# MOOD SWINGS AND THE FIRM SIZE PREMIUM

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**Abstract:** *Evidence accumulated in the literature indicates that the size effect is related to corporate and macroeconomic variables and is paid to compensate for bearing risk. We show that the size premium is also driven by daily variations in investors' moods. We focus on two conditions often cited as possible mechanisms that drive variations in mood: Monday and seasonal affective disorder. The findings are consistent with the evidence that mood deteriorates on Mondays and in the fall and are consistent with the claim that the size effect manifests during economic expansion but weakens in the contraction phase of the economic cycle.*

**Keywords:** Mood, Size effect, Size premium.

**JEL classification:** G10, G12, G14.

## 1. Introduction:

Evidence accumulated worldwide indicates that risk adjusted stock returns are a decreasing function of firm size (Banz, 1981; Cho, 2019). Extensive empirical studies on the size effect use monthly data and relate the size premium to macroeconomic and corporate variables. The classic paradigm suggests that a size premium is paid as compensation for bearing the risk of financial distress (e.g., Hur et al., 2014), idiosyncratic risks (Fu, 2009), liquidity and transaction costs (e.g., Krueger and Johnson, 1991) and changes in the macroeconomic conditions (e.g., Jagannathan and Wang, 1996). However, little is known about the role of investors' mood in justifying or explaining this premium at the daily level. This omission is largely due to the fact that corporate financial data and macroeconomic information are generally released monthly and quarterly.

Several studies about calendar anomalies have shown mixed results. In addition, difficulties in comparing findings from these studies exist, since these studies have used different methodologies, and various data frequencies, data sets and data periods. Furthermore, the differences in the choice of markets, financial assets and stock market countries used in the studies have also affected the comparisons between the findings from the studies.

Despite having published studies that address calendar anomalies, the question remains concerning how markets evolve over time. Some researchers have noted that stock markets evolve over time, from an inefficient state to an efficient state, and that calendar anomalies tend to be unstable over time. Other studies have suggested that stock markets are more efficient, eliminating the Monday and seasonal affective disorder effect. Moreover, in the current age of the information superhighway, information is readily available to a greater number of market players, within a shorter time and at a lower cost than ever before. As a result, there are greater difficulties than ever before to uncover inefficiencies in the financial

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markets. Other scholars have opposed the efficient markets hypothesis on the grounds that it doesn't account for transaction costs, information asymmetries, and irrationality of investor behavior, such as the herd instinct, mass panic, and mass psychosis. Furthermore, financial asset price data can be expected to maintain long memory (persistence), and display clustered volatility, and fat-tailed distributions.

In this study, we investigate the contribution of variations in mood to the daily size premium using US data for 1926 to August 2019. We use two variables often cited in psychology literature as possible mechanisms through which changes in mood could occur. The first is the Monday effect, and the second is the duration of daylight. We posit that a better mood prompts people to increase their risk taking (e.g., Loewenstein et al., 2001; Grable and Roszkowski, 2008). Therefore, when people feel upbeat, they prefer risky assets in the form of small stocks, yielding a positive size premium. We base this suggestion on studies from behavioral finance documenting that non-institutional investors are those who are more likely to be affected by sentiment (e.g., Berkman et al., 2012; Chang et al., 2015). In parallel, other studies report that individual investors are more likely than institutional investors to hold small stocks (e.g., Lemmon and Portniaguina, 2006; Che, 2018). Given these observations, fluctuations in mood may partially explain the daily size premium.

This study relates to the efficient markets hypothesis as postulated by Fama (1965) and Fama (1970), which accounts for markets fully reflecting all available information, and suggests that anomalies in the calendar, such as the effect of the day of the week, the effect of the beginning of the month, the effect of the beginning of the year and the effect of holidays, may not exist. Furthermore, the efficient markets hypothesis implies that investors do not need to attain a position for predicting and get ahead of the market in order to attain excess profits.

Based on previous studies published in the literature, the hypotheses posited for this study are:

$H_1$: Monday is a strong driver of changes in investors' mood.

