148)***
Australia	3874	0.0556	-0.0324	0.2134	-0.3390	-0.0191	-0.0678
		(3.1288)***	(-0.7933)	(10.3617)***	(-12.2327)***	(-0.3595)	(-0.8348)
Austria	3299	0.0183	0.0865	0.1632	-0.3247	0.1115	-0.0597
		(-0.8444)	(1.9683)*	(5.6657)***	(-9.1812)***	(1.6867)*	(-0.7277)
Belgium	3744	0.0474	-0.0278	0.1862	-0.3086	-0.0159	-0.0602
		(2.9702)***	(-0.9665)	(9.1665)***	(-11.1077)***	(-0.3902)	(-0.9840)
Canada	6585	0.0536	-0.1512	0.1988	-0.3095	-0.1460	-0.0223
		(4.5725)***	(-6.6165)***	(14.2543)***	(-15.5778)***	(-4.7340)***	(-0.4655)
Denmark	5080	0.0429	-0.0606	0.1935	-0.3142	-0.0598	-0.0197
		(3.1961)***	(-2.1417)**	(11.3841)***	(-13.2888)***	(-1.5011)	(-0.3429)
France	5587	0.0762	-0.1919	0.2257	-0.3087	-0.1157	-0.1852
		(4.1832)***	(-5.3832)***	(10.6402)***	(-9.9287)***	(-2.4329)**	(-2.4652)**
Germany	6459	0.0404	-0.0904	0.0953	-0.1129	0.0367	-0.2766
		(3.2167)***	(-2.5813)***	(6.2023)***	(-4.7302)***	(-0.8283)	(-3.8728)***
Italy	6447	0.0552	-0.1472	0.1966	-0.2787	0.0252	-0.4203
		(3.0516)***	(-3.2544)***	(7.6963)***	(-7.7334)***	(-0.4373)	(-4.5107)***
Holland	3713	0.0801	-0.1459	0.0609	0.0413	0.0124	-0.3359
		(4.9141)***	(-3.3653)***	(2.8784)***	-1.4022	(-0.2130)	(-3.9627)***
Norway	3846	0.0928	-0.1181	0.2771	-0.3818	-0.0223	-0.2405
		(4.1967)***	(-2.3312)**	(10.0737)***	(-9.9668)***	(-0.3388)	(-2.4107)**
S. Africa	2963	0.1350	-0.1972	0.3454	-0.4784	-0.2034	-0.0115
		(5.0286)***	(-3.9276)***	(11.6793)***	(-10.9191)***	(-4.2252)***	(-0.1104)
Spain	4674	-0.0032	0.2284	0.1685	-0.3924	0.4190	-0.4415
		(-0.1621)	(3.8057)***	(6.5249)***	(-11.6219)***	(5.3531)***	(-3.9146)***
Singapore	6506	0.0664	-0.0972	0.2552	-0.3912	0.0790	-0.4388
		(3.8254)***	(-2.6825)***	(12.1349)***	(-12.0676)***	(1.6953)*	(-5.6023)***
Switzerland	6341	0.0477	-0.1425	0.1476	-0.2086	-0.0766	-0.1674
		(4.0444)***	(-5.0554)***	(10.6520)***	(-9.8009)***	(-2.2499)**	(-2.8337)***
U.K.	6625	0.0721	-0.2313	0.1416	-0.1395	-0.1457	-0.1916
		(4.0313)***	(-5.9182)***	(6.1091)***	(-4.4150)***	(-2.8669)***	(-2.3101)**
Hong Kong	4920	0.1275	-0.1972	0.2034	-0.1589	0.1340	-0.7696
		(5.2016)***	(-2.8981)***	(6.5551)***	(-3.4155)***	(-1.5041)	(-4.9323)***
Indonesia	2440	0.0817	0.0319	0.2915	-0.5233	-0.0194	0.0813
		(1.6677)*	-0.6860	(3.9839)***	(-5.4366)***	(-0.2231)	-0.7492
Malaysia	4401	0.0981	-0.1844	0.2740	-0.3712	0.0092	-0.5746
		(4.4042)***	(-3.5942)***	(10.5095)***	(-9.5717)***	(-0.1414)	(-5.4431)***
Thailand	4768	0.0807	-0.0989	0.2682	-0.3816	0.0242	-0.3778
		(3.6467)***	(-2.0261)**	(9.9094)***	(-9.7432)***	(-0.4025)	(-3.9095)***
Taiwan	5749	0.0834	-0.0706	0.1571	-0.1576	0.0836	-0.3377
		(3.2362)***	(-1.3230)	(4.8274)***	(-3.3549)***	(-0.9916)	(-2.6904)***
Japan	5412	0.0546	-0.1167	0.1640	-0.2315	-0.0437	-0.2030
		(4.1691)***	(-3.6643)***	(10.3663)***	(-10.1287)***	(-1.2453)	(-2.6600)***
S. Korea	5250	0.0534	-0.0551	0.1457	-0.1819	0.0206	-0.2160
		(3.0497)***	(-1.2107)	(5.8636)***	(-5.8463)***	(0.3404)	(-2.3067)***

Note: Panels A and B give the results of two regressions on daily market return series. MON is the Monday dummy variable that equals one if the trading day is a Monday and zero otherwise. CNEG is an intercept dummy that equals one on days when previous trading days have negative return and zero otherwise. CNMON is a special Monday dummy that equals one only if the Monday is preceded by a negative Friday return and zero otherwise. Return figures are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

positive Friday, captured by $(a_0 + b_0)$ of equation (1), is 0.0816 percent (0.2876 - 0.2060) in the U.S. market. This is consistent with the findings of Cross (1973) and Abraham and Ikenberry (1994) that positive Fridays lead to positive Mondays on average. But, the result indicates the Monday effect is not completely driven by negative Fridays.

For the other fifteen markets that also exhibit the Monday effect, only Canada, France, South Africa, Switzerland, and Great Britain still exhibit a significant conditional positive Monday effect at the 5 percent level or better (as reflected by the t-values of the coefficients of b_0). For these markets, the Monday effect persists after Mondays preceded by negative Fridays are removed from the sample. The regression coefficients of $CNMON_t$ are not significant in Canada and South Africa. This does not mean the conditional negative Monday effect is not important in these two markets. It only indicates the magnitude of the conditional negative Monday effect is not significantly different from that of its conditional positive counterpart. Regardless, these markets with significant conditional positive Monday effects do not indicate bad Fridays are the sole contributor to the Monday effect. On the other hand, this also suggests the Monday effects in the other ten markets are mainly driven by bad Fridays. In fact, the MON_t in the market indexes in Germany, Italy, Holland, Singapore, Hong Kong, Malaysia, and Thailand even show a positive sign (i.e., $b_0 > 0$ in Panel B) although they exhibit a significant Monday effect (i.e., $b < 0$ in Panel A). For these markets, the returns of Mondays preceded by positive Fridays tend to be higher than the returns of non-Mondays preceded by positive days. Such relations can be interpreted as suggesting the Monday effects observed in these markets come exclusively from bad Fridays.

The overall result seems to suggest the negative Friday is indeed a general, important factor in the Monday effect. To quantify its importance further, I use equation (3) to evaluate how much bad Fridays contribute to the Monday effect. Values of all variables necessary for computing equation (3) are estimated. Because the focus is on the Monday effect, only the estimated values of the sixteen markets that exhibit the Monday effect are presented.

Panel A of Table 2 reports the mean returns of various return series. The mean conditional positive Monday returns (R_m^+) are positive for almost all markets. However, the regression results of equation (2) indicate the Monday effect can still exist. For instance, in the U.S. market, the mean conditional negative Monday return, R_m^- (-0.5681 percent), is negative compared with its non-Monday counterpart, R_{nm}^- (-0.0993 percent). But as discussed earlier, to fully evaluate the effect, the occurrence frequencies of conditional positive and conditional negative Monday returns need to be considered.

Beneath the figures of mean returns in Panel A are the corresponding numbers of observations and probabilities. The fraction of each number of observations relative to its corresponding group total gives a measure of the probability defined in equation (3). For instance, the probability of a conditional positive Monday return in the U.S. market, P_m^+ (72 percent), comes from dividing the

TABLE 2. Proportional Contributions of Conditional Positive and Negative Monday Effects to the Overall Monday Effect.

Panel A. Mean Return and Probability of Occurrence of Various Return Series

Country		R	R^+	R^-	R_m	R_m^+	R_m^-	R_{nm}	R_{nm}^+	R_{nm}^-
U.S.	Mean Return	0.0837	0.2406	-0.1633	-0.0972	0.0817	-0.5681	0.1269	0.2876	-0.0993
	No. of Obs.	8661	5142	3266	1620	1174	446	6788	3968	2820
	Probability		61%	39%		72%	28%		58%	42%
Canada	Mean Return	0.025732	0.17119	-0.14091	-0.09755	0.05278	-0.27905	0.053598	0.19875	-0.11075
	No. of Obs.	6585	3516	3069	1214	664	550	5371	2852	2519
	Probability		53%	47%		55%	45%		53%	47%
Denmark	Mean Return	0.03098	0.18129	-0.13568	-0.01771	0.13375	-0.2002	0.04293	0.19354	-0.1207
	No. of Obs.	5080	2671	2409	1001	547	454	4079	2124	1955
	Probability		53%	47%		55%	45%		52%	48%
France	Mean Return	0.03904	0.20234	-0.1386	-0.11575	0.10995	-0.38393	0.07618	0.22568	-0.08305
	No. of Obs.	5587	2911	2676	1081	587	494	4506	2324	2182
	Probability		52%	48%		54%	46%		52%	48%
Germany	Mean Return	0.022596	0.10268	-0.06332	-0.05004	0.13197	-0.25753	0.04036	0.09526	-0.017676
	No. of Obs.	6459	3343	3116	1269	676	593	5190	2667	2523
	Probability		52%	48%		53%	47%		51%	49%
Italy	Mean Return	0.0263	0.20203	-0.15224	-0.09199	0.22186	-0.47713	0.05517	0.19662	-0.08208
	No. of Obs.	6447	3249	3198	1265	697	568	5182	2552	2630
	Probability		50%	50%		55%	45%		49%	51%
Holland	Mean Return	0.051326	0.063327	0.037614	-0.06578	0.07328	-0.22131	0.08013	0.06091	0.10221
	No. of Obs.	3713	1980	1733	733	387	346	2980	1593	1387
	Probability		53%	47%		53%	47%		53%	47%
Norway	Mean Return	0.06976	0.27255	-0.15319	-0.02529	0.25479	-0.36751	0.09282	0.27713	-0.1047
	No. of Obs.	3846	2014	1832	751	413	338	3095	1601	1494
	Probability		52%	48%		55%	45%		52%	48%
S. Africa	Mean Return	0.09943	0.30749	-0.17003	-0.06213	0.14206	-0.34783	0.13503	0.34544	-0.13291
	No. of Obs.	2963	1672	1291	535	312	223	2428	1360	1068
	Probability		56%	44%		58%	42%		56%	44%

(Continued)

TABLE 2. Continued.

