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INTRODUCTION

The **London Stock Exchange** is one of the most important financial markets in the world and **FTSE100** is its main **index** indicator (Proactiveinvestors, 2018). The FTSE100 index is compounded by the **top 100** capitalised market firms traded on the London Stock Exchange. Accordingly, the main goal of this assignment is to build a portfolio based exclusively on FTSE100 firms.



Figure 0.1: The London Stock Exchange



Figure 0.2: FTSE100 Index Security Description in Bloomberg

Consequently, this report is divided into four distinctive sections. It will, in a first part, discuss the main concepts and selection criteria applied towards the development of several portfolios of assets, before analysing the organisations chosen. The third segment will refer to the construction of differently weighted portfolios and the report will then conclude on the assessment of the results.

1 METHODOLOGY

1.1 MAIN CONCEPTS

Nowadays, the most basic asset trading strategy is called **Buy and Hold**, which mainly consists of buying assets on the Stock Exchange Market at the current stock price and selling them at a higher price at some point in the future (Hull, 2012). As for example, an investor buys an asset (*long position*) on the stock market for £80 (*stock price*). The Figure 1.1 below shows the potential profits or losses in regard to the stock price fluctuations. If the stock price falls lower than £80, the investor will hold the asset, unless he accepts to lose money on the market. However, if the stock price rises above £80, the investor will sell the asset (*short position*) and make a profit from the transaction.



Figure 1.1: Long/Short share position

1.2 PRE-SELECTION REQUIREMENTS

Given the wide range of assets that could be included in the portfolio, it has been decided to apply specific criteria filters in the **EQS Bloomberg** function in order to pick the potentially most profitable stocks. Firstly, firms with a high income (*revenues*) profile will be preferential. Moreover, the income levels must be compared in parallel to the production costs (*Cost of Goods Sold or COGS*) to make sure that the company picked is theoretically successful. Therefore, the **Gross Margin ratio** will be considered for adding potential firms to the portfolio. Mathematically, the Gross Margin ratio is defined as follows:

$$\text{Gross Margin Ratio (\%)} = \frac{\text{Revenues} - \text{COGS}}{\text{Revenues}} * 100 \quad (1.1)$$

Secondly, companies with a high **Return on Common Equity (ROCE)** will be preferred, which means high net income levels in comparison to the **Average Common Equity** (Ross et all, 2016). These are mathematically defined as follows:

$$\text{Average Common Equity} = \frac{\text{Beginning Com Eq} + \text{Ending Com Eq}}{2} \quad (1.2)$$

Furthermore,

$$\text{Return on Common Equity (ROCE)} = \frac{\text{Net Income}}{\text{Average Common Equity}} \quad (1.3)$$

Finally, the above criteria are computed into Bloomberg (see Figure 1.2) as follows:

1. (51) The stock must be available for trading purposes.
2. (52) The stock must be listed in the **FTSE100**.
3. (53) The last filing **Gross Margin ratio** must be **higher than 25%**.
4. (54) The last filing **Return on Common Equity ratio** must be **higher than 25%**.



Figure 1.2: EQS search criteria

The Figure 1.3 below illustrates the results obtained after applying the previously defined search criteria.

Screen saved successfully, <Back> to Return							
Equity Screen		Universe: Jose		Actions		Export	
Screen Name: Jose		Refine By: Countries, Sectors, etc.		Group By: Securities		Settings	
Overview	Returns	Valuation	Estimates	Actuals	Credit	Technical	Custom
Page 1							Results
Name	GM LFI	ROE LF	Market Cap	Price:D-1	P/E	Total Return YTD	
Investable Universe (11)	<Enter Filter>						
30 BRITISH AMERICAN TOBACCO	79.76%	108.28%	60.37B	2632.00	1.54	5.28	
32 GLAXOSMITHKLINE PLC	67.42%	64.54%	73.51B	1480.80	39.00	-0.70	
33 RELX PLC	64.44%	82.86%	32.88B	1673.00	20.52	3.50	
34 DIAGEO PLC	61.03%	29.83%	67.00B	2772.00	24.07	-0.82	
35 RECKITT BENCKISER GROUP	60.44%	59.40%	41.49B	5865.00	11.90	-2.46	
36 CRODA INTERNATIONAL PLC	39.03%	30.62%	6.46B	4907.00	26.42	4.74	
37 EVRAZ PLC	36.99%	111.55%	7.03B	486.80	5.30	1.31	
38 NEXT PLC	34.36%	141.08%	6.76B	4886.00	11.37	22.43	
39 PERSIMMON PLC	30.78%	30.18%	7.65B	2408.00	8.92	24.77	
40 BERKELEY GROUP HOLDINGS	29.20%	27.38%	4.90B	3795.00	7.37	9.08	
41 FERGUSON PLC	28.94%	29.46%	11.92B	5141.00	19.33	2.47	

51 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852
3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2019 Bloomberg F
SN 749129 ICT GMT+7:00 H178-1452-0 31-Jan-2019 19:15:09

Figure 1.3: EQS search results

However, **Evraz PLC** will be discarded because of the absence of available data before the year 2012 and to encourage having a portfolio of stocks evaluated on equal criteria and with similar data scales. The next section will then list the specific points to be the cornerstones of adding/excluding firms to the portfolio.

