

**IS THERE A SEMI-MONTHLY EFFECT
IN THE TURKISH STOCK MARKET?**

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Abstract

The primary objective of this paper is to investigate semi-monthly effects, if any, in an emerging stock market of a developing country, namely Turkey. Unlike the previous research reporting evidence in support of such calendar effects as day of the week, month of the year and holiday in the Turkish stock market, the empirical results of the present paper verify that there do not exist semi-monthly effects in the Ystanbul Securities Exchange Composite Index (YSECI) return data for the period January 1988 to June 1995. If individual years are investigated separately, the paper reports a significant semi-monthly effect only in 1994. These results imply that international diversification pays. This is of particular importance to foreign investors who already full access to the Turkish stock market and hold approximately 25 percent of total tradable shares in Turkey.

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Key words: Semi-monthly effects, Turkish stock market.

JEL Classification: G12, G14.

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I. INTRODUCTION

Seasonal patterns or calendar effects in stock prices have been of great importance to financial scholars and practitioners. These effects or anomalies have been regarded as strong evidence against efficient market hypothesis in financial economics. The literature of this field has presented voluminous evidence in support of such calendar anomalies as day of the week, month of the year, turn of the month, holiday, and intraday effects.¹ This paper concentrates on semi-monthly effects which have been less investigated compared to the other anomalies in the literature.

The first empirical evidence for semi-monthly or intra-month effects, to our knowledge, is due to Ariel (1987) who reports that in the USA stocks appear to earn positive average returns only around the beginning and during the first half of calendar months, and zero average returns during the second half. Penman's (1987) work suggests that a reason for this anomaly may be a tendency of firms to announce good news during the first half of the month and bad news during the second half. Jaffe and Westerfield (1989) find a similar pattern for Australia but not for Japan, Canada and the U.K. Lakonishok and Smidt (1988) report that, on average, in the USA, the cumulative returns over the four day period from the last trading day of the month to the third trading day of the following month exceed the return over the entire month. In their work, this pattern is attributable to seasonalities in cash flows of individuals and institutions. Cadsby and Ratner (1992) investigate turn of the month effects in ten countries. Agrawal and Tandon (1994) investigate monthly effects for stock markets in eighteen countries other than the USA.

Much of the evidence concerning monthly anomalies like the others has been from developed stock markets. However, there has been considerable increase in the number of studies concerning stock markets in developing countries since these markets have attracted great attention in worldwide investment community. Among these so-called emerging markets, the Turkish exchange has been one of the most rapidly growing ones.

There has been little published work on the Turkish stock market in national and international literature. Previous research has investigated day of the week, month of the year and holiday effects in the Ystanbul Securities Exchange (YSE).² Balaban (1995a,b) reports that day of the week effects exist in the Ystanbul Securities Exchange (YSECI) return data for the period January 1988 to August 1994 although the magnitude and direction of these effects change through time. Balaban (1995c) finds that there exist month of the year effects in the YSE for the period January 1988 to December 1993. January, June and September have large and positive returns. These month of the year effects are explained by asymmetric information among traders. Balaban and Candemir (1995a) report the existence of holiday effects in the Turkish stock market. Murado?lu and Oktay (1993) also provide evidence in support of calendar anomalies.

This paper primarily aims to investigate semi-monthly effects, if any, in the Turkish stock market for the period January 1988 to June 1995. To our best knowledge, this is a first effort to focus on intra-month effects in the YSE. In addition, we are not aware of any other internationally published studies concerning intramonth effects in emerging markets except Agrawal and Tandon (1994), Cadsby and Ratner (1992) and Wong (1995). The first study employs data from such developing markets as Brazil, Hong Kong, Mexico, New Zealand and Singapore. The second investigates the Hong Kong market. The last one focuses on Singapore, Malaysia, Hong Kong, Taiwan and Thailand markets.

II. DATA AND METHODOLOGY

Daily observations of the YSECI obtained from the data base at the Central Bank of the Republic of Turkey range between January 4, 1988 and June 30, 1995. YSECI is a weighted index using closing prices of stocks. It is calculated and announced by the YSE. Daily percentage returns on the YSECI that amount to 1,873 observations are calculated as follows:

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

where I_t and R_t denote the index number and return on day t , respectively. Mean, median, standard deviation and coefficient of variation for each half of calendar months are calculated. The usual t -test is employed for the equality of the means of two halves. Variance ratio is also reported for comparison.

The following ordinary least squares (OLS) regression with a binary dummy variable is run to test the equality of mean returns across halves of calendar months:

$$R_t = \beta_1 + \beta_2 D_{2t} + \varepsilon_t \quad (2)$$

where $D_{2t} = 1$ if day t is in the second half of a calendar month (exclusive of the fifteenth day of a month), and 0 otherwise. β_2 is a parameter, and ε_t is an error term. The estimate of β_1 is the sample mean corresponding to the first half of calendar months. The estimate of β_2 is equal to the difference between the sample means of the first and second halves of calendar months. The standard OLS assumptions apply. The null hypothesis to be tested is:

$$\beta_2 = 0 \quad (3)$$

Note that this procedure is equivalent to regressing the returns on two dummy variables, with no constant, and testing for the equality of two parameters. The above regression is also repeated for each year to check whether the reported results change across years.