Panel A. Mean Return and Probability of Occurrence of Various Return Series

Country		R	R^+	R^-	R_m	R_m^+	R_m^-	R_{nm}	R_{nm}^+	R_{nm}^-
Singapore	Mean Return	0.047472	0.2716	-0.20106	-0.03078	0.33416	-0.49579	0.06643	0.25518	-0.13598
	No. of Obs.	6506	3421	3085	1269	711	558	5237	2710	2527
	Probability		53%	47%		56%	44%		52%	48%
Switzerland	Mean Return	0.020495	0.13216	-0.1045	-0.09475	0.07104	-0.30494	0.0477	0.14765	-0.06095
	No. of Obs.	6341	3349	2992	1211	677	534	5130	2672	2458
	Probability		53%	47%		56%	44%		52%	48%
U.K.	Mean Return	0.028493	0.1128	-0.05837	-0.15922	-0.00415	-0.33523	0.0721	0.14159	0.0021
	No. of Obs.	6625	3362	3263	1249	664	585	5376	2698	2678
	Probability		51%	49%		53%	47%		50%	50%
Hong Kong	Mean Return	0.09038	0.2301	-0.0671	-0.06969	0.3374	-0.59109	0.1275	0.20337	0.04446
	No. of Obs.	4920	2607	2313	926	520	406	3994	2087	1907
	Probability		53%	47%		56%	44%		52%	48%
Malaysia	Mean Return	0.06225	0.27596	-0.19103	-0.08631	0.28315	-0.66263	0.09807	0.27395	-0.09727
	No. of Obs.	4401	2387	2014	855	521	334	3546	1866	1680
	Probability		54%	46%		61%	39%		53%	47%
Thailand	Mean Return	0.06195	0.27335	-0.17089	-0.01824	0.2924	-0.46695	0.08065	0.26819	-0.11339
	No. of Obs.	4768	2499	2269	902	533	369	3866	1966	1900
	Probability		52%	48%		59%	41%		51%	49%
Japan	Mean Return	0.033927	0.1556	-0.10716	-0.06209	0.12027	-0.31415	0.05463	0.16397	-0.0675
	No. of Obs.	5412	2906	2506	960	557	403	4452	2349	2103
	Probability		54%	46%		58%	42%		53%	47%
S. Korea	Mean Return	0.04515	0.15224	-0.06409	0.00006	0.17082	-0.23162	0.05416	0.14788	-0.03619
	No. of Obs.	5234	2643	2591	872	502	370	4362	2141	2221
	Probability		50%	50%		58%	42%		49%	51%
Average[a]	Mean Return	0.04734	0.19696	-0.1211	-0.0698	0.17031	-0.3804	0.07489	0.20315	-0.0652
	Probability		53%	47%		56%	44%		52%	48%

(Continued)

TABLE 2. Continued.

Panel B. Proportional Contributions to the Monday Effect

Sample Period	Magnitude of the Monday Effect[b]	Proportional Contribution of the Probability-Weighted Conditional Positive Monday Effect (in percentage)	Proportional Contribution of the Probability-Weighted Conditional Negative Monday Effect (in percentage)
U.S.	-0.0022	49	51
Canada	-0.1512	51	49
Denmark	-0.0606	46	54
France	-0.1919	30	70
Germany	-0.0904	(24)	124
Italy	-0.1472	(17)	117
Holland	-0.1459	(4)	104
Norway	-0.1181	3	97
South Africa	-0.1972	56	44
Singapore	-0.0972	(57)	157
Switzerland	-0.1425	26	74
U.K.	-0.2313	32	68
Hong Kong	-0.1972	(42)	142
Malaysia	-0.1844	(15)	115
Thailand	-0.0989	(37)	137
Japan	-0.1167	14	86

[a]The average figures in Panel A are computed excluding the U.S. market.
[b]The Monday effect can be expressed as follows:

$$(R_m - R_{nm}) = (P^+_m - P^+_{nm}R^+_{nm}) + (P^-_m R^-_m - P^-_{nm}R^-_{nm})$$

where R_m is the mean Monday return and R_{nm} is the mean non-Monday return. P^+_m is the probability a Monday is preceded by a Friday with a positive return and R^+_m is its corresponding mean return. P^+_{nm} is the probability a non-Monday is preceded by a trading day with a positive return and R^+_{nm} is its corresponding mean return. P^-_m is the probability a Monday is preceded by a Friday with a negative return and R^-_m is its corresponding mean return. P^-_{nm} is the probability a Monday is preceded by a trading day with a negative return and R^-_{nm} is its corresponding mean return. Panel A gives their parameter estimates based on the daily data of CRSP equally weight return series from 1962 to 1995. For the sake of completeness, the conditional positive return, R^+, and the conditional negative return, R^-, with their respective probabilities of occurrence are also given. Plugging the estimates back into the above equation gives the contribution of the probability-weighted conditional positive and conditional negative Monday effects to the overall Monday effect, which is stated in Panel B. Return figures are multiplied by 100.

number of observations of all conditional positive Mondays (1,174) by the number of observations of all Mondays in the sample (1,620). When comparing the probabilities, the low frequency of conditional negative Mondays in the U.S. market stands out. The frequency of a non-Monday preceded by a down market, P^-_{nm}, is 42 percent, but the frequency of a Monday preceded by a bad Friday, P^-_m, is only 28 percent. Under such a situation, even though the conditional negative Monday return is typically low, its importance to the overall Monday effect would be dwarfed. In fact, the results in Panel B show that the conditional negative Monday return is responsible for only 51 percent of the overall Monday effect for the U.S. market, measured as the difference in the mean Monday and non-Monday returns. The other half of the Monday effect occurs on Mondays preceded by positive Fridays.

Other markets contrast with the U.S. market. Even though the frequencies of Mondays preceded by bad Fridays in these markets also tend to be lower than the frequencies of non-Mondays preceded by a negative return, the differences are not as extreme. The low occurrence of bad Fridays in the U.S. market is not observed in any of the other fifteen markets in the sample. The average figures for the fifteen markets in the bottom row of Table 2 indicate the frequency of Mondays preceded by bad Fridays, P^-_m, is around 44 percent, whereas the frequency of non-Mondays preceded by a negative return, P^-_{nm}, is 48 percent. Yet, the mean conditional negative Monday return of these fifteen markets (-0.3804 percent) is low relative to the mean conditional negative non-Monday return (-0.0652 percent). When large, negative returns are accompanied by highly frequent bad Fridays, bad Fridays should be a critical factor to the Monday effects in these markets. Indeed, the results in Table 1 demonstrate that in a statistical sense, bad Fridays explain away ten of the fifteen markets' Monday effects. Among these ten markets, Germany, Italy, Holland, Singapore, Hong Kong, Malaysia, and Thailand show positive albeit statistically insignificant conditional positive Monday effects. This positive conditional positive Monday effect reflects the fact that, after Mondays preceded by bad Fridays are removed, the remaining Mondays actually tend to have higher returns than non-Mondays following a positive prior-day return. In Panel B of Table 2 the results indicate the conditional positive Monday effects in these markets negatively influence the Monday effect. That is, the Monday effect in these markets is mainly due to bad Fridays.

In France, Norway, Switzerland, the United Kingdom, and Japan, bad Fridays are responsible for around 70 percent or more of the Monday effect. Only in Canada, Denmark, and South Africa do bad Fridays fail to have such a strong effect on the Monday effect.

Although the bad-Friday factor is important to most of the Monday effects in various equity markets, the effect comes in different ways. For the U.S. market, the effect brings highly negative returns on the following Mondays. The mean conditional negative Monday return, R^-_m, of -0.5681 percent in the U.S. market ranks the third lowest of its class among all markets, next only to Malaysia and

Hong Kong. For the other markets, the bad-Friday factor is important to the Monday effect because these markets have relatively more bad Fridays.

IV. The Monday Effect Across Weeks

According to Abraham and Ikenberry (1994), the Monday effect seems to be driven by bad Fridays. However, Wang, Li, and Erickson (1997) find that the Monday effect is mainly due to negative Mondays in the last two weeks of the month. When dividing each month into five trading weeks, they find that returns on Mondays in the first three weeks are not significantly different from zero. Negative Monday returns occur only during the last two weeks of the month. This phenomenom is found in the U.S. market, but it is unclear if it also exists in the other markets.