$H_2$: The amount of daylight is a strong driver of changes in investors' mood.

$H_3$: The stocks return on Mondays are negative.

$H_4$: The stocks return during Fall are negative.

$H_5$: The stocks return during Summer are positive.

We subjected our findings to a battery of robustness checks and utilized tools unaffected by outliers to make unbiased inferences. They indicate that returns on small stocks outperform those of large companies on Fridays when investors' mood is high. However, the premium is lower or negative on Mondays when optimism deteriorates. In addition, during the fall, when daylight hours start to decrease, the size premium drops.

Supportive evidence that mood varies across weekdays comes from examining the Twitter Happiness Index. Figure 1 shows that the index values are lower on Mondays, but higher on Fridays and Saturdays.

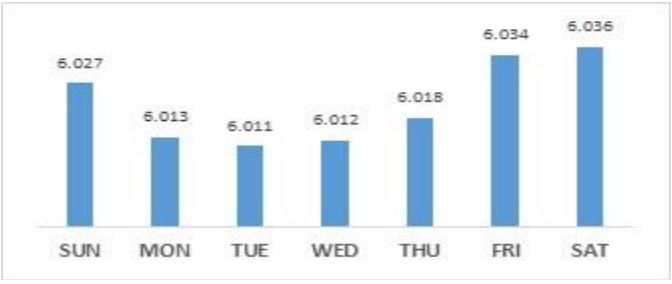


**Figure 1.** Twitter Happiness Index (in average level terms) across weekdays.
Source: Author's analysis/processing based on own data

Data are available starting from September 2008 (The Hedonometer, 2023). We rejected the hypothesis that the average on Monday equals that on Friday.
Finally, using the business cycle turning points identified by the National Bureau of Economic Research (NBER), we find that the size effect disappears during recession, but strongly presents during expansion phases of the business cycle. This finding may be due to the relatively high financial leverage and lower productivity during downturns (e.g., Kim and Burnie, 2002). Overall, our findings contradict studies claiming that the size premium has disappeared over time (e.g., Hirshleifer, 2001), and those maintaining that the Monday effect is not as significant in recent data (Zilca, 2017).

## 2. Scientific Background

Most people hate Mondays. Sleep studies have noted that people mention the pain associated with waking up on a Monday or feeling fatigued despite a full night's sleep (Yang and Spielman, 2001; Taylor, Wright and Lack, 2008). Monday was cited most frequently as the worst morning (e.g., Areni and Burger, 2008). Furthermore, studies document that suicides peak on Mondays (e.g., Stack 1995). Using Twitter posts, Golder and Macy (2011) noted that people tend to be more positive on weekends and early in the morning, and less so on Mondays. Similar results are also documented in other studies in psychology (e.g., Stone, Schneider and Harter, 2012). Transportation studies report that Mondays are seen as the worst traffic days (e.g., Yang, Lu and Liu, 2018). In parallel, the social science literature indicates that the stress that may result from arriving late to work also affects financial decision-making (e.g., Porcelli and Delgado, 2009; Starcke and Brand, 2012).
The seasonal affective disorder (SAD) effect is linked to depression driven by changes in the seasons that start in the fall and continue into the winter months (Cohen et al., 1992; Rosenthal, 1998). Published literature about psychology has established that SAD is associated with daylight in the sense of the length of the day (e.g., Young et al., 1997). Kamstra et al. (2003) and Kamstra et al. (2014) report that even after controlling for standard stock return regularities, there is greater demand for risky stocks in the spring and less demand in the fall.
Theoretically, there are two opposing approaches capable of explaining how mood can alter one's willingness to increase risk. The first is the Affect Infusion Model (AIM, e.g., Forgas 1995), while the second is the Mood Maintenance Hypothesis (MMH, e.g., Isen and Labroo 2003). According to the AIM, an improvement in mood predicts an increase in risk tolerance, whereas a negative mood is expected to lower it.
MMH, on the other hand, suggests that good mood increases agent's unwillingness to increase risk, whereas a bad mood encourages increasing risk. Our results support the AIM approach according to which better mood prompts people to increase their risk taking.

