

Brexit: Changing Dynamics of Corporate Financial Risks, Return, and Performance

Case Companies: BP, Royal Bank of Scotland, Marks & Spencer, GlaxoSmithKline, EasyJet

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Abstract <p>On the 23 of June 2016, as a result of a referendum, the United Kingdom decided to leave the European Union. Brexit was established as a term, indicating the exit of the United Kingdom from the European Union.</p> <p>The objectives were to analyze the way the Brexit vote has affected five different UK multinational corporations from different sectors in terms of corporate risk exposure, return, and performance. The companies were: BP, Royal Bank of Scotland, Marks & Spencer, GlaxoSmithKline, and EasyJet. The most important financial risks of the case companies were explored, together with implications they face because of the Brexit vote. To measure the aforementioned effects, three different theories were reviewed: 1) Beta coefficient, 2) Capital Asset Pricing Model (CAPM), 3) Jensen's alpha.</p> <p>A quantitative approach was adopted and data was collected from stock market databases and used for calculating incremental beta, incremental CAPM, and incremental Jensen's alpha for each company. The incremental values represented a percentage change over two reference periods, before the Brexit vote and after.</p> <p>The results varied for every company indicating that Brexit vote had different effects on the industries in which the companies operate. BP and EasyJet were the least affected companies, while Marks & Spencer was heavily affected. Royal Bank of Scotland faces challenges, but it cannot be said whether it is because of the Brexit vote or internal management. GlaxoSmithKline faces great uncertainty because of the industry in which it operates. The results are limited to the companies in concern, however the methodology can be applied for further research regarding the effects of Brexit on UK multinationals.</p>		
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1 Introduction

On the 23rd of June 2016, a referendum took place in the United Kingdom (UK) in order to decide whether the UK will remain or leave the European Union (EU), a member of which it was since 1973. The results showed that people had decided to leave the EU, with the percentage being 52% for Brexit and 48% against it. The turnout was 71.8%. (Wheeler, Hunt 2016.) The results came as a shock for the European Union. No country has ever left it after article 50 was introduced which allows member countries to withdraw should they please to do so. It is considered by many as the biggest disaster in EU's 59-year history and that is because of the complexity that such a phenomenon bears. (Wilkinson, Midgley 2016.)

UK contributed to 12.57% of the EU's budget in 2015 which leads to the assumption that the economic and financial world will be heavily affected from what seems to be a socio-political phenomenon (Share of total contributions to the European Union budget in 2015, by Member State* N.D.). UK will lose access to EU's single market, which means that UK multinationals are exposed to financial issues that involve trade regulations, taxation, commercial contracts, currency shifts, changes in consumer behavior, interest rate risks, credit risks, and inflation risks (Pattison 2016; Madoura 2008, 14-15). London's role is likely to be downgraded as the world's financial center as companies will seek to move to New York (Cumming, Zahra 2016, 6).

The aim of this research is to comply a multiple case study on five multinational UK companies, in order to measure and compare the financial effects of the referendum in terms of risk, return, and performance. Each company will represent a different industry for diversity in the results, since it is expected that Brexit will have different implications on companies depending on their specialization (see 2.5.5). UK multinational corporations were chosen because they will lose access to the single market, contrary to multinationals outside the UK. Moreover, Brexit is considered a global phenomenon, which means multinational corporations will be affected since they act as the agents of globalization (Brooks 2011, 3-4).

The companies and the industries are: 1) Royal Bank of Scotland (RBS) – banking, 2) Marks & Spencer – retail, 3) EasyJet – airline, 4) GlaxoSmithKline (GSK) – healthcare,

5) BP – energy. Possible implications of Brexit were considered based on previous researches and publications. The case companies are exposed to financial risks regardless of Brexit, however Brexit vote increased risks related to international trade and macroeconomics such as interest rate risk, exchange rate risk, credit risk, and inflation risk (Tragakes 2012, 216-218).

The Brexit referendum took place recently, which leads to a lack of academic, empirical research available, however news outlets (for example, BBC, CNN, Telegraph, Daily Mail) and financial/economic web outlets (for example, Reuters, Yahoo Finance, Bloomberg, Wall Street Journal) will provide the necessary information for the current research. After considering the research problem and reviewing the literature, the following research questions were formulated:

- 1) What are the key financial risks that the case companies are facing?
- 2) Has Brexit affected the degree and direction of risk exposure, investor expectations, and performance of the case companies?
- 3) How can these effects be measured and compared?

In order to answer the research questions, financial data was collected from three stock market databases: Yahoo Finance, Investing.com., and Trading Economics. There are two reference periods, the first one spanning from 03.07.2001 to 23.06.2016, and the second from 03.07.2001 to 19.04.2017. Respectively, the first period represents data before the Brexit referendum, contrary to the second one which includes data after the UK decided to leave the EU and up to the 19th of April 2017. Risk exposure is represented through beta coefficient, investor expectations through the Capital Asset Pricing Model, and performance through Jensen's alpha. After the data was collected, beta, CAPM, and Jensen's Alpha of each company were calculated for two reference periods. Then, to represent the change between the reference periods, three new terms were coined – incremental beta, incremental CAPM, and incremental Jensen's Alpha. The formula that was used was:

$$\Delta X = \frac{x_2 - x_1}{x_1}$$

where x is the measured variable (beta, CAPM, Jensen's Alpha), Δx is the incremental value, x_2 is the value for the period 03.07.2001 – 19.04.2017, and x_1 is the value for the period 03.07.2001 – 23.06.2016. The results were diversified depending on the

company, with EasyJet and BP being the least affected. On the other hand, Marks & Spencer seems to be heavily affected, with GlaxoSmithKline facing great uncertainty. Royal Bank of Scotland had the worst results, however the company faced problems before the referendum and it cannot be clear whether the results are related to the Brexit vote or not.

Chapter 2 introduces the concepts of globalization, multinational corporations, risk, return, CAPM, Jensen's Alpha, Fisher effect, as well as the history of the European Union from the perspective of the United Kingdom. The literature review is followed by the methodology chapter which includes the research approach, information about the case companies, data collection and analysis. Chapter 4 provides the results for each company following the analysis of data. The conclusion chapter summarizes the findings, assesses the research's credibility, and gives recommendations to future researchers.

2 Theoretical Framework and Literature Review

In order to understand the problem, it is of vital importance to understand the concept of a Multinational Corporation (MNC hereafter) and the various risks they face, together with the relationship between expected return and risk. First, an introduction to the MNCs and globalization will be made, followed by return and risk. Then, Capital Asset Pricing Model (CAPM hereafter) will be reviewed, including its meaning, description, limitations and applications, followed by Jensen's Alpha and Fisher effect. Last, the history of the EU from a UK perspective will be described to explain what led to the referendum on the 23rd of June in 2016, together with the possible financial implications of Brexit on UK companies.

2.1 Multinational Corporations in today's economy

Globalization is defined as the worldwide movement towards integration and interdependence of economies, financial systems, communications and trade. It allows local companies to provide their goods, services and capital on an international level (Wells, Shuey & Kiely 2001, 1). Some people see globalization as a good thing, which allowed to enrich the world from an economical as well as cultural point of view. The

United Nations have high hopes that it will be a major player in eliminating poverty across the world. However, there has been criticism towards it as well and more importantly from notable people such as Joseph Stiglitz and Ha-Joon Chang, who believe that globalization gave rise to inequality and the International Monetary Fund came to support their claims in 2007 by stating that foreign direct investments in third world countries have increased inequality levels. (C.R. 2013.). MNCs are the agents of the globalization, which gave them certain benefits such as access to previously unachievable markets, access to cheap labor factors from abroad, partnerships and extended supply chains, and tax effects (Brooks 2011, 3-4).

A MNC is a company engaged in producing and selling goods or services in more than one country. Usually it consists of a parent company located in the home country (in case of this thesis – UK) and foreign subsidiaries. Both units operate under a strategic interaction. (Shapiro 2010, 4.) The importance of MNCs rose significantly in the 1950s when US companies became engaged in European affairs under the Marshall Plan, which took a form of economic aid to Western European countries. Nearly \$13 billion was given to European nations with the funding ending in 1951. (Tragakes 2012, 500; History of The Marshall Plan N.D.) MNCs are growing rapidly in numbers. In the 1990s there were 37000 globally while in 2009 that number rose to 82000. (Tragakes 2012, 500.) Madura (2008, 2) states that the goal of MNCs is to maximize the wealth of its shareholders by maximizing the stock price because by doing so they can secure further funding to support their future operations. It is because of that goal that MNCs have been criticized throughout history due to their unethical principles such as paying low wages, exploitation of labor, depletion of resources and abuse of human rights, especially in developing countries (Aswathappa 1966, 46).

The impact of MNCs on the world economy is enormous which can be understood from the revenue they generate. Freudenberg (2015) used annual revenues metrics combining CIA data and Fortune data to show how wealthy MNCs are. He compared governments and corporations, with Walmart being the first company and 12th overall on the list with annual revenues of \$486 billion, while BP was 18th with \$353 billion. Figure 1 provides a list with the wealthiest entities by revenue for 2014.

Government/ Corporation	2014 Revenues, Billions US \$	Government/ Corporation	2014 Revenues, Billions US \$	Government/ Corporation	2014 Revenues, Billions US \$
United States	3,029	Berkshire Hathaway	195	Allianz	128
China	2,285	Denmark	193	Verizon	127
Germany	1,680	Chevron	192	Kuwait	125
Japan	1,512	Turkey	190	BNP Paribas	125
France	1,507	India	186	AmerisourceBergen	124
Italy	991	McKesson	174	Fannie Mae	122
United Kingdom	936	Daimler	172	Lukoil	121
Brazil	861	ICBC	167	Bank of China	121
Canada	675	EXOR	158	Greece	120
Spain	530	Gazprom	158	Honda Motor	117
Australia	493	General Motors	156	Argentina	117
Wal-Mart Stores	486	AXA Group	154	Costco Wholesale	116
Sinopec	428	Phillips 66	150	Colombia	114
Royal Dutch Shell	420	General Electric	149	General Group	112
Russia	417	E.ON	148	JX Holdings	111
Netherlands	414	Finland	146	Hewlett-Packard	110
Exxon Mobil	376	Eni	146	Kroger	109
BP	353	Ford Motor	144	JP Morgan Chase	102
South Korea	351	Petrobras	144	Iraq	101
State Grid	334	Venezuela	143	Express Scripts	101
PetroChina	333	United Arab		Holding	101
Mexico	301	Emirates	141	Portugal	100
Norway	294	China State		Nestle	100
Sweden	291	Construction Bank	140	Bank of America	95
Saudi Arabia	279	CVS Caremark	139	IBM	94
Volkswagen Group	269	Hon Hai Precision	139	Poland	93
Belgium	268	Indonesia	135	Marathon	
Toyota Motor	252	AT&T	132	Petroleum	91
Switzerland	228	Valero Energy	131	Cardinal Health	91
Glencore		UnitedHealth Group	131	Citigroup	91
International	221	China Construction		Boeing	90
Austria	218	Bank	131	Amazon	89
Total	211	Agricultural Bank of		Wells Fargo	88
Apple	199	China	129	South Africa	87
Samsung Electronics	196	Rosneft	129	Microsoft	87

Figure 1. The 100 Largest Governments and Corporations by Revenue (Adapted from Freudenberg 2015)

MNCs were affected by the world crisis and that is the reason why foreign direct investment – investment by firms based in one country in productive activities of another country – has fallen. As of 2015, total FDI stands at \$2.165 trillion, when in 2007 prior to the crisis that number was equal to \$3.065 trillion. (The World Bank N.D.; Tragakes 2012,500.)

