

The Impact of Credit Rating Announcements on the Efficiency of the Stock Market

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Abstract: Taking the data of China's listed banks from 2015 to 2021 as a sample, this paper uses the event study method to analyze the impact of credit rating announcements on the effectiveness of the stock market. The results indicate that credit rating announcements have no significant impact on stock returns, and the market is in a semi strong form efficient state. By observing the excess returns of stocks after credit rating downgrades and upgrades, it is found that the excess returns after rating downgrades are not significantly negative, and the market is in a semi strong form efficient state; The rating upgrade has a significant positive impact on stock returns, indicating that the market is in a weakly efficient state.

Keywords: Credit Rating Announcement; Market Effectiveness; Event Study

1. Introduction

The effective market hypothesis divides the market into weak effective market, semi-strong effective market and strong effective market. In these three types of markets, information plays a leading role. Therefore, most scholars start with studying the effectiveness of the market from some information in the capital market. If a credit rating agency adjusts the credit rating of the securities issuer, the information about credit rating changes will move the price of the stock. It can be seen that the credit rating change may provide the market with an issuer credit value change precursor. Therefore, the impact of corporate credit rating and its changes on stock earnings can be used to test the effectiveness of the market. Since the conditions for achieving a strong effective market are more demanding, here we only discuss whether the stock market is weak or semi-strong under the credit rating announcement.

This paper uses the event study to judge the market efficiency, and uses the capital asset pricing model CAPM to calculate the expected return of stocks. The event period window is (-15,15), and the market effectiveness status is determined by calculating the average excess return and cumulative average excess return over the past 30 days. Ten listed banks from 2015 to 2021 were selected as sample data to study the impact of credit rating announcements on stock market efficiency. The empirical results show that the credit rating announcements of the sample have no significant impact on stock returns, indicating that the market is in a semi strong form efficient state; The excess returns after a credit rating downgrade are not significantly negative, indicating that the market is in a semi strong form efficient state; The credit rating upgrade has a significant positive impact on stock returns, indicating that the market is in a weakly efficient or ineffective state.[1]

2. Relevant literature and research hypotheses

In existing literature on the impact of credit rating changes on excess returns, only a few believe that the stock market is efficient, and most believe that the market is ineffective. Some scholars believe that credit rating announcements have no significant impact on company stock returns. Weinstein (1977) believed that changes in bond ratings revealed new information and studied the price behavior of corporate bonds during the announcement period of credit rating changes. The research findings indicate that there is evidence of changes in bond prices during the 7-18 months prior to the announcement of credit rating changes. However, there is no evidence to suggest that bond prices have changed within the six months prior to the announcement of credit rating changes. However, some scholars have found evidence of abnormal stock price behavior after a company's credit rating announcement, such as Creighton, Gowe, and Richards (2007). Klinger and Sarig (2000) investigated whether bond ratings transmit price information by examining trends in securities prices. The results

indicate that credit rating information has not changed the value of the company. Tian Yixiang et al. (2013) found that changes in corporate credit ratings have statistically asymmetric effects on both the stock market and the bond market, and both are significant.[2]

The above literature is mainly the literature that the credit rating change has an impact on the excess return of stocks. So when the credit rating change is decomposed into the credit rating upgrade and the credit rating downgrade, how is its impact on the excess return of the stock market? Some scholars believe that the credit rating downgrade will affect excess returns, while the credit rating upgrade will not. Hand, Holthausen and Leftwich (1992) concluded that the credit downgrade disclosed new information to investors and that the increase had no impact as prices had been consolidated. Matolcsy and Lianto (1995) examined the impact and response of credit rating changes using data from the 1982-1991 Australian stock market.[3] The results show that, in line with the early research literature in the United States, the credit rating downgrade brings new information into the market, which brings significant cumulative average excess returns, while the credit rating upgrade is not obvious.[4]

