

An Analysis of Day-of-the-Week Effects in the Egyptian Stock Market

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ABSTRACT

This study investigates daily stock market anomalies in the Egyptian stock market using its major stock index, the Capital Market Authority Index (CMA), to shed some light on the degree of market efficiency in an emerging capital market with a four-day trading week. The results indicate that Monday returns in the Egyptian stock market are positive and significant on average, but are not significantly different from returns of the rest of the week. Thus, no evidence was uncovered to support any daily seasonal patterns in the Egyptian stock market, indicating that stock market returns are consistent with the weak form of market efficiency. These results should be interpreted with caution since the Egyptian stock market has only a limited number of stocks that are actively traded.

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I. INTRODUCTION

A large number of studies have documented a day-of-the-week effect and other seasonal anomalies in asset returns in U.S. financial markets. One of these anomalies is the Monday seasonal effect, which typically occurs when asset returns are lower or negative on Mondays relative to other days of the week (see for example French (1980), Gibbons and Hess (1981), Lakonishok and Levi (1982), Smirlock and Starks (1986), Lakonishok and Smidt (1988), Wang, Li and Erickson (1997), Kamara (1997) and Mehdian and Perry (2001)). There are also studies that support the presence of stock return anomalies in international asset markets (see Gultekin and Gultekin (1983), Kim (1989), Jaffe, Westerfield and Ma (1989), Solnik and Basquest (1990), Dubois and Louvet (1996) and Mehdian and Perry (1999)).

The evidence of equity market anomalies contradicts the prediction of the efficient market hypothesis (EMH), at least in its weak form, because the predictable movements in asset prices provide investors with opportunities to generate abnormal returns. In addition, stock market anomalies may result from an inefficient flow of information in financial markets, which is a violation of an underlying assumption of the EMH.

While seasonal effects in advanced equity markets have been investigated extensively, emerging markets have received less attention. In emerging markets, it is possible that the dissemination of information is restricted due to the possible manipulation of financial information by market participants and a lack of strict disclosure requirements imposed by the stock market regulatory agencies. We therefore focus on the stock market in Egypt to test for daily stock market anomalies in a typical emerging market. The Egyptian case is also interesting because it operates on a four-day per week trading cycle, in contrast to the more traditional five-day cycle of developed equity markets.

The objective of this paper is to investigate daily stock market anomalies in the Egyptian stock market using its major stock index, the Capital Market Authority Index (CMA), to shed some light on the degree of market efficiency in an emerging capital market. We examine daily stock market returns from April 26, 1998 to June 6, 2001, the period over which Egyptian equities were consistently traded on a four-day per week basis. The results of the paper indicate that Monday returns in the Egyptian stock market are positive and significant, but are not significantly different from returns of the rest of the week. We uncover no evidence to support the presence of any daily seasonal patterns in the Egyptian stock market, indicating that stock market returns there are consistent with the weak form of market efficiency. The rest of the paper is organized as follows. Section II provides an overview of the Egyptian stock market. The data and methodology employed are described in Section III, and Section IV presents the empirical results. Finally, Section V contains a summary and conclusion.

II. AN OVERVIEW OF THE EGYPTIAN STOCK MARKET

Egypt has a long and rich history of financial markets. By the late 1800s, Egypt had a sophisticated financial structure including a mature stock exchange in both Alexandria and Cairo (Wilson, 1995). The Egyptian stock market has experienced fundamental changes during four major periods from 1888-1958, 1959-1971, 1972-1992, and 1992-present. In the earliest phase, the market was active and growing at a remarkable rate. By the 1940s, both the Cairo and Alexandria exchanges were very active, and the combined Egyptian Stock Exchange ranked fifth in the world in terms of overall market capitalization. However, in the second period from 1959-1971, the Egyptian stock market was seriously marginalized by government intervention and restrictions that left it effectively inoperable (MohieEldin and Sourial, 2000). In the third period (1972-1992), serious attempts were made to revive the failing stock market to no avail, and the stock exchange continued to stagnate. Finally, in the 1990s (the fourth period), the Egyptian stock market went through a significant revival due to government liberalization policies. The restructuring of financial markets and privatization programs were key elements in stimulating economic development and capital investment in the 1990s.

Major changes in the organization of the Egyptian stock exchanges took place in January 1997 that significantly reformed the stock market. Today, the stock market once again encompasses the two exchanges at Cairo and Alexandria, both of which are governed by the same regulatory agency, and share a common trading, clearing and settlement system. Several important steps have been taken by the Egyptian government to modernize the stock exchanges. For example, a coherent organization structure with a clear division of authority and responsibilities has been created, a new state-of-the-art trading, clearing and settlement system conforming to international standards has been installed, new membership and trading rules have been legislated, and new arbitration and dispute resolution procedures were developed.

