Efficiency of CAPM Model -- Based on the Stocks of Energy and Auto Industries

Wenwen Yang[a, *]

School of Southwest Minzu University, Chengdu, Sichuan 610000, China

[a]wenwen_yang@protonmail.com

*Corresponding author

Keywords: CAPM Model, Oil Industry, Automobile Industry, Effectiveness

Abstract: As a basic model for investors to choose investment strategies in the capital market, the effectiveness of CAPM model is often controversial. In this paper,10 stocks from automobile industry and the energy industry are selected as samples and the least square regression of CAPM is carried out. The validity of CAPM model is tested from the three aspects of the regression equation: the α values, the β values and the coefficient of determination.

1. Introduction

Since its appearance, the capital market has been accompanied by high risks. In the capital market that is full of risks and uncertainties, people often use financial instruments and financial models to decide investment strategies. Among them, CAPM model, as the basis of various related asset pricing, is often applied to asset valuation, capital cost budget and resource allocation, and is the pillar of modern financial market price theory [1]. The CAPM model has been widely recognized in the field of securities theory. This model mainly analyzes the sensitivity of securities returns and market portfolio returns, and helps investors decide whether the additional returns they get are matched with the risks involved.

1.1 The Role of the CAPM Model

(1) Asset Valuation

In terms of asset valuation, capital asset pricing model is mainly used to judge whether securities are mispriced by the market [2]. According to the capital asset pricing model, securities expectation shall be equal to the risk-free rate plus a risk premium for the determination of the securities by the beta coefficient.

$$E(r_i) = r_f + (E_m - r_f)\beta_i \tag{1}$$

Where E(ri) refers to the expected return rate; r_f is risk-free interest rate; (E_m-r_f) refers to the market risk premium, that is, the difference between the expected market rate of return and the risk-free rate of return; β_i is the systemic risk of asset i.

On the one hand, when we get estimates of the expected rate of return of the market portfolio and the risk of the securities β_i estimate, we can calculate the expected return of securities I_e under the market equilibrium (r_i); On the other hand, the market has an expected value for the income stream (dividend plus ending price) generated by the security in the future, which is related to the beginning market price of security I and its expected return rate $E(r_i)$ as follows:

$$E\ (r_i) = \left[E_{(dividend+endprice)}/beginprice\right] - 1 \tag{2}$$

Where E (dividend+endprice) refers to the expected value of the revenue stream; begin price is the initial market price of a security.

In equilibrium, the two E (r_i) should have the same value. Therefore, the equilibrium price should be:

$$Equi\ (endprice) = E\ (dividend + endprice)/[1 + \ E(r_i)] \quad (3)$$

Where Equi (end price) is the equilibrium price.

We can then compare the current actual market price with the equilibrium starting price. If the two are not equal, the market price is wrong, and the false price should have the requirement of regression. By taking advantage of this, we can obtain excess returns. In particular, when the actual price is lower than the equilibrium price, it means that the security is undervalued, and we should buy the security. On the contrary, we should sell the security and move the money into other cheaper securities [3]. When the ending price in the formula is regarded as the discounted value of future cash flow, the formula can also be used to determine whether the market price of the security is mispriced [4].

(2) An Important Application of Resource Allocation

CAPM model in resource allocation is to select securities or portfolios with different coefficients according to the prediction of market trends to obtain higher returns or avoid market risks [5]. The stock market line indicates that the coefficient of the securities or portfolio reflects the sensitivity of the securities or portfolio to market systemic risk. Therefore, when the bull market is predicted with a high degree of confidence, the securities or portfolio with a high coefficient should be selected. These high- efficiency securities will multiply the market rate of return, bringing higher returns. Conversely, in a bear market, choose securities or portfolios with lower leverage to reduce losses from market declines.

