

Final Project
Digital Tools for Finance

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Introduction

This report is aimed on the estimation of the cost of capital of the main players of the oil industry.

The first part of the report gives a brief overview of main market characteristics of oil stocks.

The second part of the report is dedicated to the estimation of the cost of capital.

Overview of Market Data

Market

Table 1: Oil companies statistics

Statistics	SNP	PTR	RDS	BP	XOM	TOT	CVX
Min.	−0.0676	−0.0988	−0.1717	−0.1910	−0.1222	−0.1782	−0.2212
1st Qu.	−0.0125	−0.0142	−0.0168	−0.0172	−0.0178	−0.0127	−0.0148
Median	−0.0001	−0.0023	−0.0016	−0.0031	−0.0045	−0.0007	−0.0020
Mean	−0.0005	−0.0010	−0.0011	−0.0017	−0.0017	−0.0001	−0.0004
3rd Qu.	0.0108	0.0105	0.0138	0.0131	0.0111	0.0139	0.0122
Max.	0.1026	0.1490	0.1967	0.2160	0.1268	0.1527	0.2274

Figure 1: Dynamics of S&P Index



Cost of Capital

According to Damodaran (2001) and Plenborg and Pimentel (2016), one of the most prominent methods in calculating the cost of equity is the CAPM model, that is being implemented in the current research.

Returns Distribution

In this section we consider the type of the returns' distribution of several companies, as recommended by Fishman and Parker (2015).

