# Trading Procedures, Evolving Settlement Systems and The Day of Week Effect in the U. K. and French Stock Markets 

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#### Abstract

Purpose - The purpose of this study is to examine whether the change of settlement procedures have an impact on the distribution of day of the week effect in the UK and French markets or not. U.K and France changed their systems from fixed settlement date systems to fixed settlement lag systems Design/methodology/approach - This study adopted the data of the specific stock market indices such as FTSE 100 in the U.K market and FRCAC 40 in the French market, This study constructs a test of the differences in mean returns across the days of the week by computing the regression equations for each country index. Findings - First, this study found that the evolving settlement procedures in stock exchanges have an effect on stock return of day of the week. Second, long-run improvements in market efficiency may have diminished the effects of certain anomalies in recent periods. Improvements in market efficiency and evolving settlement systems may cause the disappearance of the weekend effect. Research implications or Originality - The Implication of this study is that recent settlement systems contributed to the disappearance of the weekend effect and explains improvements in market efficiency and diminishments of market anomaly. This study may be the first study which examines whether evolving settlement systems have an effect on the disappearance of the weekend effect in the market or not.


Keywords : Day of the Week Effect, Market Efficiency, Settlement Systems,
JEL Classifications: G14, G15

## I. Introduction

Many studies have documented that the puzzling finding that the distribution of stock returns varies across the day of the week. These studies include Cross(1973), French(1980), Gibbon and Hess(1981), Rogalski(1984) and Keim and Stambaugh(1984). Jaffe and Westerfield(1985) also document that weekly seasonal effect is a general, world-wide phenomenon. However, several other studies raise the disputes of the stability of weekend effect. Recent empirical results suggest that weekend effect is not as strong as previous studies which have been documented for several major markets indices. Coutts and Hayes(1999) report that weekend effect is not as

[^0]strong as has been previously documented for the major U.K. indices. Steeley(2001) also argues that day of the week effect appears to have faded away in the 1990s in the U.K. market. Brusa, Liu and Schulman(2000) argue reverse weekend effect. Monday returns are positive in the value weighted index. They show that Monday returns tend to be negative for small firms but positive for large firms. Connoly(1989) points out the weekend effect disappears for certain periods and then reappears for certain periods. Kohers and et al (2004) investigate whether improvements in market efficiency may have caused this anomaly to disappear over time. Other studies such as Berument and Dogan(2012), Kohers et al(2004) and Steeley (2001) show no evidence for presence of days of week effect. Chiah and Zhong (2019) also show that the market anomaly doesn't always happen, especially in their period of research. OlaOluwa and Ephraim (2019) also examines day-of-the-week effects in the cryptocurrencies. They show that this market also does not show non-significances of day-of-the-week effect in returns of Bitcoin and some other cryptocurrencies.

These results indicate that, during the 1980s, this anomaly was clearly evident in the vast majority of developed markets, but it appears to have faded away in the 1990s. The implications of these findings are that long-run improvements in market efficiency may have diminished the effects of certain anomalies in recent periods. With improvements in market efficiency over time, the day of the week effect may have disappeared. The disappearance of the weekend effect could be partly attributed to the evolving settlement system. To the extent that the weekend effect was a manifestation of a settlement effect, the evolving settlement system may be in part responsible for this disappearance.

The purpose of this study is to examine the effect of settlement procedure on the distribution of day of the week effect. First, Lakonishok and Levi (1982) offer a partial explanation for the apparently puzzling discovery of different daily stock returns. The argument is based on the delay between trading and settlements in stocks and in clearing checks. Choy and O'Hanlon(1989), Condoyanni, O'Hanlon and Ward(1987) and Jaffe and Westerfield(1985) found the strong effect of settlement procedures on the distribution of day of the week in the U.K stock markets. Also, Solnik, (1990) and Solnik and Bons(1990) report that there are strong effects of settlement procedures on the distribution of day of the week in the Paris Bourse markets.