Due to their scale, MNCs have the power to influence the world in both positive and negative ways. Pettinjer (2008) provides a list with the benefits they bring and criticism they receive:

Advantages of MNCs:

- They create wealth and jobs around the world by investing in foreign countries and operating with multiple currencies

- Their size can help achieving economies of scale, meaning more output can be produced at minimum cost
- Their profits can be utilized for research & development to ensure sustainable growth
- They set a minimum standard, meaning a consumer can trust a product if he knows that it is produced by a giant of an industry

Criticism of MNCs:

- MNCs have monopoly power, allowing them to have excess profits
- Their dominance on the market makes it hard for new companies to enter
- In developing countries, local businesses might be pushed out from the market by MNCs
- To gain profit, a corporation might act without responsibility towards the environment, causing pollution
- They pay low wages in developing countries compared to the western standards

MNCs play a big role in today's economy with the aftermath of the 2008 crisis remaining fresh. A lot of companies had to adjust their policies by either narrowing their international strategy to specific markets or even withdrawing completely from them and shifting focus to domestic markets (Ghemawat, Pisani 2013).

2.2 Return and Risk in Multinational Corporations

2.2.1 Return

Medina (1988, 70) defines return as the net income generated by an investment, which when expressed in a percentage is called rate of return. Rational firms and individuals expect to receive from an investment a yield that is above the hurdle rate (hereafter HR) – which is the minimum rate of return that will be accepted. It is equal to:

$$\text{HR} = \text{risk-free rate} + \text{risk premium (to be explained in 2.4)}$$

The risk of investing in a project depends on several factors, including the owner's funds, the financial structure, and amount of debt. (Hundal 2017.) Investors are divided into two types: 1) value based investor – a strategy of buying securities that are selling below the calculated intrinsic value, in order to gain superior returns in the long-run, 2) growth based investor – a strategy of buying securities with potential for exceptional growth, which are offered by industries with high potential and the companies within them. (Greenwald, Kahn, Sonkin & van Biema 2004, 3-4; Mayo 2016, 206.)

There are two types of risk in finance, systematic and unsystematic (see 2.2.2). Risk can be understood better by expressing it in terms of return, i.e. solving for expected risk premium (see 2.3.1 for definition).

The formula would be:

$$r_m = E(r) - r_f$$

where r_m is the risk premium, E the expected return and r_f the risk-free rate. (Hundal 2017.) This formula does not consider risk arising from investing in a security, however the Capital Asset Pricing Model does (hereafter CAPM, more in 2.3), which can be applied to estimate the risk-adjusted hurdle rate of a project (Hurdle Rate N.D.). Risk will be covered in the following sections.

2.2.2 General Risks

According to Warren Buffet, risk is *“the possibility of loss or injury”* and that it comes from *“not knowing what you are doing”*. Risk is the probability of not getting back money from an initial investment and if such a probability exists, then an investment must be avoided. (Szramiak 2016.) Multinational Corporations face many risks due to the global scale of their operations. Factors include interest rates, exchange rates, inflation rates and credit risks. (Shapiro 2010, 44.)

The CAPM (to be explained in 2.3) divides risks into two sections within a company. The first is the systematic or market risk that measures the dependence of an investment's return on fluctuations in the economy. Such risks involve interest rates, inflation etc. It cannot be avoided and is generated once a shareholder invests in the market. Second, unsystematic risk is the variance in a security's returns that cannot be

explained by movements in the market. Examples of such risk include a marketing campaign or a new competitor entering the market. Such risks can be diversified by adjusting the operations within a company. (Gossy 2008, 36; Brealey, Myers & Allen 2011, G10, G14.)

Madura (2008, 2) states that the goal of MNCs is to maximize the wealth of its shareholders by maximizing the stock price because by doing so they can secure further funding to support their future operations, therefore the unsystematic risks faced can be managed from actions undertaken by the company. The following figure provides an overview on risks that an enterprise faces.

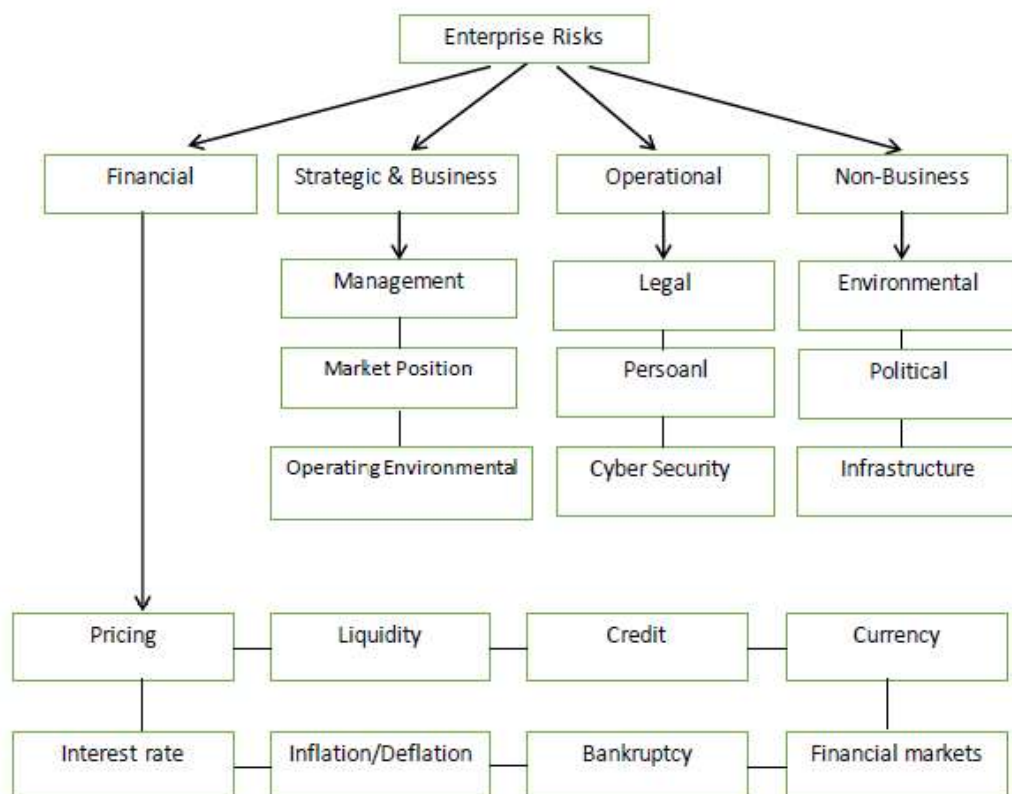


Figure 2. Enterprise Risks (Adapted from Pashkova 2016,13)

Corporations pursue international business because of the three following theories:

- 1) **The Theory of Comparative Advantage** – with multinational business increasing, countries have realized that by specializing on a product or service, production efficiency can be increased. Every country has its own advantage, with Japan and USA having the technological advantage while Jamaica and Mexico produce a big number of agricultural products and handmade goods. Since a country specializes on the production of only specific products, international trade is essential.
- 2) **Imperfect Markets Theory** – in the real world, the markets are imperfect because factors of production are somewhat immobile. Costs and restrictions limit the possibility of transferring labor and other resources. Because of that, companies seek to take advantage of opportunities provided in foreign countries.
- 3) **Product Cycle Theory** – as firms grow and establish their presence within the domestic market, they begin to realize that opportunities are up for grab in foreign countries. They shift production to the foreign country to reduce costs and try to differentiate their product from the local competitors to make it more attractive to the customers. By doing so, they constantly generate demand for their product. (Madura 2008, 6-7.)

Shareholders and debtholders are interested in the value of a MNC. The management is responsible for making decisions that would bring an increase in the firm's value, but not at the expense of the shareholders. (ibid., 11.)

Because MNCs operate in several countries using several currencies, Madura (2008, 14-15) outlines three general exposures that they face:

- **Exposure to International Economic Conditions** – the income of consumers has a direct effect on their consumption. Should the income be weakened, the consumption will as well, which would mean a decline in sales for the MNC, leading to a value decrease.
- **Exposure to International Political Risk** – also referred to as country risk. Governments may impose trade barriers on the company, making production costs more expensive, or the relationship between the company and the local consumers might be harmed by differences in the local country's government and the one from the company's country.

- **Exposure to Exchange Rate Risk** – if the foreign currency weakens against the currency from the company's country, the company will be receiving lesser amounts of its domestic currency which would decrease the value.

These exposures can be broken down into further financial risks which will be analyzed in the following section.

2.2.3 Financial Risks

Financial Risk arises when there is a possibility of a company not having enough cash flows to meet its financial obligations, which leads to investors losing their money. (Financial Risk N.D.). It can also be defined as the potential for cash flows or asset values to vary from expectations due to changes in prices, which gives an indicator of the measurement of the risk: the more volatile the price, the greater the risk (Dun & Bradstreet 2009, 3).

Financial risk arises through financial transactions, such as sales, loans and investments, and other business activities. Risks can arise as a result of a legal transaction, new projects, mergers and acquisitions, debt financing, the energy component of costs, or through the activities of management, stakeholders, competitors, and foreign governments. (Horcher 2011, 2.) There are several types of financial risks associated with MNCs, however the focus will be narrowed to the analysis of the following: credit risk, interest rate risk, exchange rate risk, and inflation risk due to them being linked to international trade and macroeconomics (Tragakes 2012, 216-218).

Credit Risk

Credit Risk (or default risk) is defined as the possibility that a counterparty in a financial contract will not fulfil a contractual commitment to meet its obligations stated in the contract (Bielecki, Rutkowski 2013, 3). The lower the risk within a company, the more access to credit. MNCs with strong management are considered of low credit risk, as well as those with various assets (buildings, machinery) which can be offered as collateral. (Madura 2008, 486.) The primary objective of a business when taking credit risk is to earn a return. Economic agents will try to either maximize the return for a given level of credit risk or minimize the risk for a given level of return. (Joseph

2013.) Corporations have limited liability and in case they cannot pay their debts they can file for a bankruptcy. When lenders finance the company through credit, they are aware they might receive a smaller return than promised. Because there is a chance for a default, loans given to corporations have a biggest rate of return than loans given to governments bonds the lenders must cover themselves from the chance of default, therefore they insure themselves. The cost of insuring matches the cost of a loan issued to the government therefore the money made from both a government and a corporate loan might be equal. (Brealey, Myers & Allen 2011, 594.)