However, there is a large amount of empirical literature proving that a downgrade of credit ratings can bring serious negative effects to the company's stock market, while a credit rating upgrade has no impact.[5] For example, Holthausen and Leftwich (1986) used the data of daily returns to conduct empirical analysis by using the event study method, and believed that the credit rating downgrades of Moody's and Standard&Poor's had significantly negative excess returns on the stocks of sample companies, while the credit rating downgrades had no response. Dichev and Piotroski (2001) studied how Moody's rating affects long-term stock returns using a sample of large-scale credit rating changes. They found that there was no significant excess return after the credit rating upgrade, while the excess return was significantly negative within one year after the credit rating downgrade announcement, ranging from -10% to -14%. Brooks et al. (2004) studied the impact of changes in sovereign credit ratings on excess returns in the stock market, and found that a downgrade of sovereign credit ratings would have a significant negative impact, while an increase in credit ratings would have an insignificant impact.[6]

3. Research Design

3.1. Model Selection

3.1.1. Excess Return (AR)

Excess returns can be expressed as the difference between actual returns and expected returns, expressed as:

$$AR_t = R_t - E(R_t) \quad (1)$$

In formula (1), AR_t refers to the excess return during period t ; R_t refers to the true rate of return for period t ; $E(R_t)$ refers to the expected return rate during period t . Calculate R_t and $E(R_t)$ separately to obtain the excess return rate.

For the real return rate R_t in formula (1), the following calculation formula is used here:

$$R_t = \ln \left(\frac{P_t}{P_t - 1} \right) \quad (2)$$

In formula (2), P_t refers to the closing price of the t period; $(P_t - 1)$ refers to the closing price on the day before the T period.

4. Empirical Results

4.1. Impact of credit rating announcements on stock returns

This part using the industrial and commercial bank of China, agricultural bank of China, bank of China, China construction bank, bank of communications, China merchants bank, China citic bank, Shanghai pudong development bank, everbright bank and minsheng bank ten listed bank data as samples, empirical analysis of credit rating announcement this event on the stock earnings of listed companies.[7]Table 1 presents the average excess returns and test statistics before and after the credit rating announcements of ten listed companies with event periods of (-15, 15).

Table 1: Average Excess Return and Test Statistics before and after Credit Rating Announcement

Window	Industrial and Commercial Bank of China		Agricultural Bank of China		Bank of China		China Construction Bank		Bank of Communications	
	AAR	t	AAR	t	AAR	t	AAR	t	AAR	t
-15	-0.0014	-0.0657	-0.0002	-0.0079	0.0047	0.2063	0.0096	0.3497	-0.0054	-0.1527
-10	-0.0047	-0.2268	-0.0058	-0.2267	0.0044	0.1989	-0.0021	-0.0794	-0.0037	-0.1264
-5	-0.0072	-0.0464	-0.0075	-0.3129	-0.0061	-0.2713	0.0019	0.0627	-0.0039	-0.1054
-4	0.0126	0.5734	-0.0017	-0.0612	-0.0033	-0.1473	0.0004	0.0128	-0.0049	-0.1465
-3	0.0052	0.2439	-0.0097	-0.3652	0.0042	0.1938	-0.0017	-0.0615	-0.0074	-0.2184
-2	0.0046	0.2036	-0.0127	-0.4574	-0.0025	-0.1184	-0.0063	-0.2151	-0.0087	-0.2356
-1	-0.0034	-0.1752	-0.0032	-0.1449	-0.0137	-0.6245	-0.0098	-0.3164	0.0021	0.0628
0	-0.0051	-0.2342	-0.0079	-0.3216	0.0017	0.0797	0.0102	0.3846	0.0034	0.0971
1	-0.0056	-0.2637	-0.0001	-0.0045	0.0019	0.0985	-0.0117	-0.3954	-0.0075	-0.2158
2	0.0001	0.0104	0.0015	0.0541	-0.0017	-0.0813	-0.0018	-0.0824	0.0075	0.2214
3	-0.0013	-0.0623	-0.0074	-0.2937	0.0053	0.2384	-0.0007	-0.0277	0.0030	0.0873
4	0.0001	0.0024	-0.0012	-0.0529	-0.0021	-0.1102	-0.0029	-0.1014	0.0007	0.0257
5	0.0047	0.2156	0.0004	0.0148	-0.0022	-0.0913	0.0082	0.2917	-0.0044	-0.1226
10	0.0078	0.3452	-0.0004	-0.0162	0.0077	0.3621	0.0035	0.1219	-0.0062	-0.1834
15	-0.0005	-0.0243	-0.0101	-0.3979	0.0117	0.5342	-0.0018	-0.0674	-0.0076	-0.2114

Note: ***, **, * respectively indicate significant differences at the 1%, 5%, and 10% levels.