The trading mechanisms of world stock markets have had two kinds of settlement procedures such as fixed settlement date systems and fixed settlement lag systems. In many countries settlements take place a fixed number of business days after the transaction (fixed settlement lag systems, U.S., Japan). In other countries previous settlements took place periodically on a fixed date when all transactions performed before this date were settled (fixed settlement date system, U.K., France, Italy). On the NYSE, stock transactions were settled in five business days after the transaction. On the London Stock Exchange (LSE) the trading year in the U.K. was divided into 24 or 25 account periods of two or three weeks. All trades were settled once in two or three weeks. On the Paris Stock Exchange, all trades were settled once a month. In recent years the trading mechanisms of world stock markets are integrated and changed to fixed settlement lag systems ( $\mathrm{T}+3$ ) .

On the NYSE, stock transactions are settled in three business days rather than five business days after the transaction since June 7th, 1995. Also some countries such as U.K and France which had fixed settlement date systems changed their systems to fixed settlement lag systems.

The trading mechanisms of U.K. changed their fixed settlement date systems to 10 days fixed settlement lag systems( $\mathrm{T}+10$ ) since July, 1994 and later they changed their systems to 5 days fixed settlement lag systems ( $\mathrm{T}+5$ ) since June 1995 and one more time they changed their systems to 3 days fixed settlement lag systems( $\mathrm{T}+3$ ) since February 5, 2001 similar to the systems of U.S.A. and Japan. The French markets also changed their fixed settlement date systems (once a month) to 3 days fixed settlement lag systems(T+3) similar to the systems of U.S.A. and Japan since September 2000.

Thus, first, this study investigates the effect of changes of settlement procedures on the stock return of day of the week. Second, this study investigates whether evolving settlement procedures have the partial effect on the disappearance of the weekend effect or not. The remainder of this paper is as follows. In Section II, the data are discussed for this study. And methodology and hypothesis are also discussed. In Section III, empirical results are described. In Section IV, empirical results are summarized and some tentative conclusions are drawn

## II. Data, Methodology and Hypotheses

This study adopted the daily return of the market indexes of U.K. and France. The source of information for the Index is the Data Stream International Ltd from the beginning of the data to November 30 2009. Data commences when the Data Stream begins the starting date. The specific stock market indexes are FTSE 100 (1984.1.3. - 2009.11.30) in the U.K markets and FRCAC 40(1987.7.10. - 2009.11.30) in the French markets,

This study constructs a test of differences in mean return across the days of the week by computing the following regression for each country index.

$$
\begin{aligned}
& R_{t}=\alpha_{1} d_{1 t}+\alpha_{2} d_{2 t}+\cdots+\alpha_{5} d_{5 t}+u_{t} \quad, \mathrm{t}=1,2, \cdots, \mathrm{~T} \\
& \text { Where } \begin{array}{r}
d_{1 t}=1 \text { if } \mathrm{t} \text { is Monday, and otherwise } \quad d_{1 t}=0 \\
d_{2 t}=1 \text { if } \mathrm{t} \text { is Tuesday, and otherwise } d_{2 t=0} \\
\text { In the similar ways } \\
d_{5 t}=1, \text { if } \mathrm{t} \text { is Friday, and otherwise } d_{5 t=0}
\end{array} .
\end{aligned}
$$

And F-statistics are computed for each regression.
To test whether there is any significance in the effect of changes of settlement procedures in stock exchanges on the stock return of day of the week,

Hypothesis 1 : The effect of changes of settlement procedures on the stock return of day of the week exists strongly.
Hypothesis 2: Changes of settlement procedures in stock exchanges have a partial effect on the disappearance of the weekend effect.

## III．Empirical Results

## 1．U．K Stock Markets

## （1）The effect of changes of settlement procedures on stock return of day of the week in the U．K

On the London Stock Exchange（LSE）settlements took place periodically on a fixed date when all transactions performed before this date were settled（we call it fixed settlement date system）．The trading year in the U．K．was divided into 24 or 25 account periods of two or three weeks．An account period begins on a Monday and ends on a Friday．Settlements for all trans－ actions during the account period occurred on the second Monday following the last Friday of the account period．An individual buying at the close of the account period and selling at the close on the following Monday pays for the shares two weeks before receiving cash for selling the shares．Therefore，the rate of return on the 24 Mondays per year（first Mondays of each ac－ count period）should be higher，by two weeks interest，because of the financing cost of interest． But if trades occur during the account period，the required return should not reflect any implicit interest rate．

