



The Monday Effect in the Dow Jones Industrial Average and Its Component Stocks: A Three Period Comparative Analysis from 1962 to 2012

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ABSTRACT

This article examines the Monday effect in the Dow Jones Industrial Average (DJIA) and each of its component stocks for the periods of 1962 to 1982, 2003 to 2008, and 2009 to 2012. We extend our investigation over multiple time periods to explore whether individual component securities behave in the same way as the broader index to which they are linked over time. The results provide evidence to support the presence of the Monday effect in the DJIA and its component stocks during the early period of 1962 to 1982 while no statistically significant Monday effect is found in the latter periods of 2003 to 2008 and 2009 to 2012. These findings suggest that a transformation has occurred in U.S. equity markets such that the Monday effect has reduced or disappeared in both the market-wide index and its component stocks. We conclude that this transformation is perhaps due to the faster speed of dissemination of information domestically or globally; consequently, no trading rule that is based on daily anomalies can be exploited to generate an abnormal return.

Keywords: Monday Effect, Dow Jones Industrial Average, Dissemination of Information, Efficient Market Hypothesis

1. Introduction

The efficient market hypothesis (EMH) proposed by Fama in the early 1960s is one of the most fundamental, important and debated financial hypotheses. The EMH states that markets adjust efficiently and accurately as information becomes available to market participants—reaching equilibrium instantaneously and eliminating possibilities for arbitrage and earning above-average market returns. Thus, it is theoretically impossible to outperform the market using any information that is already available except through

sheer luck. It follows that, for example, no daily anomalies can be utilized to generate abnormal returns. Since its introduction, the EMH has encountered serious challenges on theoretical and empirical grounds. On empirical grounds, a variety of anomalies have been discovered in stock returns related to days of the week, months of the year, or other seasonality. The Monday effect, discovered through empirical research, is an important anomaly that challenges the EMH. Past studies have examined the Monday effect by using different market indices, but no study has tested the presence of the day-of-the-week effect in individual stocks. We believe that examining the Monday effect at different levels of a market (i.e. index and individual security) is a superior approach to test the validity and the basis for the existence of a Monday effect and other market anomalies.

This article uses standard regression analysis to examine the Monday effect in the Dow Jones Industrial Average

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(DJIA) and its components over a 50-year period consisting of several market crashes. More specifically, the purpose of this article is to revisit the Monday effect to examine 1) statistical evidence to support the existence of the Monday effect in the base index over time, 2) statistical evidence to support the existence of the Monday effect in the component stocks of the base index, and 3) differences in the Monday effect between the base index and its components. We decompose the market indices into their components to discover which components are responsible for returns' daily anomalies, and we partition the timeframe into three periods: 1962 to 1982, 2003 to 2008, and 2009 to 2012. The results provide a better understanding of the total scope of the Monday effect and whether the index components behave in the same manner as the index as a whole in the case of seasonality. While there is statistically significant evidence of the Monday effect in the first subsample (1962 to 1982), this effect fades away in the latter periods of the study suggesting that the Monday effect has evolved over time in both the DJIA and its component stocks.

The rest of this article is organized as follows: Section II presents a brief overview of literature on the Monday effect. Section III describes the data set and methodology utilized in this study. Section IV reports the empirical results, and Section V concludes the paper.

II. Background and Literature Review

The Monday effect has been extensively investigated in U.S. equity markets. As early as the 1920s, practitioners identify the Monday effect prior to studies using market-return data. In 1930, Kelly cites a three-year statistical analysis that identifies Monday as the worst day to buy stocks. He specifically refers to one of the factors of the effect to be the weekend decision-making occurring in individual investor ranks. In another study, Fields (1931) examines conventional market wisdom and looks for a low-Saturday-return effect in the DJIA. Fields' findings are consistent with the Monday effect in that Saturday's average closings are higher than the adjacent Friday and Monday closings. Later, Merrill (1966) reports that for the period from 1952 through 1965, Monday returns are up 43% while returns on the other trading days of the week increase over 50%. Similarly, Cross (1973) conducts a statistical test of the Monday effect and reports that the proportion of increases in returns on Monday is significantly lower than the proportion of increases on Friday.