1.3 STOCK PICKING CRITERIA

The picked firms resulting from the pre-selection process will be evaluated under the following criteria:

1. **Company Profile. Most Relevant News.**
2. **Financial Analysis.**
3. **Equity Performance.**
4. **Competitors Relative Valuation.**
5. **Financial Analysts Rating.**

1.4 PORTFOLIO OPTIMIZATION CRITERIA

The **expected return** (μ_p) of a n-asset portfolio is mathematically defined as follows (Ingersoll, 1987):

$$\mu_p = \sum_{i=1}^N w_i * \mu_i \quad (1.4)$$

where w_i and μ_i express the weight and the expected return of the i^{th} asset. Furthermore, the **n-asset portfolio variance** σ_p^2 can be mathematically expressed as follows:

$$\sigma_p^2 = w' * \Sigma * w \quad (1.5)$$

where Σ describes the **variance-covariance matrix**.

It is possible to define a **Mean-Variance optimized portfolio** w_p^* to which there is no other portfolio with higher returns and the same variance nor with a lower variance and equal returns (Elton et al, 2014). Based on the equities previously obtained in the pre-selection stage, the asset returns of the last ten years have been computed in order to find the weights that minimize the portfolio variance (further details will be given in the third section). The Figure 1.4 displays the results for the 10-asset minimum-variance portfolio.

Figure 1.4: Optimum 10-asset Mean-Variance portfolio

Furthermore, the Figure 1.4 indicates that six of those equities do not have a big impact (*less than 1% weight*) in terms of building the portfolio. Consequently, these equities have been excluded. Note that companies which have a high individual performance do not necessarily outperform as a group.

2 FIRM ANALYSIS

This section presents the individual analysis of the different organisations, following the previously described picking criteria.

2.1 BRITISH AMERICAN TOBACCO PLC

2.1.1 COMPANY PROFILE

British American Tobacco (BATS) is the largest cigarette and tobacco product manufacturer in the world. Its headquarters are in London and the organisation employs 91,402 people. Its current **Market Capitalization** (*total equity market value*) is around **60 Billions** (£) and it represents **3.403%** on the **FTSE100** index and **2.738%** on the **S&P/ASX200** (Australian equity performance index). (See Figure 2.1 and Figure 2.2).

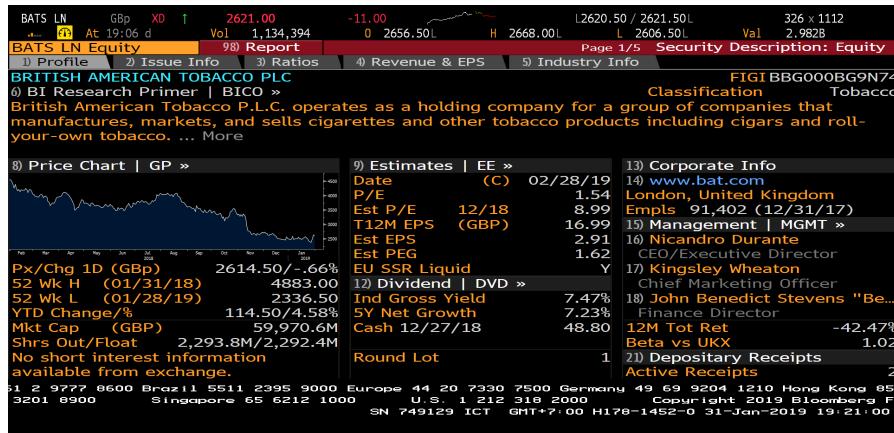


Figure 2.1: BATS LN Security Description 1

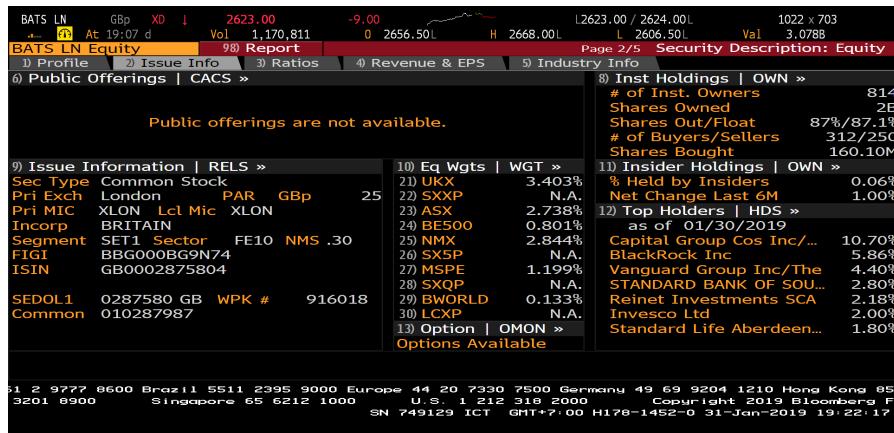


Figure 2.2: BATS LN Security Description 2

2.1.2 LATEST NEWS

According to the latest news, even though the **FDA** (*US Food and Drug Administration*) is planning on banning several vapour products, BATS' sales are expected to rise in 2019. (See Appendix for more detailed information).

2.1.3 FINANCIAL ANALYSIS

In terms of **Revenues**, BATS has been following an **upward trend** over the last four years. It is expected to have experimented a boom in 2018, when revenues were anticipated to increase from **20,292** to **24,346 Millions (£)** in just one year. (See Figure 2.3).



Figure 2.3: BATS LN Revenues 1

Moreover, the Figure 2.4 indicates an increment in the company's revenues of almost **95%** from 2015 to 2017 (**39.37%** annually).