The trading mechanisms of U．K．changed their fixed settlement date systems to 10 days fixed settlement lag systems since July， 1994 and later they changed their systems to 5 days fixed set－ tlement lag systems since June 1995 and one more time they changed their systems to 3 days fixed settlement lag systems since February 5， 2001 similar to the systems of U．S．A．and Japan

## （2）Empirical study of the effect of changes of settlement procedures on day of the week return in the U．K

〈Table 1〉 displays summary statistics for all average percent return under the fixed settlement date settlement procedure．In order to incorporate potential settlement procedures effects relating to Mondays is partitioned in three ways．First，we make the distinction between Mondays upon which the stock exchange account commences（Monday beginning account periods），and those it does not（Monday not beginning account periods）．Secondly，we consider those days upon which the stock exchange account commences，but which are not Mondays（First days if not holidays）．In table 1，Monday returns beginning account periods are 0.19 percent and are statisti－ cally significant．Monday returns not beginning account periods are -0.25 percent and are statisti－ cally significant．The return of first days if not holidays beginning account periods is 0.53 percent．Thus，this empirical result shows that there is strong effect of settlement procedures on the stock price in the U．K．stock markets．Empirical results support hypothesis 1 in the U．K． stock markets．Settlement procedures in U．K．stock exchanges have an effect on stock return of day of the week．This empirical result is similar to the previous studies［ Choy，and＇Hanlon（1989） Condoyanni，O＇Hanlon and Ward（1987），Jaffe and Westerfield（1985）

〈Table 2 〉displays comparisons of summary statistics for all average percent return between before and after the change of settlement procedure in the U．K．Market．First，it displays aver－ age percent return by day of the week under the fixed settlement date settlement procedure． Second，it displays it under the 10 days settlement lag procedure．Third，it displays it under the

Table 1. Average Percent Return in the U.K Market under the Fixed Settlement Lag settlement Procedure

|  | (1) <br> Monday Beginning <br> Account Periods | (2) <br> Monday <br> Periods beginning | First Days If not Holidays |
| :---: | :---: | :---: | :---: |
| Mean | 0.19690472 | -0.2512293 | 0.58389808 |
| T-value | 2.262646 | -3.36133 | 1.379669 |
| Standard | 0.95726487 | 0.81874601 | 0.8464322 |
| Deviation | -1.1256777 | 0.09391094 | -0.1038559 |
| Skewness | 3.20134144 | 0.67657216 | -5.3915386 |
| Kurtosis | 121 | 120 | 4 |

5 days settlement lag procedure. Fourth, it displays it under the 3 days settlement lag procedure. As shown in table 1, strongly significant positive returns on account Mondays suggests that the settlement effect is a dominant factor to have an effect day of the week under the fixed settlement date settlement procedure. However, if settlement procedures are changed to the fixed settlement lag procedures, they do not have a significant effect on the underlying weekend effect. Other effect such as changing pattern of the day of the week may have an effect on the day of the week return. Since fixed settlement lag systems induce just two day financing cost effect, it is not so strong as to have an effect on the day of the week return. F-statistics are also not statistically significant under the 3 days settlement lag procedure. Thus, this study partially support hypothesis 2 in the U.K markets. The evolving settlement procedures in stock exchanges have an effect on stock return of day of the week a partial effect on the disappearance of the week-

Table 2. Comparisons of Average Percent Return by Day of the Week before and after the Change of Settlement Procedure in the U.K. Market

