Stock Return and Trading Volume Distribution across the Day-of-the-week: Evidence from the Japanese Stock Market

Abderrazak DHAOUI
Department of Econometrics and Finance
University of Sousse –Tunisia
Faculty of Economic Sciences and Management
abderrazak.dhaoui@yahoo.fr

Ramzi FARHANI
Department of Economics
University of Sousse –Tunisia
Faculty of Economic Sciences and Management
ramzy.farhani@gmail.com

Riadh GARFATTA
Department of Econometrics and Finance
University of Sousse –Tunisia
Faculty of Economic Sciences and Management
garfatta_riadh@yahoo.fr

ABSTRACT

In this paper, we examine the behavior of stock returns and trading volume across the-day-of-the-week in the context of the Japanese Market. Several hypotheses are used to explain the day-of-the-week effect. Results indicate that Mondays have abnormal losses and low trading volume. Over other days the returns and the trading volume increase significantly once the market thickens, prices become more informative and the information effect diminishes. Our results do not support the outliers' hypothesis, the half-of-the-month hypothesis and the autocorrelation hypothesis. They are, however, consistent with the adverse selection and the overconfidence hypotheses.

***JEL Codes**: G1, G14.*

KEYWORDS

Stock Return, Trading Volume, Day-of-the-week, half-of-the-month, overconfidence, Japanese market.

ARTICLE HISTORY

Submitted: 21 June 2011
Resubmitted: 27 September 2011
Resubmitted: 4 October 2011
Accepted:16 November 2011

Introduction

Earlier studies on financial framework support widely the efficient market hypothesis of which one implication "*is that the expected returns on assets should be evenly distributed across the days, weeks, months, years, or any other unit of time*" (Tripathy, 2010). However, observations in the international market context (see Cross (1973) and French (1980) for the US market, Jaffe and Westerfield (1985) for the Japanese and the Australian markets, Syed and Sadorsky, 2006 for the context of emerging markets, Agathee (2008) for the Mauritius market, Ulussever, Guranyumusak and Kar (2011) for the Saudi Arabian market) show that significant variances in assets returns are associated with the unit of time. The day-of-the-week effect is especially common and can be observed in the majority of the aforementioned markets. This specific anomaly constitutes one of several arguments opposing the efficient market hypothesis.

Several hypotheses are given in theoretical and empirical studies to explain the day-of-the-week influence on stock returns and on trading volume. However, in spite of the importance of these hypotheses, the investor's sentiment plays a pivotal role in the decision process. Overconfidence particularly leads investors with greater information to make aggressive decisions and to increase their trading volume on Mondays since they overestimate their knowledge and their judgment skills and underestimate public information and the skills of those with less information. On the contrary, these latter act in a more rational way and delay trades until the market thickens and prices become more informative. Consequently, operations end with abnormal losses and trading volume decreases on Mondays.

The aim of this paper is to investigate the day-of-the-week effect on the stock return in the context of the Japanese market. We chose the specific case of the Japanese market since the Asian population is the most exposed to the overconfidence bias[1]. Different hypotheses, of which the overconfidence hypothesis is one, are examined to explain the day-of-the-week influence on stock returns and trading volume. In this vein, one question that could have greater importance is:

What explains the influence of the day-of-the-week effect on stock returns and trading volume?

To find some response to this question we used a sample including returns and trading volume of the Nikkei 225 index over the period from June 06, 2002 to Mai 10, 2011. Results show that stock returns and trading volume diminish dramatically

on Mondays and increase abnormally over the other days. Results do not support in any special way the *outliers'* hypothesis, the half-of-the-month hypothesis and the autocorrelation hypothesis. They are, however, consistent with the adverse selection and the overconfidence hypotheses.

The remainder of the paper proceeds as follows. Section 1 presents the literature review on the day-of-the-week influence on the stock returns and gives theoretical explanations. Section 2 summarizes the relationship between the investor's sentiment and the distribution of returns and trading volume. Section 3 provides the sources of the data and a sample selection as well as estimated models. Section 4 contains empirical results. Concluding remarks are provided in the last section.

The day-of-the-week effect on return and trading volume

Earlier studies concerning major international markets show that returns on assets and trading volume are not evenly distributed across days, weeks, months or years. This report is not consistent with the implication of the efficient market hypothesis. In this vein, Foster and Viswanathan (1993) show that in the context of the US market Mondays have abnormal losses, high return volatility and low trading volume.

Mondays' abnormal losses can also be seen in different international markets. Particularly, empirical studies show that Mondays have abnormally low returns and Fridays have significantly high returns (see Lakonishok and Smidt (1988) for the Dow Jones Industrial Average for the period from 1887 to 1986, Keim and Stambaugh (1984) for the S&P500 returns for the period from 1928 to 1982, Schwert (1990) using different sources for the period from 1802 to 1987).

