

The Monday Effect in some Asian Foreign Exchange Markets

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Abstract

This paper examines anomalous patterns in daily returns of some Asian countries' currencies. We find that the mean returns on Monday are the lowest during the week in some Asian countries. In this paper, we also show that this Monday effect was significant in the 1980s and was particularly prominent on the second, third and fourth of the month. We have no positive explanations for the latter part. However, as for the difference between the 1980s and 1990s, the increase in the market's efficiency may be related to the Monday effect, and announcements of economic conditions may cause such movements.

1. Introduction

Most empirical evidence reports that Monday stock returns are significantly negative. Following French (1980), numerous studies have confirmed the Monday effect (week-end effect) using various time periods and different kinds of stock return indexes¹. A number of studies have investigated the validity of these anomalies.

Numerous explanations have been analyzed to explain the puzzling empirical findings of negative return. Lankonishok and Levi (1982) attribute the effect to the delay between trading and settlement. However, they report that only 17 percent of the abnor-

mally low Monday return can be explained by that reason. Keim and Stambaugh (1984), and Flannery and Protopapadakis (1988) suggest that institutional aspects of the stock market cannot explain the Monday return.

Lakonishok and Maberly (1990) and Kamara (1995) find that individuals tend to increase trading on Monday, and they attribute the effect to this reason. Along this line, Damodaran (1989) documents that firms tend to report bad news on Fridays and suggests that the delay of bad news on Friday may cause the negative Monday effect.

Recent empirical analyses on Monday effects have been admitted and developed. Almost all of them, however, not only fail to explain the reasons but also focus only on stock markets. Only a few papers have been done about foreign exchange markets. We focus on several foreign exchange markets in Asian countries. The reason we focus on Asian countries is that there are various degrees of development in these markets. Namely, Japanese markets became highly developed from the 1970s. The width and depth of the market are different from other Asian markets. The developments of the markets is one of our interests as we discuss later.

This paper is structured as follows. Section 2 suggests our method of empirical analysis. Section 3 explores the possible explanations of section 2. The last section contains our conclusions.

2. Empirical Analysis and Findings

We employ seven kinds of dollar exchange rate for the analyses : Japan (YEN/U.S. DOLLAR, it is the same as other markets), Indonesia, Korea, Malaysia, the Philippines, Singapore, and Hong Kong. All of the data is daily (end of the day), and is from FRB. We divide the data into two periods, one is the 1980s, and the other is the 1990s. First, we compiled a daily record of returns for the foreign exchange market indexes of Japan, Indonesia, Korea, Malaysia, the Philippines, Singapore,

The Monday Effect in some Asian Foreign Exchange Markets

and Hong Kong. The time periods are : Japan - from January 2, 1980 to June 3, 1998 ; Indonesia - from February 18, 1987 to March 27, 1998 ; Korea - from January 23, 1984 to June 3, 1998; Malaysia - from January 2, 1980 to June 3, 1998; the Philippines - from January 2, 1996 to April 22, 1998 ; Singapore - from January 2, 1981 to June 3, 1998 ; Hong Kong - from January 5, 1981 to June 3, 1998. The reason why we divided the data into two period at the end of the 1980s, is that the markets changed dramatically. Financial deregulation and internationalization had (have) been ongoing in these areas, especially in Japan. Table 1 displays values of average returns R_t , standard deviation, kurtosis, and skewness.

Table 1 Daily Return in Asian Foreign Exchange Markets

(India : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	1.29E-05	6.45E-05	-4.76E-05**	-9.2E-05*	2.07E-05
Std. Dev.	7.91E-05	8.5E-05	0.00277	5.5E-05	0.002996
Kurtosis	2.570933	1.634474	1.548217	2.676345	0.871898
Skewness	-0.61092	-0.43116	-0.39775	-0.16723	-0.33604

F - statistic : 5.838, P - value : 0.012

- 1) Returns are computed as $R_t = \log (P_t/P_{t-1})$ P is expressed as U. S. dollar per unit of each currency. Therefore, R_t is regarded as returns on each currency to U. S. investors.
- 2) * : significant at 5% level

(India : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-0.00011*	-5.9E-05	8.3E-05	-0.00011	-0.00012*
Std. Dev.	0.002884	0.10278	0.0075378	0.002901	5.61E-05
Kurtosis	2.8404216	96.5017	60.998	35.2685	2.9414
Skewness	-0.17975	0.00237	0.00132	2.10159	-0.17656