| (1) Average Percent Return under the Fixed Settlement Date settlement Procedure |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| FTSE 100 (1984.1.3.-1994. 7.) |  |  |  |  |  |
| Mean | -0.1189658 | 0.06484979 | 0.10407376 | 0.03138675 | 0.13443233 |
| T-value | -2.41052 | 1.469333 | 2.648554 | 0.804855 | 3.447389 |
| Standard Deviation | 1.09913716 | 1.2466714 | 0.91227724 | 0.90704193 | 0.89434749 |
| Skewness | -2.4250847 | -3.4049999 | 1.13927951 | -0.2304944 | 0.6258597 |
| Kurtosis | 20.0811597 | 38.0735362 | 9.79949474 | 4.4020464 | 3.36897856 |
| Observations | 496 | 539 | 539 | 541 | 526 |
| F -value | $F(4,2636)=5.26$ |  |  |  |  |
| (2) Average Percent Return Under the 10 Days Settlement Lag Procedure |  |  |  |  |  |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| FTSE 100 (1994.7.-1995.5.) |  |  |  |  |  |
| Mean | -0.0187676 | 0.01939821 | 0.13120531 | 0.12914772 | 0.02096559 |
| T-value | -0.17589 | 0.181766 | 1.230445 | 1.159214 | 0.18572 |
| Standard Deviation | 0.69151224 | 0.73163955 | 0.73877103 | 0.76378697 | 0.77392058 |
| Skewness | -0.2486853 | 0.37776312 | -0.4444868 | -0.145585 | -0.0291266 |
| Kurtosis | -0.7358419 | 0.2517297 | -0.0840768 | -0.6893049 | -0.5177471 |
| Observations | 42 | 47 | 48 | 47 | 47 |
| F-value | $F(4,226)=0.40$ |  |  |  |  |


| (3) Average Percent Return Under the 5 Days Settlement Lag Procedure |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |  |  |
| FTSE 100(1995.7.6.-2001.2.4.) |  |  |  |  |  |  |  |
| Mean | 0.06860475 | 0.05781684 | 0.00501789 | -0.0101023 | 0.04263084 |  |  |
| T-value | 1.105701 | 0.928494 | 0.095707 | -0.17337 | 0.695582 |  |  |
| Standard | 1.10470477 | 1.15324662 | 0.9724254 | 1.08234834 | 1.12843285 |  |  |
| Deviation | 0.39034534 | -0.2521113 | 0.11974959 | -0.463305 | -0.4395299 |  |  |
| Skewness | 1.62170311 | 2.60703259 | 0.90526988 | 1.06998371 | 0.66962837 |  |  |
| Kurtosis | 317 | 343 | 344 | 345 | 339 |  |  |
| Observations | F(4, 1683)=0.33 |  |  |  |  |  |  |
| F-value | (4) Average Percent Return by Day Under the 3 Days |  |  |  |  |  | Settlement Lag Procedure |
| Monday |  |  |  |  |  |  |  |
| Tuesday |  |  |  |  |  |  |  |
| FTSE 100 (2001.2.5.-2009.11.30) | Wednesday | Thursday | Friday |  |  |  |  |
| Mean | -0.2468 | -0.0325 | 0.102062 | 0.0874734 | -.021716656 |  |  |
| T-value | -1.10733 | -0.41894 | 1.584 | 0.864058 | -.477401 |  |  |
| Standard | 1.2052167 | 130381526 | 1.2450976 | 1.2205249 | .49054113 |  |  |
| Deviation | -0.432686 | 096283066 | 0.2231528 | -0.0491008 | 102117572 |  |  |
| Skewness | 1.8743326 | 1.7769786 | 0.5656504 | 0.4389896 | 1.6392132 |  |  |
| Kurtosis | F(4, 326)=0.34 |  |  |  |  |  |  |
| F-value |  |  |  |  |  |  |  |

end effect.

## 1.French Stock Markets

## (1) The Effect of changes of settlement procedures on day of the week return in France

In France, settlements took place periodically on a fixed date when all transactions were performed. They were similar to the systems of U.K. In France, Italy, Switzerland and Belgium, the settlement of all transactions took place once a month on a fixed date. This study tests empirical evidence of the settlement effect on daily stock returns with a monthly settlement: the Paris Bourse. All major companies listed in Paris were traded on a forward market. This forward market provides a single monthly settlement of all transactions at the end of the month when ownership is transferred. The last day of trading on which all trades were settled is called the liquidation. (Liquidation date: T). This was fairly similar to the British system except for the fact that the liquidation can take place on any day of the week. The liquidation took place on the seventh business day preceding the end of the calendar month. The cash transfers took place on the last business day of the month. This settlement procedure can affect the distribution of daily stock returns. The magnitude of the effect ought to be one month of interest and hence much larger than in London, where the account period lasts two weeks, and in New York, where the difference in settlement delays is at most two days. This settlement procedure has an effect on daily stock returns on the next day of liquidation date ( $\mathrm{T}+1$ ) by one month financing cost. The French market provided a good opportunity to test the importance of settlement procedures on the distribution of daily stock returns.