In market return data, French (1980) studies the Standard and Poor (S&P) 500 Index from 1953 through 1977 finding a statistically significant difference in returns across weekdays with a significantly negative return on Monday. Gibbons and Hess (1981) examine the S&P 500 Index and equally weighted indices for the New York Stock Exchange (NYSE) and American Stock Exchange (AMEX) from 1962 through 1978 and find evidence of the Monday effect. Likewise, Keim and Stambaugh (1984) investigate the weekday seasonality in the S&P 500 Index and actively traded over-the-counter (OTC) securities and observe evidence of the Monday effect.

Bessembinder and Hertz (1993) extend the investigation of the Monday effect into an earlier and longer period than previous studies from 1885 through 1989. They show consistent outcomes across the period and in each of the 10 sub-periods studied. Siegel (1998) studies the Monday effect over the period from 1885 through 1997 and provides evidence of the Monday effect over this period. Siegel notes that if the Monday returns were on the average positive over the entire period instead of negative, the cumulative effect would have been a substantially positive impact on the DJIA's closing level actually attained in 1997.

As researchers investigate the Monday effect further, questions arise regarding whether this effect is persistent and consistent over time within the same market. For instance, Connolly (1989) examines the weekday effect from 1963 through 1983 using the standard weekday methodology. He reports clear evidence of Monday effect and other weekday effects before 1971; however, these effects largely disappear in the post-1974 data although Monday returns remain negative. In 1993, Chang, Pinegar, and Ravichandran, confirm the results of the Connolly study. Kamara (1997) also examines the weekday effect from 1963 through 1983 as did Connolly but focuses on both the large cap and small cap stocks that are part of the S&P 500 Index to explore whether the changes that are observed in the two previous studies are consistent across various types of equity securities. Kamara provides strong evidence that the Monday effect changes over time not by happenstance but rather likely under the influence of specific changes in equity market trading driven by regulatory changes.

Mehdian and Perry (2001) examine weekday returns from 1964 to 1998 and observe instability in weekday returns in both the large-firm and small-firm indices. They note that the large-firm indices display a reversal of the previous Monday effect while the small-firm data produces consistent returns with the traditional Monday effect. In support of Mehdian and Perry finding's in the post-1987 data, Brusa, Liu, and Schulman (2000) document the same phenomenon

of a reverse Monday effect in large-firm indices from 1990 through 1994. Gondhalekar and Mehdiian (2003) maintain that the Monday effect is related to pessimism and the gloomy mood of the investors who are more willing to sell than to buy stocks on Mondays compared to the other days of the week. Finally, Kohers et al. (2003), in support of Mehdiian and Perry finding's, document that the day-of-the-week effect was clearly evident in the vast majority of developed markets during the 1980's, but appears to have faded away in the 1990's.

III. Data and Methodology

The data sets for this study consist of daily closing values of DJIA and its components that cover a 50-year period from 1962 to 2012.

The daily returns of both the index and the underlying component are calculated as

$$R_{it} = ((I_{it} - I_{it-1}) / I_{it-1}) * 100 \quad (1)$$

where R_{it} is the daily percentage return of the index/component i on day t ; I_{it} and I_{it-1} are closing values of the index/component i on days t and $t-1$ respectively.