Several other authors find that the lowest average returns are observed on Tuesdays (Solnik and Bousqet (1990) in the French stock market, Athanassakos and Robinson (1994) in the Canadian market). Similar results are found in the context of Asian countries (Aggarwal and Rivoli (1989) in the stock markets of Hong Kong, Malaysia and Philippines, Wong, Hui and Chan (1992) in the markets of Singapore, Malaysia, Hong Kong, and Thailand, or Kim (1988) in the stock markets of Japan and Korea).

Tuesdays' low returns are observed also on the Istanbul stock exchange (Balaban, 1995; Bildik, 1997), and several other stock markets such as those of Australia,

Hong Kong, Japan, Korea, Malaysia, New Zealand, Philippine, Singapore, Taiwan and Thailand (Ho, 1990). The same results are observed in Wong et *al.* (1992) in the context of the markets of Singapore, Malaysia, Hong Kong and Thailand or in Dubois and Louvert (1996) for the stock markets of Japan and Australia.

For the Turkish stock market, Balaban (1995) investigated the day-of-the-week effect over a period dating from January 1988 to August 1994. Results show that Fridays have high returns and low standard deviations. The day with second highest return and second lowest standard deviation is Wednesday. Low returns are, oppositely, observed on Tuesday and high standard deviations on Mondays.

Kiymaz and Berument (2003) examined the trading volume in the Japan, the United Kingdom and the United States. They found that trading volume on Mondays and Fridays is on average lower than on other days.

Several hypotheses are used to explain the variability in stock return across the days the week. Theoretical and empirical studies argue, first of all, that low returns on Mondays are due to isolated rare events that can be detected using a robust regression test (see Conolly, 1989). This hypothesis is known as the *outliers'* hypothesis.

Moreover, authors Wang, Li and Erickson (1997) distinguish between days of the first and of the latter half of the month. They consider that the day-of-the-week effect on the stock return changes according to whether the day comes in the first or the latter half of the month. Mondays' low returns are observed especially in the latter half-of-the-month. This hypothesis is known as the latter-half-of-the-month hypothesis.

Theoretical and empirical studies argue also that abnormal losses are linked to the frequency of short sales. They document, moreover, that short sales are more frequently observed on Mondays. In this sense, Chen and Signal (2003) have documented that "*Monday losses are caused, at least in part, by short sellers unwinding short positions prior to the weekend and reestablishing short positions on Monday*"[2]. These authors find in the US market particularly that Monday losses and Friday abnormal returns increase significantly when stocks have greater short interest.

Moreover several authors such as Bessembinder and Hertzel (1993) have documented that the autocorrelation between Monday's return with the prior Friday's return has been unusually higher for several decades. This hypothesis is widely confirmed in empirical studies. Particularly, Boynton, Oppenheimer and Reid (2009) find in the Japanese market that Mondays have higher AR (1) than other days of the week.

Investors' sentiment, returns and trading volume

On the other hand and in the same vein of explanation as the day-of-the-week influence on stock returns, several studies deal with the relationship between stock returns and the trading volume. A point of view commonly shared in financial literature is that there exists a positive correlation between trading volume and prior stock returns.

Researches in behavior economics and behavioral finance provide some explanation for this relation. Authors argue that an investor's sentiment plays a pivotal role in the stock market. Sentiment beliefs particularly influence the decision process. In this sense, Chuang, Ouyang and Lo (2010) argue that "*investors have a tendency to adjust their beliefs to the most recent data and to make decisions based on information they have at the present time. They also extrapolate past experiences into future"*.

Investors increase their trading volume when they consider companies to be good investments. Oppositely, they stop trading when they foresee companies as bad investments. In this way, past trading volume reflects the investors' expectations. According to Chuang et al (2010), "*investors would buy securities with good prospects. If more and more investors extrapolate good news into future, they tend to overvalue these firms and to invest in them. Their irrational beliefs thus increase trading volume."*

These authors also examined the effect of investor sentiment on stock prices in the specific context of the Taiwanese stock market. They found that investors usually observe past trading volume to make future investment decisions. Considering this result, trading volume can be used as a proxy for measuring investors' expectations.

In the same line, several authors such as Lee and Swaminathan (2000) have documented that not only return but also trading volumes are influenced by investor expectations. Behavioral theory argues, especially, that more informed investors are more exposed to the overconfidence bias than less informed ones. They overestimate the precision of their private information and their skills and underestimate public information and the skills of less informed investors. Consequently, they trade irrationally and their irrational trading can lead to abnormal variability in trading volume and consequently on returns. In this vein, "*many empirical results show that the irrational investor behavior not only exist in the stock market but also has significant influences on the formation of prices"* (Chuang et al., 2010).