The trading mechanisms of France also changed their fixed settlement date systems (once a month) to 3 days fixed settlement lag systems which are similar to the systems of U.S.A. and

Japan since September 2000. Between 2000 and 1990 they adopted mixed systems both of a single monthly settlement and 3 days fixed settlement lag systems.

## (2) Empirical study of the effect of changes of settlement

procedures on the day of the week in France 〈Table 3〉 displays the comparison of summary statistics for all average percent return around liquidation between before and after the changes of settlement procedures in the French Market. First, it displays average percent return around liquidation date under the fixed settlement date settlement procedure (1987.7.10.-1989.12.30.). Second, it displays it under the mixed settlement procedure (1990.1-2000.8.). Third, it displays it under the 3 days settlement lag procedure (2000.9.-2009.11.30.).

## A. The effect of fixed settlement date system on the daily stock return around liquidation

We expect that the effect of settlement procedures on the daily stock return is highest on the next day of liquidation date $(T+1)$ by one month financing cost under the fixed settlement date

Table-3. Comparisons of Average Percent Return around Liquidation before and after the Change of Settlement Procedure in the France Market

| (1) Average Percent Return Around Liquidation under the Fixed Settlement Date settlement Procedure |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| (1987.7.10.-1989.12.30.) | $\mathrm{T}-3$ | $\mathrm{~T}-2$ | $\mathrm{~T}-1$ | T | $\mathrm{~T}+1$ | $\mathrm{~T}+2$ | $\mathrm{~T}+3$ | $\mathrm{~T}+4$ |
| Mean | -0.424019 | 0.01778199 | -0.0762435 | 0.19193289 | 0.53803975 | 0.05183443 | -0.0861606 | -0.2997124 |
| T -value | -1.15357 | 0.092647 | -0.3676 | 0.829273 | 3.431644 | 0.13536 | -0.39845 | -0.88877 |
| Standard | 2.01327592 | 1.05125917 | 1.13601704 | 1.267688 | 0.85876191 | 2.09744069 | 1.18439238 | 1.84703046 |
| Deviation | -3.4160553 | 0.11437583 | -0.3561073 | -1.1767964 | -0.9961897 | -1.7281689 | -0.3926888 | -3.4241543 |
| Skewness | 15.5588654 | 0.0830528 | 1.10212288 | 2.17835377 | 0.55497212 | 7.44061886 | 1.2489061 | 15.1563241 |
| Kurtosis | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Observations | 30 |  |  |  |  | 30 |  |  |
| F-value | $\mathrm{F}(12,376)=1.32$ |  |  |  |  |  |  |  |

(2) Average Percent Return Around Liquidation under the Mixed Settlement Procedure (1990.1.-2000.8.)

|  | $\mathrm{T}-3$ | $\mathrm{~T}-2$ | $\mathrm{~T}-1$ | T | $\mathrm{~T}+1$ | $\mathrm{~T}+2$ | $\mathrm{~T}+3$ | $\mathrm{~T}+4$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mean | -0.132164 | -0.1719156 | -0.307374 | -0.071677 | 0.06593944 | 0.42070252 | 0.19143128 | 0.05350901 |
| T-value | -1.10858 | -1.58062 | -3.06008 | -0.66486 | 0.605259 | 3.586958 | 1.904006 | 0.484094 |
| Standard | 1.34881405 | 1.23053484 | 1.13642263 | 1.2197031 | 1.23256309 | 1.32694763 | 1.13749533 | 1.25055213 |
| Deviation | -1.5202932 | -0.2076159 | 0.43729671 | -0.282898 | -0.0865776 | -0.218599 | -0.4580581 | 0.23939176 |
| Skewness | 7.41504607 | 1.01934294 | 1.2262168 | 0.13713873 | 0.93883239 | 1.49537624 | 1.91961479 | 5.74795105 |
| Kurtosis | 128 | 128 | 128 | 128 | 128 | 128 | 128 |  |
| Observations | 128 | 128 |  |  |  |  |  |  |
| F-value | $\mathrm{F}(12,1651)=3.07$ |  |  |  |  |  |  |  |