1.2 Motivation

However, many scholars questioned the validity of CAPM model. For example, Roll questioned the validity of the CAPM model, arguing that the empirical study of the previous hypothesis could not verify the validity of CAPM's conclusion [6]. In 1992, Fama and French comprehensively considered various abnormal phenomena before and conducted in-depth analysis on the abnormal factors [7]. The empirical test results showed that the positive correlation described by CAPM does not exist if and only if the coefficient is the only explanatory variable. Therefore, the validity of CAPM model is still controversial in the academic field. Given that the effectiveness of CAPM model affects the effectiveness of investment strategy and even affects the effectiveness of all conclusions based on CAPM model, the applicability analysis of the application of CAPM model in capital market is of great help to the investment strategy of investors [8]. To solve this problem, this paper investigated applicability of CAPM model through conducting empirical analysis on stocks from automobile industry and energy industry and further test the regression model.

The paper is constructed into following parts: Chapter 2 shows all the relative literature review; Chapter 3 elaborates the methodology; Chapter 4 shows results and discussion; Chapter 5 concludes the whole paper.

2. Literature review

2.1 Methods to Verify the Validity of CAPM Model

2.1.1 Stock Market Line Method

The test of standard CAPM can be realized by testing the linearity of its security market line, that is, the relationship between the expected return rate of the security and the beta coefficient related to the market portfolio of the security is linear, which is also the focus of early CAPM test [9]. This test can be carried out by means of cross-sectional regression of the expected return on a security to its beta coefficient, therefore calls for cross-section regression, also known as a two-step regression method.

2.1.2 Mean-Variance Method

This method refers to construct an F statistic by using the residual in CAPM, the mean, variance and constant term in the regression of expected market returns, which can test the effectiveness of the market portfolio [10]. This method can be realized by GRS test. GRS test is an accurate F statistic proposed by Gibbons, Ross and shanken in 1989 to test whether the regression alpha intercept of N assets in the risk-factor pricing model of stock assets is joint zero. In order to verify whether to reject the test of CAPM model.

2.2 The Related Literature

Since the CAPM model was proposed, financial scholars aimed at the question of whether the CAPM model is effective in the real market has been done lots of empirical tests. The first person to test CAPM model is Sharpe [11], one of the authors of the model, took America 34 for a sample of data on mutual funds from 1954 to 1963, Leigh uses this data to calculate their average annual returns and returns, the standard deviation of the rate, and carried out regression analysis on them, regression results show that the average return of these mutual funds is between zero and zero in a similar linear relationship [12].

Black, Scholes and Jensen takes all the companies listed on the New York Stock Exchange between 1926 and 1966 [13]. The company's stock data were empirically tested and the results found in the stock. There is a positive linear relationship between the return rates of this linear relationship is more significant.

Fama and MacBeth used multiple linear regression model to conduct empirical research on the stock market in the United States, and the research results were consistent with those of Black, indicating that CAPM model was applicable in the American stock market [14]. Later, Roll argued that the CAPM model could not be tested because the market index portfolio was not necessarily efficient.

Using Fama's and MacBeth's test methods, Reinganum selected the daily return rate of stocks as the sample data to make an empirical analysis of the model [15]. However, the results showed that the relationship between stock return rate and coefficient was inverse, so he questioned whether the CAPM model was effective.

3. Methodology

3.1 Empirical Model

The following model is used to estimate the risk factor between each stock and the market:

$$R_{it} - R_f = \alpha_i + \beta\left(R_{mt} - R_f\right) + E_{it} \tag{4}$$

Where, R_{it} represents the return rate of stock *i* at time *t*, R_{mt} represents the return rate of market portfolio at time *t*, and R_f represents the risk-free return rate. In the test results, if the p value of model is less than 0.05, the value is not significant, which can prove the validity of the model from one aspect. If the p value corresponding to the β value of the model is less than 0.05, the model is valid. The closer the coefficient of determination is to 1, the stronger the explanatory force of the model is.