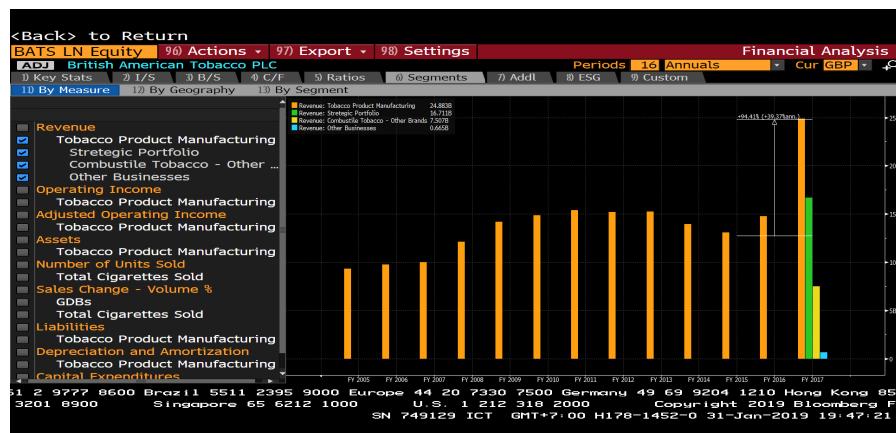


Figure 2.4: BATS LN Revenues 2

2.1.4 EQUITY PERFORMANCE

Over the last five years, **BATS LN** equity (*white line*) has been **outperforming FTSE (UKX) index (*green line*)**, achieving its highest peak in summer 2017. (See Figure 2.5). However, as of one year after the Brexit referendum, the mentioned equity has been decreasing, to the point of converging with the UKX index at the beginning of 2019.



Figure 2.5: BATS LN Performance against FTSE100

2.1.5 COMPETITORS

Currently, BATS' **ROE (Return on Equity ratio)** is at **17.19%**, which is 12% lower than the sector median (see Figure 2.6).



Figure 2.6: BATS LN Comparables 1

The Figure 2.7 presents that British American Tobacco experimented the highest **Sales Growth** in the last year (**37.56%**), almost 34% higher than the sector median.



Figure 2.7: BATS LN Comparables 2

Finally, Figure 2.8 points out that BATS achieved the highest **Gross Margin Ratio (80.96%)**, and 21.86% higher than the sector median) over the last year.



Figure 2.8: BATS LN Comparables 3

2.1.6 ANALYSTS RATING

The Figure 2.9 indicates the **financial analysts opinion**, where more than 65% recommend to **Buy** against 8.3% to **Sell**.



Figure 2.9: BATS LN Analysts Recommendation

2.2 GLAXOSMITHKLINE PLC

2.2.1 COMPANY PROFILE

Glaxosmithkline PLC (GSK) is the sixth largest pharmaceutical company in the world. The organisation develops a wide range of vaccines and health-related products, and employs about 100,000 people. Its headquarters are in Brentford, UK. Currently, its **Market Capitalization** is around **73 Billions** (£) and it represents **4.095%** on the **FTSE100** index composition and **3.294%** on the **S&P/ASX200**. (See Figure 2.10 and Figure 2.11).



Figure 2.10: GSK LN Security Description 1



Figure 2.11: GSK LN Security Description 2

2.2.2 LATEST NEWS

Although GSK has experimented some issues with negative credit outlook ratings by agencies such as S&P and Moody's last December, its **LTM FCF** ratio (*Last Twelve Months Free Cash Flow*) is still positive at 1.49%.

Months Free Cash Flow Margin) in 2018 is almost 4.5% of revenue higher than the average over the past five years. (See Appendix).

2.2.3 FINANCIAL ANALYSIS

Glaxosmithkline's revenues reached **23,923 Millions** (£) in 2015. Furthermore, the company's revenues have been increasing over the last few years, getting at **30,186 Millions** (£) in 2017, and they are expected to achieve a record peak of **31,637.9 Millions** (£) in 2019. (See Figure 2.12).



Figure 2.12: GSK LN Revenues 1

The Figure 2.13 displays the upward trend mentioned above, with an accrual of **31.77%** between 2015 and 2017 (**9.62%** annually).

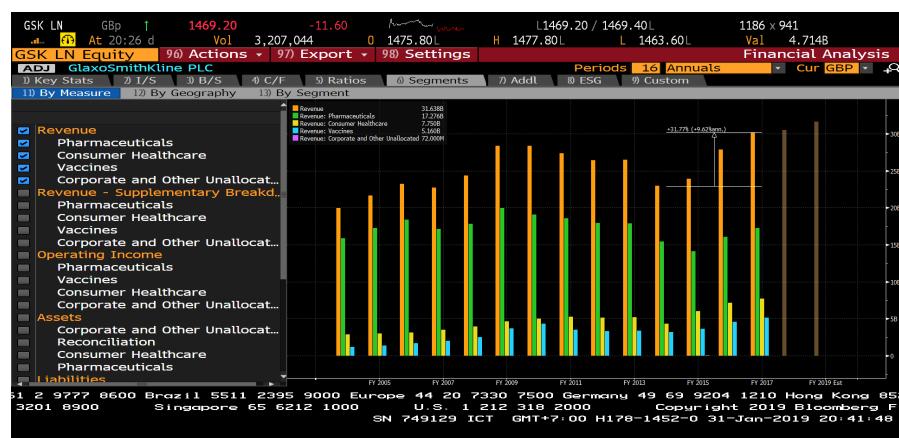


Figure 2.13: GSK LN Revenues 2

2.2.4 EQUITY PERFORMANCE

The Figure 2.14 highlights a comparison between **UKX** index (*green line*) and **GSK LN** equity (*white line*) performance over the last five years. Generally, GSK has been **outperforming** UKX index since 2016, with the exception of a significant fall between the summers of 2017 and 2018 (interestingly similar to BATS LN equity over the same period). However, GSK has been experiencing a very positive trend since the beginning of 2018; with a current performance of **23.9%** against 7.9% of UKX index.