To examine this issue, I follow the approach of Wang, Li, and Erickson (1997). I divide each month into five calendar weeks. If the first trading day of the month is a Monday, it belongs to the week-1 Monday; otherwise, there is no week-1 Monday. Hence, the first trading Monday of a month is typically a week-2 Monday. South Korea and Taiwan markets trade on Saturday morning and Japan had Saturday trading during part of the time. Because of this, some months have six trading weeks. This happens when the month has thirty-one days and the first day of the month is a Saturday (the last day of the month is then a Monday). Based on the above definition, such a month has no week-1 Monday but will have a week-6 Monday. This leads to unnecessary complication. Hence, under this situation, week-1 Monday is redefined as the first Monday of the month and week-5 Monday is defined as the last Monday of the month. I then perform the following regression:

$$R_t = a_0 + a_1\text{MON}_t + a_2\text{W2MON}_t + a_3\text{W3MON}_t + a_4\text{W4MON}_t + a_4\text{W5MON}_t + e_t \quad (4)$$

where W2MON is a Monday dummy variable that equals one only when the Monday falls on the second week of a month, and it is zero otherwise. Other Monday dummy variables are defined accordingly to separate Mondays of different weeks of a month. As such, a_0 gives the mean non-Monday return[4] and a_1 captures the mean first-week Monday return in excess of the non-Monday return. In a sense, a_1 is the Monday effect on the first week of the month.[5] On the other hand, a_2 captures the excess of the week-2 Monday effect over the week-1 Monday effect, a_3 captures the excess of the week-3 Monday effect over the week-1 Monday effect, a_4 and a_5 are similarly interpreted. If Wang, Li, and Erickson are correct, a_1, and a_2,

[4]For simplicity, I assume non-Monday returns do not have seasonality across weeks of a month like Monday returns do.

[5]This setting is different from that of Wang, Li, and Erickson (1997). They look at whether Monday returns on different weeks are significant and negative, whereas I look at whether Monday returns on different weeks are significantly lower than non-Monday returns, as in equation (1).

and a_3 will not differ significantly from zero, whereas a_4 and a_5 will be significant and negative. Results are shown in Table 3.

Consistent with the results of Wang, Li, and Erickson (1997) that were based on value-weighted return series, the results here on the U.S. equally weighted return series also indicate Monday returns on the first three weeks are not significantly different from zero. Specifically, the mean Monday return on the first week of the month, which is captured by $(a_0 + a_1)$, is -0.0163 percent (0.1275 - 0.1438). But, relative to the positive non-Monday return, this week-1 Monday return is significantly lower with a t-value of -2.66. This supports the ealier contention that the Monday return is abnormal relative to the non-Monday return although it may not be significantly lower than zero. Nevertheless, my results are consistent with Wang, Li, and Erickson. The week-4 Monday return is 0.2002 percent lower than the week-1 Monday return, with a t-value of -3.08.[6] It is the lowest among all the Monday returns. Thirteen other markets exhibit a similar pattern. The averaged figures of the twenty-two foreign markets (excluding the U.S. market) shown at the bottom of the table also point to the week-4 Monday return as being the lowest among other Monday returns.

The week-5 Monday return, however, does not appear to be unique. In the U.S. market, it is 0.1169 percent lower than the week-1 Monday return. But a t-value of -1.69 indicates that, statistically, it is only marginally significant. Furthermore, only Germany, Switzerland, and Thailand demonstrate lower week-5 Monday returns with statistical significance. Although Spain, Singapore, and South Korea also show significantly lower week-5 Monday returns, these markets have positive week-1 Monday returns and lower Monday returns in the second and third weeks than in the fifth week. The averaged figures of the other twenty-two markets also indicate the week-5 Monday return is only 0.09 percent lower than the week-1 Monday return, whereas the week-2 and week-3 Monday returns are 0.12 percent and 0.15 percent lower, respectively.

V. The Weekend Correlation

The Monday effect may be related to another anomalous phenomenon— the weekend correlation being higher than the nonweekend correlation. If bad Fridays drive the Monday effect, the correlation between Friday and Monday returns might be high. Indeed, Bessembinder and Hertzel (1993) show there is a higher return correlation over weekends relative to weekdays. However, they do not examine whether the correlation is symmetric between the positive and the negative sides. This may be important here because if the high weekend correlation is mainly due

---

[6]Although a_4 gives the difference between the week-4 Monday effect and the week-1 Monday effect, it is also the difference between the week-4 Monday return and the week-1 Monday return. This is because equation (4) sets the non-Monday return constant throughout various weeks of the month.

TABLE 3. Average Monday Return Across Weeks of the Month.

	Obs.	Constant	MON	W2MON	W3MON	W4MON	W5MON
U.S.	8662	0.1275	-0.1438	-0.0355	0.0041	-0.2002	-0.1169
		(11.9647)***	(-2.6640)***	(-0.5528)	(0.0640)	(-3.0896)***	(-1.6966)*
Australia	3873	0.0552	-0.0990	0.1871	0.0699	0.0622	-0.0446
		(3.1069)***	(-0.8347)	(1.3702)	(0.4699)	(0.4517)	(-0.3032)
Austria	3298	0.0183	0.3318	-0.2966	-0.2258	-0.3630	-0.1916
		(0.8445)	(2.9049)***	(-2.0451)**	(-1.4908)	(-2.3351)**	(-1.4612)
Belgium	3743	0.0475	0.0501	-0.0469	-0.0584	-0.1638	-0.0714
		(2.9795)***	(0.6072)	(-0.4621)	(-0.5719)	(-1.5737)	(-0.6460)
Canada	6584	0.0536	-0.1361	0.0197	0.0372	-0.0847	-0.0409
		(4.5676)***	(-1.7196)*	(0.2151)	(0.4185)	(-0.9400)	(-0.4704)
Denmark	5079	0.0435	0.0296	-0.0349	-0.1690	-0.1249	-0.0697
		(3.2403)***	(0.4464)	(-0.4180)	(-2.0084)**	(-1.4451)	(-0.7304)
France	5586	0.0759	-0.1133	-0.0795	-0.1004	-0.1736	0.0170
		(4.1697)***	(-0.9733)	(-0.6071)	(-0.7321)	(-1.2314)	(0.1172)
Germany	6458	0.0404	0.0838	-0.1622	-0.2152	-0.1830	-0.2147
		(3.2167)***	(1.0389)	(-1.6986)*	(-1.9329)*	(-1.7635)*	(-2.1330)**
Italy	6447	0.0552	-0.1541	-0.2717	-0.1488	0.2981	0.1715
		(3.0516)***	(-1.2821)	(-1.8584)*	(-1.0190)	(1.8757)*	(1.1164)
Holland	3712	0.0808	0.0546	-0.2478	-0.1590	-0.2995	-0.1863
		(4.9514)***	(0.4727)	(-1.8355)*	(-1.0994)	(-2.1252)**	(-1.3001)
Norway	3846	0.0928	-0.0585	-0.0158	0.0255	-0.1812	-0.0958
		(4.1967)***	(-0.4232)	(-0.0931)	(0.1439)	(-1.0735)	(-0.5606)
S. Africa	2963	0.1350	-0.1312	0.0618	-0.0887	-0.1514	-0.1168
		(5.0286)***	(-0.6092)	(0.2679)	(-0.3669)	(-0.6755)	(-0.5158)
Spain	4673	-0.0031	0.6531	-0.4516	-0.4345	-0.5902	-0.3786
		(-0.1569)	(3.3934)***	(-2.0941)**	(-1.9126)*	(-2.6020)***	(-1.7058)*
Singapore	6505	0.0664	0.1418	-0.2321	-0.3005	-0.2934	-0.2205
		(3.8254)***	(1.2292)	(-1.7142)*	(-2.0999)**	(-2.1146)**	(-1.6664)*
Switzerland	6341	0.0477	0.1518	-0.2768	-0.3063	-0.3948	-0.3242
		(4.0444)***	(2.0093)**	(-2.8303)***	(-3.3398)***	(-4.1593)***	(-3.5263)***
U.K.	6624	0.0723	-0.1018	-0.1090	-0.0182	-0.3622	-0.0565
		(4.0391)***	(-0.9003)	(-0.7862)	(-0.1373)	(-2.7593)***	(-0.4009)
Hong Kong	4919	0.1275	-0.1434	-0.0548	0.0431	-0.2842	0.0974
		(5.2016)***	(-0.6809)	(-0.1964)	(0.1747)	(-1.1143)	(0.3475)
Indonesia	2439	0.0736	-0.0739	0.1309	0.0133	0.1537	0.1478
		(1.6245)	(-0.4416)	(0.6647)	(0.0733)	(0.6489)	(0.6487)
Malaysia	4405	0.0986	-0.0800	-0.1239	-0.2403	-0.0007	-0.0768
		(4.4292)***	(-0.5755)	(-0.7298)	(-1.3532)	(-0.0039)	(-0.4694)
Thailand	4828	0.0802	0.2591	-0.3659	-0.4284	-0.3233	-0.4482
		(3.6665)***	(1.5670)	(-1.9698)*	(-2.1815)**	(-1.6982)*	(-2.2247)**
Taiwan	5748	0.0827	0.0285	-0.1090	-0.2227	-0.1065	0.0343
		(3.2122)***	(0.1322)	(-0.4170)	(-0.9098)	(-0.4431)	(0.1312)
Japan	5419	0.0548	-0.1868	0.0957	0.1063	-0.1052	0.2185
		(4.1864)***	(-1.6498)	(0.6915)	(0.8611)	(-0.7934)	(1.5066)
S. Korea	5249	0.0530	0.3465	-0.4427	-0.4854	-0.5129	-0.2872
		(3.0302)***	(2.7336)***	(-2.7807)***	(-3.2833)***	(-3.3690)***	(-1.8767)*
Avg. (-U.S.)		0.0660	0.0388	-0.1285	-0.1503	-0.1902	-0.0972

Note: The following regression is performed on daily return series:

$$R_t = a_0 + a_1\text{MON}_t + a_2\text{W2MON}_t + a_3\text{W3MON}_t + a_4\text{W4MON}_t + a_5\text{W5MON}_t + e_t.$$

WiMON is a dummy variable that equals one if Monday falls on the i^{th} week of a month and zero otherwise. a_0 is the mean non-Monday return. a_1 is the mean first-week Monday return in excess of the non-Monday return. In a sense, a_1 is the Monday effect on the first week of the month. a_2 is the excess of the week-2 Monday effect over the week-1 Monday effect; a_3 is the excess of the week-3 Monday effect over the week-1 Monday effect; and a_4 and a_5 are similarly interpreted. Return figures are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

to the bad-Friday/Monday-effect relation, the weekend correlation should be asymmetric. However, before addressing correlation asymmetry, I need to see whether high weekend correlation is as general as the Monday effect across various equity markets. The regression model is as follows:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \mathrm{MON}_t + a_3 \mathrm{MON}_t {*} R_{t-1} + e_t \qquad (5)$$

where MON is defined as before. Because the market index return typically exhibits positive serial correlation, both the weekend correlation ($a_1 + a_3$) and the nonweekend correlation (a_1) are expected to be significantly positive. However, if the weekend correlation is higher than the nonweekend correlation, a_3 will be significantly positive as well. In fact, a_3 can be interpreted as the "weekend-correlation effect," the difference between the daily return autocorrelation for weekday pairs versus the correlation over the weekend (i.e., Friday–Monday), except this weekend-correlation effect is expected to be positive.