## 3. Data

The data come from Kenneth French's library (French, 2023). Our sample ranges from July 1926 through August 2019. We follow the literature (e.g., Zakamulin, 2013) and capture the size premium using the average return on the three small-cap portfolios minus the average return on the three large-cap portfolios, sometimes known as the Small Minus Big (SMB) portfolio developed in Fama and French (1993). We obtained the hours of daylight from the Time and Date website (Timeanddate, 2023). Table 1. reports the descriptive statistics of the key variables.

**Table 1.** Descriptive Statistics
Sample A: Full Sample

| | Mean | Med | Max | Min | Stdev. | Skewness | Kurtosis | JB(×100) | #Obs |
|---|---|---|---|---|---|---|---|---|---|
| PRM | 0.005 | 0.020 | 8.210 | -11.620 | 0.583 | -0.763 | 25.711 | **530** | 24,559 |
| DAYLIGHT | 12.261 | 12.283 | 15.231 | 9.250 | 1.999 | -0.033 | 1.566 | **21** | 24,559 |
| H | 11.739 | 11.717 | 14.750 | 8.769 | 1.999 | 0.033 | 1.566 | **21** | 24,559 |
| SAD | 0.415 | 0.000 | 2.733 | -1.636 | 0.828 | 1.744 | 4.480 | **14.6** | 24,559 |
| FALL | 0.208 | 0.000 | 2.733 | -1.175 | 0.621 | 2.961 | 10.442 | **92.55** | 24,559 |
| TWTR | 6.016 | 6.020 | 6.240 | 5.770 | 0.042 | 0.203 | 4.249 | **1.99** | 2,763 |

Source: Author's analysis

The table reports the descriptive statistics of the key variables in this study. The Twitter data starts on September 9, 2008. Data on the rest of the variables are available since July 1, 1926. JB is the Jarque-Bera statistic. PRM is the size premium; "H" is the number of hours between sunrise and sunset, and TWTR is the level of the Twitter Happiness Index.

## 4. Method

In line with Kamstra et al. (2003), we track the daily variations in the size premium using the following model.

$$PRM_t = C_0 + C_{SAD}SAD_t + C_{FALL}FALL_t + +C_{MON}MON_t + C_{TAX}TAX_t + \sum_{j=1}^{p} d_j\, PRM_{t-j} + u_{i,t}, \quad (1)$$

where $PRM_t$ is the daily size premium captured by Fama and French's (1993) SMB risk factor on day t; $C_0$ is an intercept; and $SAD_t$ is defined as follows:

$$SAD_t = \begin{cases} H_t - 12 & \text{for trading days in the fall and winter} \\ 0 & otherwise \end{cases}, \quad (2)$$

where $H_t$ is the number of hours between sunrise and sunset, and $(H_t - 12)$ represents the length of the night relative to the annual average length of the night. $FALL_t$ is a dummy variable that receives the value of "$SAD_t$" for days of the year in the fall season (September 21 to December 20 in the northern hemisphere), and zero otherwise; $MON_t$ captures Mondays; and $TAX_t$ is a dummy variable for tax-loss selling that takes the value of 1 for the day prior to and the four days following the start of a tax year and 0 otherwise (Starks et al., 2006). Finally, we lagged the size premium variable, $\sum_{j=1}^{p} d_j\, PRM_{i,t-j}$, to control for autocorrelation in the residuals.

In order to assess the association between Mondays and negative size premiums, we test the average returns on Mondays and the average on the rest of the trading days.

$$PRM_t = \alpha_0 + \alpha_1 Monday_t + u_t\,. (3)$$

We use the following model to calculate the average of the size premium on Mondays (by $\alpha_1$), Fridays (by $\alpha_2$) and the rest of the trading days (by $\alpha_0$).

$$PRM_t = \alpha_0 + \alpha_1 Monday_t + \alpha_2 Friday_t + v_t. (4)$$

As previously stated, research in psychology has established the existence of weekly cycles in mood, with Mondays as the worst day of the week and Fridays and Saturdays as the favorites (Jessen et al., 1998). Hence, we hypothesize that $\alpha_1 \neq \alpha_2$.