Figure 2.14: GSK LN Performance against FTSE100

2.2.5 COMPETITORS

The Figure 2.15 illustrates that GSK's **Gross Margin ratio** is currently **equal** to the sector median (**68.43%**).



Figure 2.15: GSK LN Comparables 1

Furthermore, GSK's **ROE** is **much higher** than the rest of its competitors (**172.72%**,

so 153.7% above the sector median). (See Figure 2.16).



Figure 2.16: GSK LN Comparables 2

2.2.6 ANALYSTS RATING

The Figure 2.17 points out the financial analysts opinion, where, interestingly, **more than 50%** recommend Hold. Furthermore, the choice to Buy is of **34.6%** against 7.7% to Sell.

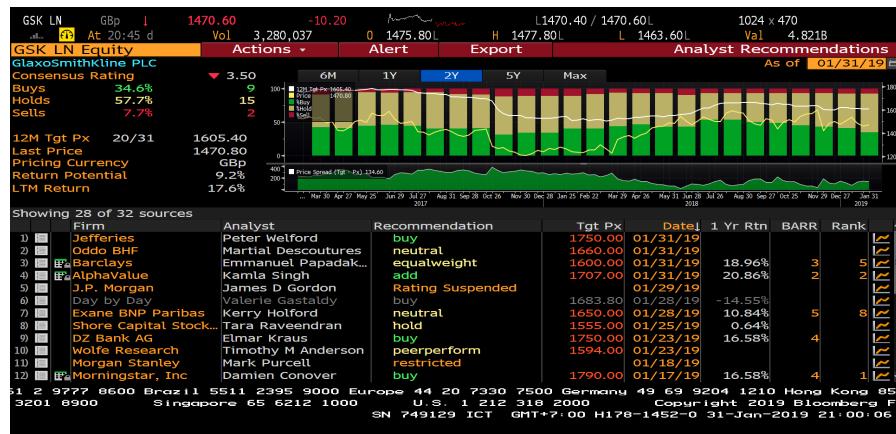


Figure 2.17: GSK LN Analysts Recommendation

2.3 RECKIT BENCKISER GROUP

2.3.1 COMPANY PROFILE

The **Reckit Benckiser Group (RB)** is a consumer goods company, in the manufacturing and distribution industry. The organisation is based in Slough, UK, and employs more than 40,000 people. Its current **Market Capitalization** is around **41.9 Billions (£)** and it represents **2.056%** on the **FTSE100** index and **1.654%** on the **S&P/ASX200**. (See Figure 2.18 and Figure 2.19).

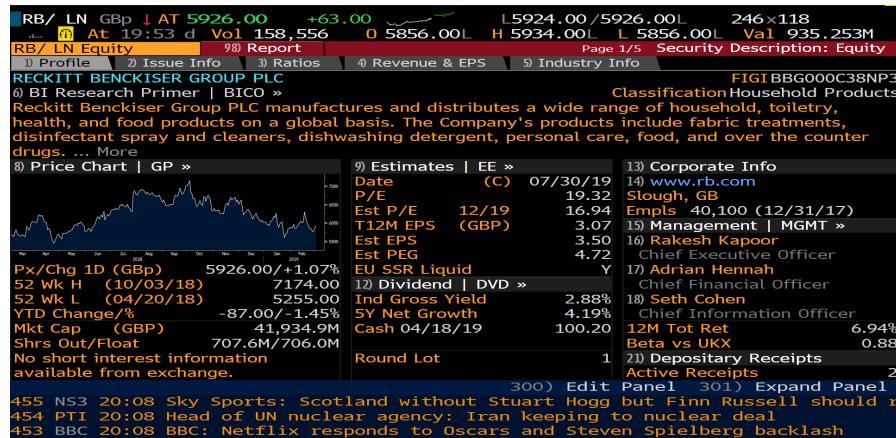


Figure 2.18: RB/ LN Security Description 1



Figure 2.19: RB/ LN Security Description 2

2.3.2 LATEST NEWS

The latest news on the **Reckit Benckiser Group** announced that the company will pay dividends next 23th May. Furthermore, revenues from **Home Products** were said to have risen **51.9%** year-over-year in the end of 2018. However, RB's **LTM FCF** ratio

in 2018 was almost 4% of revenue lower than the average over the past five years. (See Appendix).

2.3.3 FINANCIAL ANALYSIS

Reckit Benckiser Group's revenues have been increasing significantly over the last several years, going from **8,874 Millions (£)** in 2015 to **12,597 Millions (£)** in late 2018. The organisation is expected to keep expanding and reach **13.6 Billions (£)** in revenues in 2020. (See Figure 2.20).



Figure 2.20: RB/ LN Revenues 1

The Figure 2.21 proves the upward trend mentioned above, with an increment of **41.95%** from 2015 to 2018 (**12.37%** annually).



Figure 2.21: RB/ LN Revenues 2

2.3.4 EQUITY PERFORMANCE

The Figure 2.22 illustrates a comparison between **UKX** index (*green line*) and **RB/ LN** equity (*white line*) performance over the last five years. Clearly, RB/ LN equity has been **highly outperforming** FTSE100 since the end of 2014. Moreover, although RB/ LN equity suffered a significant fall between the summers of 2017 and 2018 (like the previously analysed equities), it quickly recovered and continues to perform better than the UKX index (28.6% against 7.8% respectively).



Figure 2.22: RB/ LN Performance against FTSE100

2.3.5 COMPETITORS

Currently, RB's **ROE** is **16.59%**, which is almost **equal** to the sector median (see Figure 2.23).