III. EMPIRICAL RESULTS

Descriptive statistics for the first and second halves of calendar months for the period January 1988 to June 1995 is provided in *Table 1*. For the first half of calendar months, mean daily return is about 0.37% and significant at the 1% level. Mean daily return in the second half is about 0.17% and significant at the 5% level. There seems no difference between the variances of two samples. Before any formal tests are performed, it is expected that those mean daily returns with equal variances should differ from each other since the mean return in the first half is more than twice greater than that in the second one. Although not reported in a table to save space, the usual t -test cannot reject the null of equality of mean returns across these halves. The result is significant only at the 15.5% level. In addition, variance ratio between the first and second halves is 1.0053.

Table 1. Summary Statistics: 1988-95

	First Half	Second Half	All days
Observations	931	942	1,873
Mean	0.372 ***	0.174 *	0.273 ***
Median	0.215 **	0.075	0.138 **
Standard deviation	3.028	3.020	3.025
Coefficient of variation	8.12	17.38	11.10

All figures except observations and coefficient of variation are in

percentages. ***, ** and * indicate statistical significance at the 1%, 5%

and 10% levels, respectively.

The regression results for each year as well as the whole period are given in *Table 2*. For the period January 1988 to June 1995, the null of equality of mean daily returns across halves of calendar months cannot be rejected at the 10% level or better. The overall regression is significant at the 17.4% level and F -ratio is 1.843 (not reported in the table). The estimate of the sample mean daily return of the first half is positive and differs from zero at the 1% level.

Mean daily return for the first half is undistinguishable from zero in 1990, 1991 and 1992. The estimate of β_2 is significant only for 1994 (at the 1% level). In this year, mean daily return for the first half is significantly greater than that for the second half. R_2 is 4.3% and F -ratio is 11.305 (not reported in the table). A similar observation is valid for 1995 at the 12.5% level.

Table 2. Regression Results

$$R_t = \beta_1 + \beta_2 D_{2t} + \varepsilon_t$$

Estimate (10-3) Standard error (10-3) t -value

1988

$$\beta_1 -3.530^* 2.136 -1.653$$

$$\beta_2 2.954 3.052 0.968$$

1989

$$\beta_1 8.751^{***} 2.640 3.314$$

$$\beta_2 -2.327 3.698 -0.629$$

1990

$$\beta_1 1.583 3.189 0.497$$

$$\beta_2 4.780 4.482 0.107$$

1991

$$\beta_1 0.796 3.062 0.260$$

$$\beta_2 2.410 4.459 0.541$$

1992

$$\beta_1 1.270 2.033 0.625$$

$$\beta_2 -2.451 2.836 -0.864$$

1993

$$\beta_1 5.480^{**} 2.389 2.294$$

$$\beta_2 3.484 3.406 1.023$$

1994

$$\beta_1 9.085^{***} 3.175 2.861$$

$$\beta_2 -15.129^{***} 4.500 -3.362$$

1995

$$\beta_1 8.914^{**} 3.481 2.561$$

β_2 -7.391 4.788 -1.544

1988-95

β_1 3.677 ** 0.988 3.720

β_2 -1.897 1.397 -1.358

***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

IV. DISCUSSION AND FURTHER RESEARCH

Unlike the previous research reporting day of the week, month of the year and holiday effects in the Turkish stock market, the empirical results of this paper verify that there do *not* exist semi-monthly or intra-month effects in the YSECI return data for the period January 1988 to June 1995. If individual years are investigated separately, the paper reports a significant semi-monthly effect only in 1994. Similar results were obtained for the other countries. For example, Cadsby and Ratner (1992) report no turn of the month effect in Japan, Hong Kong, Italy and France. Agrawal and Tandon (1994) cannot find any turn of the month effects in eight of eighteen countries they investigate. Wong (1995) shows that intra-month effects are almost non-existent in the stock markets of Singapore, Malaysia, Hong Kong, Taiwan and Thailand.

The empirical results *imply* that aggregate stock returns in Turkey appear to be generated by *different* factors compared to those in the developed markets where semi-monthly effects have been present in almost all. Therefore, international portfolio diversification *works*.³ This is of particular importance to foreign investors who already full access to the Turkish stock market and hold approximately 25 percent of total tradable shares in Turkey. We believe that this point is more appealing in recent times than ever before thanks to the Customs Union Agreement which has become effective between Turkey and the European Community on January 1, 1996.⁴

Further research can and should be constructed to investigate *day of the month effects*, if any. Once these daily results are obtained, turn of the month effects can be investigated in a similar way followed by Cadsby and Ratner (1992) and Agrawal and Tandon (1994), among others. It should be noted that the turn of the month effect can occur over a *different sequence* of days in the Turkish stock market as pointed out by Ziemba (1989) for Japan.

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