Each stock/index is tested for the presence of the Monday effect using the following regression equation:

$$R_{it} = \sum_{j=1}^5 \beta_{jt} D_{jt} + \varepsilon_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \beta_5 D_{5t} + \varepsilon_t \quad (2)$$

where R_{it} is the daily return of the index; D_{1t} , D_{2t} , D_{3t} , D_{4t} , D_{5t} are dummy variables for Monday to Friday (that is if t is a Monday, $D_{1t}=1$ otherwise zero, etc). The estimated coefficient β_{jt} will be significantly negative for those securities and index that exhibit a traditional Monday effect. The ε_t is the random error term. We test for the stationarity of the returns series at index and components, and the result of augmented Dickey-Fuller (ADF) tests indicates that all series are stationary at their first difference.

IV. Empirical Results

Equation (2) is estimated for the DJIA and each

component stock using Ordinary Least Squares, or standard regression analysis, with five dummy variables and no constant term. This regression provides average returns and t -statistics for each day of the week that can be used for various levels of comparison. The results of this analysis are presented in Table 1, which contains the estimated coefficients and corresponding statistics from the estimation using the data from the 1962 to 1982 sub-period. As shown, the average Monday return of the DJIA and 14 of the 19 component stocks is negative and statistically significant at the 10% level or better compared with the other days of the week. The DJIA has a negative average return during this period with a statistically significantly t -statistic of -5.465. These findings are consistent with prior literature studying the DJIA during this period which shows that a negative Monday effect exists in U.S. equity markets.

In addition to supporting prior literature on DJIA returns, the analysis also adds to the research in this area by providing insight into the behavior of the component stocks of the index. An important aspect of the Monday effect is that it is expected to be consistent in nature crossing companies, indices, and markets. The results of this analysis provide the insight that the Monday effect does appear to impact not only the aggregate index but also the component stocks of that index, which do cross many industries. Table 1 also provides evidence to support the postulation that the Monday effect, if evident in the market index, is also present in the majority of the component stocks of the index in the same time period. One of the most surprising findings of the analysis is exactly how pervasive the Monday effect is across the tested data with 14 of the stocks showing a statistically significant negative Monday return through the tested period, which equates to 74% of the tested component stocks. It is important to note that every tested component stock in the sample that returned a statistically significant result had a negative average Monday return. The component stock returns over this period show consistently negative returns with statistical significance supported by t -statistics that range between -2.0078 and -5.9278. By way of comparison, the analysis returned 29 other statistically significant results for the component stocks during the other days of the week (Tuesday through Friday) with 27 of the 29 component stocks providing positive average returns for that stock on that respective day of the week. The t -statistics for the component stock return results for the other, non-Monday days range between 1.6636 and 3.5207. In short, for the time period between 1962 and 1982, statistically significant evidence of a negative Monday effect is apparent for the DJIA and a majority of its component stocks.

TABLE 1: Regression Results - DJIA and 19 Component Stocks (1962 - 1982)