Figure 2.23: RB/ LN Comparables 1

Furthermore, the Figure 2.24 indicates that RB achieved a **higher Gross Margin**

Ratio than the sector median (**60.61%** and **46.46%** respectively) over the last year. However, the organisation is still far behind other worldwide competitors such as L’Oreal (**72.78%**) or Oriflame Holding AG (**69.22%**).



Figure 2.24: RB/ LN Comparables 2

2.3.6 ANALYSTS RATING

The Figure 2.25 displays the financial analysts opinion, where **more than 50%** recommends to **Buy** against **16.7%** to **Sell**.

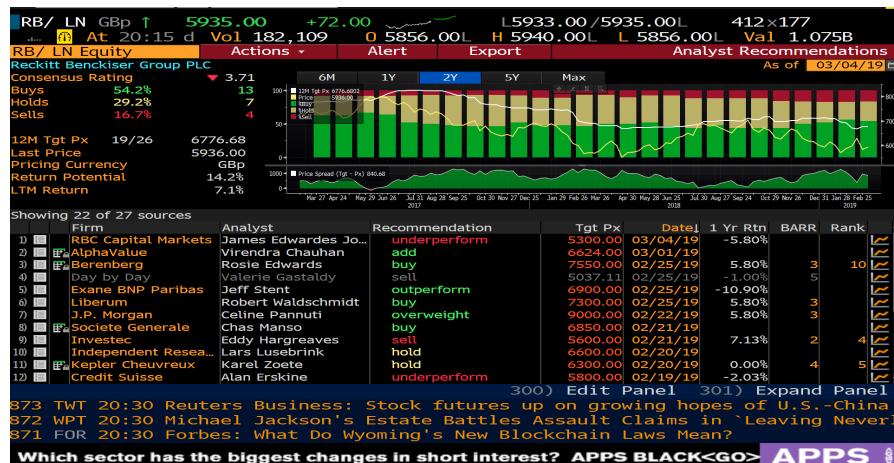


Figure 2.25: RB/ LN Analysts Recommendation

2.4 DIAGEO PLC

2.4.1 COMPANY PROFILE

Diageo (DGE) is the leading alcoholic beverage organisation in the world. Its headquarters are in London and the company employs about 30,000 people. Its current **Market Capitalization** is **71.7 Billions** (£) and it represents **3.973%** on the **FTSE100** index and **3.195%** on the **S&P/ASX200**. (See Figure 2.26 and Figure 2.27).

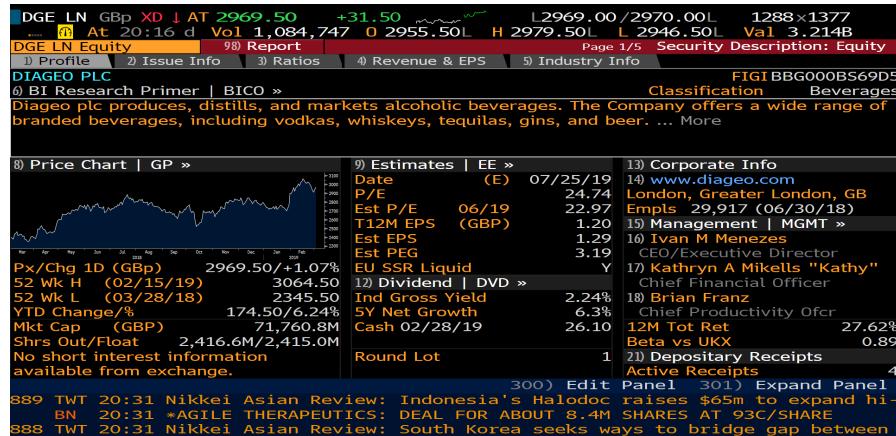


Figure 2.26: DGE LN Security Description 1



Figure 2.27: DGE LN Security Description 2

2.4.2 LATEST NEWS

The latest news on **Diageo PLC**, which are positive, acknowledge that the **LTM FCF** ratio is almost **4% of revenue** higher than the average of the past five years. Moreover, the company announced it will pay dividends on 11th April 2019. (See Appendix).

2.4.3 FINANCIAL ANALYSIS

Diageo reached a total of **10,485 Millions (£)** in revenues in 2016. The upward trend can be shown with the accomplishment of **12,163 Millions (£)** in revenues at the end of 2018, and it is expected to reach **13,325 Millions (£)** by 2020. (See Figure 2.28).



Figure 2.28: DGE LN Revenues 1

The Figure 2.29 below indicates the mentioned trend, with an increase of **18.57%** from 2014 to 2018 (**4.35%** annually), despite an unexpected fall in revenues in 2016.

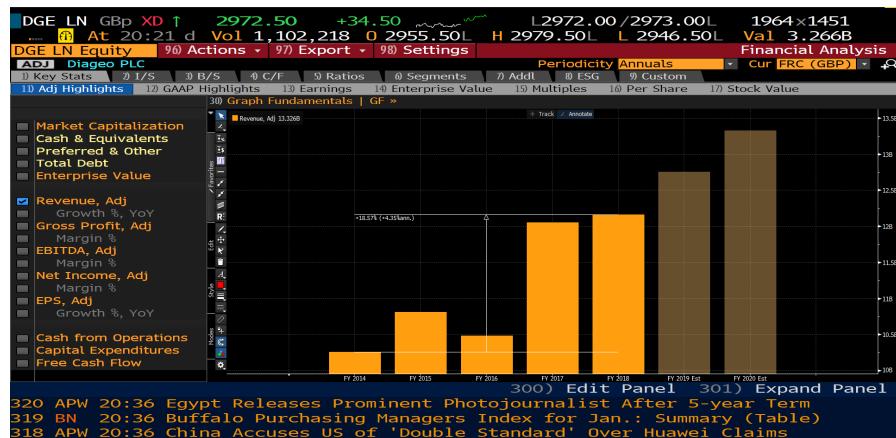


Figure 2.29: DGE LN Revenues 2

2.4.4 EQUITY PERFORMANCE

The Figure 2.30 displays a comparison between **UKX** index (*green line*) and **DGE LN** equity (*white line*) performance over the last five years. Since the summer of 2016, DGN LN equity has been **widely outperforming** UKX index. Furthermore, the equity has not experimented any fall over the summers of 2017 and 2018 (contrarily to the other