Results in Table 4 support the findings of Bessembinder and Hertzel (1993). Almost all markets show significantly higher weekend correlation. For instance, in the U.S. market, the mean daily autocorrelation excluding weekends is 0.3653 whereas the weekend correlation is 0.3144 higher. The only exceptions are Austria, Canada, Denmark, and Indonesia. Even so, the weekend correlation in Austria and Canada tends to be higher than the nonweekend correlation, although it is not statistically significant. Of the sixteen markets (including the United States) that exhibit the Monday effect, fifteen also show higher weekend correlations.

The two phenomena seem to be related. But, if the high weekend correlation is really due to the bad-Friday/Monday-effect relation, the weekend correlation should be asymmetric. Specifically, what should be high (relative to the nonweekend correlation) is only the weekend correlation conditional on the previous Friday return's being negative (the conditional negative weekend correlation) and not the weekend correlation conditional on the previous Friday return's being positive (the conditional positive weekend correlation). To consider such a possibility, I perform the following regression:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \mathrm{CNEG}_t + a_3 \mathrm{CNEG}_t {*} R_{t-1} + a_4 \mathrm{MON}_t + a_5 \mathrm{MON}_t {*} R_{t-1}$$
$$+ a_6 \mathrm{CNMON}_t + a_7 \mathrm{CNMON}_t {*} R_{t-1} + e_t \qquad (6)$$

where CNEG, MON, and CNMON are as previously defined. The formulation allows asymmetric daily correlation conditional on whether the prior-day return is positive or negative. Specifically, a_1 captures the conditional positive nonweekend correlation. The expression ($a_1 + a_3$) captures the conditional negative nonweekend correlation. If a_3 is significant and positive, the nonweekend correlation is asymmetric with the conditional negative correlation's being larger than its conditional positive counterpart.

TABLE 4. A Comparison of Autocorrelation over the Weekend.

	Constant	R_{t-1}	MON	MON*R_{t-1}
U.S.	0.1090	0.3653	-0.3581	0.3144
	(15.0606)***	(21.3415)***	(-16.9027)***	(7.5864)***
Australia	0.0493	0.1569	-0.0583	0.1635
	(3.1419)***	(5.4126)***	(-1.3543)	(2.9777)***
Austria	0.0129	0.1527	0.0840	0.0993
	(0.6919)	(2.3001)**	(1.7697)*	-0.4566
Belgium	0.0408	0.2245	-0.0532	0.1168
	(3.1508)***	(7.4820)***	(-1.7315)*	(1.6506)*
Canada	0.0499	0.1940	-0.1621	0.0698
	(5.0782)***	(6.6747)***	(-6.5484)***	-1.0514
Denmark	0.0401	0.1426	-0.0665	0.0015
	(3.3597)***	(4.1035)***	(-2.4003)**	-0.0113
France	0.0736	0.1423	-0.2265	0.1386
	(4.5247)***	(6.1097)***	(-5.9971)***	(2.5729)**
Germany	0.0402	0.0164	-0.1058	0.2047
	(3.2315)***	(0.6419)	(-2.9100)***	(3.3872)***
Italy	0.0560	0.0893	-0.2028	0.2415
	(3.3345)***	(3.2737)***	(-4.2864)***	(3.7629)***
Holland	0.0824	-0.0283	-0.1520	0.1539
	(4.9642)***	(-1.2840)	(-3.4685)***	(2.3664)**
Norway	0.0893	0.0821	-0.1554	0.1514
	(4.2154)***	(1.0990)	(-2.9996)***	(3.0146)***
S. Africa	0.1129	0.2221	-0.2247	0.2279
	(4.9451)***	(3.1660)***	(-4.2166)***	(2.1674)**
Spain	-0.0058	0.2013	0.1837	0.2549
	(-0.3546)	(4.1897)***	(3.0643)***	(2.5598)**
Singapore	0.0617	0.1416	-0.1472	0.379
	(4.0554)***	(5.6139)***	(-4.0083)***	(5.8945)***
Switzerland	0.0473	0.1046	-0.1735	0.2219
	(4.3844)***	(4.8179)***	(-5.8666)***	(2.9327)***
U.K.	0.0717	0.0487	-0.2485	0.1296
	(4.1566)***	(2.3320)**	(-6.1792)***	(2.3602)**
Hong Kong	0.1260	0.0207	-0.2533	0.3024
	(5.2294)***	(0.9993)	(-3.5631)***	(4.1904)***
Indonesia	0.0379	0.5247	0.0237	-0.2036
	(1.8227)*	(2.3736)**	(0.3406)	(-1.1510)
Malaysia	0.0955	0.1021	-0.2661	0.3297
	(4.7077)***	(2.9583)***	(-5.0454)***	(3.1305)***
Thailand	0.0755	0.1686	-0.1813	0.2526
	(4.0005)***	(4.8220)***	(-3.1880)***	(1.9477)*
Taiwan	0.0778	0.0881	-0.0941	0.1396
	(3.2516)***	(4.1881)***	(-1.4511)	(2.4959)**
Japan	0.0525	0.1517	-0.1607	0.233
	(4.5436)***	(6.3803)***	(-4.5475)***	(2.5946)***
S. Korea	0.0510	0.0963	-0.1014	0.2493
	(3.1771)***	(4.9502)***	(-2.0933)**	(3.3880)***
Average		0.1482		0.1814

Note: The following regression is performed on daily market return series:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \mathrm{MON}_t + a_3 \mathrm{MON}_t{*}R_{t-1} + e_t.$$

MON is the Monday dummy variable that equals one if the trading day is a Monday and zero otherwise. R_{t-1} is the one-period lag return. $\mathrm{MON}_t{*}R_{t-1}$ is an interactive dummy. Return figures are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

As for the conditional weekend correlations, $(a_1 + a_5)$ captures the conditional positive weekend correlation. Because a_5 is the difference between the conditional positive weekend correlation and the conditional positive nonweekend correlation, it bears the interpretation of the conditional positive weekend-correlation effect. Similarly, $(a_1 + a_3 + a_5 + a_7)$ captures the conditional negative weekend correlation. As $(a_1 + a_3)$ is the conditional negative nonweekend correlation, $(a_5 + a_7)$ is the conditional negative weekend-correlation effect. Most important, a_7 is the difference between the two conditional weekend-correlation effects. If the bad-Friday/Monday-effect relation is the only reason for the high weekend correlation, a_5 should not be different from zero whereas a_7 should be significant and positive. The regression results are shown in Table 5.

The daily autocorrelation exhibits asymmetry. The coefficient a_3, which captures the difference between the conditional negative and conditional positive nonweekend correlation, is almost uniformly negative across all countries and statistically differs from zero in eight countries. This means that when excluding the weekend, the daily index return tends to have a stronger autocorrelation on the prior-day return's being positive than on its being negative. This also tends to be true for the weekend correlation. The sum of the regression coefficients $(a_3 + a_7)$ captures the difference of the conditional negative and conditional positive weekend correlations. For instance, this sum in the U.S. market adds to -0.0274 (-0.1370 + 0.1096). This means the conditional negative weekend correlation is lower than the conditional positive weekend correlation in the U.S. market. Ten other countries have such negative, summed coefficients. In fact, a look at the average figures across all twenty-three countries reveals that a_3 equals -0.1211 and a_7 equals 0.0735 (bottom row of Table 4). This indicates the conditional negative weekend correlation is 0.0476 (-0.1211 + 0.0735) lower than the conditional positive weekend correlation.

However, taking into account that the conditional negative nonweekend correlation is lower than its conditional positive counterpart, that is, if the comparison is done instead on the conditional weekend-correlation effects (as captured by a_7), the conditional negative weekend-correlation effect is actually 0.0735 higher than the conditional positive weekend-correlation effect. Looking at individual countries, fifteen show a positive a_7 coefficient. Moreover, in Italy, Norway, Switzerland, Malaysia, and Japan, the coefficient differs significantly from zero. In fact, in these five markets, the conditional positive weekend-correlation effect (a_5) is not statistically different from zero and, as indicated by Table 4, the weekend-correlation effect exists in these markets. That is, high weekend correlation is driven solely by weekends with negative Friday returns in these five markets. On the other hand, the Monday effect also exists in these five markets (Table 1) and is due mainly to the bad-Friday factor (Table 2). Hence, for these five countries, there is evidence that the bad-Friday factor drives the Monday effect, which, in turn, leads to the weekend-correlation effect. However, statistical significance is generally lacking in the other eighteen countries. This means that although bad Fridays