Table 2: Average excess return and inspection statistics before and after the credit rating announcement (continued)

Window	China Merchants Bank		China Citic Bank		Shanghai Pudong Development Bank		Everbright Bank		China Minsheng Banking Corp.Ltd.	
	AAR	t	AAR	t	AAR	t	AAR	t	AAR	t
-15	-0.0029	-0.0896	0.0126	0.3841	0.0141	0.5562	0.0021	0.1001	-0.0045	-0.1035
-10	0.0002	0.0067	-0.0137	-0.4018	0.0016	0.0571	0.0038	0.1643	0.0144	0.3951
-5	0.0177	0.5416	-0.0072	-0.2064	0.0129	0.5194	0.0013	0.0517	-0.0027	-0.0728
-4	-0.0427	-1.1467	-0.0151	-0.4246	0.0021	0.0875	-0.0046	-0.2001	0.0005	0.0118
-3	-0.0131	-0.4027	-0.0152	-0.4776	0.0114	0.5264	0.0078	0.3357	-0.0186	-0.3942
-2	0.0487	1.4882	-0.0101	-0.3002	0.0213	0.7624	-0.0001	-0.0028	0.0005	0.0127
-1	0.0096	0.3117	-0.0063	-0.1812	0.0041	0.1684	0.0082	0.3546	0.0006	0.0185
0	0.0115	0.3517	-0.0074	-0.2189	0.0115	0.4257	-0.0023	-0.1100	-0.0194	-0.5013
1	0.0006	0.0214	-0.0152	-0.4412	0.0191	0.7247	-0.0072	-0.3524	-0.0111	-0.2852
2	0.0159	0.4975	0.0007	0.0214	-0.0019	-0.0818	-0.0044	-0.1986	-0.0221	-0.5672
3	-0.0027	-0.0861	-0.0046	-0.1364	0.0178	0.7362	-0.0015	-0.0717	0.0052	0.1348
4	-0.0026	-0.0854	-0.0081	-0.2387	0.0029	0.1147	0.0036	0.1528	0.0007	0.0168
5	-0.0158	-0.4892	-0.0030	-0.0894	0.0125	0.4997	-0.0067	-0.2856	-0.0021	-0.0576
10	-0.0039	-0.1295	-0.0191	-0.5621	0.0067	0.2637	0.0005	0.0222	0.0062	0.1624
15	0.0079	0.2539	-0.0186	-0.5384	0.0138	0.5468	-0.0030	-0.1268	-0.0081	-0.2034

From the results in Table 1 and 2, it can be seen that for these ten listed banks, the average excess return on the day of the credit rating announcement was relatively small and had different directions. The average excess return on the day of the credit rating announcement of five listed banks, including Industrial and Commercial Bank of China, Agricultural Bank of China, CITIC Bank, Everbright Bank,

and Minsheng Bank, was negative, while the average excess return on the day of the credit rating announcement of the other five listed banks was positive.[8] However, the values of the test statistic t for the above data are relatively small, indicating that these data are not significant. For each listed bank, the average excess return before and after the credit rating announcement (-15, 15) window is relatively small, with varying positive and negative values, and is not significant. These results indicate that there is no significant impact on stock returns before and after the credit rating announcements of these ten listed banks, indicating that the market is in a semi strong form efficient state. This is consistent with our previously proposed hypothesis H1b.

5. Conclusion

Since Fama proposed the efficient market hypothesis in 1970, there have been numerous literature analyzing and studying market efficiency. These literature use a variety of research methods and perspectives, resulting in varying conclusions. There is also a lot of research on this aspect in China, but there is not much literature on studying stock returns from the perspective of credit rating announcements and credit rating downgrades. In this context, we select the data of listed banks in China from 2008 to 2014 as a sample, and use the general event study method to study the impact of credit rating announcements of listed banks on market effectiveness. We conclude that credit rating announcements and downgrades have no significant impact on market effectiveness, while credit rating upgrades have a significant impact on market effectiveness.

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