previously analysed equities), and continues to perform better than UKX index up until now, achieving its highest peak of 54% above the index.



Figure 2.30: DGE LN Performance against FTSE100

2.4.5 COMPETITORS

Although DGE's **ROE** (33.44%) and **Gross Margin ratio** (61.90%) are currently above the sector median (14.20% and 53.31% respectively), both indicators are performing slightly worse than other competitors such as Fevertree Drinks PLC or Remy Cointreau. (See Figure 2.31 and Figure 2.32).



Figure 2.31: DGE LN Comparables 1



Figure 2.32: DGE LN Comparables 2

2.4.6 ANALYSTS RATING

Finally, the Figure 2.33 displays the financial analysts opinion, where **more than 50%** recommend to **Buy** against 10.7% to **Sell**.



Figure 2.33: DGE LN Analysts Recommendation

3 PORTFOLIO CONSTRUCTION

Given that the four equities previously analysed (**British American Tobacco PLC**, **Glaxosmithkline PLC**, **Reckitt Benckiser Group** and **Diageo PLC**) potentially meet performance expectations, this report will then proceed on the construction of three portfolios with different characteristics and based on different requirements.

3.1 EFFICIENT PORTFOLIO FRONTIER

The **Mean-Variance Efficient Portfolio Frontier** is mathematically described as follows (Bailey, 2005; Jones, 2013):

$$\sigma_p = \sqrt{\frac{A * \mu_p^2 - 2 * B * \mu_p + C}{D}} \quad (3.1)$$

where σ_p is the standard deviation portfolio, μ_p expresses the portfolio return and A, B, C, D are defined as follows:

$$\begin{aligned} A &= \mathbf{1}' * \Sigma^{-1} * \mathbf{1} > 0 \\ B &= \mathbf{1}' * \Sigma^{-1} * \boldsymbol{\mu} > 0 \\ C &= \boldsymbol{\mu}' * \Sigma^{-1} * \boldsymbol{\mu} > 0 \\ D &= A * C - B^2 > 0 \end{aligned} \quad (3.2)$$

Moreover, based on the historical last ten-year equity returns (see Appendix), the **Efficient Portfolio Frontier (EPF)** is graphically represented as follows:

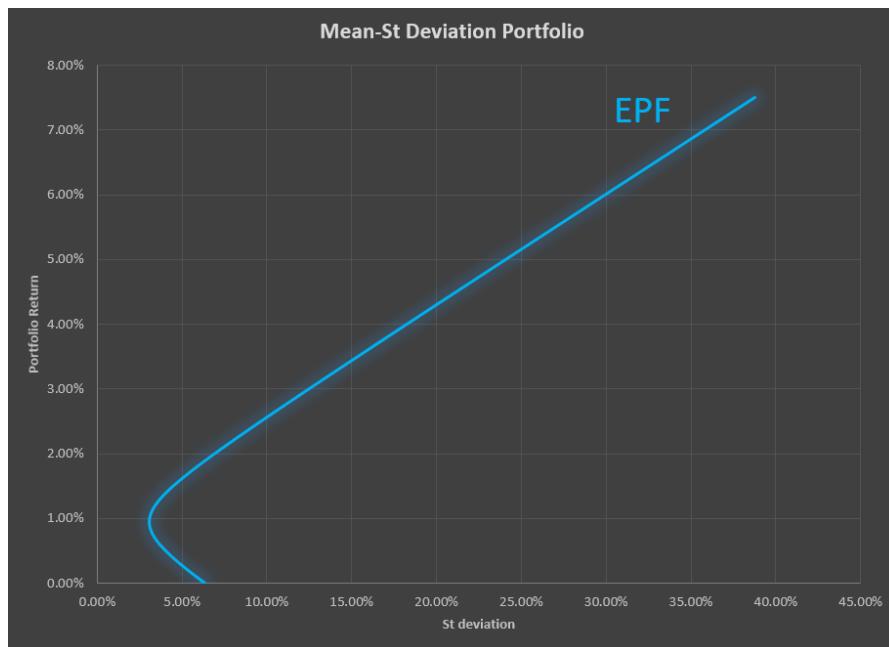


Figure 3.1: Mean-Standard Deviation EPF

3.2 GLOBAL MINIMUM VARIANCE PORTFOLIO (GMVP)

GMVP weights (\mathbf{W}_{GMVP}) can be mathematically obtained as follows (McMillan et al, 2011; Levy et al, 1984):

$$\mathbf{W}_{GMVP} = \frac{\Sigma^{-1} * \mathbf{1}}{\mathbf{1}' * \Sigma^{-1} * \mathbf{1}} \quad (3.3)$$

The Figure 3.2 below indicates the numerical results:

Global Minimum Variance Portfolio			
	Portfolio Weights	Portfolio Return	
BATS LN Equity	17.36%	0.00944575	
GSK LN Equity	22.10%	0.000959241	
RB/LN Equity	24.02%		0.030971611
DGE LN Equity	36.52%		
	100.00%		

Figure 3.2: Global Minimum Variance Portfolio (GMVP) 1

Furthermore, GMVP can be located graphically as in the following picture:

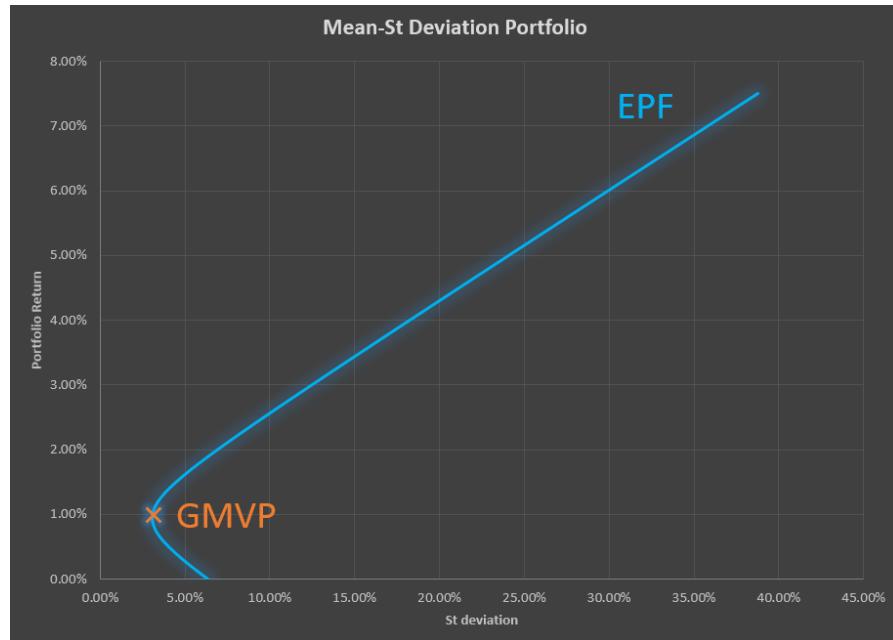


Figure 3.3: Global Minimum Variance Portfolio (GMVP) 2

3.3 EQUALLY WEIGHTED PORTFOLIO (EWP)

In this case, the four equities will be equally weighted, giving the following results:

		Equal Weighted Portfolio	
	Portfolio Weights		
BATS LN Equity	25.00%	Portfolio Return	0.009432832
GSK LN Equity	25.00%	Portfolio Variance	0.000995595
RB/ LN Equity	25.00%	Portfolio SD	0.031553049
DGE LN Equity	25.00%		
	100.00%		

Figure 3.4: Equally Weighted Portfolio 1

Note that EWP is located **ALMOST** at the same level as GMVP. (See Figure 3.5).

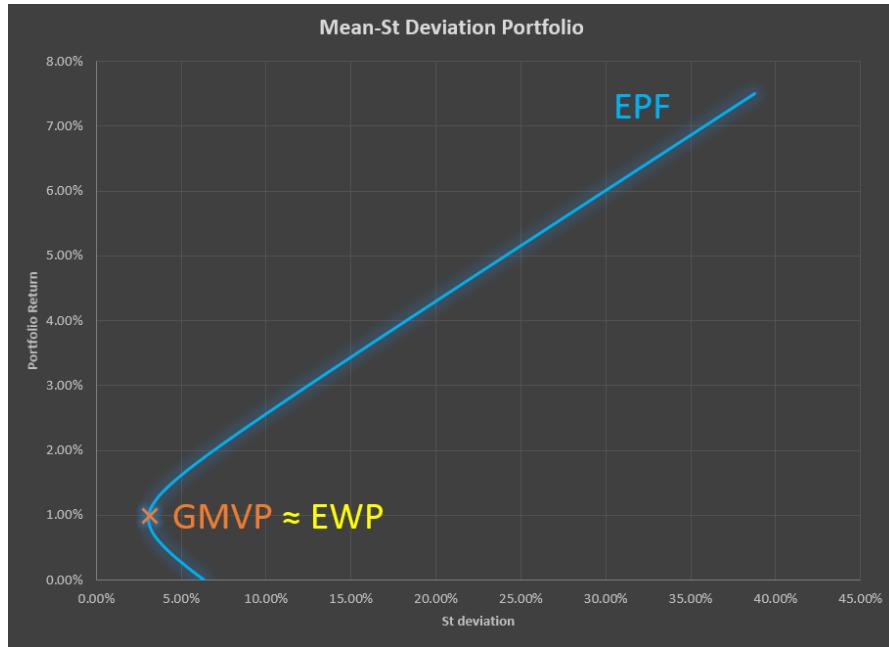


Figure 3.5: Equally Weighted Portfolio 2

3.4 TANGENCY PORTFOLIO (TP)

The **Capital Market Line (CML)** expresses, as a result, the portfolios that the investor should choose, according to the minimum risk level and the maximum expected return. Consequently, the CML is mathematically defined as follows:

$$\mu_p = r_f + \sigma_p * \sqrt{C - 2 * r_f * B + r_f^2 * A} \quad (3.4)$$

where r_f is the free interest rate (it will be fixed to 3% annually).