Interest Rate Risk

Interest rate risk is a risk associated with the possibility of the value of an investment going down. It affects more bonds than stocks. Bonds are a form of debt and are issued by companies to other parties in order to raise funds. The company issues bonds to bondholders and promises to pay the loan principal to the holder on a fixed date, as well as the fixed interest rate during the life of the bond. Regardless of the currency that a MNC uses to finance its operations, it has to decide on the maturity of the issued bonds. The goal is to minimize the payment that has to be made when a bond matures, and usually MNCs will not use maturity that exceeds the expected life of the business in a country. A company faces interest rate risk when it sets a short maturity because of the potential increase of the interest rate, forcing it to pay back more. On the other hand, this situation can be avoided by setting a long maturity that will match the business cycle in the country, however in this case interest rate risk will also appear since the interest rate might go down but the company will have to pay according to the interest rate agreed at the time the bond was issued. (What is a Bond? N.D.; Moir 1997, 115; Madura 2008, 515.)

Exchange Rate Risk

Exchange rate is defined as the rate at which one currency can be exchanged for another, or the number of units of foreign currency that correspond to the domestic currency. Exchange rate risk is the variability of unanticipated changes in the exchange rates. (Tragakes 2012, 544; Levi 2005, 204.)

The foreign exchange market is taking place electronically. The dealers are commercial and investment banks. When a corporation wants to trade with currencies, they

usually do so through a commercial bank. (Brealey, Myers & Allen 2011, 676.) Currencies can be exchanged either immediately or in the future, thus the definition of spot rate of exchange, which represents the value of a currency as of the present, and the forward rate, which represents an estimation of what the value of the currency could be in 1,3,6,12 months. If a company assumes that a currency will depreciate (decrease in value) in 3 months, they make a forward contract with the bank, agreeing to exchange (buy from the bank) a certain amount, according to the rate of the time of the transaction. If the currency which they are buying has lost its value, the company will be able to buy more of that currency. (Brealey, Myers & Allen 2011, 677; Tragakes 2012, 543.)

Sharp movements in the exchange rates cause problems to MNCs and make them to lose profits. In order to cope with the exchange rate risk, companies use hedging. As written earlier, companies have the possibility of making forward contracts with banks regarding currency exchange. Suppose a MNC based in the UK agrees to buy goods from a company based in the USA in three months. The American firm will accept only US dollars as a form of payment and the price is \$1,000,000. Therefore, the British company can hedge themselves by considering the forward rate of the dollar. If they expect the dollar to depreciate, they can make a forward contract to sell pounds at the spot rate in three months. By doing so, they will be able to buy \$1,000,000 with less pounds than they would have paid with the spot rate. Respectively, if they expect the dollar to appreciate (increase in the value of a currency), they can make a forward contract but agree to pay according to the spot rate, rather than the future rate. Both cases involve risk, since the currency might not shift in the expected direction, but it is recommended to hedge since it makes company life easier and the cost of hedging is minimal (the difference between the spot and future rate). (Brealey, Myers & Allen 2011, 687; Tragakes 2012, 540.)

Inflation Risk

Inflation is defined as a sustained increase in the general price level. General refers to an average of prices of goods and services. (Tragakes 2012, 274.) Inflation risk arises when the cost dynamic is subject to sudden acceleration that cannot be met with increased revenues. Both financial and industrial costs are affected by that risk. (Gatti 2007, 41.) Assuming a company buys a bond with a maturity of 1 year and a

10% rate with \$1000, they expect to get \$1100 when the bond matures. However, if the inflation in the country has went up by more than 10%, the company loses its purchasing power, meaning that they can buy less with the 100\$ made than one year ago. (Brealey, Myers & Allen 2011, 59.) Attié and Roache (2009, 24-25) found out that the better way for hedging against inflation lies in investing into commodities (products from primarily the agricultural sector and raw materials) rather than equity (represents ownership and the right to participate in earnings) and bonds. However, this theory refers to a 12-month period. Considering a longer period, commodity prices begin to fall, with bond returns being greater and outperforming inflation, with equity suffering short-term losses that usually fail to recover. Overall, when investing in the long-term, a strategic allocation of commodities and bonds must be done for hedging from inflation risk. Should there be an inflation shock, a focus on commodities must be made, however later a switch must be made back to bonds at the expense of commodities. (Kevin 2014, 88; Walter 2004, 2.)

2.3 Capital Asset Pricing Model

2.3.1 Meaning and Description

The decisions of investors are based on the relationship between the risk and return of an investment. The higher the risk, the higher the return, but investors can reduce the risk by diversifying their investments. This gives birth to the portfolio, made from a particular set of securities or assets. (Alam, Chowdhury & Chowdhury 2015, 40.)

Before the middle of 1960s, there was no clear picture regarding the relationship between risk and return. Sharpe (1964) and Lintner (1965) gave a solution by introducing the Capital Asset Pricing Model. It is an economic theory that asserts that the only risk considered by the investors is systematic risk, since it cannot be eliminated by diversification. Therefore, the expected return of a security or a portfolio is equal to the rate on a risk-free security plus a risk premium multiplied by the asset's systematic risk (beta coefficient). (Fama, French 2003, Abstract; Gupta 2003, 85.) The formula for calculating CAPM is:

$$r_a = r_f + \beta_\alpha (r_m - r_f)$$

where r_a is the expected return on an investment or a portfolio, r_f is the risk free rate, β_α is the beta coefficient and r_m is the expected market return (Estrada 2005, 69-70).

Expected return the net income generated by an investment, which when expressed in a percentage is called rate of return (Medina 1988, 70).

Risk free rate – an investment with no risk, that guarantees the original principal, as well as a minimal return over a period of time. Government bonds are considered risk free investments, with US Treasury bonds being the measure of the risk-free rate. (Stowe 2007, 49.) For an asset to be risk free it should: 1) have no risk of default associated with its cash flows, 2) there can be no reinvestment risk. Higher inflation currencies will have a higher risk-free rate than low inflation currencies. However, no investment can be risk free in real terms due to inflation. The risk-free rate given by the government is known as the nominal risk free rate. In order to obtain the real risk free rate, the expected inflation rate is subtracted from the nominal rate, thus providing a more realistic valuation. (Damodaran 2008, 12, 14.)

Beta coefficient - it measures the volatility of a security against the market. A security that is highly affected by movements in the market is given a high beta, while a security that is lightly affected by movements in the market is given a low beta. If beta equals to 1, it means that the security's value shifts together with the market. If beta equals to less than 1, it means the security is less volatile than the market, with its value increasing less when the market goes up, but decreasing less as well when the market's value decreases. Respectively, if beta equals to more than 1, it means that the security is more volatile than the market, meaning that it will give a bigger increase in its value when the market's value increases, but a bigger decrease when the market goes down. (Tucci 2014,60.)

Expected market return & market risk premium – market return (r_m) is the return on the overall theoretical market portfolio (Bernstein, Fabozzi 1998, 17-19). The market return can be based on the composition of a portfolio, taking into account its riskiness together with the investing style. For those who do not have a portfolio manager, the expected market return rate is provided by indexes such as Dow Jones, FTSE 100, and Nasdaq. The given rate is based on the historic performance of the

market. (Boyte-White 2015.) The market risk premium ($r_m - r_f$) is the difference between the expected market return and the risk-free rate. Since 1900, it has averaged at 7.1% a year. (Brealey, Myers & Allen 2011, 192.) This number is based as well on historical data, with Warren Buffet adding that *“The economy, as measured by gross domestic product, can be expected to grow at an annual rate of about 3 percent over the long term, and inflation of 2 percent would push nominal GDP growth to 5 percent. Stocks will probably rise at about that rate and dividend payments will boost total returns to 6 percent to 7 percent, he said”*. However, the problem with rates is that they are based on past performance and cannot indicate the future. (S&P 500: Total and Inflation-Adjusted Historical Returns N.D.; Hamm 2016.)

2.3.2 Application and Limitations

Investors use the CAPM to identify portfolios that would guarantee a return against a relatively low risk. They are called efficient portfolios. Depending on the investor, he can choose to either: 1) invest his money on a high risk - high reward, i.e. common stocks, 2) invest half of his money on stocks and half on government bonds (risk free), 3) invest all the money on bonds. The decision is based on the personality of the investor, as well as the information he holds. Risk that arises from stocks should not be seen individually but as part of the portfolio, i.e. the beta coefficient of the stock. CAPM states that the risk premium must be proportional to beta. (Brealey, Myers & Allen 2011, 194.)

CAPM is being applied widely for investing decisions and evaluations. However, the model is imperfect and has faced criticism throughout its existence. Coffie and Chuckwulobelu (2012, 121-147) used it to assess if CAPM reasonably describes the return generating process on the Ghanaian Stock Exchange using monthly return data of 19 individual companies listed on the Exchange during the period January 2000 to December 2009. The findings showed that although beta influences the expected return, it is not as significant as CAPM predicts, and in some cases very weak. Alam, Chowdhury & Chowdhury (2015, 43) found in their study that CAPM cannot be applied on the Chittagong Stock Exchange (hereafter CSE), because the difference between expectation and actual return is very significant at normal risk level. However, any result may mislead the investors to forecast future movement of stocks.

The intensity of differences implies that CAPM has no applicability in CSE. Kristofik (2010) outlines that CAPM considers only beta coefficient as the relevant risk, however this might not be applicable when investing in emerging countries, because beta does not consider the geographical location of a company. The companies in the same industry but in different countries could have the same risk but investors frequently demand different returns from the same business depending on its location. Therefore, he proposes a modification to CAPM by adding country risk (CR), and changing the equation to:

$$r_a = r_f + \beta_\alpha [(r_m - r_f) + CR]$$

Zucchi (2015) lists the advantages and disadvantages of CAPM as follows:

Advantages:

- CAPM is simple and its calculations are sufficient to provide the required confidence for an investment
- A diversified portfolio eliminates unsystematic risk
- CAPM takes into account systematic risk (beta coefficient), which other models do not
- CAPM can be applied when businesses seek investments where the business mix and financing differ from the current business

Disadvantages:

- The Risk-free rate (r_f) considered in the CAPM changes daily, which creates volatility
- When the market return (r_m) is negative, it creates problem. Also, it looks back at the historical performance and cannot predict the future
- CAPM assumes that investors can borrow and lend money at a risk-free rate, which is unrealistic
- Not all companies are listed on the stock exchange, which means not all of them have a beta. When an investment must be made in such a company, a “proxy beta” is calculated by the investor. The reliability of the proxy beta is under question.