Panel A: DJIA Base Index							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
DJIA							
Coefficient	-0.001431311	8.64201E-05	0.000703503	0.000229822	0.000729205	0.007887892	5184
t-stat	-5.465339213	0.337760817	2.733864071	0.893533553	2.822853825		
Panel B: DJIA Component Stocks							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
Allied Chemical							
Coefficient	-0.002177693	0.000444071	0.00093807	-6.47643E-05	0.000820182	0.003337285	5183
t-stat	-4.038975972	0.842621628	1.77066745	0.12207082	1.539962105		
ALCOA							
Coefficient	-0.00087638	0.000193473	0.000802583	0.000133846	0.00134516	0.001220974	5184
t-stat	-1.612528958	0.36383908	1.501417606	0.250270113	2.507975029		
American Can							
Coefficient	-0.002320438	-0.00053073	0.000891729	0.000857402	0.000101327	0.009420293	5183
t-stat	-5.927796104	-1.387082082	2.319485364	2.22805912	2.625503107		
DuPont							
Coefficient	-0.000699393	0.000902626	0.000534614	0.000098044	0.00070824	0.000402951	5182
t-stat	-1.623318226	0.21401779	1.260363851	0.231030009	1.663564476		
Eastman Kodak							
Coefficient	-0.000228192	0.000508076	0.000922153	0.000115462	0.000748959	0.000568886	5183
t-stat	-0.481313872	1.094750959	1.975619852	0.247366419	1.599169939		
GE							
Coefficient	-0.001318292	-0.00035869	0.000980635	0.002049871	0.000470299	0.003048404	5184
t-stat	-2.2291281	-0.06195865	1.685048079	3.520652187	0.80501989		
General Foods							
Coefficient	-0.001018447	-0.00035373	0.000586167	0.000536434	0.000490318	0.001197983	5183
t-stat	-2.371247421	-0.084258933	1.389617414	1.270496381	1.157926362		
GM							
Coefficient	-0.001275239	-0.0001191	0.000935297	0.000918674	0.000979022	0.003751707	5184
t-stat	-3.011749086	-0.287342908	2.244700256	2.203749003	2.34069946		
Goodyear							
Coefficient	-0.001510961	-0.000656185	0.001258157	0.000541372	0.001809035	0.00410975	3197
t-stat	-2.264269508	-1.010106613	1.944194631	0.826932112	2.754609472		
International Harvester							
Coefficient	-0.002044595	-0.001278141	0.001248014	-0.000395516	0.001603295	0.004901324	5182
t-stat	-3.517217237	-2.251635706	2.187069727	-0.692454352	2.797541858		
International Paper Co							
Coefficient	0.000498601	0.001583123	0.001362697	0.000426234	-2.29366E-05	0.001332325	3191
t-stat	0.674152259	2.200068193	1.901553099	0.5879213	0.031538119		
Johns-Manville							
Coefficient	-0.001495412	-0.000208258	0.00051551	-0.000441781	0.001131451	0.001606181	5181
t-stat	-2.705524194	-0.385476506	0.949648825	-0.81265812	2.075305312		
Owens-Illinois Glass							
Coefficient	-0.001833421	-6.09319E-05	0.000727787	0.000634398	0.000616662	0.002167027	5181
t-stat	-3.403285048	-0.011571417	1.375548867	1.197314617	1.16048245		
P&G							
Coefficient	-0.000309848	1.60982E-06	0.000443667	0.000879012	0.00085147	0.000483673	3197
t-stat	-0.582001965	0.003106129	0.859335949	1.682945072	1.624686152		
Sears							
Coefficient	-0.002314216	0.000193011	0.001227754	0.000744198	0.000542523	0.007085713	5182
t-stat	-5.357095835	0.45732889	2.895263168	1.753269966	1.274454431		
Standard Oil of CA							
Coefficient	-0.001093982	-0.000146486	0.000981332	0.000195459	0.001303936	0.00257189	5181
t-stat	-2.341553611	-0.320931578	2.138714933	0.425779373	2.832246221		
Union Carbide							
Coefficient	-0.001222824	-2.65422E-05	0.000470352	-3.90232E-05	-0.000978963	0.001763756	5183
t-stat	-2.799360899	-0.061919016	1.091005661	0.09047278	2.263118863		
Westinghouse Electric							
Coefficient	-0.001185117	0.000342665	0.001612446	0.000115304	0.000684783	0.001645451	5182
t-stat	-2.007760325	0.594198972	2.781451777	0.198612926	1.176140634		
Woolworth							
Coefficient	-0.00017246	-0.000260285	0.000301224	0.000959102	0.000938666	0.002461285	5183
t-stat	-3.254287126	-0.50272294	0.578754502	1.840111757	1.796574109		

Note: Bold T-statistics indicate statistical significance at the 10% level or higher

TABLE 2: Regression Results - DJIA and 24 Component Stocks (2003 - 2008)