TABLE 5. A Comparison of Autocorrelation of Positive Returns and Negative Returns over the Weekend.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7
U.S.	0.1108	0.3986	-0.0764	-0.1370	-0.3383	0.2550	0.0068	0.1096
	(8.3797)***	(13.7575)***	(-2.9128)***	(-2.5875)***	(-11.0713)***	(4.0366)***	(0.1074)	-0.7783
Aaustralia	0.1421	0.1057	-0.2688	-0.1166	-0.2045	0.2809	0.3209	0.0251
	(3.3374)***	(1.8190)*	(-3.9284)***	(-1.4553)	(-2.5174)***	(2.6085)***	(2.3428)**	-0.1586
Austria	0.1376	0.0721	-0.2340	0.0404	-0.2352	0.7553	0.1622	-1.0800
	(1.9244)*	(0.5163)	(-2.8851)***	(0.3036)	(-2.6040)***	(3.6696)***	(1.1616)	(-3.1444)***
Belgium	0.0734	0.2493	-0.1846	-0.2304	-0.0816	0.1195	0.0906	0.0649
	(2.6715)***	(4.1343)***	(-4.8438)***	(-2.6237)***	(-1.4618)	(1.0396)	(1.0228)	-0.337
Canada	0.158	0.0788	-0.2015	0.0447	-0.2131	0.1430	0.0468	-0.1174
	(4.1415)***	(1.0322)	(-4.1812)***	(0.5414)	(-3.9280)***	(1.3365)	(0.5699)	(-0.6056)
Denmark	0.1466	0.0917	-0.2913	-0.1378	0.0521	-0.2227	-0.0427	0.4085
	(3.6653)***	(1.1943)	(-6.0347)***	(-1.5920)	(0.3495)	(-0.6703)	(-0.2605)	-1.0851
France	0.1632	0.0792	-0.1744	0.0106	-0.2341	0.1327	0.0627	0.0553
	(5.4047)***	(2.2534)**	(-2.9895)***	(0.1576)	(-2.9352)***	(1.3861)	(0.4934)	-0.368
Germany	0.0525	0.0618	-0.1650	-0.1956	-0.0063	0.0613	-0.0284	0.244
	(1.7284)*	(1.4043)	(-3.1457)***	(-2.5666)***	(-0.0998)	(0.7142)	(-0.2556)	-1.3655
Italy	0.0165	0.1865	-0.1748	-0.2665	0.0454	-0.0125	-0.0692	0.4812
	-0.3869	(4.5262)***	(-2.4849)**	(-3.9684)	(0.5334)	(-0.1399)	(-0.4615)	(2.5072)**
Holland	0.0384	0.0312	0.0024	-0.1200	0.0510	-0.0562	-0.3252	0.1267
	-0.914	(0.5507)	(0.0425)	(-1.5744)	(0.5761)	(-0.4389)	(-2.3171)**	-0.6235
Norway	0.1121	0.1877	-0.4192	-0.4257	0.0645	-0.1013	0.1225	0.6844
	(2.1811)**	(3.4667)***	(-2.4352)**	(-2.1341)**	(0.6719)	(-1.1731)	(0.6131)	(2.3368)**
S. Africa	0.222	0.1824	-0.2915	-0.0831	-0.2734	0.1857	0.2157	0.1837
	(2.9039)***	(1.4234)	(-2.6889)***	(-0.4752)	(-2.4844)**	(0.9329)	(1.1346)	-0.709
Spain	0.1732	0.1189	-0.4209	-0.1190	0.1430	0.2666	0.0099	-0.0710
	(2.5713)***	(1.2386)	(-4.9981)***	(-1.0899)	(0.9806)	(1.3917)	(0.0456)	(-0.2275)
Singapore	0.1853	0.0923	-0.3044	-0.0697	-0.1498	0.3308	0.0858	0.1196
	(6.0124)***	(2.2555)**	(-5.8974)***	(-1.1925)	(-1.8853)	(2.6898)***	(0.8267)	-0.6341

(Continued)

TABLE 5. Continued.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7
Switzerland	0.0714	0.1391	-0.1637	-0.1924	-0.1129	0.0632	0.1065	0.4118
	(3.0872)***	(3.4575)***	(-4.5786)***	(-3.5021)***	(-1.6405)	(0.4531)	(0.9694)	(1.8098)*
U.K.	0.1106	0.0336	-0.1120	-0.0374	-0.1827	0.0413	0.0979	0.2666
	(2.1915)**	(0.5641)	(-1.8431)*	(-0.4956)	(-1.7435)*	(0.3314)	(0.7371)	-1.5384
Hong Kong	0.1573	0.0385	-0.1866	-0.1019	-0.1565	0.2646	-0.3021	-0.0998
	(3.3339)***	(1.0225)	(-2.5685)***	(-1.8673)*	(-1.2898)	(2.3579)**	(-1.3993)	(-0.5014)
Indonesia	-0.0493	0.6072	0.0506	-0.2331	0.0820	-0.1824	-0.2414	-0.1712
	(-0.3535)	(1.9337)*	(0.2706)	(-0.7814)	(0.5515)	(-0.5824)	(-1.1901)	(-0.5015)
Malaysia	0.2029	0.0816	-0.3373	-0.1222	-0.0671	0.1030	-0.1285	0.3913
	(2.9080)***	(1.0263)	(-3.5708)***	(-1.3287)	(-0.4702)	(0.5683)	(-0.5909)	(1.7730)*
Thailand	0.1487	0.1439	-0.1767	-0.0347	-0.1868	0.2976	-0.2015	-0.3255
	(3.9230)***	(2.7833)***	(-2.7635)***	(-0.4952)	(-1.5335)	(1.5830)	(-0.9750)	(-0.8492)
Taiwan	0.0289	0.1082	0.1060	0.0037	-0.1395	0.2084	-0.1157	-0.1906
	-0.6179	(2.5533)**	(1.6341)	(0.0597)	(-1.0925)	(1.9186)*	(-0.6947)	(-0.9701)
Japan	0.0519	0.2080	-0.1129	-0.1966	-0.0612	0.0243	0.1162	0.61
	(2.3557)**	(4.8833)***	(-3.2229)***	(-3.0789)***	(-1.1838)	(0.2430)	(1.0481)	(2.6551)***
S. Korea	0.0463	0.1163	-0.0431	-0.0659	-0.2691	0.4593	0.0771	-0.4376
	-1.2739	(3.0643)***	(-0.8749)	(-1.1721)	(-3.2100)***	(4.3786)***	(0.5611)	(-1.7842)*
Average		0.1484		-0.1211		0.1486		0.0735

Note: The following regression is performed on daily market return series:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \text{CNEG}_t + a_3 \text{CNEG}_t{*}R_{t-1} + a_4 \text{MON}_t + a_5 \text{MON}_t{*}R_{t-1} + a_6 \text{CNMON}_t + a_7 \text{CNMON}_t{*}R_{t-1} + e_t.$$

MON is the Monday dummy variable that equals one if the trading day is a Monday and zero otherwise. CNEG is an intercept dummy variable that equals one on days whose previous trading days have a negative return, and it is zero otherwise. CNMON is a special Monday dummy variable that equals one only if the Monday is preceded by a Friday with a negative return, and it is zero otherwise. $\text{CNEG}_t{*}R_{t-1}$, $\text{MON}{*}R_{t-1}$, and $\text{CNMON}_t{*}R_{t-1}$ are interactive dummy variables. Return figures are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

TABLE 6. A Comparison of Weekend Correlation Across Weeks of the Month.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7
U.S.	0.1100	0.3427	-0.3053	0.2400	-0.1706	0.3744	-0.1155	0.2574
	(14.5408)***	(12.2374)***	(-11.1862)***	(4.4024)***	(-2.9404)***	(1.8652)*	(-1.7832)*	-1.5341
Australia	0.0385	0.1155	-0.0227	0.2201	-0.0443	-0.0393	-0.1386	0.2253
	(2.0140)**	(3.2047)***	(-0.4039)	(3.0353)***	(-0.4926)	(-0.4156)	(-1.3781)	-1.4259
Austria	0.0092	0.1567	0.1229	-0.1568	-0.2131	0.7792	0.0134	0.7575
	(0.4917)	(2.3845)**	(1.9626)*	(-0.6427)	(-1.9227)*	(2.5020)**	(0.1638)	(2.9161)***
Belgium	0.0395	0.1854	-0.0337	0.1881	-0.1617	0.0352	-0.0137	0.085
	(2.8964)***	(4.9257)***	(-0.8100)	(1.9883)**	(-1.6268)	(0.1801)	(-0.1726)	-0.4609
Canada	0.0495	0.1597	-0.1302	0.1203	-0.1232	0.2326	-0.0800	-0.0769
	(4.8294)***	(3.7706)***	(-3.9154)***	(1.4885)	(-2.0400)**	(1.1729)	(-1.2451)	(-0.4916)
Denmark	0.0388	0.1334	-0.0854	0.2538	-0.0208	-0.1441	0.0511	-0.6804
	(3.2121)***	(3.8371)***	(-2.4722)**	(2.7023)***	(-0.3352)	(-1.2658)	(0.6902)	(-1.9925)**
France	0.0732	0.1263	-0.2147	0.1156	-0.1217	-0.0658	-0.0234	0.1663
	(4.4602)***	(4.9070)***	(-4.4415)***	(1.9079)*	(-1.3422)	(-0.5397)	(-0.2268)	-1.4207
Germany	0.0380	0.0097	-0.0929	0.1943	-0.0280	0.0391	-0.0738	0.069
	(3.0057)***	(0.3927)	(-1.8847)*	(2.3163)**	(-0.3359)	(0.3532)	(-0.9370)	-0.5668
Italy	0.0546	0.0893	-0.3581	0.2418	0.3449	0.0045	0.3354	-0.0393
	(3.2450)***	(3.3119)***	(-6.5564)***	(2.9923)***	(2.8589)***	(0.0330)	(3.0853)***	(-0.2661)
Holland	0.0806	-0.0510	-0.1286	0.1924	-0.1830	-0.0245	-0.0597	-0.2181
	(4.7519)***	(-1.6798)*	(-2.3329)**	(2.0448)**	(-1.6211)	(-0.1542)	(-0.5254)	(-1.2177)
Norway	0.0828	0.0557	-0.0857	0.1311	-0.2339	0.1271	-0.1334	0.3356
	(3.6813)***	(0.8199)	(-1.2707)	(2.1496)**	(-1.8809)*	(0.7994)	(-1.1303)	(2.1526)**
S. Africa	0.1079	0.1970	-0.1856	0.3214	-0.1162	-0.0077	-0.0812	0.0255
	(4.5370)***	(3.0666)***	(-2.4534)**	(2.5984)***	(-1.1457)	(-0.0564)	(-0.7565)	-0.1419
Spain	-0.0110	0.2052	0.2209	0.3432	-0.1942	-0.1749	-0.0138	0.0817
	(-0.6436)	(4.3719)***	(2.9260)***	(2.5364)**	(-1.3665)	(-0.8730)	(-0.1110)	-0.4225
Singapore	0.0567	0.1200	-0.1276	0.3698	-0.1323	0.1855	0.0160	0.0944
	(3.4599)***	(3.4236)***	(-2.6575)***	(4.2239)***	(-1.3796)	(0.9218)	(0.2080)	-0.8235