Baghdadabad (N.D., 1, 14) used the CAPM to measure systematic risk and return of Iran's currency market, stock market, and real estate market from 1995 to 2007. The results showed a negative relationship between systematic risk and expected return for both the currency and stock markets, and a positive relationship between the variables for the real estate market. Moreover, the relationship between the realized return in the stock and real estate markets was not significant. Tomic (2013, 105, 122-123) applied CAPM on the Croatian capital market during the drop in total trade turnover. He divides his findings into two parts. The first states that using beta in regression analysis, that is applying CAPM to calculate the adjusted rate of return, is practical. On the other hand, as Zucchi (2015) stated as well, CAPM becomes problematic when the market return is in negative value. Fernandez (2015, Abstract, 11) calls CAPM an "absurd" model due to its assumptions and predictions being totally unrealistic. He states that it is important to differentiate between a fact (something that is happening) and an opinion (what someone thinks), and that CAPM could only be applicable if all investors had the same expectations. He adds that the expected return de facto does not exist. Instead, he proposes another formula to calculate the required return, which takes the form of:

$$K_e = R_f + RPs,$$

where K_e is the required return, R_f the risk-free rate, and RPs the shares risk premium, or in other words market risk premium.

As it can be seen, beta is taken out completely as he suggests using it according to common sense. He concludes that CAPM is about expected return, but valuation and capital investment are about required return, and also quotes Fema and French (2004) "*Unfortunately, the empirical record of the model is poor – poor enough to invalidate the way it is used in applications... Evidence mounts that much of the variation in expected return is unrelated to market beta.*" In another study, Fernandez (2015, Abstract, 5) collected 305 comments regarding CAPM from several professors, finance professionals and Ph.D. students. Opinions were divided, with 234 agreeing that CAPM is absurd, and the rest 71 disagreeing, with some reasons being that "*CAPM is based on facts*", "*it is only an approximation*", "*common sense is not an alternative model*" etc. Mullins (1982) wrote that empirical tests of CAPM has shown that: 1) although beta appears to be related to past return, it does add explanatory

power to the risk/return relationship, 2) relationship between beta and past return is linear, that is the higher the risk the higher the reward and vice versa, 3) low-beta securities earn more than the CAPM predicts, and higher beta securities earn less than the CAPM predicts. As for its application, he states that it does make unrealistic assumptions, that beta is unstable, and that the estimates of future risk-free rates and expected return might be incorrect. Ang and Chen (2003, 19-20) found that CAPM performs well over the long-run between the years 1926-2001, however some deviations could be seen, but not sufficient to find evidence of a reversal effect. Black, Jensen & Scholes (1972, Abstract) found out that expected excess returns are not strictly proportional to the β , as CAPM suggests, and that the traditional model can be rejected. Moreover, the model is subject to error bias. However, they state that beta seems to be an important determinant of security returns.

2.3.3 Jensen's Alpha

In 1967, Michael C. Jensen derived a risk-adjusted measure of portfolio performance that estimates how much a fund's manager ability to forecast the future affects the returns. Today this derivative is called Jensen's Alpha. His findings suggested that managers rarely can outperform the market. (Jensen 1967, Abstract.) Jensen's Alpha measures the difference between a portfolio's actual return and its expected return (benchmark) according to CAPM. The formula is given as:

$$\alpha = r_a - [r_f + \beta_\alpha (r_m - r_f)]$$

where r_a is the expected portfolio return, r_f the risk-free rate, β_α the beta of the portfolio and r_m the expected market return. (Longo 2009, 204.)

If a portfolio's alpha is greater than zero, it means it has produced a return higher than predicted by the CAPM. Respectively, a negative alpha indicates that the return produced was less than predicted. Alpha is commonly expressed in annual equivalents. (Feibel 2003, 196.) Thakor (2015) states in her article, that Swedroe and Berkin studied the performance of managers, and that as of the day of the writing only 2% of all active managers generate statistically significant alpha. That is because: 1) alpha is converted into beta (exposure can be Accessed at lower costs) and managers realize they can generate big profits by investing in value stocks, 2) companies decide to switch from individuals to institutions since they have more information regarding

the markets, 3) competition is tougher, with technological advantages and level of education playing a significant role, 4) due to globalization, many investors want to invest in profitable projects, which are limited.

2.4 Fisher Effect, Purchasing Power Parity, & International Fisher Effect

In the previous paragraph, the concept of losing purchasing power was explained when investing in securities that have a lower interest rate than the expected inflation rate. High inflation rates may discourage investors from investing into a country because they may reflect expectations of high inflation. That is why the real interest rate must be considered, which can be calculated by subtracting the inflation rate from the nominal interest rate:

$$\text{Real interest rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}$$

This relationship is called the Fisher Effect. (Madura 2008, 91.) The nominal interest rate represents the amount of money that will be received upon the agreed time, i.e. a \$1000 deposit at a 10% annual rate means that \$100 will be added to the deposit after a year. However, with the expected inflation being at 2%, the real interest rate will be 8%, meaning that at the end of the year the \$1100 will have a purchasing power of \$1080. (Teall 2012, 190.)

The Purchasing Power Parity (hereafter PPP) theory makes the buying power of each currency equal to the buying power of \$1, and therefore equal to each other. It eliminates the price level differences between countries and makes comparison more convenient. (Tragakes 2012, 552.) The Economist invented the Big Mac Index in 1986 based on the PPP to compare currencies and evaluate whether a currency is overvalued or undervalued. For example, a Big Mac in the USA costs \$5 and £3 in the UK. The exchange rate therefore is expected to be

$$5/3 = 1.67,$$

meaning that for every pound 1.67 dollars can be obtained. If it is more, it means the pound is overvalued, if it is less, it means the dollar is undervalued. It is important to note that “burgernomics” are merely a tool for calculating currency misalignment. (D.H., R.L.W. 2017.)

Another theory for explaining exchange rates is the International Fisher theory. Although it has some similarities with the Fisher effect, it differs in its meaning. It states that changes in the nominal interest rates for two countries will have an equal effect on the inflation rates, but in the opposite direction. It uses the interest rates rather than inflation rates to explain the changes in the exchange rates but it is similar to the PPP theory since interest rates are correlated to the inflation rates. (Gallagher, Andrew 2007, 596; Madura 2008, 223.)

2.5 European Union from the perspective of the United Kingdom

2.5.1 The History of the European Union

The European Union (EU) is a unique economic and political union that includes 28 member states that cover the majority of the continent. Its creation was a result of the Second World War with its purpose being to stop the bloody wars between neighbors. Economic cooperation was of vital importance since the idea was to create an interdependence to avoid future conflicts.

In 1950, Belgium, France, Italy, Germany, Luxembourg and The Netherlands unite to form the European Coal and Steel Community. Later in 1957, the European Economic Community (EEC) was established, aiming at having a common market in Europe. (European Union 2017.) Tragakes (2012, 541) defines the common market as a type of trading bloc formed by countries within a geographical area to promote duty free trade and free movement of labor and capital among its members. After experiencing growth for more than a decade, EU was expanded by the joining of Denmark, Ireland and the UK on January 1 in 1973. Money were given to poorer countries for growth, the EU parliament was constantly increasing its influence and more sensitive things were considered within Europe besides the economy, such as the pollution. In 1986 the Single European Act (SEA) laid the ground for the "Single Market" by allowing members states to trade across the EU borders freely (European Union 2017) and without trade protection - defined by Tragakes (2012, 365) as government intervention in international trade through the imposition of trade restrictions to prevent the free entry of imports into a country or to protect the domestic economy from foreign competition.

Between years 1990-1999 and with the collapse of communism across central and eastern Europe, the single market sees the opportunity to allow to the member countries to move goods, services, people and money freely. The Maastricht (1993) and Amsterdam (1999) treaties address matters such as the environment and security. The Schengen is established which allows people to travel without having to show their passport at the borders. Students are highly benefiting from this as they can travel and study abroad. Later and with the beginning of the 21st century, euro is introduced and more countries begin to adopt it. In 2004, ten more countries join the EU and two more in 2007. Europe is not left unharmed by the financial crisis bursting in 2008 and the treaty of Lisbon is ratified and entered into force in 2009, with one of its key elements being the introduction of article 50. As of today, the EU is facing several challenges even though there have been no wars inside Europe and the EU winning the Nobel Prize for peace in 2012. Climate change is a major concern and terrorism has given rise to radical nationalism which leads to more Eurosceptics – people that follow a political doctrine that advocates disengagement from the European Union, supporting tighter immigration control and being populist (Ray 2014) - being elected into the parliament. EU also should face people who respectively are seeking refuge by leaving their countries due to war. (European Union 2017.)

2.5.2 United Kingdom as a member of the European Union: 1973-2017

UK's prime minister Theresa May stated in October that Brexit negotiations will be triggered by the end of March 2017 which means that UK will leave the EU by the summer of 2019 (Brexit: Theresa May to trigger Article 50 by end of March 2016). Although UK was present in both The Treaty of Paris (1951) and Rome (1957), UK limited themselves to being spectators and did not participate much in neither of the summits. Such behavior was due to the dislike towards the supranational and technocratic elements of the treaties that UK did not want, or at least did not want to be the one establishing them. They respected their relationship with the commonwealth (countries that were formerly parts of the British Empire) and wanted to see the sterling being the currency under which the Europe will unite. However, by joining the EU in 1973 UK had to comply with the elements that were the reasons for not joining the EU on the first place. (Why did the United Kingdom not join the European

Union when it started? N.D.) Later in 1975, Harold Wilson's government announced a referendum since it was a promise during the pre-election campaign. At that time the question that was asked was "Do you think the UK should stay in the European Community (Common Market)?" The answer was clear – 67.2% voted YES and UK remained in the EU. According to polling at that time, the reasons behind such a strong statement from the people was that they considered economic factors, the role of UK regarding international affairs and the avoidance of further conflicts because aftermath from the second World War was still fresh. (Walsh 2016; Nelson 2015.) In 1979, relationships between Brussels and London were shaken when Margaret Thatcher threatened at the Dublin European Council to halt payments to the EEC. She said "*We are not asking for a penny piece of Community money for Britain. What we are asking is for a very large amount of our own money back, over and above what we contribute to the Community, which is covered by our receipts from the Community*" (Thatcher 1979.) By that time, the UK was by far the poorest member of the community yet was soon to become the biggest net contributor to the EU budget. That happened because the UK had a small number of farms and the council's expenditure was compiled of 70% for farm subsidies (Britain's 40 Year relationship with the EU, 2016.) Later in 1988, the situation escalated even more, when Thatcher accused the EU of trying to centralize the power in Brussels - "*We have not successfully rolled back the frontiers of the state in Britain, only to see them reimposed at a European level, with a European superstate exercising a new dominance from Brussels.*" (Palmer 1988.) In 1992, The Maastricht Treaty was signed establishing the EU, however UK secured an opt-out from participating in the creation of a single currency. Opinions were once again divided within the country. After the 2009 crisis broke out in Europe, right wing parties have been gaining popularity across Europe that respectively are considered eurosceptics. "*I don't want to be rude but, really, you have the charisma of a damp rag and the appearance of a low-grade bank clerk, and the question I want to ask is: Who are you? I'd never heard of you. Nobody in Europe had ever heard of you.*" – that is what Nigel Farage, a United Kingdom Independence Party (hereafter UKIP) member said to the first EU president Herman Van Rompuy in 2010. (Stewart 2016.) Earlier in 2005, the leader of the Conservative Party David Cameron moved to withdraw his party's Members of the European Parliament from the mainstream center-right party political grouping in Brussels which can be

considered as a win for the eurosceptics inside the party. Having Euroscepticism increased in the party at the same time with UKIP rising and the crisis affecting heavily the EU, the referendum on the 23rd of June 2016 was inevitable. It was a product of both long and short term historical factors that have been negatively affecting the relationships between the EU and the UK. Britain repeatedly opted out from key ideas of the EU such as the euro, the Schengen area and other policies regarding justice. (Kenealy 2016.)