Taken together these arguments indicate that investors' sentiments, especially

overconfidence, play a pivotal role in the decision process. They lead investors to make irrational and aggressive decisions thus increasing trading volume. Since less informed investor expects this irrational behavior they delay trading, which dramatically influences the result of the operation.

Data and methodology

The data we used includes daily returns and trading volume on the "*Nikkei 225"* index over the period from June 06, 2002 to May 10, 2011. We include all data corresponding to every trading day. Final sample includes 2176 daily observations.

In order to investigate the influence of the day-of-the-week on the stock returns we regress returns on each of the day of the week. The estimated equation is:

$$R_t = \alpha_0 + \sum_{i=1}^{N} \alpha_i d_i + \varepsilon_t \qquad (1)$$

with i = 1, …, 5 (1 : Monday, 2 : Tuesday, 3 : Wednesday, 4 : Thursday, 5 : Friday).

$R_t = \left[\ln(I_{[N]t}) - \ln(I_{[N](t-1)}) \right] \times 100$ with I_N : the Nikkei Index.

ε_t : is the error term.

To investigate the effect of the day of the week on trading volume, we regress this latter on each of the day of the week. The estimated equation is:

$$V_t = \alpha_0 + \sum_{i=1}^{N} \alpha_i d_i + \varepsilon_t \qquad (2)$$

With: V_t: the logarithm of the daily trading volume.

We estimate, first of all, both equation (1) and equation (2) using the whole of the data with daily classification and half-of-the-month classification. This allows us to test the latter-half-of-the-month hypothesis. To test the *outliers'* hypothesis we use, in a second step, robust regression for the two equations.

The test for the short-sales hypothesis will be, however, withdrawn since there is no short-sale interest in the Japan.

In the third step we test the autocorrelation hypothesis. In order to do this, we

investigate the relation below:

$$R_t = \alpha + \beta_t R_{(t-1)} + \varepsilon_t \qquad (3)$$

With $R_{t:}$ the return in the day t.

Equation 3 can be presented as follow:

$$\begin{bmatrix} R_{Mo(t)} \\ R_{Tu(t)} \\ R_{We(t)} \\ R_{Th(t)} \\ R_{Fr(t)} \end{bmatrix} = \begin{bmatrix} \alpha_{Fr(0)} & \beta_{Fr(t)} \\ \alpha_{Mo(0)} & \beta_{Mo(t)} \\ \alpha_{Tu(0)} & \beta_{Tu(t)} \\ \alpha_{We(0)} & \beta_{We(t)} \\ \alpha_{Th(0)} & \beta_{Th(t)} \end{bmatrix} \times \begin{bmatrix} R_{Fr(t-1)} \\ R_{Mo(t-1)} \\ R_{Tu(t-1)} \\ R_{We(t-1)} \\ R_{Th(t-1)} \end{bmatrix} + \begin{bmatrix} \varepsilon_{Fr(t)} \\ \varepsilon_{Mo(t)} \\ \varepsilon_{Tu(t)} \\ \varepsilon_{We(t)} \\ \varepsilon_{Th(t)} \end{bmatrix}$$

With: Mo : Monday, Tu : Tuesday, We : Wednesday, Th : Thursday, Fr : Friday.

We test, in the final stage, the adverse selection and the investor's sentiment hypothesis (investor's beliefs and overconfidence sentiment). We investigate, especially, the impact of investors' beliefs on the variability of trading volume across the days of the week. Using the return in the day (t-1) as a proxy, we regress trading volume across every day (t) on the return of the day (t-1). The estimated equation is:

$$V_t = \alpha + \beta_t R_{(t-1)} + \varepsilon_t \qquad (4)$$

With V_t : the trading volume in the day t.

Equation (4) can be presented as follow:

$$\begin{bmatrix} V_{Mo(t)} \\ V_{Tu(t)} \\ V_{We(t)} \\ V_{Th(t)} \\ V_{Fr(t)} \end{bmatrix} = \begin{bmatrix} \alpha_{Fr(0)} & \beta_{Fr(t)} \\ \alpha_{Mo(0)} & \beta_{Mo(t)} \\ \alpha_{Tu(0)} & \beta_{Tu(t)} \\ \alpha_{We(0)} & \beta_{We(t)} \\ \alpha_{Th(0)} & \beta_{Th(t)} \end{bmatrix} \times \begin{bmatrix} R_{Fr(t-1)} \\ R_{Mo(t-1)} \\ R_{Tu(t-1)} \\ R_{We(t-1)} \\ R_{Th(t-1)} \end{bmatrix} + \begin{bmatrix} \varepsilon_{Fr(t)} \\ \varepsilon_{Mo(t)} \\ \varepsilon_{Tu(t)} \\ \varepsilon_{We(t)} \\ \varepsilon_{Th(t)} \end{bmatrix}$$

With: Mo : Monday, Tu : Tuesday, We : Wednesday, Th : Thursday, Fr : Friday.