(Continued)

TABLE 6. Continued.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7
Switzerland	0.0476	0.0749	-0.1283	0.2538	-0.1805	0.0671	-0.1330	0.0946
	(4.3029)***	(2.4409)**	(-3.2309)***	(3.0894)***	(-2.2458)**	(0.4137)	(-1.5136)	-0.4636
U.K.	0.0694	0.0502	-0.1683	0.0927	-0.3457	0.1396	-0.0407	0.0739
	(3.9934)***	(2.4056)**	(-3.3542)***	(1.2661)	(-3.9035)***	(1.2315)	(-0.4085)	-0.6534
Hong Kong	0.1260	-0.0022	-0.2095	0.2621	-0.3181	0.3457	-0.0569	0.8566
	(5.1303)***	(-0.0840)	(-2.1106)**	(3.0473)***	(-1.8727)*	(2.2454)**	(-0.2218)	-1.2164
Indonesia	0.0377	0.5246	0.0204	-0.5122	-0.0736	0.4056	0.0979	0.5633
	(1.8333)*	(2.3732)**	(0.2835)	(-2.1890)**	(-0.6312)	(3.8848)***	(0.6172)	(5.0241)***
Malaysia	0.0911	0.0832	-0.2998	0.2278	-0.0093	0.5781	0.0333	0.2829
	(4.2765)***	(2.2037)**	(-4.3903)***	(1.7967)*	(-0.0648)	(2.7445)***	(0.2853)	-1.5602
Thailand	0.0689	0.1888	-0.1305	0.1713	-0.0792	0.1811	-0.1322	-0.0323
	(3.6045)***	(5.0363)***	(-1.8643)*	(1.2136)	(-0.7118)	(0.8930)	(-0.8790)	(-0.0734)
Taiwan	0.0677	0.0974	-0.1425	0.1140	0.0598	0.0451	0.2176	0.1224
	(2.7651)***	(4.5010)***	(-1.8082)*	(1.6691)*	(0.4286)	(0.3205)	(1.3747)	-0.54
Japan	0.0525	0.1044	-0.1514	0.2216	-0.2004	0.0852	0.1448	0.1703
	(4.3395)***	(2.2704)**	(-3.6973)***	(1.7359)*	(-2.5691)***	(0.5404)	(1.6146)	-0.9041
S. Korea	0.0507	0.0964	-0.0748	0.1559	-0.1641	0.2978	0.0658	0.1696
	(3.1640)***	(4.9731)***	(-1.2021)	(1.6364)	(-1.6449)	(2.0545)**	(0.5832)	-0.9867
Average		0.1332		0.1636		0.1507		0.1471

Note: The following regression is performed on daily market return series:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \mathrm{MON}_t + a_3 \mathrm{MON}_t{*}R_{t-1} + a_4 \mathrm{W4MON}_t + a_5 \mathrm{W4MON}_t{*}R_{t-1} + a_6 \mathrm{W5MON}_t + a_7 \mathrm{W5MON}_t{*}R_{t-1} + e_t$$

W4MON is a Monday dummy variable that equals one only when the Monday falls on the fourth week of a month, and it is zero otherwise. W5MON is defined similarly for the fifth week of the month. Returns are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

explain most of the Monday effect, bad Fridays fail to explain fully the high weekend correlation. Furthermore, countries with a large positive a_7 are not necessarily countries with strong Monday effects. As such, the evidence is not strong for a relation between the Monday effect and the high weekend correlation.

VI. Weekend Correlation Across Weeks

In this section the possible relation between the high weekend correlation and the Monday effect is examined from a different perspective. Because the Monday effect concentrates on the fourth week and, to a lesser extent, the fifth week of the month, the weekend correlation on these two weeks may be higher if the two phenomena are related. I use the following regression to examine this issue:

$$R_t = a_0 + a_1 R_{t-1} + a_2 \text{MON}_t + a_3 \text{MON}_t{}^* R_{t-1} + a_4 \text{W4MON}_t + a_5 \text{W4MON}_t{}^* R_{t-1} + a_6 \text{W5MON}_t + a_7 \text{W5MON}_t{}^* R_{t-1} + e_t. \quad (7)$$

Equation (7) is an extended version of equation (5). Such a setting highlights the possibility of seasonality in weekend correlations in the fourth and fifth weeks.[7] If the high weekend correlation, like the Monday effect, concentrates on the last two weeks, the difference between the weekend correlation in the first three weeks and the nonweekend correlation, a_3, will not be different from zero. On the other hand, the difference between the weekend-correlation effect of the fourth week and that of the first three weeks, a_5, will be significant and positive. Similarly, the difference between the weekend-correlation effect of the fifth weekend and that of the first three weeks, a_7, should be significant and positive.

Results in Table 6 show that, in general, the weekend correlation in the first three weeks is significantly higher than the nonweekend correlation in most of the markets, confirming the results in Table 4. However, only a few markets show statistically higher weekend correlation in the fourth or fifth weeks. The only two markets that have significantly higher weekend correlations in both the fourth and the fifth weeks are Austria and Indonesia. But these markets do not exhibit the Monday effect; furthermore, their overall weekend correlations are not higher than nonweekend correlations (see Table 4).

Nonetheless, the weekend correlations in the fourth and fifth weeks are larger than those in the first three weeks, on average.[8] At the bottom of Table 6, the average weekend correlation across the twenty-three markets on the first three weeks

[7] Similar to equation (4), for simplicity, I assume the nonweekend correlation bears no seasonality across weeks.

[8] Again, based on the setting of equation (7) that nonweekend correlation is constant, the difference between weekend correlations is the same as the difference in weekend-correlation effects across different weeks.

is 0.16 higher than the nonweekend correlation. The weekend correlations on the fourth and fifth weeks are roughly 0.15 higher than those in the first three weeks. The results support the findings in Table 3 that the Monday effect concentrates in the fourth and fifth weeks, although statistical significance is lacking. Hence, the evidence of seasonality of weekend correlation is weak at best.

However, the weak evidence may be a result of lumping together the conditional positive and conditional negative weekend correlations without considering to the possible asymmetry between the two. To allow for asymmetry, equation (7) is decomposed into conditional positive and conditional negative components. Specifically, I want to see if the conditional negative weekend correlation is higher in the last two weekends of the month.

$$\begin{aligned} R_t = {} & a_0 + a_1 R_{t-1} + a_2\text{CNEG}_t + a_3\text{CNEG}_t{*}R_{t-1} + a_4\text{MON}_t + a_5\text{MON}_t{*}R_{t-1} \\ & + a_6\text{CNMON}_t + a_7\text{CNMON}_t{*}R_{t-1} + a_8\text{W4MON}_t + a_9\text{W4MON}_t{*}R_{t-1} \\ & + a_{10}\text{W4CNMON}_t + a_{11}\text{W4CNMON}_t{*}R_{t-1} + a_{12}\text{W5MON}_t \\ & + a_{13}\text{W5MON}_t{*}R_{t-1} + a_{14}\text{W5CNMON}_t + a_{15}\text{W5CNMON}_t{*}R_{t-1} + e_t. \qquad (8) \end{aligned}$$

This is an extended version of equation (6), but the focus is on the possible asymmetry in the return correlation only for the last two weekends of the month. Each pair of dummy and interactive dummy variables is split into conditional positive and conditional negative components. The expression $(a_1 + a_5)$ captures the conditional positive weekend correlation, and a_5 captures the conditional positive weekend-correlation effect on the first three weeks. The expression $(a_1 + a_3 + a_5 + a_7)$ captures the conditional negative weekend correlation, and $(a_5 + a_7)$ captures the conditional negative weekend-correlation effect on the first three weeks. A positive a_7 means the conditional negative weekend-correlation effect is larger than the conditional positive weekend-correlation effect in the first three weeks.

More important, $(a_7 + a_{11})$ captures the difference of the week-4 conditional negative weekend-correlation effect over the week-4 conditional positive weekend-correlation effect. Hence, a positive a_{11} suggests the difference in the week-4 conditional weekend-correlation effects is greater than that in the first three weeks. By the same token, $(a_7 + a_{15})$ captures the difference in the week-5 conditional negative weekend-correlation effect over the week-5 conditional positive weekend-correlation effect. A positive a_{15} suggests the difference in the week-5 conditional weekend-correlation effect is greater than that in the first three weeks. The coefficients a_{11} and a_{15} will be positive if high weekend correlation is mainly due to a strong Monday effect induced by a negative Friday return in the fourth and fifth weeks.