3.2 Data

3.2.1 Stocks of Energy and Automobile Industries

Scholars have focused on whether CAPM model is applicable to stock market, a certain industry or even a certain stock [16]. As the world's population continues to grow and people's living standards continue to improve, people's demand for energy and cars is also increasing. The energy industry and the automobile industry play an important role in promoting the development of the national economy. At the same time, they have always been the hot sectors in the stock market, and many investors often choose the stocks of these two sectors to allocate. Therefore, the energy industry and automobile industry are selected as research objects to test the effectiveness of CAPM model for the energy industry and automobile industry and provide some references for investors. Based on regression analysis, this paper selects five popular stocks in two industries respectively, and analyzes whether the CAPM model is applicable to these two industries based on the monthly return rate from 2015 to 2019, so as to provide some help for investors in their selection. Five stocks of energy industry are: Phillips 66; Valero Energy Corp; Exxon Mobil; BP Programmable Logic Controller;

Royal Dutch Shell A. Five stocks of automobile industry are: Daimler AG; Fiat Chrysler Automobiles; Tesla Inc; Ford Motor Company; General Motor.

3.2.2 Data Resources

The market return rate is the weighted return rate of the market portfolio. The S&P 500 index is selected in this paper (see appendix for details). The risk-free rate is the rate of interest that can be obtained by investing money in an investment object without any risk. This is an ideal return on investment, generally affected by the benchmark interest rate. Interest rate is the compensation for opportunity cost and risk, and the compensation for opportunity cost is called risk-free rate. It is the investment of the asset that has no credit risk and market risk namely, point to maturity date is equal to the interest rate of the national debt of investment period. In this paper, the short-term Treasury bond interest rates of the United States from 2015.01.01-2019.12.01 are selected to analysis the CAPM model.

4. Results and Discussion

4.1 Results

EVIEWS software is used to carry out regression of the model:

Table 1. The least-squares regression results for 10 stocks

Stocks	αi	βi	R-squared	F-statistic	Durbin-Watson
Phillips 66	0.0043 (0.58)	0.88^{***} (9.89)	0.63	97.72	1.93
Valero Energy Corp	0.0093 (0.93)	0.75^{***} (6.24)	0.41	38.91	2.17
Exxon Mobil	-0.0079 (-1.52)	0.95^{***} (15.21)	0.81	231.39	2.14
BP plc	-0.0017 (-0.21)	0.94^{***} (9.97)	0.64	99.33	2.62
Royal Dutch Shell A	-0.0021 (-0.29)	0.94^{***} (11.07)	0.68	122.59	2.69
Daimler AG	-0.0095 (-1.16)	0.91^{***} (9.08)	0.59	82.38	2.54
Fiat Chrysler Automobiles	0.0129 (-1.16)	0.81^{**} (3.99)	0.22	15.95	2.36
Tesla Inc	0.0116 (0.73)	0.77^{**} (4.02)	0.22	16.17	2.07
Ford Motor Company	-0.0096 (-1.37)	0.93^{***} (10.97)	0.68	120.39	2.01
General Motor	-0.0035 (-0.4569)	0.84^{***} (9.29)	0.61	86.47	1.91

(Note: t test value is shown in brackets. *,* * and *** indicate that the estimated coefficients are significant at the levels of 0.1, 0.05 and 0.01, respectively.)

4.2 Discussion

It can be seen from the table 1 that the estimated values of the 10 stocks are all significantly positive, indicating that the estimation of the stock return rate is valid during the period of 2015-2019. According to CAPM model, represents the systematic risk of stocks relative to the market. Among the systematic risk coefficient of a single stock, Exxon Mobil has the largest value (0.95).Valero Energy Corpis the smallest (0.75). The average value of the 10 stocks is 0.87. All the stocks are defensive, with an average value of less than 1. The auto sector has less aggressive stocks than the energy sector.

From the regression results, we can see that the α value is not significant, which indicates that the model is valid to some extent.