Panel A: DJIA Base Index							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
DJIA							
Coefficient	0.000391	0.000794	0.000806	-0.000218	-0.000358	0.0008301	1410
t-stat	0.735010	1.560418	1.591736	-0.426218	-0.696611		
Panel B: DJIA Component Stocks							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
3M							
Coefficient	0.000324	0.000244	0.000582	0.000160	-0.000075	-0.0027818	1410
t-stat	0.445264	0.350139	0.839370	0.229188	-0.106828		
ALCOA							
Coefficient	0.000542	-0.000346	0.000310	0.000399	0.002074	-0.0009892	1410
t-stat	0.447631	-0.298152	0.268440	0.341953	1.769438		
American Express							
Coefficient	-0.000555	0.001594	0.000939	0.000593	-0.000739	-0.0001443	1410
t-stat	-0.542994	1.628678	0.964739	0.602850	-0.747246		
Boeing							
Coefficient	-0.000114	0.000696	0.002847	0.000153	-0.000104	0.0040411	1410
t-stat	-0.121432	0.771752	3.174392	0.168757	-0.114388		
Caterpillar							
Coefficient	0.001344	0.001732	0.002336	-0.000422	0.000201	0.0041604	1410
t-stat	1.318195	1.774059	2.405611	-0.430253	0.203724		
Citigroup							
Coefficient	-0.001708	0.000976	0.000620	-0.000401	-0.000297	-0.0007935	1410
t-stat	-1.561772	0.931707	0.594996	-0.380866	-0.280320		
Coca Cola							
Coefficient	0.000274	0.000943	0.000524	-0.000021	-0.000315	-0.0008728	1410
t-stat	0.441378	1.586842	0.885269	-0.035047	-0.524631		
DuPont							
Coefficient	0.000469	-0.000121	0.001024	-0.000152	0.000252	-0.0018726	1410
t-stat	0.591965	-0.159015	1.357481	-0.199501	0.328696		
Exxon Mobil							
Coefficient	0.001059	0.001034	0.001117	0.000027	0.000811	0.0011654	1410
t-stat	1.306421	1.333087	1.446988	0.035142	1.034900		
GE							
Coefficient	0.000391	0.000862	0.000867	0.000242	-0.000748	-0.0005143	1410
t-stat	0.516491	1.189116	1.201944	0.332258	-1.020999		
GM							
Coefficient	0.000519	0.001686	-0.000370	-0.002217	-0.001712	-0.0002226	1410
t-stat	0.324805	1.102874	-0.243490	-1.442628	-1.107816		
Hewlett Packard							
Coefficient	0.001209	0.000433	0.002777	-0.000027	-0.000324	0.0022413	1410
t-stat	1.078227	0.403230	2.599646	-0.024663	-0.298687		
Home Depot							
Coefficient	0.000449	0.001512	0.001012	-0.000111	-0.001077	0.0001338	1410
t-stat	0.454442	1.597224	1.074104	-0.116130	-1.125882		
Intel							
Coefficient	0.001530	0.002098	-0.000084	0.000712	-0.001733	0.0022318	1410
t-stat	1.323797	1.895403	-0.076397	0.640284	-1.548838		
IBM							
Coefficient	0.000715	0.002039	0.000829	-0.000483	-0.001010	0.0060306	1410
t-stat	0.985623	2.934148	1.199042	-0.690957	-1.438303		
Johnson & Johnson							
Coefficient	0.000524	0.000608	0.000730	0.000246	-0.000488	-0.0000846	1410
t-stat	0.920438	1.114072	1.345954	0.448982	-0.884656		
JP Morgan							
Coefficient	-0.000223	0.001709	0.002353	-0.000044	-0.000745	0.0023742	1410
t-stat	-0.204350	1.637283	2.266825	-0.041788	-0.706322		
McDonald's							
Coefficient	0.001667	0.000485	0.000178	0.001644	0.002125	0.0059006	1410
t-stat	1.854779	0.563550	0.207781	1.899836	2.443046		
Merck & Co							
Coefficient	-0.000155	0.000299	0.001243	-0.001097	-0.000032	-0.0016788	1410
t-stat	-0.142542	0.286906	1.199206	-1.047385	-0.030554		
Microsoft							
Coefficient	0.000615	0.000805	0.001171	0.000165	-0.001498	0.0010961	1411
t-stat	0.701783	0.959421	1.403357	0.195084	-1.769869		
P&G							
Coefficient	0.000650	0.000122	0.001579	0.000630	-0.000602	0.0053875	1410
t-stat	1.155445	0.226178	2.946391	1.163987	-1.106497		
United Technologies							
Coefficient	0.000624	0.000726	0.001078	-0.000351	0.001199	0.0010364	1410
t-stat	0.801965	0.974602	1.455351	-0.469029	1.592599		
Wal-Mart							
Coefficient	0.001042	0.001786	0.000340	0.000218	-0.001955	0.0078747	1410
t-stat	1.411648	2.527375	0.483806	0.306887	-2.737607		
Walt Disney							
Coefficient	0.000100	0.001268	0.001357	0.000508	-0.000321	-0.0000073	1410
t-stat	0.109101	1.447040	1.556598	0.576920	-0.362725		