## 5. Empirical Findings

The estimation results of Eq. (1) is reported in Table 2.. For robustness, we present the estimation results in four different time periods. The first covers the entire sample period of 1926-2019. We divided the whole sample into three relatively equal sub-periods: (1) 1926-1957; (2) 1958-1989; (3) 1990-2019. By and large, the coefficients' signs are maintained regardless of the sample period considered. Technically speaking, the size premium is positively correlated with SAD, but negatively related to FALL. In addition, Mondays are significantly associated with lower size premiums. Finally, the TAX dummy is generally positive and statistically significant. However, it is not statistically significant in the 1990-2019 sub-sample. These findings accord with Kamstra et al. (2003).

**Table 2.** Regression Results

| Sample Period | $C_0$ | SAD | FALL | MON | TAX | PRM(-1) | Adj-$R^2$ | F-Stat |
|---|---|---|---|---|---|---|---|---|
| **1926-2019** | 0.003 | 0.027a | -0.032a | -0.049a | 0.255a | -0.051a | 0.008 | 39.83a |
| **1926-1957** | 0.029a | 0.015 | -0.03b | -0.108a | 0.309a | 0.07a | 0.011 | 20.895a |
| **1958-1989** | 0.007 | 0.034a | -0.042a | -0.065a | 0.246a | 0.063 | 0.018 | 30.694a |
| **1990-2019** | 0.012 | 0.026a | -0.024b | -0.101a | 0.018 | 0.037c | 0.007 | 11.017a |

Source: Author's analysis

Notes: "a," "b" and "c" indicate statistical significance at the 1%, 5% and 10% levels, respectively.

The table reports the estimation results for Eq. (1). The sample ranges from June 1926 to August 2018. For the sake of robustness, we separate this sample into three equal sub-samples. The first is 1926-1957; the second is 1958-1989 and the last subsample covers 1990-2019. SAD is defined in Eq. (2), and it is the length of the night relative to the annual average length of the night for trading days in the fall and winter; $FALL_t$ is an interactive dummy variable that receives the value of "SAD" for days of the year in the fall season, and zero otherwise; "MON" is a dichotomous variable that captures Mondays; and TAX is a dummy variable for tax-loss selling that takes the value of 1 for the day prior to and the four days following the start of a tax year and 0 otherwise. Eqs. (1) and (2) are as follows.

$$PRM_t = C_0 + C_{SAD}SAD_t + C_{FALL}FALL_t + +C_{MON}MON_t + C_{TAX}TAX_t + \sum_{j=1}^{p} d_j\, PRM_{t-j} + u_{i,t},$$

where:

$$SAD_t = \begin{cases} H_t - 12 & \text{for trading days in the fall and winter} \\ 0 & otherwise \end{cases}.$$

The distribution of the size premium on Monday and the rest of the weekdays is reported in Table 3. The findings in Panel A, considering the entire sample period (1926-2019) with 24,539 observations, indicate that Mondays are associated with negative size premiums. The negative size premium appears in all of the sub-sample periods, yet with strong statistical significance for 1958-1989 and 1990-2019.

We also test whether the results are driven by outliers. We use the sign test to assess the null hypothesis, which postulates that the results are not different from a coin toss – 50:50. For this purpose, we simply count the number of Monday and Fridays associated with positive and negative size premiums to determine whether the ratios obtained are statistically different from 50%.