As can be seen from the above table, the coefficient of determination of most regression equations is not large, with the largest being 0.81 (Exxon Mobil) and the smallest being 0.22 (Fiat Chrysler Automobiles and Tesla Inc).The coefficient of determination reflects the part of the sum of squares of the total dispersion that can be explained by the regression equation, that is, the proportion of the system risk in the total risk. This shows that the system risk is not strong enough to explain the expected stock return rate, and the stock return rate is not high enough to compensate the system risk

5. Conclusion

From the above analysis, it can be seen that CAPM model has been tested and is effective, that is, CAPM model is applicable to the investment analysis of stocks in the automobile industry and energy industry. However, the explanation of the system risk to the expected stock return rate is weak, and the expected stock return rate is also affected by many other factors. Therefore, CAPM model is valid for investing stocks, but is not perfect in estimating the factors that affect the return rate.

References

[1] Zhang Jiabao. Research on stock returns based on three-factor capital asset pricing model [D]. Zhejiang University, 2019.

[2] Zhang Yan, Wang Yideng. Research on the effectiveness of CAPM model -- based on the empirical comparison of China's securities industry during the bull bear market [J]. Foreign trade and economics, 2019 (05): 133 - 137.

[3] Xiong Pengfei. Empirical analysis of CAPM application--market-based validity test [J]. Modern economic information, 2019 (16): 285 - 286.

[4] Wang Guan. Validity test of CAPM model in real estate industry [J]. Industry and technology forum, 209, 18 (17): 139 - 140.

[5] Sun Xuepeng. Practical analysis of capital asset pricing model theory [J]. Financial science (academic edition), 2019 (03): 39 - 41.

[6] Roll. A critique of the asset pricing theory’s test [J]. Journal of Financial Economics, 1977, 12(2): 129 - 176.

[7] Fama EF, MacBeth J. Risk return and equilibrium: empirical test [J]. Journal of Political Economy, 1973, 71 (1): 607 - 654.

[8] Zhou Liang, Wang Yinzhi. A study on the anomaly of low risk in Chinese stock market [J]. Financial theory and practice, 2020 (03): 90 - 96.

[9] Gibbons M, Ross S, Shanken J. A test of the efficiency of given portfolio [J]. Econometrica, 1989, 57: 1121 - 1152.

[10] Wang Yong. Test method and hypothesis of CAPM [J]. Statistics and information forum, 2009, 24 (06): 8-11 + 20.

[11] Shape WF. Capital asset prices: a theory of market equlibrium under condition of risk [J]. Journal of Finance, 1964, 19 (2): 425 - 442.

[12] Nikolaos Galatis, Ekaterini Nitsi, Chrysoula Theloura. Investigating Financial Performance of Low-and High-Rated ETFs during the QE-Tapering. 2020, 11 (1): 107 - 123.

[13] Black F, Jensen M C, Scholes M. The capital asset pricing model: some empirical test [M]. New York: Praeger, 1972.

[14] Fama E, MacBeth J. Risk, Return, and Equilibrium: Empirical Tests [J]. Journal of Political Economy, 1973, 71: 607 - 636.

[15] Reinganum MR. A new empirical perspective on the CAPM [J]. Journal of Financial and Quantitative Analysis, 1981, 16 (4): 439 - 462.

[16] Yu Lingqin. Empirical study of CAPM model in Chinese securities market [D]. Guizhou University of finance and economics, 2010.