Note: Bold T-statistics indicate statistical significance at the 10% level or higher

TABLE 3: Regression Results - DJIA and 30 Component Stocks (2009 - 2012)

Panel A: DJIA Base Index							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
DJIA							
Coefficient	0.001304	0.000742	0.000662	0.001222	-0.000380	-0.0016700	686
t-stat	1.313580	0.792944	0.710667	0.918250	-0.398618		
Panel B: DJIA Component Stocks							
	Monday	Tuesday	Wednesday	Thursday	Friday	Adj R-squared	Sample Size
3M							
Coefficient	0.001510	-0.000370	0.001358	0.001222	-0.000425	-0.0020180	682
t-stat	1.142796	-0.296339	1.087522	0.971492	-0.333464		
ALCOA							
Coefficient	-0.000220	-0.000310	0.000852	0.001696	-0.000750	-0.0060900	686
t-stat	-0.093964	-0.138288	0.382937	0.751561	-0.326924		
American Express							
Coefficient	0.001647	0.001053	0.002018	0.003178	-0.001590	0.0021380	688
t-stat	0.887894	0.602569	1.154512	1.792779	-0.886261		
AT&T							
Coefficient	0.002641	0.001337	-0.000594	-0.000026	-0.001266	0.0104910	688
t-stat	2.781594	1.493639	-0.663320	-0.028155	-1.379783		
Bank of America							
Coefficient	-0.001180	-0.001820	0.002337	0.003323	-0.003570	0.0002590	688
t-stat	-0.441121	-0.724624	0.927825	1.301090	-1.383002		
Boeing							
Coefficient	0.000266	-0.000660	0.000840	0.002661	0.000303	-0.0024700	688
t-stat	0.159512	-0.418136	0.534371	1.669067	0.188177		
Caterpillar							
Coefficient	0.004178	0.002952	0.000263	0.001398	0.000505	0.0039600	688
t-stat	2.131508	1.598382	0.142607	0.746451	0.266536		
Chevron							
Coefficient	0.001569	0.001794	-0.000500	0.000767	0.000245	-0.0012100	688
t-stat	1.204669	1.461581	-0.408398	0.616451	0.194663		
Cisco							
Coefficient	0.002049	-0.000399	0.001219	-0.000162	-0.001661	-0.0027680	688
t-stat	1.201529	-0.248521	0.758442	-0.099589	-1.007540		
Coca Cola							
Coefficient	0.000066	0.000650	0.001434	0.000398	0.000152	-0.0018620	688
t-stat	0.073879	0.769547	1.692030	0.462919	0.175785		
DuPont							
Coefficient	0.001517	0.001492	0.001231	0.002074	-0.000710	-0.0005200	688
t-stat	0.953161	0.994754	0.820678	1.363780	-0.463127		
Exxon Mobil							
Coefficient	0.001587	0.001358	0.000371	-0.000320	-0.001300	-0.0003300	688
t-stat	1.345016	1.220623	0.333598	-0.281755	-1.137043		
GE							
Coefficient	0.001844	0.000548	0.001479	0.001212	-0.001700	-0.0016000	688
t-stat	1.103708	0.347757	0.939494	0.758806	-1.051864		
Home Depot							
Coefficient	0.000720	0.001973	-0.000072	0.002624	0.000075	0.0029470	688