Figure 2: Daily returns distribution of China Petroleum & Chemical

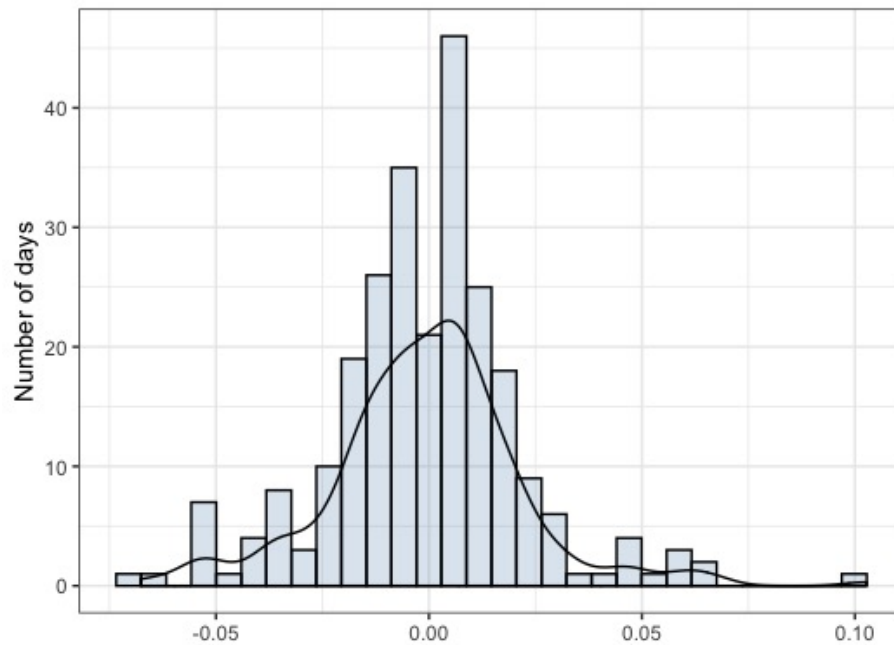


Figure 3: Daily returns distribution of PJSC Lukoil

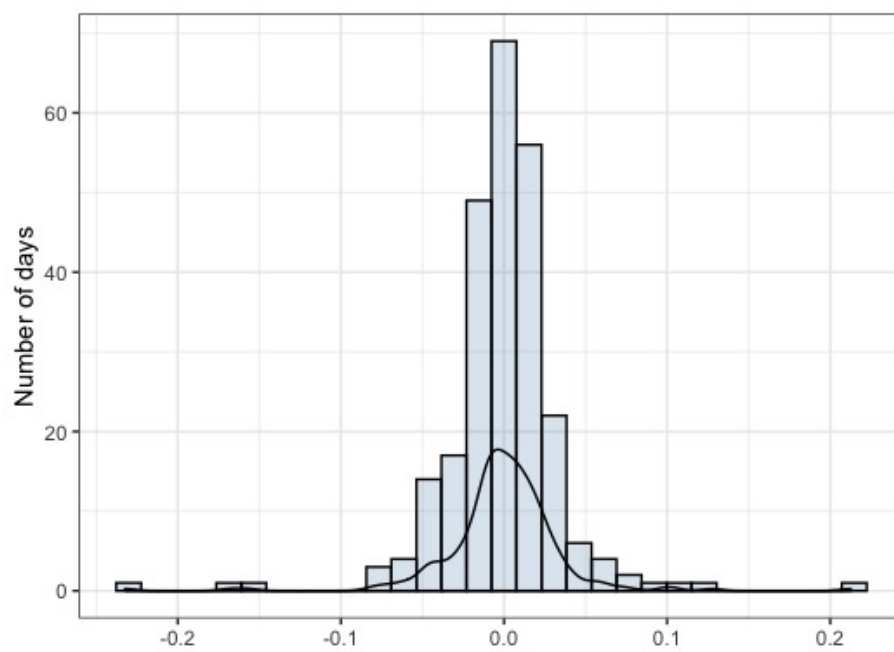
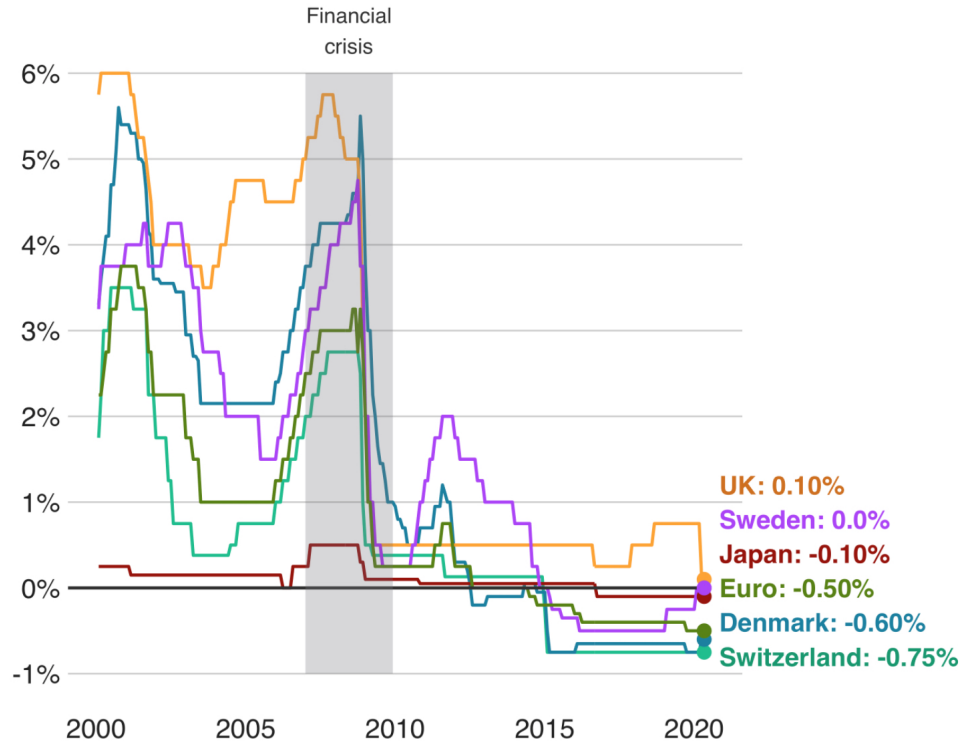


Figure 4: Global risk free rates



Source: Bank for International Settlements

BBC

Risk-free rate

According to Anderson (2012), for the estimation of risk-free rates we considered global risk-free rates (Figure 4)

The risk free rate for the current project was accepted to be 0.

Beta estimation

Companies' beta coefficients were calculated, using the methodology, described by Casey and Simon-Kerr (2015).

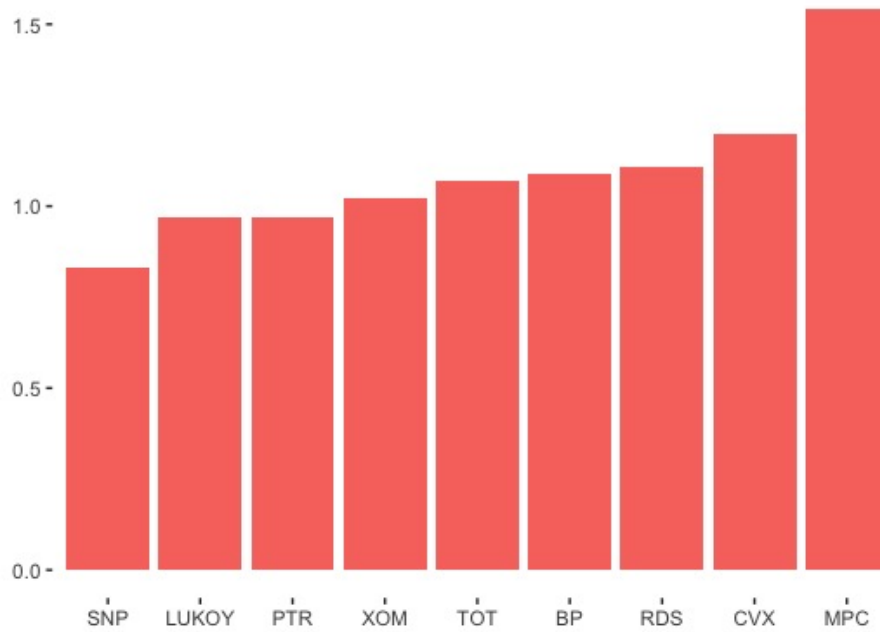
The 5 year time period was used for the estimation. The market index was represented by S&P 500.

The results are presented in Table 2.

Table 2: Beta coefficients

1	China Petroleum & Chemical	0.83
2	PetroChina	0.97
3	Royal Dutch Shell PLC	1.11
4	BP PLC	1.09
5	Exxon Mobil Corp.	1.02
6	Total SE	1.07
7	Chevron Corp.	1.20
8	Marathon Petroleum Corp.	1.54
9	PJSC Lukoil	0.97

Figure 5: Beta Coefficients



Cost of Equity

Cost of equity was calculated with the CAPM method, using the following formula:

$$r_e = r_f + \beta(r_m - r_f)$$

The results of calculations are provided in Table 3.

Table 3: Cost of Capital

1	China Petroleum & Chemical	0.15
2	PetroChina	0.17
3	Royal Dutch Shell PLC	0.20
4	BP PLC	0.19
5	Exxon Mobil Corp.	0.18
6	Total SE	0.19
7	Chevron Corp.	0.21
8	Marathon Petroleum Corp.	0.27
9	PJSC Lukoil	0.17

Findings and Conclusion

References

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