(3) Average Percent Return Around Liquidation under the 3 Days Settlement Lag Procedure

| (2000.9.-2002.11.30.) | $\mathrm{T}-3$ | $\mathrm{~T}-2$ | $\mathrm{~T}-1$ | T | $\mathrm{~T}+1$ | $\mathrm{~T}+2$ | $\mathrm{~T}+3$ | $\mathrm{~T}+4$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | -0.0147623 | -0.4687603 | -0.4432843 | -0.5168984 | 0.02137301 | -0.0642974 | 0.33448371 | 0.21942673 |
| Mean | -0.04349 | -1.38171 | -1.35635 | -1.33851 | 0.066584 | -0.17081 | 1.069328 | 0.434882 |
| T-value |  |  |  |  |  |  |  |  |
| Standard | 1.76397446 | 1.76285333 | 1.69820842 | 2.00662581 | 1.66792922 | 1.95593127 | 1.62534645 | 2.62180289 |
| Deviation |  |  |  |  |  |  |  |  |
| Skewness | 0.86886238 | -0.5787937 | -0.4418467 | 0.28183343 | -0.253505 | 1.37617697 | -0.3373428 | 0.73128787 |
| Kurtosis | 0.18297389 | 1.43520013 | 1.52074652 | 0.56746388 | -0.4874997 | 2.5272672 | -1.0263234 | 1.61731362 |
| Observations | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| F-value | $\mathrm{F}(12,338)=0.78$ |  |  |  |  |  |  |  |

systems. The French market provides a good opportunity to test the importance of settlement procedures on the distribution of daily stock returns. Thus, this study analyzed the daily return of eight days around liquidation date (T). Table 3 shows that daily stock returns on the next day of liquidation date $(\mathrm{T}+1)$ is 0.538 percent and it is highest and statistically significant around liquidation date under the fixed settlement date settlement procedure as expected. The daily stock returns of the other days are not statistically significant. This empirical result is similar to the previous studies [Solnik, (1990) and Solnik and Bons(1990)]

Second, this study analyzed the daily return under the mixed settlement procedure. 〈Table 3〉 shows that daily stock returns on the second day of liquidation date ( $\mathrm{T}+2$ ) is
0.42 percent and it is highest and statistically significant, since lagged information is reflected on the stock returns. Third, this study analyzed the daily return under the 3 days settlement lag procedure. Table 3 shows that daily stock returns on the next day of
liquidation date $(\mathrm{T}+1)$ is not statistically significant and the daily stock returns of the other days are not statistically significant. Thus, this study supports hypothesis 2 in

France: The changes of settlement procedures in stock exchanges have an effect on stock return of day of the week.
B. Comparison of Average Percent Return by Day of the Week before and after the Change of Settlement Procedure in the France Market

Table 4. Comparison of Average Percent Return by Day of the Week Before and After the Change of Settlement Procedure in the France Market

|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| :---: | :---: | :---: | :---: | :---: | :---: |
| FRCAC 40 (1987.7.10.-1989.12.30) |  |  |  |  |  |
| Mean | -0.3974412 | 0.05473672 | 0.13513731 | 0.21995199 | 0.24334815 |
| T-value | -2.3417 | 0.509772 | 1.103752 | 1.79912 | 2.597543 |
| Standard Deviation | 1.82007776 | 1.20528131 | 1.37432324 | 1.44457689 | 1.03477341 |
| Skewness | -1.7786069 | -1.1819484 | -2.1569297 | 1.92610322 | 0.13190267 |
| Kurtosis | 9.06533999 | 11.5792636 | 13.0381236 | 11.2959221 | 1.85522219 |
| Observations | 115 | 126 | 126 | 126 | 122 |
| F-value | $F(4,610)=4.13$ |  |  |  |  |
| (2) Average Percent Return by Day of the Week Under the Under the Mixed Settlement Procedure |  |  |  |  |  |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| FRCAC 40 (1990.1.-2000.8.) |  |  |  |  |  |
| Mean | -0.0239215 | 0.09376892 | 0.06013472 | 0.0623926 | 0.06639283 |
| T-value | -0.39825 | 1.852506 | 1.188219 | 1.120994 | 1.290552 |
| Standard Deviation | 1.36046514 | 1.18492171 | 1.1793121 | 1.29098381 | 1.17988186 |
| Skewness | -0.2893462 | 0.11614294 | 0.10912347 | -0.0751324 | -0.111823 |
| Kurtosis | 2.90127652 | 1.66309129 | 1.39077703 | 2.81085693 | 0.78414282 |
| Observations | 513 | 548 | 543 | 538 | 526 |
| F-value | $F(4,2663)=0.67$ |  |  |  |  |