Appendix

Table S1. The historical price of stocks of energy industry

Date	**PSX**	**VLO**	**XOM**	**BP**	**RDS-A**
2015/1/1	60.21	44.05	72.06	28.19	44.37
2015/2/1	67.18	51.39	72.99	30.09	47.20
2015/3/1	67.76	53.39	70.60	28.82	43.69
2015/4/1	68.37	47.75	72.56	31.80	46.46
2015/5/1	68.21	49.71	70.76	30.55	43.74
2015/6/1	69.94	52.89	69.67	29.86	42.39
2015/7/1	69.02	55.42	66.33	27.62	42.74
2015/8/1	68.64	50.45	63.01	25.06	39.34
2015/9/1	67.15	51.09	62.84	23.22	35.80
2015/10/1	77.82	56.04	69.93	27.12	39.63
2015/11/1	79.99	61.09	69.02	26.28	37.59
2015/12/1	71.92	60.54	66.46	24.14	35.23
2016/1/1	70.47	58.11	66.38	24.99	33.80
2016/2/1	69.81	51.44	68.34	22.46	34.99
2016/3/1	76.71	55.46	71.92	23.80	38.07
2016/4/1	72.74	50.90	76.05	26.48	41.56
2016/5/1	71.19	47.29	76.59	24.76	38.10
2016/6/1	70.85	44.57	81.33	28.52	44.20
2016/7/1	67.93	45.69	77.17	27.63	41.46
2016/8/1	70.06	48.37	75.60	27.20	39.14
2016/9/1	72.52	46.84	76.37	28.76	40.85
2016/10/1	73.06	52.35	72.90	29.08	40.63
2016/11/1	74.79	54.40	76.38	28.64	41.69
2016/12/1	78.38	60.94	79.67	31.12	45.19
2017/1/1	74.04	58.66	74.05	29.96	45.20
2017/2/1	70.93	60.61	71.78	28.24	43.12
2017/3/1	72.43	59.75	73.05	29.25	44.59
2017/4/1	72.74	58.24	72.73	29.08	44.13
2017/5/1	69.59	55.41	71.71	30.63	46.01
2017/6/1	76.27	61.45	72.59	29.86	45.74
2017/7/1	77.25	62.83	71.97	30.28	48.61
2017/8/1	77.30	62.04	68.64	29.93	47.45
2017/9/1	85.21	70.80	74.43	33.67	52.97
2017/10/1	84.72	72.61	75.67	35.64	55.11
2017/11/1	90.75	78.80	75.62	35.11	56.06
2017/12/1	94.80	85.31	76.64	37.37	59.21
2018/1/1	95.97	89.08	79.99	38.04	62.34
2018/2/1	84.70	83.93	69.40	34.55	56.15
2018/3/1	90.58	86.90	69.07	36.59	57.46

2018/4/1	105.12	103.91	71.97	40.24	62.94
2018/5/1	110.01	113.53	75.20	41.35	62.65
2018/6/1	106.76	104.53	77.36	41.74	63.17
2018/7/1	117.25	111.63	76.22	41.22	62.38
2018/8/1	112.66	111.18	74.96	39.20	59.52
2018/9/1	107.90	108.04	80.32	42.73	63.05
2018/10/1	98.42	86.52	75.28	40.20	58.47
2018/11/1	89.52	75.89	75.11	37.40	55.89
2018/12/1	83.16	71.89	65.07	35.66	54.76
2019/1/1	92.10	84.21	69.93	38.67	58.01
2019/2/1	93.01	78.21	75.42	40.11	58.46
2019/3/1	92.64	82.23	77.96	41.72	59.71
2019/4/1	91.76	87.88	77.46	41.73	60.61
2019/5/1	78.65	68.25	68.29	38.85	58.96
2019/6/1	91.99	83.92	74.79	40.38	62.99
2019/7/1	100.86	83.56	72.57	38.48	60.88
2019/8/1	97.00	73.79	66.83	35.78	53.82
2019/9/1	101.63	84.48	69.77	37.40	57.93
2019/10/1	115.94	96.12	66.76	37.32	57.07
2019/11/1	113.86	94.64	67.32	36.84	56.59
2019/12/1	111.41	93.65	69.78	37.74	58.98