As shown in Table 7, a_{11} and a_{15} lack statistical significance in general. The coefficient a_{11} is significant and positive in six countries, and both a_{11} and a_{15} are

TABLE 7. A Comparison of Conditional Return Autocorrelation over the Weekend.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{12}	a_{13}	a_{14}	a_{15}
U.S.	0.1108	0.3986	-0.0764	-0.1370	-0.3248	0.2541	-0.0120	-0.1001	0.0007	-0.0729	-0.1222	0.3503	-0.0496	0.0382	0.1667	0.4311
	(8.3797)***	(13.7575)***	(-2.9128)***	(-2.5875)***	(-8.2188)***	(3.4349)***	(-0.1274)	(-0.5612)	(0.0115)	(-0.4603)	(-0.9372)	(1.3127)	(-0.6088)	(0.2133)	(1.0286)	(1.1665)
Australia	0.1421	0.1057	-0.2688	-0.1166	-0.2030	0.3080	0.3391	-0.0458	0.0874	-0.1745	-0.0849	0.2530	-0.0914	0.0278	-0.0158	0.0758
	(3.3374)***	(1.8190)*	(-3.9284)***	(-1.4553)	(-1.9580)*	(2.2857)***	(2.1131)**	(-0.2254)	(0.6143)	(-1.0521)	(-0.3067)	(0.8176)	(-0.5144)	(0.0997)	(-0.0553)	-0.1829
Austria	0.1376	0.0721	-0.2340	0.0404	-0.2722	0.7545	0.1482	-1.3738	0.0429	-0.1066	0.2731	1.6930	0.0838	0.2742	0.2782	0.8703
	(1.9244)*	(0.5163)	(-2.8851)***	(0.3036)	(-2.4348)**	(2.6782)***	(1.0282)	(-4.1755)***	(0.2857)	(-0.3459)	(1.1826)	(2.8672)***	(0.6155)	(1.0269)	(1.5783)	(2.2426)**
Belgium	0.0734	0.2493	-0.1846	-0.2304	-0.1097	0.2285	0.1018	-0.0888	-0.0200	-0.2553	0.0852	0.4324	0.1400	-0.2235	-0.1176	0.2597
	(2.6715)***	(4.1343)***	(-4.8438)***	(-2.6237)***	(-1.8362)*	(1.9804)**	(0.9195)	(-0.3364)	(-0.1376)	(-1.1586)	(0.4531)	(1.1873)	(1.1015)	(-1.1810)	(-0.6168)	-0.7401
Canada	0.1580	0.0788	-0.2015	0.0447	-0.1674	0.0921	0.1021	0.0428	-0.1096	0.1835	-0.0790	-0.2224	-0.0997	0.0642	-0.1507	-0.5046
	(4.1415)***	(1.0322)	(-4.1812)***	(0.5414)	(-2.4512)**	(0.7603)	(0.9773)	(0.1886)	(-1.1107)	(0.9314)	(-0.4861)	(-0.6164)	(-1.1242)	(0.3924)	(-0.9217)	(-1.4426)
Denmark	0.1466	0.0917	-0.2913	-0.1378	-0.0794	0.1128	0.2010	0.4422	-0.2107	0.2390	0.0495	-0.7301	0.4701	-1.0544	-0.6034	0.4372
	(3.6653)***	(1.1943)	(-6.0347)***	(-1.5920)	(-1.0601)	(0.7486)	(1.6036)	(1.5088)	(-2.0416)**	(1.4978)	(0.2864)	(-2.3472)**	(2.3623)	(-2.3480)**	(-2.3547)**	-0.7299
France	0.1632	0.0792	-0.1744	0.0106	-0.1493	0.0391	-0.0766	0.0534	-0.0286	-0.0518	-0.0295	0.1133	-0.3417	0.3964	0.7032	-0.0313
	(5.4047)***	(2.2534)**	(-2.9895)***	(0.1576)	(-1.7207)*	(0.3883)	(-0.5570)	(0.2936)	(-0.1497)	(-0.2337)	(-0.1138)	(0.3624)	(-1.8975)	(2.2736)**	(2.2014)**	(-0.0739)
Germany	0.0525	0.0618	-0.1650	-0.1956	0.0078	0.0757	-0.0610	0.2041	-0.0376	0.0176	0.0051	-0.0902	-0.0228	-0.0995	0.1923	0.3806
	(1.7284)*	(1.4043)	(-3.1457)***	(-2.5666)***	(0.0919)	(0.6428)	(-0.4115)	(0.7737)	(-0.2674)	(0.0998)	(0.0196)	(-0.2534)	(-0.1629)	(-0.6647)	(0.8255)	-1.1175
Italy	0.0165	0.1865	-0.1748	-0.2665	-0.1948	0.0894	-0.1272	0.2070	0.7002	-0.2508	0.1773	0.9382	0.2576	-0.0441	0.2456	0.0622
	(0.3869)	(4.5262)***	(-2.4849)**	(-3.9684)***	(-1.9850)**	(0.8414)	(-0.7640)	(0.9002)	(3.4733)***	(-1.5363)	(0.5293)	(2.6316)***	(1.1710)	(-0.1840)	(0.8300)	-0.1573
Holland	0.0384	0.0312	0.0024	-0.1200	0.1429	-0.0690	-0.4414	0.1810	-0.3882	0.1755	0.3183	-0.3536	-0.0263	-0.1773	0.2045	0.206
	(0.9140)	(0.5507)	(0.0425)	(-1.5744)	(1.2598)	(-0.4338)	(-2.5779)***	(0.7214)	(-1.8570)*	(0.6025)	(1.0792)	(-0.9004)	(-0.1330)	(-0.5796)	(0.6935)	-0.4601
Norway	0.1121	0.1877	-0.4192	-0.4257	0.0951	-0.1133	0.2039	0.6883	-0.0163	-0.0812	-0.4306	-0.0804	-0.2292	0.3145	0.1609	-0.0988
	(2.1811)**	(3.4667)***	(-2.4352)**	(-2.1341)**	(0.8363)	(-1.3073)	(0.8889)	(2.1371)**	(-0.0718)	(-0.3844)	(-1.2961)	(-0.2342)	(-1.0492)	(1.3531)	(0.4608)	(-0.2276)
S. Africa	0.2220	0.1824	-0.2915	-0.0831	-0.2782	0.3086	0.1910	-0.0179	-0.0980	-0.0611	0.0858	0.2473	0.1163	-0.5424	0.0066	0.6792
	(2.9039)***	(1.4234)	(-2.6889)***	(-0.4752)	(-2.1779)**	(1.3211)	(0.7338)	(-0.0671)	(-0.6155)	(-0.2491)	(0.2745)	(0.6707)	(0.7090)	(-1.8890)*	(0.0234)	-1.273
Spain	0.1732	0.1189	-0.4209	-0.1190	0.1963	0.2144	0.2997	0.3555	-0.0943	-0.0196	-0.7855	-0.7814	-0.2021	0.3618	-0.2496	-0.9152
	(2.5713)***	(1.2386)	(-4.9981)***	(-1.0899)	(1.0590)	(0.9294)	(1.0251)	(0.8143)	(-0.3835)	(-0.0674)	(-1.9519)*	(-1.4441)	(-0.7935)	(1.0451)	(-0.6529)	(-1.6653)*
Singapore	0.1853	0.0923	-0.3044	-0.0697	-0.1444	0.2976	0.0701	0.0460	0.0948	-0.1140	-0.0423	0.5056	-0.2053	0.4107	0.2254	-0.2804
	(6.0124)***	(2.2555)**	(-5.8974)***	(-1.1925)	(-1.5905)	(2.0789)**	(0.5105)	(0.1968)	(0.5152)	(-0.3882)	(-0.1662)	(1.1259)	(-1.5031)	(2.3788)**	(1.0241)	(-0.8725)
Switzerland	0.0714	0.1391	-0.1637	-0.1924	-0.1742	0.2437	0.1008	-0.0276	0.1060	-0.3997	-0.0071	0.9150	0.1573	-0.3894	0.0085	0.9386
	(3.0872)***	(3.4575)***	(-4.5786)***	(-3.5021)***	(-2.7298)***	(2.0845)**	(0.7845)	(-0.1039)	(0.6254)	(-1.2038)	(-0.0317)	(1.9838)**	(1.0512)	(-1.3041)	(0.0360)	(1.8681)*
U.K.	0.1106	0.0336	-0.1120	-0.0374	-0.1524	0.0838	-0.0055	0.0308	-0.0997	-0.2127	0.3369	0.8968	0.0192	-0.0147	0.0943	0.1766
	(2.1915)**	(0.5641)	(-1.8431)*	(-0.4956)	(-0.9991)	(0.4441)	(-0.0316)	(0.1420)	(-0.5214)	(-0.9670)	(1.3155)	(3.1251)***	(0.0985)	(-0.0660)	(0.2976)	-0.5061

(Continued)

TABLE 7. Continued.

	a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7	a_8	a_9	a_{10}	a_{11}	a_{12}	a_{13}	a_{14}	a_{15}
Hong Kong	0.1573	0.0385	-0.1866	-0.1019	-0.1123	0.2229	-0.4744	-0.2483	-0.1331	0.0662	0.6454	0.8116	-0.1783	0.2625	0.2303	-0.4404
	(3.3339)***	(1.0225)	(-2.5685)***	(-1.8673)*	(-0.8420)	(1.8555)*	(-1.7993)	(-1.0529)	(-0.4488)	(0.2497)	(1.3020)	(1.9275)*	(-0.4002)	(0.5046)	(0.4341)	(-0.7324)
Indonesia	-0.0493	0.6072	0.0506	-0.2331	-0.0036	-0.0541	-0.2362	-0.4254	-0.0497	-0.1336	0.5471	1.0880	0.2610	0.0144	0.0498	0.6384
	(-0.3535)	(1.9337)*	(0.2706)***	(-0.7814)	(-0.0208)	(-0.1183)	(-1.0331)	(-0.9482)	(-0.3662)	(-0.4116)	(1.9885)	(2.1733)**	(0.8300)	(0.0399)	(0.1463)	(1.7569)*
Malaysia	0.2029	0.0816	-0.3373	-0.1222	-0.0680	-0.0118	-0.2374	0.3649	0.0692	0.3784	0.3170	0.3701	-0.3077	0.4461	0.4215	-0.5159
	(2.9080)***	(1.0263)	(-3.5708)***	(-1.3287)	(-0.4152)	(-0.0618)	(-0.8595)	(1.3926)	(0.3153)	(1.4313)	(0.9032)	(0.9651)	(-1.4269)	(1.5074)	(1.3233)	(-1.3508)
Thailand	0.1487	0.1439	-0.1767	-0.0347	0.0227	0.0127	-0.2259	0.2045	-0.1727	0.3025	0.1748	-0.1134	-0.7178	0.9592	-0.1608	-2.2629
	(3.9230)***	(2.7833)***	(-2.7635)***	(-0.4952)	(0.2147)	(0.0748)	(-1.2335)	(0.5251)	(-0.9373)	(1.0147)	(0.6342)	(-0.2255)	(-3.2973)***	(2.5030)**	(-0.4350)	(-3.3748)***
Taiwan	0.0289	0.1082	0.1060	0.0037	-0.1883	0.1492	0.0111	-0.0733	0.0847	0.0333	-0.1262	-0.0343	0.0231	0.4707	-0.4217	-0.8496
	(0.6179)	(2.5533)***	(1.6341)	(0.0597)	(-1.0461)	(1.0124)	(0.0527)	(-0.4015)	(0.3304)	(0.1418)	(-0.3162)	(-0.0920)	(0.0795)	(2.2008)	(-0.8344)	(-1.8454)
Japan	0.0519	0.2080	-0.1129	-0.1966	-0.0213	-0.0681	0.1348	0.8105	-0.2097	0.1596	-0.1496	-0.4120	-0.0384	0.4307	0.1919	-0.5437
	(2.3557)**	(4.8833)***	(-3.2229)***	(-3.0789)***	(-0.3052)	(-0.5047)	(0.8876)	(2.7135)***	(-2.0812)**	(0.8987)	(-0.5806)	(-0.7401)	(-0.3860)	(2.1523)	(0.8212)	(-1.0330)
S. Korea	0.0463	0.1163	-0.0431	-0.0659	-0.2353	0.3503	0.0485	-0.4321	-0.0512	0.1506	0.0149	0.3518	-0.1124	0.3348	0.2336	-0.1475
	(1.2739)	(3.0643)***	(-0.8749)	(-1.1721)	(-2.2533)**	(2.8815)***	(0.2561)	(-1.4557)	(-0.2938)	(0.6404)	(0.0531)	(0.8863)	(-0.6320)	(1.4982)	(0.7773)	(-0.3085)
Average		0.1484		-0.1211		0.1531		0.0347		-0.0099		0.2673		0.0983		-0.0624