F - statistic : 5.838, P - value : 0.012

(Japan : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-8.7E-05**	-6.4E-05*	-0.0002*	0.00016	0.000214
Std. Dev.	0.002929	0.002968	0.002748	0.00267	0.002854
Kurtosis	2.503679	2.423513	2.514254	3.734936	2.779648
Skewness	-0.29115	0.08432	-0.45157	-0.37483	-0.18904

F - statistic : 13.582, P - value : 0.004

(Japan : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-3.3 E-06	-0.45301	0.489526	-0.501287	0.00009
Std. Dev.	8.675749	10.02587	9.524194	9.351298	0.002101
Kurtosis	517.7547	415.2147	421.4102	413.5214	2.742514
Skewness	0.000210	-16.5814	20.15921	-20.3152	-0.43179

F - statistic : 8.588, P - value : 0.033

(Indonesia : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	0.000303	0.000926	0.000353	0.000231	-0.00018
Std. Dev.	0.007399	0.008714	0.005639	0.0055	0.006274
Kurtosis	72.91134	83.3334	74.95581	64.52172	103.6401
Skewness	1.985755	7.583073	3.725634	4.405597	-6.53683

F - statistic : 3.476, P - value : 0.025

(Korea : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-0.00059*	0.00019	-3.2E-05	-1.9E-05	-0.00014
Std. Dev.	0.002361	0.001513	0.001103	0.000913	0.001081
Kurtosis	7.23184	16.96826	34.82013	66.28832	54.15131
Skewness	-0.84173	2.714017	0.444837	0.585251	-1.75972

F - statistic : 10.483, P - value : 0.065

The Monday Effect in some Asian Foreign Exchange Markets

(Korea : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-0.00059*	0.00019	-3.2E-05	-1.9E-05	-0.00014
Std. Dev.	0.002361	0.001513	0.001103	0.000913	0.001081
Kurtosis	7.23184	16.96826	34.82013	66.28832	54.15131
Skewness	-0.84173	2.714017	0.444837	0.585251	-1.75972

F - statistic : 8.4732, P - value : 0.065

(Malaysia : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	1.16E-05	9.95E-05	-9E-05	4.49E-05	0.000122
Std. Dev.	0.004503	0.001785	0.001216	0.001167	0.004069
Kurtosis	306.2031	39.80259	4.812708	14.18115	403.6274
Skewness	-15.765	3.10952	-0.65308	1.779365	18.85247

F - statistic : 7.433, P - value : 0.033

(Malaysia : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	0.000099	4.22E-05	-4.9E-06	7.20E-05	6.89E-05
Std. Dev.	0.003145	0.001259	0.001598	0.004021	0.002987
Kurtosis	42.84187	33.60102	30.65489	17.41528	26.54985
Skewness	-3.29854	1.225687	0.012658	1.853651	1.059621

F - statistic : 4.858, P - value : 0.021

(Philippine : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-5.4E-05*	0.000164	0.000238	0.000539	0.00045
Std. Dev.	0.003966	0.003531	0.003344	0.004158	0.006057
Kurtosis	12.92631	16.00358	11.76925	8.193231	55.82779
Skewness	0.839538	2.414735	1.908006	0.349568	6.518085

F - statistic : 8.544, P - value : 0.001

(Singapore : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	5.1E-05	1.62E-05	-1E-04	-3.1E-05	-8.8E-06
Std. Dev.	0.001715	0.001327	0.001203	0.00114	0.001276
Kurtosis	10.50692	15.78549	5.240194	5.376847	6.090202
Skewness	-1.11037	-1.5165	-0.41082	-0.67113	0.603276

F - statistic : 7.987, P - value : 0.001

(Singapore : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-0.00017*	-7.8E-05	4.14E-06	4.39E-05	4.97E-05
Std. Dev.	0.001339	0.001591	0.001348	0.001446	0.001303
Kurtosis	6.827961	9.722556	7.962173	12.49024	6.294051
Skewness	0.282552	-0.02083	-0.11201	0.996863	-0.27044

F - statistic : 6.783, P - value : 0.006

(Hong Kong : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-0.00017*	-7.8E-05	4.14E-06	4.39E-05	4.97E-05
Std. Dev.	0.001339	0.001591	0.001348	0.001446	0.001303
Kurtosis	6.827961	9.722556	7.962173	12.49024	6.294051
Skewness	0.282552	-0.02083	-0.11201	0.996863	-0.27044