Panels B and C of the table report, respectively, the ratio of the Mondays associated with negative size premiums and the ratio of the Fridays associated with positive size premiums. The findings indicate that between 1926-2019, 52% of Mondays were associated with negative size premiums. This ratio increased to 54.3% during 1990-2019. These ratios are statistically different from 50%, as evident from the sign test results. On the other hand, Fridays during 1926-2019 concluded with positive size premiums in 55.3% of the sampled Fridays. Among the 4,680 Fridays examined, there were 2,588 Fridays in which the premium increased, 2,029 where it declined and 63 in which it was unchanged. During 1958-1989 the ratio of Fridays associated with positive size premiums leaped to 61%. Again, based on the sign test, we reject the null hypothesis, meaning that the ratios obtained are not equal to 50%.

**Table 3a.** Size Premium on Mondays. Panel A: Estimation Results of Eq. (3)

| | **Variable** | **Coefficient** | **St. Error** | **T-Stat.** | **Prob.** | **#Obs** |
|---|---|---|---|---|---|---|
| 1926-2019 | Intercept | 0.015 | 0.004 | 3.555 | 0.000 | 24,539 |
| | Monday | -0.055 | 0.010 | -5.675 | 0.000 | |
| 1926-1957 | Intercept | 0.004 | 0.008 | 0.559 | 0.576 | 9,036 |
| | Monday | -0.008 | 0.019 | -0.395 | 0.693 | |
| 1958-1989 | Intercept | 0.019 | 0.005 | 3.703 | 0.002 | 8,047 |
| | Monday | -0.061 | 0.012 | -5.043 | 0.000 | |
| 1990-2019 | Intercept | 0.022 | 0.007 | 2.936 | 0.003 | 7,457 |
| | Monday | -0.100 | 0.017 | -5.874 | 0.000 | |

Source: Author's analysis
Notes: The table reports the estimation results of Eq. (3): $PRM_t = \alpha_0 + \alpha_1 Monday_t + u_t$.

**Table 3b.** Size Premium on Mondays. Panel B: Ratio of Negative Size Premium on Mondays –Sign Test Results

| | **"+" Mondays** | **"–" Mondays** | **Unchanged Mondays** | **"–" Mondays (%)** |
|---|---|---|---|---|
| **1926-2019** | 2,112 | 2,343 | 53 | 52.0%*** |
| **1926-1957** | 757 | 756 | 27 | 49.1% |
| **1958-1989** | 724 | 821 | 12 | 52.7%** |
| **1990-2019** | 631 | 766 | 14 | 54.3%*** |

Source: Author's analysis
Notes: For 1926-2019, there were 4,508 Mondays. Out of the 4,508 Mondays, there were 2,112 positive Mondays and 2,343 negative Mondays. The ratio of the negative Mondays is 52%. This ratio peaks to 54.3% during 1990-2019. The null hypothesis is that the ratio is equal to 50% - a coin toss. The right-hand column presents the ratios of the negative Mondays. *** and ** indicate the rejection of this hypothesis at the statistical significance levels of 1% and 5%, respectively.

**Table 3c.** Size Premium on Mondays. Panel C: Ratio of Positive Size Premium on Fridays –Sign Test Results

| | **"+" Fridays** | **"–" Fridays** | **Unchanged Friday** | **"–" Fridays (%)** |
|---|---|---|---|---|
| **1926-2019** | 2588 | 2029 | 63 | 55.3%*** |
| **1926-1957** | 813 | 735 | 31 | 51.5% |
| **1958-1989** | 979 | 607 | 19 | 61.0%*** |
| **1990-2019** | 796 | 687 | 13 | 53.2%*** |

Source: Author's analysis

Notes: The right-hand column presents the ratios of the positive Fridays. *** indicates rejection of the null hypothesis (50%-50%) at the statistical significance level of 1%.

In Table 4, we report the estimation results for Eq. (4), which captures the average of the size premium on Monday, Friday and the rest of the weekdays. Our findings accord with the hypothesis about investors' mood. Previous research has established that Monday and the amount of daylight are strong drivers of changes in investors' mood. We find that these changes have a demonstrable effect on the *daily* size premium, in other words, we validated hypothesis $H_1$ and hypothesis $H_2$. The size premium is negative on Mondays but positive on Fridays. This finding holds true for the entire sample and all of the sub-sample periods. The results are remarkable in terms of statistical significance and coefficients, particularly for the periods following 1958.