Table S2. The historical price of stocks of auto industry

Date	DDAIF	FCAU	TSLA	F	GM
2015/1/1	70.47	7.48	203.60	11.15	26.15
2015/2/1	75.29	8.73	203.34	12.52	29.91
2015/3/1	75.55	9.24	188.77	12.36	30.06
2015/4/1	75.44	8.36	226.05	12.10	28.34
2015/5/1	75.68	9.08	250.80	11.73	29.07
2015/6/1	73.92	8.23	268.26	11.61	26.94
2015/7/1	71.69	8.95	266.15	11.47	25.73
2015/8/1	64.66	12.40	249.06	10.83	24.04
2015/9/1	58.56	7.48	248.40	10.60	24.52
2015/10/1	69.86	8.29	206.93	11.57	28.86
2015/11/1	71.77	8.07	230.26	11.31	29.93
2015/12/1	67.24	7.93	240.01	11.12	28.12
2016/1/1	56.30	6.06	191.20	9.42	24.76
2016/2/1	54.63	5.91	191.93	9.99	24.59
2016/3/1	61.75	6.95	229.77	10.78	26.26
2016/4/1	56.07	6.98	240.76	10.83	26.90
2016/5/1	57.82	6.18	223.23	10.90	26.46
2016/6/1	50.86	5.28	212.28	10.15	23.94
2016/7/1	57.57	5.53	234.79	10.22	27.02
2016/8/1	58.60	5.93	212.01	10.29	27.34
2016/9/1	59.87	5.52	204.03	9.86	27.22
2016/10/1	60.49	6.31	197.73	9.59	27.39
2016/11/1	56.28	6.60	189.40	9.89	29.93
2016/12/1	62.85	7.86	213.69	10.03	30.20
2017/1/1	63.78	9.48	251.93	10.22	32.08
2017/2/1	61.55	9.46	249.99	10.48	32.28
2017/3/1	62.79	9.42	278.30	9.74	30.99

2017/4/1	66.05	9.80	314.07	9.60	30.67
2017/5/1	64.52	9.11	341.01	9.43	30.04
2017/6/1	64.35	9.17	361.61	9.49	30.92
2017/7/1	62.21	10.42	323.47	9.51	32.21
2017/8/1	64.69	13.04	355.90	9.47	32.71
2017/9/1	70.71	15.44	341.10	10.28	36.15
2017/10/1	74.29	14.96	331.53	10.54	39.27
2017/11/1	73.73	14.74	308.85	10.89	39.37
2017/12/1	75.05	15.38	311.35	10.86	37.45
2018/1/1	81.35	20.84	354.31	9.54	39.10
2018/2/1	76.15	18.27	343.06	9.35	36.28
2018/3/1	75.28	17.69	266.13	9.76	33.50
2018/4/1	69.88	18.82	293.90	9.90	34.22
2018/5/1	68.07	20.03	284.73	10.31	39.77
2018/6/1	60.13	16.29	342.95	9.88	36.69
2018/7/1	64.80	14.64	298.14	8.96	35.61
2018/8/1	61.41	14.75	301.66	8.58	33.87
2018/9/1	59.03	15.10	264.77	8.37	31.63
2018/10/1	55.34	13.03	337.32	8.64	34.75
2018/11/1	52.88	14.30	350.48	8.67	36.04
2018/12/1	49.42	12.47	332.80	7.05	31.77
2019/1/1	55.56	14.84	307.02	8.11	37.45
2019/2/1	56.24	12.70	319.88	8.22	37.89
2019/3/1	54.85	12.80	279.86	8.23	35.60
2019/4/1	61.57	13.29	238.69	9.97	37.75
2019/5/1	48.47	11.39	185.16	9.23	32.31
2019/6/1	55.70	13.82	223.46	9.92	37.34
2019/7/1	51.63	13.19	241.61	9.24	39.52
2019/8/1	46.97	13.14	225.61	9.02	36.33
2019/9/1	49.66	12.95	240.87	9.01	36.71
2019/10/1	58.36	15.32	314.92	8.46	36.77
2019/11/1	56.31	14.75	329.94	9.06	35.62
2019/12/1	54.48	14.69	418.33	9.30	36.21