2.5.3 On the Causes of Brexit and Poor Polling

Arnorsson and Zoega (2016) have found out that regions within UK were more likely to vote in favor of Brexit if they fulfilled the following criteria: gross domestic product per capita is low, lack of high-level education, major proportion of inhabitants has an age of more than 65, net immigration is strong in the region which gives way for considering immigrants as a “threat”. Friedman (2016) outlines three pillars as probable causes: 1) Economics – EU has struggled to bounce back from the 2008 crisis that is still ongoing and UK citizens do not want to be a part of such a dysfunctional economic system anymore because they believe that soon they will face the same problems the European South has been facing, where the unemployment is 20%. However, they did not consider that EU will be enabling trade barriers which is something UK will try to avoid; 2) Sovereignty – the rise of nationalism is becoming a worldwide phenomenon and UK is no different. Distrust is growing towards multinational institutions established after WWII such as the IMF, World Bank and the EU itself. People believe that they take away control from individual nations. Immigration crisis came to support this particular reasoning. Unfortunately, the EU has failed to manage nationalism since it is considered a civil right; 3) Political Elitism – Brexit was a vote against the British elite. People have lost their trust in the financial industry, the politicians, the business leaders and the intellectuals. That is because they felt as if they no longer represent people’s interests but instead have a personal agenda which they follow. On the other hand, according to Chu (2016), sovereignty does not even come close to being a reason. Instead of looking at the outside factors, internal ones are considered. As Arnorsson and Zoega pointed out (2016), Chu also states that areas within the country that had the weakest wage growth since 1997 voted to leave.

It shows that people felt economically “left behind”. Suggestions of a cultural shock also are present, meaning by that that people cannot handle anymore the immigration process not only from the middle-east but also EU countries, pointing out that “leave” voters were hostile towards changes in society such as multiculturalism, feminism, social liberalism and environmentalism. However, it could be so that initially economic problems lead to cultural ones because people had to blame someone or something. At last, another cause could be the fact that media outlets that have “right” views were pushing towards a Brexit for more than 30 years using propaganda tools. Contrary to Chu, Robertson (2016) believes that the “leave” campaign was primarily built on Islamophobia as well as getting votes from the financially poor citizens. Both the financial and immigration crisis have caused some problems to several EU countries and poor people believe that they are being affected the most because they assume their social benefits will be reduced. They do not have trust in politicians that are in favor of the immigration process and believe it is causing harm to their motherland. They want to #TakeBackControl – a hashtag used during the “leave” campaign.

There has been a lot of debate over the reasons that lead to the Brexit vote. The majority of the polls predicted a “Remain” result but ended up being on the wrong side. According to Saiidi who quotes Cohen (2016), the reasons for that were the low turnout of young voters to whom the campaign was primarily targeted at, as well as the death of Jo Cox, an event that made it very hard to get an honest and clear opinion from the voters. On the other hand, Edwards quotes Wells (2016), in order to provide a different perspective that is targeted more at the pollsters themselves, stating that their practices were in a way outdated, and here are some factors: a) phone polls do not work anymore; b) polls undercount voters who are hard to reach; c) graduates are over-presented in polls.

2.5.4 United Kingdom’s Financial Costs and Benefits from its European Union Membership

The Confederation of British Industry has provided a fact sheet based on their business report. It states that overall EU Membership is considered to have a positive impact on most UK businesses. Only 13% of the businesses saw a negative impact, with

78% saying they will vote in favor of remaining in the EU in case of a referendum. In terms of gross domestic product, the net benefit for UK is £62bn - £78bn a year. The direct benefits companies are getting are the following: 1) Access to a \$16.6 trillion a year Single Market of 500m people, which allows companies to freely buy and sell products within the EU. It is estimated that EU membership helped UK to increase trade by 50% with some countries. More than that, access is given to EU's supply chains which includes a big number of partners worldwide. 2) EU opened global markets to its members through trade deals. The worth of the market is \$24 trillion. 3) Investments have been massively increasing in the UK given its status as the financial center of EU. UK accounted for 47% of EU's FDI in 2011. 4) Free movement of labor made it easier for companies to recruit and hire talent from countries outside UK, as well as sending employees abroad. 5) The net contribution of UK to the EU budget accounts for only 0.4% of UK's GDP. Net contribution per person is £116, lower than that from Sweden, Denmark, Finland, Germany and the Netherlands (FactSheet 2 – Benefits of EU membership outweigh costs, N.D.) The ONS report from 2014 where stated that EU accounted for 44.6% of all UK exports of goods and services as well as 53.2% of imports. CEPR shows that the overall contribution of EU to the exports economy of UK was £187 billion in 2015 and could potentially rise to £277 billion in 2030. More than that, future trade deals that will be made by the EU could have added £58 billion to the UK economy every year by 2030 (Lewis 2016.)

2.5.5 Possible Implications

Pattinson (2016) from Trowers & Hamplins wrote a report prior to the vote on the corporate risks that UK businesses must consider in case of Brexit. He focuses on five models. First, UK could try to become an EEA & EFTA member, following the example of Norway and Iceland. This would allow UK to have access to the EU single market and vice versa. UK will have to negotiate new bilateral agreements with the EU, which is more likely to happen on EU terms, as well as countries outside it. Another solution would be to establish a customs union with the EU, one that for example Turkey has. It will allow the free movement of goods and services without the threat of customs restrictions and tariffs, however the UK will have to comply with EU regulations and trade policy, especially when it comes to the provision of financial and

professional services on equal terms. Free Trade Agreements could be signed with partner countries but such a scenario would take away control over the internal market – something Brexit voters will not like. UK could trade under WTO policies which would mean that all UK exports would be subject to EU regulations and tariffs. Impact on the financial sector is expected to be massive since a large proportion of UK's legislation on financial services derives from EU. UK is the financial center of EU with many international banks operating in the City of London. The most likely scenario is that banks will seek a relocation. As for the corporate and commercial sector, UK companies that have subsidiaries within the EU will be heavily affected. Freedom of establishment and cross-border contracts are likely to see disruptive changes. Employees are unlikely to be significantly affected, which depends on the trade agreements that will be made between EU and the UK. Commonwealth countries might play a big role in post-Brexit Britain since it will open a new window of opportunities for trading with the UK. Already as of today, UK is importing a significant amount of commodities from these countries, with the potential of increasing the numbers being rather realistic. It is possible that the organization as a whole will be making further bilateral agreements with the UK to ease up trade. UK will need that because trade with EU will decline further as it is already doing, and seeking support from the commonwealth countries which have potential for growth seems like a good idea. Moreover, the visa process for member countries of the commonwealth is expected to be fast-tracked in order to make business smoother between the engaged parties. (The Commonwealth 2017; Chabe 2016; MacLeod 2016.)

PwC (2016,8) wrote a report regarding the possible implications of Brexit on the life science sector. They are primarily related to regulation, trade, investment, and talent. Companies in the field such as GlaxoSmithKline might have to cope with European regulations regarding pharmaceutical products without having a say in it, with the European Medicine Agency (EMA) moving its offices out from London. As for trade, companies will hope that a free trade agreement will be negotiated between EU and the UK, which will lose access to funding programmes coming from the European Investment Bank (EIB) and European Investment Fund (EIF). Both implications will lead to a decrease in venture capital investment. An exit from the EU will mean that non-UK citizens would need to have working visas, a process that might be

lengthy and costly for the companies, with clarifications still to be announced regarding what kind of a job entitles the person to a working visa. Passporting is a key player in the UK's financial sector since it allows countries outside EU to operate in it as long as they operate in one of the member countries, which as of today is mainly UK for institutes that provide financial and security services. The most likely scenario is that companies that provide financial services will be moving to other countries such as Germany and France. (Renison 2016.) Finch (2017) interviewed several banks about whether they plan to relocate staff outside London, and figures show that around 35,000 employees could be moved from The City of London, with Dublin and Frankfurt being the most attractive options. Royal Bank of Scotland chairman Howard Davies said that "tens" of employees will be moved out from UK (Morris, Partington 2017). The possible implications of Brexit were felt by Marks & Spencer already after the vote, with sales going down already a month after it occurred, because of consumer confidence being low ahead of Brexit and the pound losing its value against the dollar and euro. However, the company managed to fulfil its 2016 forecasts. On the other hand, although the company made a promise not to increase prices due to the decreasing pound, they are reportedly set to increase prices up to 15%, together with closing up to sixty stores across UK. Moreover, their signature shop in Paris is also expected to close due to a cost reduction strategy. (Shammas 2017; Jarvis 2016; Cahill 2016.) A more positive scenario might be applicable for BP, with the company stating in June 2016 that they "*do not expect Brexit to have a significant impact on the business*", and adding that "*It is far too early to understand the detailed implications of this decision and uncertainty is never helpful for a business such as ours*". BP is already battling with low oil prices and political uncertainty cannot seem helpful. (Bambrough 2016.) Although the shares of BP went down soon after the vote, the demand for UK oil might increase because the dollar is becoming stronger and the pound weakens, therefore making UK oil cheaper to buyers (Saintvilus 2016). Bob Dudley, the CEO of BP, said in an interview before the vote that investment in UK's energy sector might go down if Brexit happens, adding also that EU needs Britain. However, the vote de facto encouraged UK investors to buy BP shares, because BP pays its dividends in dollars, which means that a UK investor will gain on the dividend once it is converted from dollars to pounds due to a weaker pound and a stronger dollar. (Ahmed 2016; Ward 2016.) The aviation industry might be facing

some challenges because of Brexit. The problem is that UK will be leaving not only the EU, but its single aviation market as well, which is considered the most liberal sky regime. Without an agreement to replace the existing deal, UK might be falling behind in an industry that is producing around £60 billion a year. The problem with negotiating a new agreement – like one Switzerland has with the EU – is the fact that if one occurs it would have to be under EU terms and legislation, something UK does not want at this point. Moreover, EU governs airline access to 17 non-EU countries as well, apart from the union itself, which makes the matter more complicated. Should the UK leave the European Aviation Safety Agency, it means that it will have to establish its own regulations, but the biggest problem is to convince the rest of the world that these regulations are trustworthy. (McClellan, Barker 2017.) Ryanair boss said that UK will “*fall off the cliff*” if it loses access to EU’s open skies agreement (which allows companies to fly between any two airports within Europe), and that it is impossible to negotiate agreements separately with each one of the 27 (to be left after UK leaves) members states. Moreover, he adds that airlines are facing problems since they already plan schedules for 2019, but with uncertainty arising from Brexit it is hard to plan. (Chapman 2017.)