F - statistic : 5.698, P - value : 0.001

(Hong Kong : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-1.6E-05*	6.39E-06	3.03E-06	2.54E-06	-1.5E-07
Std. Dev.	0.000145	0.00016	0.000143	0.000175	0.000197
Kurtosis	2.11E-08	38.30394	10.93026	34.33201	40.63917
Skewness	7.7471833	4.348769	-0.72507	-2.63364	-0.01878

F - statistic : 7.684, P - value : 0.017

The Monday Effect in some Asian Foreign Exchange Markets

(All countries : 1980s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-8.19E-05**	2.56E-05	-9.06E-05	-9.1E-05	2.18E-05
Std. Dev.	0.00015	0.00098	0.000138	5E-05	4.2E-05
Kurtosis	2.838515	283.2654	12.55515	30.4154	155.6215
Skewness	-0.26772	-0.23557	-0.59385	0.10842	6.782806

F - statistic : 6.578, P - value : 0.003

(All Countries : 1990s)

	Monday	Tuesday	Wednesday	Thursday	Friday
Mean	-3.91E-05**	8.57E-05	1.2E-05	1.83E-05	7.01E-05
Std. Dev.	0.000126	0.000115	0.001253	4.31E-05	0.006321
Kurtosis	2.96E-06	546.9593	18.0251	6.094515	480.5629
Skewness	-0.28741	20.98675	-0.69214	0.16794	-0.41572

F - statistic : 7.582, P - value : 0.001

Consistent with previous research on 'stock' markets, we find a negative average Monday return in some cases². This so-called, weekend effect, is also significant in some cases. Our results indicate that the Monday effect is shown in some Asian countries, and in some periods, especially in the 1980s. Maybe the developments of the markets have reduced this effect, especially in Japan. However, we analyze that in the next section.

Next, we categorize the data by the week of the month, following Jaffe and Westfield (1985) and Wang, Li and Erickson (1997). The first Monday of the month is the Monday for the first week of the month. The first week of the month is defined as the week that contains the first trading day of the month. The daily return is calculated as the change in the last price from the previous day's last price. We analyze the cases and the results are as we expected (and significant). The cases are : Japan - 1980's ; Korea - 1980's and 1990's ; Singapore - 1990's ; and Hong Kong - 1990's. The results are as follows ;

Table 2 The Monday Effect in Asian Foreign Exchange Markets

(India : 1990s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.00014***	-9.3E-05***	-0.00015***	4.39E-06***	-0.00014
Std. Dev.	6.61E-05	6.79E-05	6.78E-05	9.47E-05	0.098874
Kurtosis	3.777337	2.194364	3.590287	-2.14299	1436.999
Skewness	-0.12607	-0.54776	-0.1419	-0.06308	0.000147

F - statistic : 6.7348, P - value : 0.002

(Japan : 1980s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.00014***	-9.3E-05***	-0.00015***	4.39E-06***	-0.00014
Std. Dev.	6.61E-05	6.79E-05	6.78E-05	9.47E-05	0.098874
Kurtosis	3.777337	2.194364	3.590287	-2.14299	1436.999
Skewness	-0.12607	-0.54776	-0.1419	-0.06308	0.000147

F - statistic : 10.251, P - value : 0.003

(Korea : 1980s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.00043*	-0.00084*	-0.00065*	-5.5E-05***	-0.00059**
Std. Dev.	0.001709	0.002574	0.00177	0.000263	0.000488
Kurtosis	12.81222	9.872157	9.308185	2.829118	0.788571
Skewness	-3.61467	-3.13452	-2.95641	-0.5116	0.889717

F - statistic : 18.154, P - value : 0.001

(Korea : 1990s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.00043*	-0.00084*	-0.00065*	-5.5E-05***	-0.00059**
Std. Dev.	0.001709	0.002574	0.00177	0.000263	0.000488
Kurtosis	12.81222	9.872157	9.308185	2.829118	0.788571
Skewness	-3.61467	-3.13452	-2.95641	-0.5116	0.889717

F - statistic : 9.548, P - value : 0.002

The Monday Effect in some Asian Foreign Exchange Markets

(Singapore : 1990s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.0001**	-0.00019***	-0.00022***	-0.00056***	-0.00035***
Std. Dev.	0.001753	0.001187	0.000495	0.001051	0.002705
Kurtosis	6.71594	1.077835	-0.32415	1.010611	2.916433
Skewness	-0.32744	-0.6785	-0.49963	-0.79641	1.377475