Results and discussion

Figures 1 to 5 show the time series of day-of-the-week Return Distribution. The X-axis gives the time series (day of the week over the analysis period). The Y-axis gives, however, the distribution of the returns on the day of the week across the time.

Figure 1. Monday Return Distribution

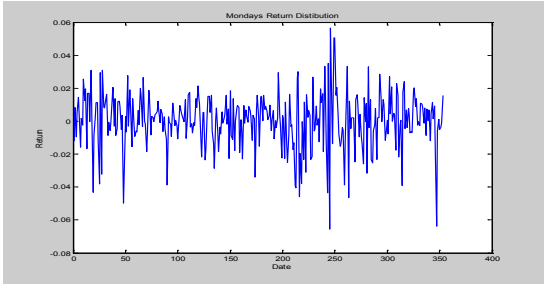


Figure 2. Tuesday Return Distribution

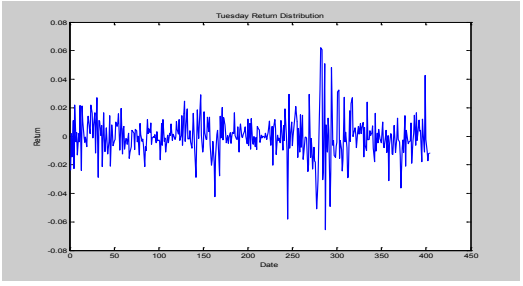


Figure 3. Monday Return Distribution

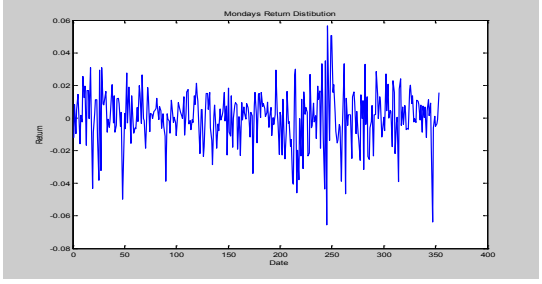


Figure 4. Tuesday Return Distribution

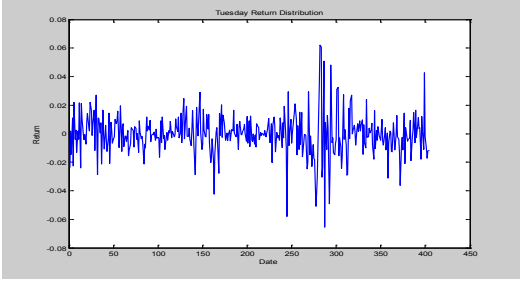
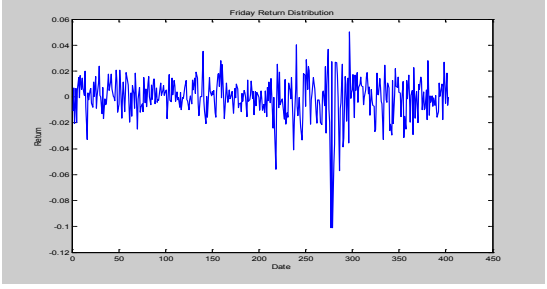


Figure 5. Friday Return Distribution



Figures 1 to 5 show that the volatility of stock returns changes significantly over the days of the week. The volatility is very high on Mondays and becomes much lower on Thursdays. Moderate volatility is observed on Tuesdays, Wednesdays and Fridays. High volatility across all days is observed during the period from December 2007 to October 2008.

Figures 6 to 10 present the time series of Trading Volume by day of the week respectively, starting from Monday until Friday. The X-axis gives the time series evolution. The Y-axis gives the distribution of the trading volume across the days of the week from January 2002 to March 2011.