t-stat	0.541789	1.574763	-0.056782	2.064899	0.058552		
Hewlett Packard							
Coefficient	0.001583	-0.000136	0.000443	-0.000100	-0.003557	0.0004670	688
t-stat	0.904881	-0.082403	0.268589	-0.060079	-2.104321		
IBM							
Coefficient	0.002158	0.000321	0.001320	0.000678	0.000398	0.0016810	688
t-stat	1.969048	0.310564	1.278243	0.647394	0.375413		
Intel							
Coefficient	0.002403	0.001400	0.002361	-0.000160	-0.001530	0.0047270	688
t-stat	1.686582	1.042434	1.758629	-0.114503	-1.114629		
Johnson & Johnson							
Coefficient	0.001168	0.000739	0.000360	0.000472	-0.001370	0.0025690	688
t-stat	1.454561	0.975973	0.476175	0.615414	-1.762989		
JP Morgan							
Coefficient	0.000805	-0.000260	0.002096	0.001328	-0.002050	-0.0027300	688
t-stat	0.409704	-0.137872	1.131482	0.706852	-1.078268		
Kraft							
Coefficient	-0.000314	0.000712	0.000134	0.000976	0.000072	-0.0013690	688
t-stat	-0.327166	0.788064	1.482936	1.064171	0.077700		
McDonald's							
Coefficient	0.001658	0.001285	-0.000205	0.000754	0.000660	0.0032570	688
t-stat	1.863681	1.532868	-0.243925	0.886787	0.767933		
Merck & Co							
Coefficient	0.001213	0.000955	0.000880	0.000279	0.000002	-0.0041130	688
t-stat	0.964049	0.806101	0.742589	0.232840	0.001363		
Microsoft							
Coefficient	0.001934	0.001928	0.000136	0.001344	-0.002132	0.0055690	688
t-stat	1.497254	1.584416	0.111366	1.088343	-1.707893		
P&G							
Coefficient	0.001168	0.000213	-0.000200	0.000601	0.000287	-0.0034100	688
t-stat	1.367305	0.264642	-0.249354	0.736764	0.347782		
Pfizer							
Coefficient	0.002725	0.001673	-0.000054	0.000409	-0.001288	0.0041770	688
t-stat	2.162679	1.408709	-0.045375	0.339461	-1.057671		
Travelers							
Coefficient	0.000541	-0.001117	0.002112	0.001128	-0.000121	-0.0002900	688
t-stat	0.416209	-0.911908	1.723272	0.907479	-0.096156		
United Technologies							
Coefficient	0.001308	0.000335	0.000650	0.001300	-0.000114	-0.0038440	688
t-stat	0.985343	0.267736	0.519181	1.024279	-0.088623		
Verizon							
Coefficient	0.001303	0.001915	-0.000446	0.000279	-0.000780	0.0024290	688
t-stat	1.293214	2.016472	-0.470026	0.289448	-0.801170		
Wal-Mart							
Coefficient	0.000985	0.002409	-0.001097	-0.000150	-0.000811	0.0125820	688
t-stat	1.181135	3.065351	-1.395849	-0.187693	1.006086		
Walt Disney							
Coefficient	-0.000683	0.000208	0.001174	0.002308	0.001268	-0.0010980	688
t-stat	-0.454051	0.146609	0.828477	1.605065	0.872547		

Note: Bold T-statistics indicate statistical significance at the 10% level or higher