Overall, investors seem optimistic on Fridays and pessimistic on Mondays. The literature has established that optimistic people underreact to negative information and overreact to positive information (e.g., Sharot, et al., 2011; Gama and Vieira, 2013).

**Table 4.** Friday, Monday and the Rest of the Weekdays

| | **Variable** | **Coefficient** | **St. Error** | **T-Stat.** | **Prob.** | **N** |
|---|---|---|---|---|---|---|
| 1926-2019 | Intercept | 0.006 | 0.005 | 1.310 | 0.190 | 24,536 |
| | Monday | -0.046 | 0.010 | -4.666 | 0.000 | |
| | Friday | 0.036 | 0.010 | 3.733 | 0.000 | |
| 1926-1957 | Intercept | 0.006 | 0.009 | 0.672 | 0.501 | 9,036 |
| | Monday | -0.009 | 0.020 | -0.466 | 0.641 | |
| | Friday | -0.008 | 0.020 | -0.383 | 0.702 | |
| 1958-1989 | Intercept | 0.001 | 0.006 | 0.097 | 0.922 | 8,047 |
| | Monday | -0.042 | 0.012 | -3.367 | 0.001 | |
| | Friday | 0.077 | 0.012 | 6.280 | 0.000 | |
| 1990-2019 | Intercept | 0.012 | 0.009 | 1.430 | 0.153 | 7,475 |
| | Monday | -0.091 | 0.018 | -5.158 | 0.000 | |
| | Friday | 0.039 | 0.017 | 2.253 | 0.024 | |

Source: Author's analysis

Notes: The table reports the estimation results of Eq. (3): $PRM_t = \alpha_0 + \alpha_1 Monday_t + \alpha_2 Friday_t + u_t$.

### 5.1. Robustness checks

To assess the robustness of our results, we capture the size premium using the difference between the lowest (Decile1) and the highest decile (Decile10) portfolios – i.e., $D_1$-$D_{10}$ (e.g., Hur, et al., 2014), and use both equal-weighted and value-weighted decile returns. The results appear in Tables 5 and 6, and strongly support our hypothesis.

**Table 5a.** $D_1$-$D_{10}$ on Mondays. Panel A: Value-weighted $D_1$-$D_{10}$

| | **"+" Monday** | **"–" Monday** | **Unchanged Mondays** | **"–" Monday (%)** |
|---|---|---|---|---|
| **1926-2019** | 2060 | 2448 | 27 | 54.3%*** |
| **1926-1957** | 696 | 844 | 7 | 54.8%*** |
| **1958-1989** | 730 | 827 | 13 | 53.1%** |
| **1990-2019** | 634 | 777 | 7 | 55.1%*** |

Source: Author's analysis

**Table 5b.** $D_1$-$D_{10}$ on Mondays. Panel B: Equal-weighted $D_1$-$D_{10}$

| | **"+" Monday** | **"–" Monday** | **Unchanged Mondays** | **"–" Monday (%)** |
|---|---|---|---|---|
| **1926-2019** | 2173 | 2335 | 34 | 52.2%** |
| **1926-1957** | 743 | 797 | 12 | 52.1 % |
| **1958-1989** | 762 | 795 | 16 | 51.6% |
| **1990-2019** | 668 | 743 | 6 | 52.9%** |

Source: Author's analysis

Notes: The size premium is defined here as the difference between the lowest (Decile1) and the highest decile (Decile10) portfolios – i.e., $D_1$-$D_{10}$ (e.g., Hur, et al., 2014). This proxy also supports the tendency for higher premiums on Fridays and lower premiums on Mondays. "+" Fridays and "–" Fridays indicate the number of positive and negative Fridays detected within the sample period, respectively. "+" Fridays (%) is the percentage of positive Fridays in the specific sample period.