3 Methodology

Research methodology is one of the most pivotal aspects of any research endeavor. It provides readers with the information about research approach, data, analysis methods and even behavioral aspects involved in the research. (Hundal 2016.) The following subchapter 3.1 will be based on the research “onion” by Saunders, Lewis & Thornhill (2009, 108). The “onion” deals with understanding which method of data collection must be used and why. Before deciding which technique will be used, the outer layers of the onion must be first peeled.

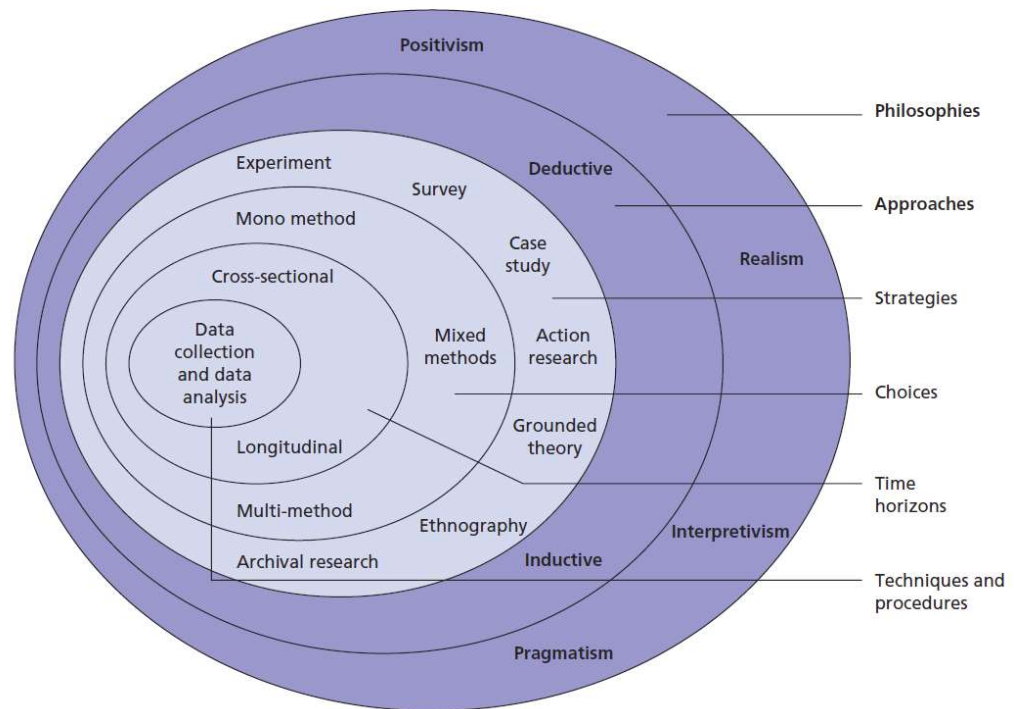


Figure 3. Research "onion"

3.1 Research Approach

The first layer is the research philosophy, which refers to the development of knowledge and the nature of that knowledge. There are four types of philosophies, with positivism being the suitable one. Positivism represents the stance of a natural scientist, meaning that the phenomena observed will lead to the production of credible data. This will happen when financial information will be collected and then analyzed to represent the findings. Moreover, existing theories were used (CAPM, Jensen's Alpha, PPP) to develop a hypotheses. (Saunders et al. 2009, 113.)

Various research approaches are attached to the different philosophies. The research approach can be either deductive (quantitative) or inductive (qualitative). The deductive approach allows to test hypotheses, to have a structured methodology, to operationalize concepts in order to measure them quantitatively, and allows reductionism and generalization. (Saunders et al. 2009, 124-125.) The classification of research approach depends on the discipline and the field of science concerned. According to

a simple classification there are two approaches: qualitative and quantitative. (Kannan 2011, 36.) In order to meet the research objectives, the appropriate type of research must be chosen, taking into account access to data, location, time etc. (Saunders et al. 2009, 141-142). Qualitative research methods are designed to help researchers understand people and what they say and do as well as the social and cultural contexts within which people live (Myers 2013, 11). Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures. (Creswell 2013, 4.) Due to the nature of the research, the quantitative approach was chosen since different variables were obtained and analyzed to answer the research questions. Moreover, it would be impossible de facto for this research to try and use the inductive method, since the data required (financial information) cannot be generated by the author due to limitation of resources. Hence, the choice of the approach is mono method since only one is used. (Saunders et al. 2009, 151.)

The purpose of this research is to analyze the impact that the Brexit vote is having on the financial risks, expected return, and overall performance of UK multinationals by comparing past figures to present ones, making it an explanatory study that will establish casual relationships between variables (Saunders et al. 2009, 140). The strategy of the research falls under the multiple case study, since it focuses on establishing whether the findings regarding one company can occur in the other companies. (ibid. 2009, 146).

Therefore, the before-and-after study design can be considered suitable for this research, since it can measure change in a situation, phenomenon, issue, problem or attitude, however it is less helpful for studying the pattern of change. To determine the pattern of change in relation to time, a longitudinal study design is used. In longitudinal studies, the study population (in this case the companies) are visited several times at regular intervals, to collect the required information. (Kumar 2014, 136-138.) The reference period refers to the time-frame in which the phenomenon is explored, and is categorized as follows: retrospective, prospective, and retrospective-prospective. This research falls under the retrospective-prospective category since it focuses on past trends in a phenomenon and studies it into the future. (ibid. 139-

141.) Taking into consideration the above, panel studies were chosen as the most suitable design. In addition to being longitudinal, the information collected is always from the same respondent. A panel data is common for studies in the fields of economics and finance. This form of data organization allows the researcher to generate microlevel measures that were not present in the original data. (Kumar 2011, 154; Baum 2006, 46.)

3.2 Case Companies

Five multinational UK companies were chosen for this research, each representing a different sector. Financial information was obtained in the form of secondary data from the stock market. Then the data was used to perform various calculations such as finding beta and alpha, which measure risk exposure and benchmark performance (more in 3.4). The reasoning for choosing to investigate them can be found in the introduction chapter, where the magnitude of Brexit is explained, since it is first time a member of the EU decides to withdraw, at the same time being a key member and having a major impact on the economy of the union, and vice versa receiving various benefits from the union, and 2.5, where possible implications of Brexit were explained. Different sectors were chosen since the implications will not be the same for all the companies. Some may benefit while others might experience challenges.

3.2.1 BP

BP, formerly known as British Petroleum, is a company that operates in the field of transportations fuel, energy for heat and light, lubricants for engines and petrochemicals. It was established in 1908 under the name Anglo-Persian oil company. After years of success and growth, WWII came to disrupt the business, since company resources were required for supporting the allied forces. After the war, the company began again to grow by finding new territories which could be drilled, primarily in the middle-east. However, disrupts in the area lead to many countries nationalizing the oil production, which was a big hit for companies such as BP who had been relying on these territories for oil extraction. In the late 1990s, the company was engaged in a series of mergers and acquisitions to establish further dominance on the market. In the new millennium, BP has been involved in various scandals and unpleasant events,

such as the accident in the Gulf of Mexico in 2010, however the company managed to continuously grow, by exploring new ventures in several countries, primarily in Europe, together with investing a lot of money in research. For 2016, the company's profit was \$115 million. (BP, N.D.; BP 2016, 122.)

3.2.2 Royal Bank of Scotland

Royal Bank of Scotland was established in 1727 in Edinburgh. Later in the century, many banks were founded in Scotland which was creating a healthy and competitive "multi-bank" financial system. In 1783, the bank began its expansion by opening a branch in Glasgow. In the 19th century England face several financial crises, which lead to formations of "joint-stock" banks, meaning that the ownership of the bank will belong to the shareholders and that the bank will be publicly traded, meaning people can purchase shares of the firm in order to receive dividend payments in the future. RBS was a major player in the railway network expansion, funding many infrastructures such as tracks and stations. In 1864, RBS made its first acquisition, buying Dundee Banking Co. Later in 1874 the bank opened its first branch in London. By the end of the century and with the beginning of the 20th century, smaller banks were pushed aside by the big banks, which started to consider international affairs more seriously. Two World Wars heavily affected the banking industry, since governments were heavily relying upon funding from the banks to fight in the war. Moreover, many banks were destroyed due to bombings. Later in the century banks started providing new products and services such as house loans and ATMs. The bank opened a branch in New York and merged with the National Commercial Bank of Scotland in 1969. In 1985, RBS merged further with Williams & Glyn's Bank, establishing England's first nationwide high street bank. The bank continued its expansion by further mergers and acquisitions, and in 2000 it acquired National Westminster Bank for a record fee at that time. The financial crisis that broke out in 2008 heavily affected the bank, and further mismanagement made the situation even worse. Intervention was necessary and as a consequence the government became a part owner of the bank. Following the crisis, the bank has been trying to rebuild resilience, trust, and shareholder value. For 2016, the company reported losses of £7 billion. (RBS, N.D.; RBS 2016.)

3.2.3 Marks & Spencer

Marks & Spencer is an international and multi-channel retailer, selling all possible goods. As of today, it operates 914 stores in the UK together with 468 international stores. Founded in 1884 by Michael Marks in Leeds as a penny bazaar, the company began to be what we know today when Marks formed a partnership with Tom Spencer in 1894. As living conditions were improving the company was growing. The outbreak of the first World War helped the company since people needed needles, buttons, and threads that were sold in the shops in order to update the old clothes. Later the company began to adjust to the needs of the people and started selling more life essentials, such as underwear. As of today, bra is one of the most signature products. The second World War taught the company how to deliver high quality products under difficult circumstances. In the post-war era, the company followed Christiane Dior's example by introducing a new style of dress – The New Look. Between the 60s and 70s, the company was the first one to offer fresh chicken to its customers, further diversifying its product list. Trends were changing, and cooking was no different. More women were getting jobs and did not have time to make dinner anymore, and that is the reason the company began to sell boil-in-bag-meals and microwave dinner. Between 1990 and 2010, competition has increased rapidly, and the company has tried to respond by offering new products and at the same time improving or maintaining the high quality of previously sold items. For 2016, the company's reported profit before tax was £488.8 million. (Marks in Time, N.D.; Marks & Spencer 2016.)

3.2.4 GlaxoSmithKline

GlaxoSmithKline is a global healthcare company, operating in the field of researching, producing, and distributing various life sciences products across the world. It was founded in 2001 as a result of merger between GlaxoWellcome plc and SmithKline Beecham plc. Both companies underwent a series of mergers and acquisitions before establishing the company we know today. The history begins in 1830 when John K Smith opened a drugstore in Philadelphia. From then, business grew, new companies emerge, the pharma sector flourished and gave opportunities to people with ideas.

In 1865 Mahlon Kline joined Smith. Later in 1873, Joseph Nathan established a trading company which would be the foundation of the later formed Glaxo. Throughout the 20th century, the separate entities continue to merge and expand further, with scientific breakouts appearing, such as the launch of Betnovate cream for the skin, Ventolin for asthma, Amoxil as a widely used antibiotic, Zantac, Zovirax etc. SmithKline Beecham was formed in 1989 and GlaxoWellcome later in 1995. In 2000 the merger was announced and completed on the 1st of January in 2001. For 2016, the company's total operating profit was £2.6 billion. (GSK, N.D.; GSK 2016.)