Table 2 contains the estimated coefficients and corresponding statistics from the estimation of equation (2) using the data from the 2003 to 2008 sub-period. The results do not provide a great deal of insight into the Monday effect during this period in terms of a stand-alone analysis. Over the tested period, the DJIA does not provide any statistically significant average return for any days of the week with t-statistics ranging from -0.4262 to 1.5918. When shifting the focus of the analysis specifically on the Monday regression results, the data do not provide any further insight into the daily results. Of the DJIA and the 24 component stocks tested for the Monday effect during the 2003 to 2008 time period, only one stock, McDonald's, provides a statistically significant (at 10% or higher) Monday return with a t-statistic of 1.8548. In total, of the 125 total average returns tested (i.e. the DJIA and each of the 24 component stocks for each day of the week), only 15% of the average returns are statistically significant at the 10% level or better.

Table 3 contains the estimated coefficients and corresponding statistics from equation (2) using the data from the 2009 to 2012 sub-period to represent a post-financial crisis area. The findings do not provide any essential insight into the Monday effect during this period in terms of a stand-alone analysis. Over this period, the DJIA does not provide a statistically significant average return for any of the days of the week with t-statistics ranging from -0.3986 to 1.3136. When shifting the focus specifically on the Monday regression results, we do see further insight into the daily results. Of the DJIA and the 24 component stocks tested for the Monday effect during the 2009 to 2012 sub-period, only six of the component stocks provide a statistically significant (at 10% or higher) positive return Monday rather than a negative return. In total, of the 155 total average returns tested (i.e. the DJIA and each of the 30 component stocks for each day of the week), only 11% of the average returns were statistically significant at the 10% level or higher.

To summarize, the data for three time periods are individually tested by conducting a regression analysis on each as separate datasets with the intent of providing insight into the research hypothesis that no difference exists between the DJIA and the stocks that comprise the DJIA as far as the Monday effect is concerned. The results for the first time period, from 1962 to 1982, are conclusive in that the DJIA showed a consistent and strongly negative Monday return. The Monday return of the DJIA during this period is the only day of the week that reports a negative return on average. The results demonstrate a strong correlation between individual stocks that are part of the DJIA with the average itself where 14 of the 19 component stocks are

negative and statistically significant. They also provide statistically significant support for Wednesday and Friday returns of the DJIA being positive on average. The results of the regression analysis for the second and third time periods, 2003 to 2008 and 2009 to 2012, are not consistent with the first time period. More specifically, our findings for the DJIA and its components support earlier research where Monday average returns are no longer statistically significant negative.

V. Summary and Concluding Remarks

We use daily closing values of the DJIA and its components during three time periods of 1962 to 1982, 2003 to 2008, and 2009 to 2012 to investigate the presence of Monday effect in the index and its components. The results of a standard regression analysis for the first time period, from 1962 to 1982, are conclusive. We find strongly negative Monday mean returns for the DJIA during this period. Monday is the only day of the week for which the returns on average are negative. The results for individual stocks that are components of the DJIA are very consistent with those found for the DJIA. Specifically, 14 of the 19 component stocks exhibit negative and statistically significant Monday mean return. The results of the regression analysis for the second and third time periods, from 2003 to 2008 and 2009 to 2012, are not consistent with the first period, and the results are not as clearly overwhelming where Monday average returns are no longer negative at a statistically significant level.

The key findings of this article support prior research of U.S. equity markets which has provided growing evidence to support the possible evolution of the Monday effect. More specifically, this study provides evidence that the Monday effect is disappearing in latter time periods of U.S. equity markets, especially in the case of large cap stocks.

The analysis of the three distinct time periods in the DJIA and its component stocks demonstrates that the Monday effect is no longer significantly present in either a frequently cited market index or a majority of its component stocks. Perhaps, a cautious conclusion of this finding is that the U.S. equity markets are becoming at least weakly efficient.

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