Figure 6. Monday Trading Volume Distribution

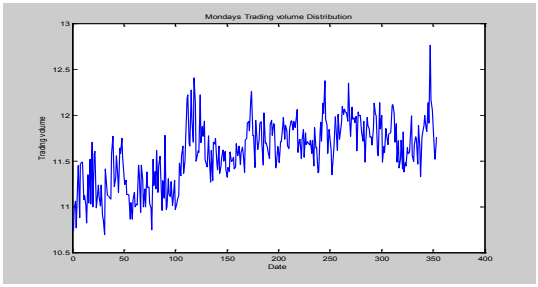


Figure 7. Tuesday Trading Volume Distribution

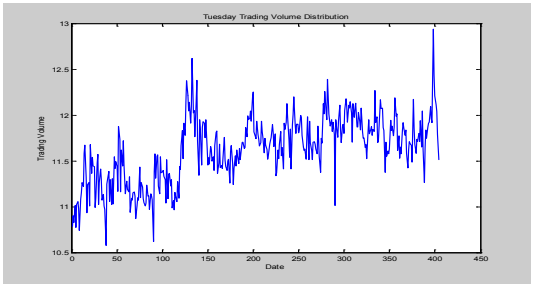


Figure 8. Wednesday Trading Volume Distribution

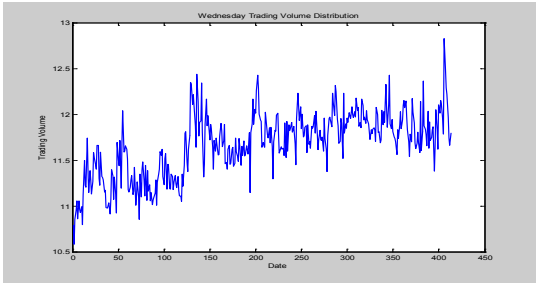


Figure 9. Thursday Trading Volume Distribution

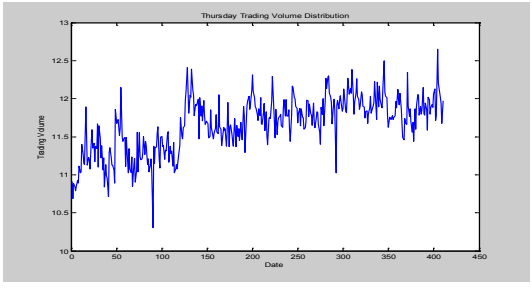
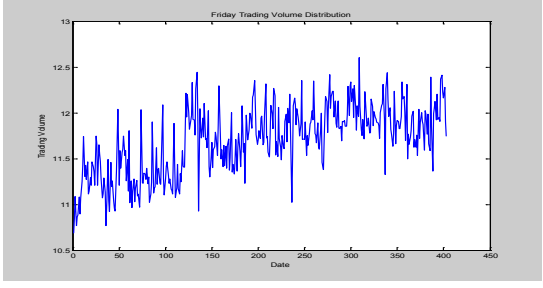


Figure 10. Friday Trading Volume Distribution



Figures 6 to 10 show that the volatility of the trading volume changes significantly over the course of the week. Trading volume volatility is very high on Fridays and then on Tuesdays and Mondays. Thursdays have, however, lower volatility of trading volume.

Taken together, these results indicate that both stock return volatility and trading volume volatility remain lower on Tuesdays. Over the other days, the volatility of both returns and trading volume changes dramatically.

Table 1 presents results for the regression of the return on the day of the week.

Table 1. Day-of-the-week Returns regression (overall, first and latter half-of-the-month)

Variables	Returns		
	Overall	First half-of-the-month	Latter half-of-the-month
Mo	-0,001039 (-1,84)*	-0,0010162 (-3,07)**	-0,0007256 (-1,81)*
Tu	-0,004554 (-1,24)ns	-0,0002864 (-1,54)ns	-0,0005789 (-1,74)*
We	-0,002016 (-0,857)ns	-0,0008466 (-0,83)ns	0,0003819 (1,67)*
Th	0,004116 (1,73)*	-0,001614 (-1,54)ns	0,0027343 (1,97)*
Fr	0,007390 (2,17)**	0,0013137 (1,68)*	0,0003445 (2,86) ***
Cons_	0,000944 (6,49)***	0,0004478 (4,18)***	-0,0004353 (-1,42)ns
R-Square	0,2796	0,3871	0,1367
Adjusted R-Square	0,2782	0,3859	0,1351

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Results in table 1 indicate a significant negative effect of Mondays on stock returns $(\alpha_{Mo} = -0,001039; t_{Mo} = -1,84)$. On the other hand, Thursdays and Fridays have significantly positive effects $(\alpha_{Th} = 0,004116; t_{Th} = 1,73 \, and \, \alpha_{Fr} = 0,007390; t_{Th} = 2,17)$. Tuesdays and Wednesdays have non-significant effects on stock returns. This indicates that stock returns are not evenly distributed across the days of the week. They are consistent with the results observed in several international markets such as those of French (1980), Aggrawal and Rivoli (1989) Barbee, Jeong and Mukherji (2008) Tripathy (2010) and Ulussever et al. (2011) according to which the average return on Mondays is significantly less than the average of the other days of the week.