Note: The following regression is performed on daily market return series:

$$R_t = a_0 + a_1R_{t-1} + a_2\text{CNEG}_t + a_3\text{CNEG}_t{*}R_{t-1} + a_4\text{MON}_t + a_5\text{MON}_t{*}R_{t-1} + a_6\text{CNMON}_t + a_7\text{CNMON}_t{*}R_{t-1} + a_8\text{W4MON}_t + a_9\text{W4MON}_t{*}R_{t-1}$$

$$+ a_{10}\text{W4CNMON}_t + a_{11}\text{W4CNMON}_t{*}R_{t-1} + a_{12}\text{W5MON}_t + a_{13}\text{W5MON}_t{*}R_{t-1} + a_{14}\text{W5CNMON}_t + a_{15}\text{W5CNMON}_t{*}R_{t-1} + e_t$$

W4MON is a Monday dummy that equals one only when the Monday falls on the fourth week of the month, and it is zero otherwise. W4CNMON is a special Monday dummy that equals one if the week-4 Monday is preceded by a Friday with a negative return, and it is zero otherwise. W5MON and W5CNMON are defined similarly for the fifth week of the month. Returns are multiplied by 100. Numbers in parentheses are Newey-West t-statistics corrected for heteroskedasticity and serial correlation.

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

significant and positive only in Austria, Switzerland, and Indonesia. This means only these three markets exhibit significantly higher conditional negative weekend-correlation effects in both the fourth and fifth weeks than in the first three weeks.

From the average figures of the twenty-three markets shown in the bottom row of Table 7, the conditional negative weekend-correlation effect of the first three weeks is 0.0347 (a_7) higher than its conditional positive counterpart. The difference of the conditional negative and conditional positive correlation effects in the fourth weekend is 0.2673 larger than that in the first three weekends, as captured by a_{11}. In fact, only nine markets have negative a_{11}, and only Denmark shows statistical significance. Again, the fifth weekend is not special. The difference in the conditional weekend-correlation effects on the fifth week is not larger than that on the first three weekends, as a_{17} has a negative value (−0.0624). Eleven markets show a negative a_{17}, and Spain, Thailand, and Taiwan are statistically significant.

The results indicate only mild evidence that the difference in the conditional negative weekend-correlation effect on the conditional positive weekend-correlation effect on the fourth weekend is larger than the difference on the other weekends. On the other hand, the conditional negative weekend-correlation effect on the last weekend is not special. Hence, there is not much supporting evidence that the high weekend correlation is due to a strong Monday effect induced by a negative Friday return in the fourth and the fifth weeks.

VII. Conclusion

The anomalous phenomenon of the Monday effect has attracted much interest in the finance profession, but satisfactory explanations are still lacking. Lakonishok and Maberly (1990) and Abraham and Ikenberry (1993) partially succeed in explaining the phenomenon. They find that individual investors tend to sell on Monday and institutional investors refrain from trading on Monday. Such selling pressure on Monday increases if the market is down on the previous Friday. This relation supports the findings by Bessembinder and Hertzel (1994) that weekend correlation is higher than nonweekend correlation. On the other hand, Wang, Li, and Erickson (1997) show that the Monday effect is driven mainly by Mondays in the fourth and fifth weeks of the month, and Sias and Starks (1995) find the day-of-the-week effect is strong for portfolios dominated by institutional investors.

Examining twenty-three stock markets, I search for international evidence of the bad-Friday/Monday-effect relation, the seasonality of the Monday effect across weeks of the month, and the possible relation between the Monday effect and the high weekend correlation. I find, first, that it is true in general that the Monday return is more negative when the return for the previous Friday is negative. Based on the measurement method constructed in this article, the bad-Friday factor can explain half of the Monday effect in the U.S. market and more than 70 percent of the Monday effect in ten of fifteen foreign markets that exhibit a Monday effect.

Second, I find that the Monday return on the fourth week tends to be the lowest compared with Monday returns on the other weeks of the month. This is true regardless of whether the market exhibits the Monday effect.

Third, I also find that the weekend correlation is higher in most of the international markets examined. Yet, this high weekend correlation and the bad-Friday/Monday-effect relation appear to be unrelated phenomena. This is because high weekend correlation is not driven solely by bad Fridays. Furthermore, the importance of the fourth week of the month to the weekend correlation is not as pervasive as it is to the Monday effect. Although some evidence suggests the correlation is asymmetric in the fourth weekends of the month, statistical significance is lacking in general.

Appendix

Sample Countries, Stock Market Indexes, and Sample Periods.

Index Name	Country	Sample Period
Equally Weighted Return Series	U.S.	62/7/2–95/12/31
Australia All Ordinary–Price Index	Australia	80/1/1–95/6/30
Australia GZ Allshare–Price Index	Austria	80/1/1–95/6/30
Brussels SE General–Price Index	Belgium	80/1/1–95/6/30
Toronto SE (300) Composite–Price Index	Canada	69/1/1–95/6/30
Copenhagen SE General–Price Index	Denmark	74/1/1–95/6/30
France-DS Market–Price Index	France	73/1/1–95/6/30
FAZ General–Price Index	Germany	69/1/1–95/6/30
Milan Banca Comm.Ital.–Price Index	Italy	69/1/1–95/6/30
CBS All Share General–Price Index	Holland	80/1/1–95/6/30
Oslo Stock Exchange Industry–Price Index	Norway	80/1/1–95/6/30
Johannesburg SE Industrials–Price Index	South Africa	84/2/1–95/6/30
Madrid S.E.–Price Index	Spain	80/1/1–95/6/30
Singapore-Straits T. Industrial–Price Index	Singapore	69/1/1–95/6/30
Credit Suisse General–Price Index	Switzerland	69/1/1–95/6/30
FT Ordinary Share–Price Index	U.K.	69/1/1–95/6/30
Hang Seng–Price Index	Hong Kong	75/1/1–95/6/30
Jakarta Composite–Price Index	Indonesia	85/1/1–94/12/31
Kuala Lumpur Composite–Price Index	Malaysia	80/1/1–94/12/31
Bangkok S.E.T.–Price Index	Thailand	80/1/1–94/12/31
Taiwan Weighted–Price Index	Taiwan	75/1/1–94/12/31
Nikkei Stock Average (225)–Price Index	Japan	75/1/1–94/12/31
Korea SE Composite (KOSPI)–Price Index	S. Korea	77/1/1–94/12/31

Note: Data for the stock market indexes of Thailand, Hong Kong, Malaysia, and Japan are from the Pacific Basin Capital Market Database (PACAP), and all other data series are from Datastream.

References

Abraham, A. and D. Ikenberry, 1994, The individual investor and the weekend effect, *Journal of Financial and Quantitative Analysis* 29, 263–77.

Bessembinder, H. and M. Hertzel, 1993, Return autocorrelations around nontrading days, *Review of Financial Studies* 1, 155–89.

Cross, F., 1973, The behavior of stock price on Fridays and Mondays, *Financial Analysts Journal* Nov-Dec, 67–69.

French, K., 1980, Stock returns and the weekend effect, *Journal of Financial Economics* 8, 55–70.

Jaffe, J. and R. Westerfield, 1985, The weekend effect in common stock returns: The international evidence, *Journal of Finance* 40, 433–54.

Jaffe, F, R. Westerfield, and C. Ma, 1989, A twist on the Monday effect in stock prices: Evidence from the U.S. and foreign stock markets, *Journal of Banking and Finance* 13, 641–50.

Keim, D., R. Rogalski, and R. Stambaugh, 1984, A further investigation of the weekend effect in stock returns, *Journal of Finance* 39, 819–35.

Kelly, F. 1930, *Why You Win or Lose* (Fraser Publishing, Burlington, VT).

Lakonishok, J. and E. Maberly, 1990, The weekend effect: Trading patterns of individual and institutional investors, *Journal of Finance* 45, 231–43.

Maberly, E., 1995, Eureka! Eureka! Discovery of the Monday effect belongs to the ancient scribes, *Financial Analysts Journal* Sept-Oct, 10–11.

Sias, R. and L. Starks, 1995, The day-of-the-week anomaly: The role of institutional investors, *Financial Analysts Journal* May-June, 58–67.

Wang, K., Y. Li, and J. Erickson, 1997, A new look at the Monday effect, *Journal of Finance* 52, 2171–86.