The Capital Market Authority (CMA) was established in 1990s, as the primary regulatory body for the Egyptian stock exchange and it is responsible for the issuance of licenses to all financial intermediaries including the Central Clearing and Depository Company. The CMA is also responsible for the introduction and revision of any laws and regulations pertaining to the efficiency and transparency of the market. The company Misr Central Clearing and Depository (MCSD) oversees the clearing and settlement of all securities transactions. MCSD is a private company whose primary shareholders are 16 banks, 15 brokerage houses and the stock market exchange itself. Together with the CMA, these two agencies work to guarantee that the market functions efficiently and transparently.

The market capitalization of the Egyptian stock exchange has grown by an average of 40% per year since the 1997 reforms, reaching \$36.7 billion by May 2001. Egypt's recent economic reform, mainly the successful implementation of a large privatization program, is often cited as being largely responsible for the rapid growth in Egyptian stock market activities over the last five years. After the early momentum provided by modernization of the exchanges, privately owned companies are now the most active participants in primary and secondary stock offerings. Of the 1,071

companies listed as of March 2001, over 90 are actively traded. More than 400 companies are classified as closed family corporations, which are listed to qualify for certain tax benefits (AMF, 2001).

The overall performance of the Egyptian stock market is measured by the Capital Market Authority (CMA) Index, which covers all listed companies and is calculated and released daily by the CMA. The Egyptian stock market has been included in the International Finance Corporation's composite stock index since January 1997, with a 1% weighting in the overall index. Furthermore, Morgan Stanley Capital International covers the Egyptian stock market on a standalone basis, although it has not yet included Egypt in its benchmark emerging markets index. See Table 1 for more details and summary statistics.

III. DATA AND METHODOLOGY

The data set used in this paper consists of daily closing values for the major Egyptian stock market index, the CMA Index, from April 26, 1998 to June 6, 2001. Prior to April 1998, stock trading in Egypt took place from Monday to Thursday, and also occasionally on certain Fridays and Sundays, resulting in an irregular pattern of four-day, five-day and six-day trading weeks. The inception date of the sample period was selected here to coincide with the time period when a consistent four-day trading week (Monday through Thursday) was established in April 1998. The daily return for the CMA Index is computed as follows:

$$R_t = \log (I_t / I_{t-1}) \times 100 \quad (1)$$

where R_t is the daily percentage return on the CMA Index on day t , I_t and I_{t-1} are closing values of the stock index on days t and $t-1$ respectively. Panel B of Table 1 displays summary statistics for the Egyptian stock returns calculated using equation (1). To first investigate the day of the week effect we estimate the following regression equation:

$$R_t = \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + \beta_4 D_4 + \varepsilon_t \quad (2)$$

where R_t is the daily return as defined earlier, D_1 through D_4 are dummy variables such that if t is a Monday, then $D_1=1$ and $D_1=0$ for all other days, if t is a Tuesday $D_2 = 1$ and $D_2 = 0$ for all other days, and so forth; ε_t is a random term and β_1 - β_4 are coefficients to be estimated using ordinary least squares (OLS). If the Egyptian stock market exhibits a traditional Monday effect, then a) the estimated coefficient β_1 is expected to be negative and statistically significant and b) Monday returns should also be significantly less than returns during the rest of the week.

Table 1
Summary statistics for the Egyptian stock returns and CMA Index

Panel A							
	1994	1995	1996	1997	1998	1999	2000
Market Capitalization (\$b)	4.3	8.1	14.2	20.9	23.8	32.6	30.8
Market Capitalization (% of GDP)	8%	13%	21%	27%	28%	36%	31%
Number of listed shares	700	746	649	654	874	1,033	1,076
Annual Trading Value (\$m)	741.2	1,115.8	3,179	7,020.2	6,772.2	11,329.3	10,674.1
Annual Volume of Listed Trading (Millions of shares)	29.3	43.7	170.5	286.7	440.3	841.1	952.7
Egyptian Stock Exchange Index	238.4	213.2	296.7	359.9	382.8	624.5	626.16

(Source; Cairo & Alex Stock Exchange Statistical Bulletin, CMA, Reuters), and published in <http://www.sigma-cap.com/wwwhome2/ese.htm>

Panel B. Summary Statistics for Daily Returns from April 1998 to June 2001

Sample Period	April 26, 1998 to June 6, 2001
Observations	620
Mean Return	.07425
Median Return	.03382
Maximum Return	3.2405
Minimum Return	-2.6099
Standard Deviation	0.7620
Skewness	0.4482
Kurtosis	4.6117
Standard Deviation	0.7620