3.2.5 EasyJet

EasyJet is an airline that operates under the low-cost model with over 220 aircrafts flying over 700 routes to more than 30 countries. It is the UK's largest airline, Europe's fourth largest, and world's 10th largest. It was founded in 1995 by Stelios Haji-Ioannou, who had the idea of creating a customer-focused brand that would revolutionise the industry. Already in 1998, the company allows booking from their website. After a successful 5 years period, in 2000 the company was floating in the London Stock Exchange. Few acquisitions take place, with EasyJet acquiring Go Airline in 2002 and GB Airways in 2007. In 2009, over 50% of its passengers were from outside the UK. In 2013 the company became a member of the FTSE 100 index. In 2014 the company announced plans to apply new technologies into their aircrafts in order to reduce flights delays and at the same time maintain high safety standards. In 2016, the company's profit before tax was £495 million. (Easyjet, N.D.; EasyJet 2016, 7.)

3.3 Data Collection

Primary data are collected for the purpose of the research, while secondary data include data that are analyzed in order to answer a research question other than the question(s) for which the data was initially collected. (Kara 2013; Vartanian 2011, 3.) For this research, only secondary data was used, that is because advantages of obtaining secondary data include: a) fewer resource requirements, b) more trustworthy than collecting would be, c) they fit the purpose of longitudinal studies, d) provide comparative and contextual data, e) can result in unforeseen discoveries, f) the data is permanent and can revisited. As for the disadvantages, they include data not

matching the research purpose, difficulty of access and unsuitable definitions, however none can be attributed to this research. (Saunders et al. 268-271.) Moreover, it would be impossible to collect the needed data individually, due to lack of resources and access.

The data was obtained from stock market databases. Although collecting data is the best way for obtaining information that will help in analyzing a hypothesis, secondary data sets provide an alternative, often giving the researcher access to more information than would be available in primary data sets.

The CAPM theory was carefully reviewed from different perspectives based on previous research that has tried to apply the model in different countries and situations. Despite the aforementioned limitations (see 2.3.2), the particular model is the most suitable to answer the research questions of the present study.

The financial information was obtained from three stock market databases, Yahoo Finance, Investing.com, and Trading Economics. The historical databases were accessed and the required reference period entered. After the database yielded the result, the data was extracted in the form of Word Excel spreadsheets. Both databases follow-up the performance of the stock markets across the world and have up to date information, therefore they can be considered reliable. The data was then processed and used for calculations that will be described in 3.4. Two reference periods were considered, the first one between 03.07.2001 and 23.06.2016, and the second between 03.07.2001 and 19.04.2017, that is, the samples (in that case beta, CAPM, and Jensen's alpha) were split further into two sub-samples. The prime justification for choosing a period of total sixteen years is no other than validity and credibility. The reason for choosing two separate time periods will be explained in 3.4.

All terms and definitions were based on the academic publications of experts in the field of business, finance, and economics. The most accurate and simple explanations were chosen for presenting the case.

3.4 Data Analysis

The obtained data were entered into an excel spreadsheet and the calculations of CAPM, beta and Jensen's alpha were performed as explained in 3.4.2, 3.4.3, 3.4.4.

For better understanding of the analysis process, a list defining the key variables is provided in the following sub-chapter.

3.4.1 Definition of Key Variables

$$\text{CAPM: } r_a = r_f + \beta_\alpha (r_m - r_f)$$

$$\text{Jensen's Alpha: } \alpha = r_a - [r_f + \beta_\alpha (r_m - r_f)]$$

r_a : expected market return, calculated under CAPM.

r_f : risk-free rate. Rate that in theory carries no investment risk. The interest rate on short-term government bonds (1 year) can be perceived as the risk-free rate.

β_α : beta of a security. Is given for most of publicly listed companies but can be calculated as well (see 3.4.2).

r_m : market return, i.e. what is the expected return on an investment from a company that is listed on a particular market index (FTSE 100, S&P 500 etc.). Obtained from stock market databases. Calculated by the index companies based on historical performance.

CAPM₁ / Beta₁ / Jensen's Alpha₁: CAPM, beta, and Jensen's alpha of the case companies, calculated for the period 03.07.2001 – 23.06.2016

CAPM₂ / Beta₂ / Jensen's Alpha₂: CAPM, beta, and Jensen's alpha of the case companies, calculated for the period 03.07.2001 – 19.04.2017.

Δ CAPM / Δ Beta / Δ Jensen's Alpha: Incremental CAPM, beta, and Jensen's alpha of the case companies, calculated by dividing the difference between period 2 and 1 by period 1 for each variable.

3.4.2 Calculating Beta

In order to quantify the effects that Brexit is causing on the risk exposure of the case companies, beta was calculated. As explained in 2.3.1, beta measures the volatility of a stock against the market. In most of the cases when browsing through stock market databases, the betas are already given for companies. The problem with provided betas against personally calculated betas is the fact that provided ones are calculated

by taking into account time frames unknown to the end users. Moreover, most provided betas are using S&P 500 as their index for calculations, which might not be the best measure when considering markets outside the US. (Mcnulty 2015.) That is the reason why the Financial Times Stock Exchange 100 index (hereafter FTSE 100) was chosen for the present calculations, since it deals with the London Stock Exchange and is based in the UK and therefore can provide more accurate information when considering UK multinationals (FTSE 100 N.D.). The formula for calculating beta is given as:

$$b_i = \left(\frac{\sigma_i}{\sigma_M} \right) p_{iM}$$

where p_{iM} is the correlation between the stock return and market return, σ_i is the standard deviation of the stock return, and σ_M is the standard deviation of the market return. By applying this calculation, we will get the slope of a regression line which shows how a stock moves in response to the movements in the general market. (Ehrhardt, Brigham 2008, 211-212.) Therefore, the variables needed to calculate beta are the market return, i.e. the FTSE 100 index, and the stock return of the company concerned. Then, once the data is obtained, Microsoft Excel will be used to make the calculations. However, a further calculation will take place, and that is because there are two reference periods from when data will be collected, and the goal is to find the change in the variable over the two periods. The reference periods are mentioned in 3.1, and so the first period will be named hereafter b_1 and the second b_2 . The reason for deriving two sub-samples from a single sample is to compare two sets of values and estimate whether the Brexit vote (in terms of Brexit itself) is affecting the risk exposure of the companies or not. In order to compare the change in beta before and after the vote, a new term had to be coined – incremental beta, which will be calculated using the following formula:

$$\Delta\beta = \frac{\beta_2 - \beta_1}{\beta_1}$$

where $\Delta\beta$ is the change in betas over time, b_2 is beta for the period between 03.07.2001 and 19.04.2017 and β_1 is the period between 03.07.2001 and 23.06.2016. The incremental beta should provide information regarding the changes in the risk exposure of the case companies and could work as a guide for the future.

3.4.3 Calculating CAPM

CAPM helps investors to understand what kind of a return they should expect from an investment, given the risk they are willing to take. It is a model that has faced both appraisal and criticism (see 2.3), however its application is considered valid for this research. It is calculated by the following formula:

$$r_a = r_f + \beta_\alpha (r_m - r_f)$$

where r_a is the expected return, r_f is the risk-free rate that will be obtained from Trading Economics (<http://www.tradingeconomics.com/united-kingdom/interest-rate>), β_α is the beta coefficient that will be calculated (see 3.4.2), and r_m is the expected market return that will be obtained from stock market databases. CAPM calculations will be done for the two reference periods mentioned in 3.4.1, followed by the calculation of the incremental value which tells whether investors demand a bigger or a smaller return from their investments in the case companies after the Brexit vote on the 23rd of June 2016. The incremental CAPM was calculated as follows:

$$\Delta\text{CAPM} = \frac{\text{CAPM}_2 - \text{CAPM}_1}{\text{CAPM}_1}$$

where ΔCAPM is the change in CAPM over time, CAPM_2 is CAPM calculated for the period between 03.07.2001 and 19.04.2017, and CAPM_1 is CAPM calculated for the period between 03.07.2001 and 23.06.2016.

3.4.4 Calculating Jensen's alpha

Jensen's Alpha is a popular measure to calculate the risk-adjusted alpha of an investment, i.e. the given market return (Mirabile 2016, 221). The definition of Jensen's alpha can be found in 2.3.3. It is calculated by the following formula:

$$\alpha = r_a - [r_f + \beta_\alpha (r_m - r_f)],$$

where r_a is the expected portfolio return, r_f the risk-free rate, β_α the beta of the portfolio and r_m the expected market return. The risk-free rate will be obtained from trading economics like in 3.4.3. The expected return r_a , the beta β_α , and the expected market return r_m will be taken from the beta calculations. It is possible to rewrite the equation for alpha and simplify it as follows:

$$\text{Jensen's Alpha} = \text{Actual Return} - \text{Predicted return under CAPM (ibid. 221)}.$$

Like beta calculations, the reference periods for calculating alpha will be named as α_1 and α_2 . Furthermore, another definition must be coined which will be called incremental alpha and calculated using the same method as beta, that is:

$$\Delta\alpha = \frac{\alpha_2 - \alpha_1}{\alpha_1}$$

where $\Delta\alpha$ is the change in alpha over time, α_2 is alpha for the period between 03.07.2001 and 19.04.2017 and α_1 is the period between 03.07.2001 and 23.06.2016. By calculating the incremental value of alpha, it is possible to better understand whether the case companies have under or overperformed before and after the Brexit vote. To avoid misinterpretation, the negative sign in the denominator will be ignored. That is, should a company's incremental alpha be negative, it would de facto mean that the company has improved its performance, and respectively, should a company's incremental alpha be positive, that would mean that the company has decreased its performance.

4 Results

Yahoo Finance was used to obtain company data, Investing.com was used to obtain the FTSE 100 data, and Trading Economics for obtaining the risk-free rate. The formulas that were used for calculating CAPM, beta, and Jensen's alpha can be found in 3.4.2, 3.4.3, and 3.4.4. The results for each company were divided into sub-chapters according to the company in concern, and presented in separate tables for each variable. The tables include numerical information representing calculations from both reference periods (values of CAPM, Beta, and Jensen's alpha), together with the incremental values, which are presented as a percentage change. Having incremental values in terms of percentage change can help with understanding the change in the variables concerned when comparing two different reference periods and establish a logical relationship when considering all variables.

Overall, the calculations provided good insight on what has happened to the companies after the Brexit vote up to the 19th of April 2017. In some cases, the results do not follow the basic risk - reward principle, i.e. high risk – high reward. Such findings provide the foundation for further investigating and expanding this research.

4.1 BP

Incremental Beta

BP's incremental beta showed a decrease of approximately 111% (see Table 1), which is a rather big number. It means that the systematic risk of the company has been largely reduced after the Brexit vote, making BP a safe investment, since the company is slightly affected by movements in the market.