**Table 6a.** $D_1$-$D_{10}$ on Fridays. Panel A: Value-weighted $D_1$-$D_{10}$

| | **"+" Friday** | **"–" Friday** | **Unchanged Fridays** | **"+" Friday (%)** |
|---|---|---|---|---|
| 1926-2019 | 2671 | 2009 | 21 | 56.8%*** |
| 1926-1957 | 788 | 791 | 10 | 49.6% |
| 1958-1989 | 1007 | 598 | 6 | 62.5%*** |
| 1990-2019 | 876 | 620 | 5 | 58.4%*** |

Source: Author's analysis

**Table 6b.** $D_1$-$D_{10}$ on Fridays. Panel B: Equal-weighted $D_1$-$D_{10}$

| | **"+" Friday** | **"–" Friday** | **Unchanged Fridays** | **"+" Friday (%)** |
|---|---|---|---|---|
| 1926-2019 | 2894 | 1786 | 28 | 61.5%*** |
| 1926-1957 | 911 | 668 | 10 | 57.3%*** |
| 1958-1989 | 1037 | 568 | 13 | 64.1%*** |
| 1990-2019 | 946 | 550 | 5 | 63.0%*** |

Source: Author's analysis

Notes: The size premium is defined here as the difference between the lowest (Decile1) and the highest decile (Decile10) portfolios – i.e., $D_1$-$D_{10}$ (e.g., Hur et al., 2014). This proxy also supports the tendency for higher premiums on Fridays and lower premiums on Mondays. "+" Fridays and "–" Fridays indicate the number of positive and negative Fridays detected within the sample period, respectively. "+" Fridays (%) is the percentage of positive Fridays in the specific sample period.

Finally, we test whether the picture is maintained during recession and economic expansion periods - identified by the NBER. Our sample includes 199 months associated with recession. The results in Panel A of Table 7 indicate that the size premium fails to detect any abnormal premiums on both Mondays and Fridays during recession periods. However, the results for the expansion phase of the economy, reported in Table 8, show that the effect is more significant on Friday and Monday. Overall, our findings are consistent with the empirical evidence that firm size effect intensifies during economic expansion phase of the economic cycle but fades during recession (Kim and Burnie, 2002). Since the findings are consistent with the evidence that mood deteriorates on Mondays and in the Fall and are consistent with the claim that the size effect manifests during economic expansion but weakens during the contraction phase of the economic cycle, we invalidated hypothesis $H_3$ and hypothesis $H_4$ and hypothesis $H_5$.

**Table 7a.**Size Premium during Recession Periods. Panel A: Fama-French SMB

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 407 | 389 | 11 | 48.2% | 416 | 397 | 14 | 50.3% |
| **1926-1957** | 222 | 185 | 7 | 44.7%* | 208 | 205 | 10 | 49.2% |
| **1958-1989** | 125 | 129 | 3 | 50.2% | 139 | 122 | 1 | 53.1% |
| **1990-2019** | 60 | 75 | 1 | 55.1% | 69 | 70 | 3 | 48.6% |

Source: Author's analysis

**Table 7b.**Size Premium during Recession Periods. Panel B: Value-weighted $D_1$-$D_{10}$

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 373 | 428 | 6 | 53.0%** | 426 | 398 | 3 | 51.5% |
| **1926-1957** | 184 | 228 | 2 | 55.1%** | 195 | 226 | 2 | 46.1%* |
| **1958-1989** | 127 | 126 | 4 | 49.0% | 151 | 110 | 1 | 57.6%*** |
| **1990-2019** | 62 | 74 | 0 | 54.4% | 80 | 62 | 0 | 56.3%* |

Source: Author's analysis

**Table 7c.** Size Premium during Recession Periods. Panel C: Equal-weighted $D_1$-$D_{10}$

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 401 | 401 | 5 | 49.7% | 469 | 355 | 3 | 56.7%*** |
| **1926-1957** | 200 | 212 | 2 | 51.2% | 233 | 189 | 1 | 55.1%** |
| **1958-1989** | 132 | 122 | 3 | 47.5% | 149 | 111 | 2 | 56.9%** |
| **1990-2019** | 69 | 67 | 0 | 49.3% | 87 | 55 | 0 | 61.3%*** |

Source: Author's analysis data

Notes: For the sample period (1926-2019), there were 807 Mondays and 827 Fridays during recession periods as defined by the National Bureau of Economic Research (NBER).