Table 2
OLS results for day-of-the-week effects

Variable	Coefficient	Std. Error	t-Statistic	Probability
Monday	.1394	.0626	2.2244	.026
Tuesday	.0106	.0612	.1739	.861
Wednesday	.0913	.0608	1.5011	.133
Thursday	.0599	.0608	.9851	.325
Chow Test for Structural Stability				
Breakpoint	October 26, 1999			
F-test	.387			
Probability	.817			

IV. EMPIRICAL RESULTS

Equation (2) is estimated for the CMA Index using Ordinary Least Squares and the estimated parameters and related statistics are presented in Table 2. A Chow test indicates that the estimated coefficients reported in Table 2 are structurally stable over the entire sample period. Note that the estimated coefficient for Monday returns is positive and statistically significant (5% level), indicating a positive mean return for Mondays in the Egyptian equity market. This is inconsistent with the results reported in the finance literature for a large number of countries, where significantly lower or negative Monday returns are reported (the traditional Monday effect). Note also that the other coefficients in Table 2 are all positive but none are statistically different from zero.

In order to further investigate the presence of a positive Monday seasonality in the Egyptian equity market, we perform a difference-of-means test of the null hypothesis that the mean return on Monday is equal to the mean return during the rest of the week. As can be seen in Table 3, the difference-of-means test is not statistically significant, indicating that Monday returns are significantly positive, but are not significantly different from the returns during the rest of the week. Therefore, the empirical results do not provide evidence that there is a significant Monday effect in the Egyptian stock market.

Table 3
Monday returns versus returns during the rest of the week

	Mean	Standard Dev.
Returns on Monday	.1394	1.0606
Returns during Rest of Week	.0542	.6426
Difference of Means Test	.92	
Difference of Variance Test	2.72***	

In addition, we note that the standard deviation of Monday returns (1.0606) is higher than the standard deviation during the rest of the week (.6426), and a difference-of-variance test shows that the difference is statistically significant. The significantly positive Monday returns for the CMA Index are consistent with the fact that Monday returns are significantly more volatile than returns during the rest of the week. Taken together, the results in Tables 2 and 3 indicate that a) the Monday effect, to the extent that it exists in the Egyptian stock market, should not be considered a stock market anomaly and b) Egyptian stock market returns are consistent with the weak form of the EMH.

Following the intra-month approach of Wang, Li and Erickson (1997), we further examine the nature of significantly positive Monday returns in the Egyptian

equity market. Specifically, we investigate whether the positive Monday returns are caused by returns in the fourth and fifth weeks of the month, as Wang, Li and Erickson find in the U.S. stock market. In order to achieve this, Monday returns are first sorted by the five weeks of the month. We then divide the returns into Monday returns during the first three weeks of the month and Monday returns during the last two weeks of the month, and perform a difference-of-means test of the null hypothesis that Monday returns are equal in the two separate intra-month periods. The results of this investigation are presented in Table 4. As can be seen, the mean return during the first three weeks is higher than the mean return during the last two weeks, but this difference is not statistically significant (t-statistic = 1.17). These results suggest that the significantly positive Monday returns for the CMA Index are not caused by the returns during the last two weeks of the month, as Wang et al. find for the U.S. market, providing further evidence of at least a weak-form efficient stock market in Egypt.

Table 4
Monday returns by week of the month

	First 3 weeks	Last 2 weeks	Difference in two Periods
Mean	.2327	.0266	t-stat = 1.17
Standard Dev.	1.0472	1.0735	

V. SUMMARY AND CONCLUSIONS

In this paper we examine daily returns for the CMA Index from 1998-2001 to test for the Monday effect in the Egyptian equity market. The Egyptian stock market provides a unique opportunity to test for seasonal anomalies in an emerging and recently modernized stock exchange where trading takes place on a four-day week basis (Monday through Thursday) as opposed to the more traditional five-day week. The empirical results indicate that while Monday stock returns are significantly positive, they are not significantly different from returns during the rest of the week. Furthermore, Monday returns are significantly more volatile than returns from Tuesday to Thursday. Hence, the significantly positive returns on Monday are associated with returns that are more risky.

In addition, an intra-month return analysis provides evidence to indicate that the significantly positive Monday returns are not caused by higher returns during the last two weeks of the month, as Wang, Li and Erickson have found for the U.S. stock market. The overall implication of this study suggests that the emerging Egyptian market is at least weakly efficient. Therefore, no specific trading rule can be exploited to generate abnormal stock returns in the Egyptian stock market.

Finally, it is important to note that Egypt, like other emerging equity markets has an immature capital market. Thus, the results presented here should be interpreted

cautiously since the Egyptian stock market has a limited number (about 100) of stocks that are actively traded among the 1,071 listed stocks.

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