Considering the half-of-the-month classification, results remain similar whether the days are in the first or the last half of the month. Whichever the half of the month,

returns decrease significantly on Mondays and increase abnormally starting from Thursdays. Fridays have a higher positive effect on the stock returns. Abnormal losses are especially observed on Mondays during the first half of the month. Similarly, higher Friday returns are observed during the first half of the month. These results are not consistent with the latter-half-of the-month hypothesis according to which Mondays' abnormal losses are shown in the latter half of the month.

Table 2 presents results for the regression of the trading volume on the day-of-the-week.

Table 2. Day-of-the-week Trading volume regression (overall, first and latter half-of-the-month

Variables	Trading volume (ln)		
	Overall	First half-of-the-month	Latter half-of-the-month
Mo	-0,115013 (-1,93)*	-0,1435844 (-2,84)***	-0,0906864 (-1,94)*
Tu	0,0623029 (1,84)**	0,0831203 (1,73)*	0,0442832 (1,94)*
We	0,1163678 (1,63)ns	0,1319225 (1,86)*	0,1035988 (1,27)ns
Th	0,1180755 (2,16) **	0,1251352 (1,98)*	0,1120267 (2,48)**
Fr	0,1631291 (1,98)**	0,2343976 (1,84)*	0,1019931 (3,17)***
Cons_	0,390471 (3,17)***	1,433481 (2,96)***	1,263122 (2,83)***
R-Square	0,3851	0,4408	0,2642
Adjusted R-Square	0,3839	0,4397	0,2628

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Results in table 2 indicate that trading volume decreases abnormally on Mondays and increase significantly over the other days. Higher effects of the day of the week on trading volume are, however, observed on Fridays. These results are consistent with the adverse selection hypothesis. In this sense, individual investors expect that on Mondays institutional investors, as more informed investors, have greater information and will exploit their information advantage in trades. Consequently, they (i.e. individual investors) postpone trades as a best strategy until the market thickens and the prices become more informative. The delay of trade induces a decrease in trading volume on Mondays. Starting from Tuesday, the information effect diminishes and prices start to become more informative. Consequently both institutional and individual investors trade together which induces an increase in trading volume.

Results for the robust regressions of returns and trading volume on the day of the week are given in table 3.

Table 3. Return distribution and trading volume (Robust regression)

Variables	Return Distribution (robust regression)	Trading Volume Distribution (robust regression)
Mo	-0,0000944 (1,74)*	-0,1150134 (-2,37)**
Tu	-0,0004554 (-1,14)ns	0,0623029 (1,62)ns
We	-0,0002016 (-1,48)ns	0,1163678 (1,19)ns
Th	0,0007116 (1,36)ns	0,1180755 (2,08)*
Fr	0,000439 (2,58)**	0,1631291 (2,36)*
Cons_	-0,0001039 (3,17)***	1,27545 (4,12)***
R-Square	0,1207	0,1738
Root MSE	0,01623	2.3847

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Results in table 3 indicate the persistence of low returns on Mondays even using a robust regression test. These results challenge the *outliers* hypothesis according to which low returns on Mondays are due to isolated rare events that can be detected using a robust regression test.

Taken together, results associated with the latter-half-of-the-month and with the *outliers* hypothesis are consistent with those of Boynton et al (2009), who did not confirm the two hypotheses.

Table 4 presents results associated with the autocorrelation hypothesis and those testing the effect of the investors' expectation on returns and on trading volume.

Table 4. Results on autocorrelation and overconfidance hypothesis tests

Model (Days relation)	N	Endogenous Variable	Exogenous Variables	T-statistic	R-squared Adj. R-squared
Tu/Mo	257	$R_{Tu(t)}$	$R_{Mo(t-1)}$ = -0,1137036 Cons_ = -0,0004668	-2,42 (0.016)*** -0,66 (0.513)ns	R^2 =0,2204 Adj. R^2 = 0,2141
		$V_{Tu(t)}$	$R_{Mo(t-1)}$ = -0,12992 Cons_ = 2,50003	-1,74 (0.083)* 7,36 (0.000)***	R^2 = 0,1174 Adj. R^2 = 0,1103
We/Tu	434	$R_{We(t)}$	$R_{Tu(t-1)}$ = -0,0186290 Cons_ = -0,0001872	-0,43 (0.667)ns -0,26 (0.798)ns	R^2 = 0,0814 Adj. R^2 = -0,0771
		$V_{We(t)}$	$R_{Tu(t-1)}$ = 0,3085539 Cons_ = 2,40007	0,05 (0.964)** 8,10 (0.000)***	R^2 = 0,1623 Adj. R^2 = 0,1584
Th/We	439	$R_{Th(t)}$	$R_{We(t-1)}$ = -0,0280665 Cons_ = 0,0006791	-0,55 (0.585)ns 0,87 (0.384)ns	R^2 = 0,0951 Adj. R^2 = 0,0909
		$V_{Th(t)}$	$R_{We(t-1)}$ = 1.40344 Cons_ = 2,40132	2,04 (0.042)** 8,36 (0.000)*	R^2 = 0,1358 Adj. R^2 = 0,1318
Fr/Th	148	$R_{Fr(t)}$	$R_{Th(t-1)}$ = -0,0530225 Cons_ = 0,0010738	-0,64 (0.524)ns 1,03 (0.307)ns	R^2 = 0,0816 Adj. R^2 = 0,0689
		$V_{Fr(t)}$	$R_{Th(t-1)}$ = 2,99868 Cons_ = 3,64075	1,06 (0.292)ns 4,34 (0.000)***	R^2 = 0,0507 Adj. R^2 = 0,0376
Mo/Fr	252	$R_{Mo(t)}$	$R_{Fr(t-1)}$ = 0,0671137 Cons_ = -0,0011966	0,93 (0.355)ns -1,24 (0.216)ns	R^2 = 0,0934 Adj. R^2 = 0,0861
		$V_{Mo(t)}$	$R_{Fr(t-1)}$ = -0,754204 Cons_ =2,53782	-0,65 (0.517)ns 6,79 (0.000)***	R^2 = 0,1017 Adj. R^2 = 0,0944

*** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

Results in table 4 indicate that only Tuesdays have a significant AR(1). Mondays' returns have negative effects on those of Tuesdays $(\alpha_{R_{Mo(t-1)}/R_{Th(t)}} = -0,1137036; t_{R_{Mo(t-1)}/R_{Th(t)}} = -2,42)$. These results challenge the autocorrelation hypothesis according to which Mondays have higher AR(1) than other days and which is confirmed in the context of the Japanese market by Boynton et *al.* (2009).

These results can be explained considering the investor's sentiment (investor's beliefs and the overconfidence hypothesis). On Mondays the overconfident investors overestimate the precision of their knowledge and their judgment skills. They underestimate, at the same time, the public information and the skills of less informed investors. They make, consequently, aggressive decisions and increase their trading volume. Since the less informed investors act in a rational way, they delay trading and the operation ends with abnormal losses. Once the prices become more informative, the less informed investors change their strategy and increase their trading volume. Operations end, consequently, with higher gains.

Conclusion

We can conclude from our analysis that stock returns and trading volume are not evenly distributed across time. Mondays have abnormal losses and Fridays have higher returns. Trading volume decreases abnormally on Mondays and increases significantly over the other days.

Results, using the NIKKEI 225 data for return and trading volume over a period from June 06, 2002 to May 10, 2011 show that stock returns and trading volume diminish dramatically on Mondays and increase abnormally over the other days. Results do not support, particularly, the *outliers'* hypothesis, the half-of-the-month hypothesis and the autocorrelation hypothesis. They are, however, consistent with the adverse selection and the overconfidence hypotheses. In this sense, information plays a pivotal role in the decision process. More informed investors overestimate the precision of their knowledge and their judgment skills and underestimate public information and the skills of the less informed investors. They therefore make aggressive decisions and increase their trading volume. On the other hand, less informed investors postpone trades since they know that on Mondays the more informed investors will exploit their information advantage in trades. The delay of trade driven by the less informed investors' behavior induces a decrease in returns on Mondays.

References

Agathee U.S., (2008). *Day of the Week Effects: Evidence from the Stock Exchange of Mauritius (SEM)*, International Research Journal of Finance and Economics, Issue 17, pp. 7-14.

Aggarwal R. and Rivoli P., (1989). *Seasonal and Day-of-the-Week Effect in Four Emerging Stoick Markets*, Financial Review, vol. 24, pp. 541-550.

Athanassakos G. and Robinson M.J., (1994). *The Day-of-the-week anomaly: The Toronto Stock Exchange experience*, Journal of Business Finance & Accounting, vol. 21, pp. 833-856.

Balaban E., (1995). *Day of the week effects: New evidence from an emerging market*, Applied Economic Letters. Vol. 2, pp. 139-143.

Barbee Jr W.C., Jeong J.G. and Mukherji S, (2008). *Relations between portfolio returns and market multiples*, Global Finance Journal, vol. 19, pp. 1-10.

Bessembinder H. and Hertzel M.G., (1993). *Return autocorrelations around non-trading days*, Review of Financial Studies, vol. 6, pp. 155-189.

Bildik R., (1997). *Hisse Senedi Piyasalarinda Aykiriliklar: IMKB'nda Gun Etkisi,* Unpublished Working Paper at Finance Department of Istanbul University.

Boynton W., Oppenheimer H.R., and Reid S.F., (2009). *Japanese day-of-the-week patterns: New results*, Global Finance Journal, vol. 20, pp. 1-12.