Table S3. S&P 500 index

Date	S&P 500	Date	S&P500
2015/1/1	1988.50	2017/7/1	2467.50
2015/2/1	2102.75	2017/8/1	2470.00
2015/3/1	2060.75	2017/9/1	2516.00
2015/4/1	2079.00	2017/10/1	2572.75
2015/5/1	2104.25	2017/11/1	2648.00
2015/6/1	2055.00	2017/12/1	2676.00
2015/7/1	2098.50	2018/1/1	2825.75
2015/8/1	1969.25	2018/2/1	2714.50
2015/9/1	1903.75	2018/3/1	2643.00
2015/10/1	2073.75	2018/4/1	2647.00
2015/11/1	2079.75	2018/5/1	2705.50
2015/12/1	2035.50	2018/6/1	2721.50
2016/1/1	1930.00	2018/7/1	2817.00
2016/2/1	1929.50	2018/8/1	2902.00
2016/3/1	2051.50	2018/9/1	2919.00

2016/4/1	2060.25	2018/10/1	2711.00
2016/5/1	2095.00	2018/11/1	2758.25
2016/6/1	2086.00	2018/12/1	2505.25
2016/7/1	2168.25	2019/1/1	2704.50
2016/8/1	2169.50	2019/2/1	2784.75
2016/9/1	2160.50	2019/3/1	2837.75
2016/10/1	2120.00	2019/4/1	2948.50
2016/11/1	2198.75	2019/5/1	2752.50
2016/12/1	2236.25	2019/6/1	2970.25
2017/1/1	2274.50	2019/7/1	2982.25
2017/2/1	2362.75	2019/8/1	2924.75
2017/3/1	2359.25	2019/9/1	2978.50
2017/4/1	2380.50	2019/10/1	3035.75
2017/5/1	2411.00	2019/11/1	3143.75
2017/6/1	2422.00	2019/12/1	3231.00

Table S4. Treasury bond interest rats from 2015 to 2019

Date	Yield	Date	Yield
2015/2/1	0.1952	2017/8/1	-0.0746
2015/3/1	-0.0340	2017/9/1	0.0967
2015/4/1	0.0579	2017/10/1	0.0215
2015/5/1	0.0239	2017/11/1	0.0173
2015/6/1	0.1146	2017/12/1	-0.0050
2015/7/1	-0.0557	2018/1/1	0.1310
2015/8/1	-0.0023	2018/2/1	0.0544
2015/9/1	-0.0636	2018/3/1	-0.0443
2015/10/1	0.0442	2018/4/1	0.0711
2015/11/1	0.0311	2018/5/1	-0.0388
2015/12/1	0.0230	2018/6/1	0.0096
2016/1/1	-0.1490	2018/7/1	0.0404
2016/2/1	-0.0989	2018/8/1	-0.0374
2016/3/1	0.0264	2018/9/1	0.0712
2016/4/1	0.0185	2018/10/1	0.0337
2016/5/1	0.0082	2018/11/1	-0.0462
2016/6/1	-0.1887	2018/12/1	-0.1085
2016/7/1	-0.0202	2019/1/1	-0.0190
2016/8/1	0.0754	2019/2/1	0.0288
2016/9/1	0.0255	2019/3/1	-0.1096
2016/10/1	0.1405	2019/4/1	0.0394
2016/11/1	0.2912	2019/5/1	-0.1463
2016/12/1	0.0469	2019/6/1	-0.0663
2017/1/1	-0.0113	2019/7/1	0.0105
2017/2/1	-0.0379	2019/8/1	-0.2548
2017/3/1	0.0161	2019/9/1	0.1122
2017/4/1	-0.0476	2019/10/1	0.0096
2017/5/1	-0.0377	2019/11/1	0.0503
2017/6/1	0.0483	2019/12/1	0.0028
2017/7/1	-0.0043		