〈Table 4〉 displays comparison of summary statistics for all average percent return of day of the week between before and after the change of settlement procedure in the French market． First，it displays average percent return of day of the week under the fixed settlement date settle－ ment procedure（1987．7．10．－1989．12．30．）．Second，it displays it under the mixed settlement pro－ cedure（1990．1－2000．8．）．Third，it displays it under the 3 days settlement lag procedure （2000．9．－2009）．Table $4-1$ shows that Monday average return is -0.37 percent and Friday average return is 0.2454 percent for the FRCAC40 index under the fixed settlement date settlement proce－ dure in France．And Monday and Friday average percent return are statistically significant．F－sta－ tistics are also statistically significant．We found that there is still weekend effect．It may be part－ ly due to the effect of settlement procedures in the French market．During the period of 1987．7．10．－1989．12．30．，the distribution of the liquidation dates was as follows： 4 Mondays， 5 Tuesdays， 6 Wednesdays， 10 Thursday，and 5 Fridays．

The frequent occurrence of Thursdays is natural．The liquidation took place on the
seventh business day preceding the end of the calendar month．If the month ends on a Friday，Saturday，or Sunday，the liquidation would take place on Thursday，if there are no vaca－ tions in－between．Because the major impact of the liquidation on the daily return took place on the next day，this phenomenon will tend to increase the mean return observed for Fridays．If the trading mechanisms of France change their fixed
settlement date systems to the fixed settlement lag systems，there is no more impact of the liq－ uidation on the daily return．After changing settlement procedures we expect that all mean re－ turns are not unequal for each day of the week．

Second，〈Table 4－2〉 shows that Monday and Friday average return reduced dramatically under the fixed settlement date settlement procedure in the French market．And Monday and Friday average percent return are not statistically significant．F－statistics are also not statistically sig－ nificant under the mixed settlement procedure．Third，Table 4－2 shows that not only Monday but also Friday average return have minus value under the 3 days settlement lag procedure in the French market．And Monday and Friday average percent return are not statistically significant． F－statistics are also not statistically significant under the 3 days settlement lag procedure．All mean returns are not unequal for each day of the week as expected．After settlement procedures change the weekend effect disappears．Thus，this study supports hypothesis 2 in the French market．The changes of settlement procedures in stock exchanges have an effect on stock return of day of the week．

## IV. Summary and Conclusions

The existence of the weekend effect had been a general, world-wide phenomenon. However, several studies raised the disputes of the stability of weekend effect. More recent empirical findings showed that the weekend effect has disappeared after the period from 1990 in international stock markets. The implications of these findings are that long-run improvements in market efficiency may have diminished the effects of certain anomalies in recent periods. Improvements in market efficiency and evolving settlement systems may cause the disappearance of the weekend effect.

The purpose of this study is to examine the effect of settlement procedure on the distribution of day of the week effect. This study found that the settlement procedures in stock exchanges have an effect on stock return of day of the week in the U.K and the French market, Empirical results also showed that the evolving settlement procedures in stock exchanges have an effect on stock return of day of the week. The

This study may be the first study which indicates that evolving settlement systems have an effect on the disappearance of the weekend effect in the market.

If the market anomaly reduces in recent years, weekend effect tends to disappear. Also, we need to examine whether other market anomalies such as monthly effect or size effect still exists in international stock market or not. In this case, these empirical results may be considered in the practical researches in these fields.

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