According to Panel A, the probability of obtaining negative size premium on Monday equals 50%, and the same applies for Fridays. When considering other definitions of the size premium i.e., $D_1$-$D_{10}$ (e.g., Hur et al., 2014), we find that small firms still outperform big ones

on Friday as illustrated in Panels B and C. "+" and "–" denote positive and negative, respectively.

**Table 8a.** Size Premium during Economic Expansion. Panel A: Fama-French SMB

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 2112 | 2343 | 53 | 52.0%*** | 2588 | 2029 | 63 | 55.3%*** |
| **1926-1957** | 757 | 756 | 27 | 49.1% | 813 | 735 | 31 | 51.5% |
| **1958-1989** | 724 | 821 | 12 | 52.7%** | 979 | 607 | 19 | 61.0%*** |
| **1990-2019** | 631 | 766 | 14 | 54.3%*** | 796 | 687 | 13 | 53.2%*** |

Source: Author's analysis

**Table 8b.** Size Premium during Economic Expansion. Panel B: Value-weighted $D_1$-$D_{10}$

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 1687 | 1993 | 21 | 53.9%*** | 2245 | 1590 | 18 | 58.3%*** |
| **1926-1957** | 512 | 609 | 5 | 54.1%*** | 593 | 555 | 8 | 51.3% |
| **1958-1989** | 603 | 688 | 9 | 52.9%** | 856 | 482 | 5 | 63.7%*** |
| **1990-2019** | 572 | 696 | 7 | 54.6%*** | 796 | 553 | 5 | 58.8%*** |

Source: Author's analysis

**Table 8c.** Size Premium during Economic Expansion. Panel C: Equal-weighted $D_1$-$D_{10}$

| | **Mondays** | | | | **Fridays** | | | |
|---|---|---|---|---|---|---|---|---|
| | "+" Monday | "–" Monday | Un-Changed Monday | "–" Monday (%) | "+" Friday | "–" Friday | Un-Changed Friday | "+" Friday (%) |
| **1926-2019** | 2173 | 2335 | 34 | 47.8%** | 2425 | 1403 | 25 | 62.9%*** |
| **1926-1957** | 743 | 797 | 12 | 47.9% | 678 | 469 | 9 | 58.7%*** |
| **1958-1989** | 762 | 795 | 16 | 48.4% | 888 | 444 | 11 | 66.1%*** |
| **1990-2019** | 668 | 743 | 6 | 47.1%** | 859 | 490 | 5 | 63.4%*** |

Source: Author's analysis

Notes: Data on the economic expansion and recession periods come from the NBER. (***), (**) and (*) indicate statistical significance at the levels 1%, 5% and 10%, respectively.

## 6. Conclusions

Prior works have established that Monday and the amount of daylight are strong drivers of changes in investors' mood. We find that these changes have a demonstrable effect on the *daily* size premium. Our robustness checks obviate the possibility that outliers are driving the results. Our findings are important and have useful implications for market efficiency, and help to reconcile mixed findings in previous studies, including findings that show there is no appearance of the weekday effect in those years. Furthermore, these findings support the recent literature highlighting the role of investors' mood in affecting asset pricing. This study used only available US data to investigate the contribution of variations in mood to the daily size premium. Additional research could expand the study using corroborating evidence from markets in other countries. Future research also could be designed to extend our study and focus on other investment tools such as derivatives, options, cryptographic

assets and others, so we can learn more about the phenomenon of the day-of-the-week effect.

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