Chen H. and Singal V., (2003). *Role of speculative short sales in price formation: The case of the weekend effect*, Journal of Finance, vol. 58, pp. 685-705.

Chuang W.J., Ouyang L.Y. and Lo W.C., (2010). *The Impact of Investor Sentiment on Excess Returns A Taiwan Stock Market Case,* International Journal of Information and Management Sciences, vol. 21, pp. 13-28.

Conolly R.A., (1989). *An examination of the robustness of the weekend effect,* Journal of Financial and Quantitative Analysis, vol. 24, pp. 133-171.

Cross F., (1973). *The behavior of stock prices on Fridays and Mondays*, Financial Analysts Journal, vol. 29, pp. 67-69.

Damodaran A, (1989). *The weekend effect in information releases: A study of earnings and dividend announcements*, Review of Financial Studies, vol. 2, pp. 607-623.

Dubois M. and Louvet P. (1996). *The day-of-the-week effect: the international evidence*, Journal of Banking & Finance, vol. 20 No.9, pp.1463-84.

Foster F.D. and Viswanathan S., (1990). *A theory of intraday variations in volume, variances, and trading cost in securities market,* Review of Financial Studies, vol. 3, pp. 593-624.

French K., (1980). *Stock returns and the weekend effect*, Journal of Financial Economics, vol. 8, pp. 55-70.

Ho, (1990). *Stock Return Seasonalities in Asia Pacific Markets*, Journal of International Financial Management and Accounting, vol. 2, n° 1 (Spring), pp. 47-77.

Jaffe J. and Westerfield R., (1985). *Patterns in Japanese common stock returns: Day of the week effects and turn of the year effects,* Journal of Financial and Quantitative Analysis, vol. 20, pp. 261-272.

Keim D.B. and Stambaugh F., (1984). *A Further Investigation of Weekend Effect in Stock Returns*, Journal of Finance, vol. 39, pp. 819-840.

Kim S., (1988). *Capitalizing on the Weekend Effect,* Journal of Portfolio Management, vol. 14, n° 3, pp. 59-63.

Kiymaz H. and Berument H., (2003). *The day of the week effect on stock volatility and volume: International evidence,* Review of Financial Economics, vol. 12, pp. 363–380.

Lakonishok J. and Smidt S., (1988). *Are seasonal anomalies real? A ninety year perspective*, Review of Financial Studies, vol. 1, pp. 403-425.

Lee C.M.C. and Swaminathan B., (2000). *Price momentum and trading volume*, Journal of Finance, vol. 55, pp. 2017-2069.

Penman S.H., (1987). *The distribution of earnings news over time and seasonalities in aggregate stock returns,* Journal of Financial Economics, vol. 18, pp. 199-228.

Schwert G.W., (1990). *Indices of U.S. stock prices from 1802 to 1987*, Journal of Business, vol. 63, pp. 399-426.

Solnik B. and Bousquet. L., (1990). *Day of the week effect on the paris bourse,* Journal of Banking and Finance,.vol. 14, pp. 461-468.

Syed A.B. and Sadorsky P. (2006). *Day-of-thr-week effects in emerging stock markets,* Applied Economics Letters, vol. 13, pp. 621-628.

Tripathy N., (2010). *Expiration and Week effect: Empirical Evidence from the Indian Derivative Market*, Annual London Business Research Conference, 12 to 14 July, London, United Kingdom.

Ulussever T., Guranyumusak I and Kar M., (2011). *The Day-of-the-Week Effect in the Saudi Stock Exchange: A Non Linear Garch Analysis,* Journal of Economic and Social Studies, vol. 1, N° 1, January, pp. 9-23.

Wang K., Li Y. and Erickson J., (1997). *A new look at the Monday effect*, Journal of Finance, vol. 52, pp. 2171–2186.

Wong K.A., Hui T.K. and Chan C.Y., (1992). *Day of the week effects: evidence from developing stock markets*, Applied Financial Economics, vol. 2, pp. 49-56.

Yates, J.F., Lee J.W. and Shinotsuka H., (1996). *Beliefs about overconfidence, including its Cross-national Variation*, Organization Behavior and Human Decision Process, vol. 65, pp. 138-147.

Yates, J.F., Lee J.W. and Bush J.G., (1997). *General knowledge overconfidence: Cross-National Variations, Response Style, and "Reality",* Organization Behavior and Human Decision Process, vol. 70, pp. 87-94.

(Endnotes)

1 In this sense, psychologists have demonstrated that the Asian population exhibits overconfidence in general knowledge (see Yates, Lee and Shinotsuka (1996) and Yates, Lee and Bush (1997) for more details). This specifically implies, among other things, that Asian investors may suffer from psychological biases of which one is the overconfidence bias.

2 For more details see Boynton et *al.* (2009).