F - statistic : 20.183, P - value : 0.001

(Hong Kong : 1990s)

	First Week	Second Week	Third Week	Fourth Week	Fifth Week
Mean	-0.0001**	-0.00019***	-0.00022***	-0.00056***	-0.00035***
Std. Dev.	0.001753	0.001187	0.000495	0.001051	0.002705
Kurtosis	6.71594	1.077835	-0.32415	1.010611	2.916433
Skewness	-0.32744	-0.6785	-0.49963	-0.79641	1.377475

F - statistic : 18.595, P - value : 0.001

Our results show that the Monday effect is caused largely by the Mondays of the middle weeks of the Month³. So, we calculated the differences in the two periods, namely second, third and fourth weeks with and the others of two weeks of the month. The results are as follows ;

Table 3 The Difference in the Two Periods of the Month

	India: 1990s	Japan: 1980s	Korea : 1980s	Korea : 1990s	Singapore : 1990s	Hong Kong : 1990s
Differences in the two periods	-0.000021	-0.000201	-0.000333	-0.000419	-0.002158	-0.000985
t-statistics	-5.1236	-3.8156	-4.5631	-4.7701	-3.1587	-2.9815

3. Possible Explanations

Our findings seem clear, however, as in previous studies, it is difficult to explain Monday effect. One explanation is the delay between the trading and the clearing. The other is that traders, especially informed ones have more private information on Mondays after the 'foreign exchange' and 'stock' market have closed for the weekend. And the large volatilities that some economists observed at the opening (Harvey and Huang, 1991) on Fridays may be attributed to U. S. public announcements that often take place during the opening hour of trading on Fridays. However, it cannot explain why the differences between weeks appear. Damodaran (1989) says that firms tend to report bad news on Friday, so investors may sell assets. However, it cannot explain why the Monday effect is concentrated in the middle weeks of the month or explain the effect by theoretical analysis.

For stock markets, it is known that the low Monday return is correlated with the return on the prior day (Abraham and Ikenberry, 1994). However, it is not positively correlated with that (we do not see this result). And, the Monday of the fourth week usually follow the expiration day of stock options, however, there are no such trading practices in foreign exchange markets.

We must look at the difference between the 1980s and 1990s. As the market becomes mature, its efficiency goes up. We focus on the developments of the markets. Generally speaking, markets are not mature at the first stage. We classify Indonesia, Malaysia, Philippine, Singapore (1980s), and Hong Kong (1980s) as first stage markets. These markets are also influenced not only by economic conditions but also political conditions that we do not take into account. Next, as the markets become mature and investors get information, especially on weekends, and trade more freely than before, they sell more assets on Mondays. There are many economic announcements released in the middle of the month and weekends. Our examples may be Japan : 1980s, Korea :

1980s and 1990s, Singapore : 1990s, and Hong Kong : 1990s. Finally, when the markets become more mature, the efficiency goes up. At that point, there should not be any differences in the week. Japan : 1990s is a typical example. The difference between Mondays and the other days should not be in the markets if efficiency is realized.

The differences across currencies might be due to the differences of economic policies in each country. The foreign exchange management policies of financial officials might also affect the movements of the currencies in some countries⁴. Most of the changes happen on Mondays, so investors sell assets fearing risk.

4. Conclusions

If the market was perfect and risk neutral, the Monday effect would of course disappear. In this article we showed that the Monday effect occurred in the 1980s particularly in the the fourth and fifth weeks of the month. We must see the difference between the developments of the markets. The market's relative efficiency may be linked to the Monday effect. Our results suggest that when foreign exchange markets become efficient, there are no 'Monday effects. '

Footnotes

1. Aggarwal and Rivoli (1989) have investigated the seasonal and Day-of-the Week effects in four emerging stock markets. Vetter and Wingender (1996) investigated the January effect in stock markets. See Yamori (1998).
2. However, Mcfarland, Pettit and Sung (1982) found that returns on foreign currency stocks to an American investor are generally high on Monday and Wednesday and low Tuesday and Friday. For some Tuesday cases, we got similar results.
3. The results seem similar to Wang, Li and Erickson (1997). However, they analyze that

effect on stock markets.

4. See, for example, Calderson-Ressel and Ben-Horim (1982), Kraus and Litzenberger (1974), Friend and Westerfield (1980), Samuelson (1970).

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The Monday Effect in some Asian Foreign Exchange Markets

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