Table 1. BP's beta

Term	Value
Beta 1	-0.00465175
Beta 2	0.00055148
Δ Beta	-111.855%

Incremental CAPM

CAPM has followed the trend initially set by beta and has also decreased by 0.515% (see Table 2 on page 44), meaning that investors expect a smaller return from their investments. That is because the risk went down. Such a scenario follows the basic risk principle where investors are rewarded for the amount of risk they are willing to take.

Table 2. BP's CAPM

Term	Value
CAPM 1	0.010548541
CAPM 2	0.010494268
Δ CAPM	-0.515%

Incremental Jensen's Alpha

BP's incremental alpha also has decreased by 0.875% (see Table 3), which means that the company improved its performance in the post Brexit vote era compared to itself, however it kept underperforming compared to the market, since the value remained negative. It is logical from the point of view that a company can rarely overperform the market.

Table 3. BP's Jensen's alpha

Term	Value
Jensen's Alpha 1	-0.0104988
Jensen's Alpha 2	-0.01040695
Δ Jensen's Alpha	-0.875%

4.2 Royal Bank of Scotland

Incremental Beta

The incremental beta of RBS has decreased by approximately 80% (see Table 4), making the company an investment with little risk and small volatility towards market fluctuations.

Table 4. RBS's beta

Term	Value
Beta 1	0.01654044
Beta 2	0.00327444
Δ Beta	-80.203 %

CAPM

Contrary to beta findings, CAPM has increased by approximately 1.35% (see Table 5 on page 46) since the Brexit vote. This finding contradicts the principle of high risk-high reward, since investors should expect a smaller return from RBS considering that the risk of investment went down after the Brexit vote.

Table 5. RBS's CAPM

Term	Value
CAPM 1	0.0103274
CAPM 2	0.01046597
Δ CAPM	1.3417%

Incremental Jensen's Alpha

The company's performance decreased by almost 3% in the post Brexit vote era by (see Table 6). The findings for RBS are somewhat contradicting. Although a low-risk investment, RBS performed badly, and at the same time the investors demand a higher return.

Table 6. RBS's Jensen's alpha

Term	Value
Jensen's Alpha 1	-0.0082194
Jensen's Alpha 2	-0.0084607
Δ Jensen's Alpha	2.935%

4.3 Marks & Spencer

Incremental Beta

In agreement with the literature review (see 2.5.5), where the challenges faced by M&S were introduced, the company's beta has increased by approximately 24% (see Table 7).

Table 7. M&S's beta

Term	Value
Beta 1	-0.02027
Beta 2	-0.02505
Δ Beta	23.56%

Incremental CAPM

CAPM theory is verified since for M&S the change is approximately 0.46% (see Table 8). Because of the increase in the risk of an investment, the investors demand respectively more return.

Table 8. M&S's CAPM

Term	Value
CAPM 1	0.010712
CAPM 2	0.01076
Δ CAPM	0.455%

Incremental Jensen's Alpha

Although the company is facing increased systematic risk together with increased expectations from the investors, its performance decreased by approximately 0.57% (see Table 9).

Table 9. M&S's Jensen's alpha

Term	Value
Jensen's Alpha 1	-0.01039
Jensen's Alpha 2	-0.01045
Δ Jensen's Alpha	0.569%

4.4 GlaxoSmithKline

Incremental Beta

Table 10 on page 49 shows that GSK's beta has increased by approximately 11.6% since the Brexit vote. Once again, this finding supports the insights provided in the literature review since GSK is facing a rather big uncertainty ahead of Brexit due to the industry that the company is involved with.

Table 10. GSK's beta

Term	Value
Beta 1	0.040776139
Beta 2	0.045505849
Δ Beta	11.599 %

Incremental CAPM

CAPM calculations lead to another contradiction of the high risk – high reward principle, since the value has decreased by approximately 0.47%. Therefore, although the risk of an investment has increased, the return expected by the investors has decreased.

Table 11. GSK's CAPM

Term	Value
CAPM 1	0.010074501
CAPM 2	0.010027047
Δ CAPM	-0.471%

Incremental Jensen's Alpha

GSK has managed to performed better than it did before the Brexit vote by approximately 0.73%, as shown on page 50. Since the vote, the company has performed better and uncertainty increased the risk, however investors are demanding a smaller return from their investments.

Table 12. GSK's Jensen's alpha

Term	Value
Jensen's Alpha 1	-0.010064563
Jensen's Alpha 2	-0.00999149
Δ Jensen's Alpha	-0.726%

4.5 EasyJet

Incremental Beta

EasyJet's beta follows the company's growth. It has decreased by approximately 48% (see Table 13 on page 51). Despite the Brexit phenomenon, the company is rapidly expanding and is respectively considered as one of the best airlines in the UK (Smith 2016).

Table 13. EasyJet's beta

Term	Value
Beta 1	0.029891844
Beta 2	0.01545272
Δ Beta	-48.305%

Incremental CAPM

The company's CAPM has increased by approximately 1.5% (see table 14), meaning that investors demand a higher return despite the decrease in the risk.

Table 14. EasyJet's CAPM

Term	Value
CAPM 1	0.010188078
CAPM 2	0.010339396
Δ CAPM	1.485%

Incremental Jensen's Alpha

Although a rapidly growing and profitable company, EasyJet has not managed to perform better than the market, like all the other case companies. Moreover, the company performed worse than it did after the Brexit vote by approximately 2.58% (see Table 15).

Table 15. EasyJet's Jensen's alpha

Term	Value
Jensen's Alpha 1	-0.00946981
Jensen's Alpha 2	-0.00971393
Δ Jensen's Alpha	2.578%

5 Conclusion

Multinational corporations are complex financial institutions that deal with several markets, countries, and currencies. These factors add risk to their operations. Financial risks play an important role since they deal with macroeconomics. Because of the scale and power of MNCs, investors demand that their investments are met with corresponding returns, based on their risk tolerance. CAPM has proved to be a helpful model to estimate how much investors should expect to get, despite its limitations. The beta coefficient helps in understanding how volatile a company is towards market fluctuations and is of vital importance in the finance world. Jensen's alpha compares a company's performance to the overall market performance, and with Brexit affecting both the companies and the markets, alpha provided key insight for this research.

The Brexit talk and later the vote added uncertainty, especially on UK based companies. They will have to face a situation that has not been faced previously, therefore it is hard to predict what will happen. The relationship between risk, return, and overall performance of the companies was explained in the literature review and theoretical framework chapter, together with possible implications that Brexit may bring, as well as the history of the relationship between the United Kingdom and the European Union, which led to the referendum.

The research aimed at finding out how the case companies have performed after the Brexit vote on the 23rd of June 2016 until the 19th of April 2017 in terms of volatility towards market fluctuations (incremental beta), expected return from the investors (incremental CAPM), and overall performance (incremental Jensen's Alpha). This was done by choosing two reference periods, the first one spanning from 03.07.2001 to 23.06.2016, and the second one from 03.07.2001 to 19.04.2017. Respectively, the first period did not consider the results of the vote contrary to the second. The results were represented as a percentage change in beta, CAPM, and Jensen's alpha, and the term "incremental" was coined to define that change, since no similar study has been done yet, or has not been published.

Choosing five different companies from different industries confirmed the initial hypotheses that the results will be diversified, due to Brexit affecting companies differently, as it was explained in this thesis. BP's incremental beta largely decreased, since the industry in which BP operates is among the pillars of today's economies and can rarely be affected significantly, even from a massive event such as Brexit. Moreover, the company benefited from the decrease in the value of pound. Overall, the company's performance followed the leads given by beta and CAPM, meaning that due to decreased risk and decreased demand on the return of an investment, BP improved its performance due to possibly not having extra pressure from neither the market or the investors. Royal Bank of Scotland faces a difficult situation, having losses of £7 billion for 2016. Incremental Jensen's Alpha supported this figure, by showing a significant decrease in the company's performance. However, the systematic risk of the company went down, and at the same time investors demand a higher return. This could mean that the market is ignoring RBS or that investors are afraid for their money and that is why the variables contradict each other. Marks & Spencer is facing some troubles due to Brexit, as well as the retail sector in the UK due to a decreased pound. However, that would mean that M&S products should become cheaper outside the UK, but since UK remains the company's main target area, the increase in beta is logically justified. Respectively, the risk went up, as well as the expected return that investors demand. Moreover, the company's performance has decreased as shown in the results, which goes in agreement with M&S closing stores and reportedly increasing prices. GlaxoSmithKline's case is interesting due to the

pharma industry in which the company operates. As explained in chapter 2, the uncertainty surrounding this sector is rather big due to the complexity of producing and selling medical products. It is yet unclear by which laws and regulations GSK would have to manufacture its products in order to export them to the EU in the post Brexit era, therefore the increase in beta is justified. The expected return went down, and at the same time the company has improved its performance. It is possible that investors realize the complexity of the case and do not want to put extra pressure on the company. Lastly, EasyJet seems to be the company that has managed to perform better than the others. The airline industry has been booming in the recent years (IATA 2016), and EasyJet has followed the trend of its industry to the best of its capabilities. The beta of the company has decreased, with CAPM following the opposite direction, possibly because investor money in the previous years was spent on the expansion. Companies tend to reinvest the money that is supposed to be paid out to investors when expanding (Staar 2011, 81), therefore investors might demand more after the expansion period. The company's performance has decreased but it could be justified since expansion requires a significant amount of resources.

5.1 Credibility

The data used for the calculations can be considered valid since they were extracted from the official stock market databases, as well as the formulas used, which were taken from academic works of researchers that have worked with CAPM, beta coefficient, and Jensen's alpha.

Although the research yielded the expected results, it has its limitations. First, the FTSE 100 index is only available from the year 2001, which limits the reference periods for the calculations, even if company data is available for more years. Second, the effects of Brexit vote do not represent Brexit, but could work as a mere prediction about what will be happening. Third, almost ten months have passed since the Brexit vote, which can be considered a rather small term when considering such a big phenomenon with many different possible implications.

Limitations apply as well in terms of the literature review. Brexit is a rather new phenomenon, and because of that there is very little academic literature about it.

A multiple case study approach was undertaken in this research in order to provide results for each company. Additionally, the results of the companies can be compared to each other, however since companies were chosen from different industries, the validity of the comparison might come under question. Furthermore, the results of a single company do not represent the industry in which the company is operating, however the company does get affected by the industry.

5.2 Recommendations

This subchapter provides a few recommendations regarding the topic that was studied, as well as the methodology applied.

First, although the focus was made on MNCs, the methodology could be applied to small and medium sized companies as well, especially in case they are involved in international trade. Second, this research can be extended to estimate changes in industries rather than single companies. To do that, ten to fifteen companies from one industry will have to be chosen and analyzed through the incremental values of beta coefficient, CAPM, and Jensen's alpha. Furthermore, it will be possible in the future to naturally extend the reference period of the calculations, and that should provide more accurate information regarding how Brexit has affected UK companies. The best time to do that would be after the Brexit has occurred de facto. Only then the implications will be clear and their imprint could be spotted on the performance of the companies.

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