Furthermore, the **Tangency Portfolio (TP)** is defined by the tangency point between

the CML and the EPF. The TP thus describes the optimal portfolio in terms of risk and is mathematically composed as follows (Bodie et al, 2008):

$$W_{TP} = \frac{\Sigma^{-1} * (\mu - r_f * \mathbf{1})}{B - A * r_f} \quad (3.5)$$

Therefore, considering the historical data, the Figure 3.6 below shows the numerical results:

	Portfolio Weights	Tangency Portfolio				
BATS LN Equity	29.59%	Portfolio Return	0.013423543			
GSK LN Equity	-26.54%	Portfolio Variance	0.001508593			
RB/ LN Equity	28.26%	Portfolio SD	0.038840605			
DGE LN Equity	68.69%					
	100.00%	Rf=	0.0025	Sharpe Ratio =	0.28124029	
		Risk Premium=	0.010923543			

Figure 3.6: Tangency Portfolio 1

where the **Sharpe Ratio** is defined as follows (Campbell et al, 1997):

$$\text{Sharpe Ratio} = \frac{(\mu_p - r_f)}{\sigma_p} \quad (3.6)$$

Finally, the TP is graphically indicated as the red rhombus in Figure 3.7.

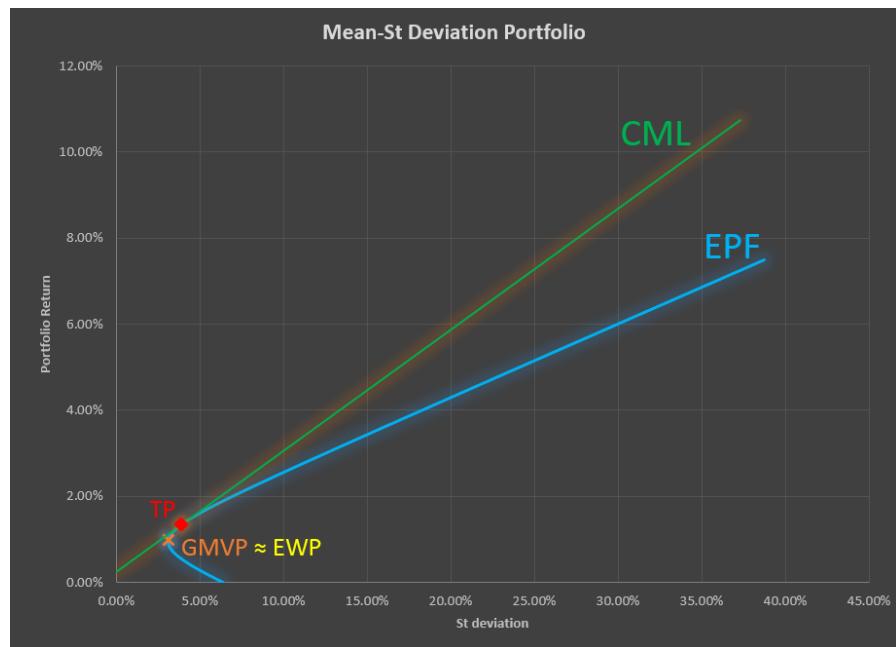


Figure 3.7: Tangency Portfolio 2

4 CONCLUSIONS

The following table summarizes the results obtained during the portfolio optimization process:

	GMVP	EWP	TP
BATS LN Equity	17.365%	25.000%	29.592%
GSK LN Equity	22.099%	25.000%	-26.544%
RB/ LN Equity	24.021%	25.000%	28.258%
DGE LN Equity	36.515%	25.000%	68.694%
Portfolio Return	0.945%	0.943%	1.342%
Portfolio Variance	0.096%	0.100%	0.151%
Portfolio SD	3.097%	3.155%	3.884%

Figure 4.1: Portfolio Optimization Results

Accordingly, the obtained conclusions are listed as follows:

1. GMVP and EWP are fully based on long positions, while TP short-sells 26.55% of its weight in GSK LN equities.
2. GMVP achieves higher returns than EWP and indicates less risk (*as expected by the fact that GMVP lies on the EPF while EWP does NOT*).
3. TP describes the optimal portfolio based on the combination of risky and risk-free assets.
4. CML illustrates the different alternatives for different risk profile investors considering borrowing or lending money at a risk-free rate.

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APPENDIX



Figure 4.2: BATS LN NEWS 1



Figure 4.3: BATS LN NEWS 2



Figure 4.4: BATS LN NEWS 3

GSK LN	GBp	↓	1470.80	-10.00	1470.80 / 1471.00	L1224 x 2106	Val 4,751B	Key Insights
At 20:33 d	Vol 3,231,940	0 1475.80L	H 1477.80L	L 1463.60L				Currency GBP
GSK LN Equity	Alert	Export to Note						
All (23)	Valuation (4)	Estimates (5)	Fundamentals (7)	Industry (3)	News (1)	Deals (3)		
0 Upcoming Presentation							01/31	◇
Sachis Associates European Life Sciences CEO Forum on Feb 25 13:00 PM								
0 Upcoming Presentation							01/31	◇
Immuno-Oncology 360° Conference on Feb 06 13:00 PM								
0 Debt Maturities Approaching							01/31	▼
GBP 8.6B in debt is due within the next 12 months, representing 30.1% of current total debt outstanding and 222.6% of cash balance as of September 30, 2018								
0 Pending Management Changes							01/31	◇
Pending changes in 1 top executive position								
0 Recent Management Changes							01/31	◇
3 of 21 executives and 1 of 12 board members in role less than one year								
0 Negative Credit Outlook							12/06	▼
Issuer Ratings with Negative Outlook: Moody's (Dec 5, 2018), S&P (Dec 6, 2018), Fitch (Apr 11, 2018)								
1 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2019 Bloomberg L.P. SN 749129 ICT GMT+7:00 H178-1452-0 31-Jan-2019 20:49:33								

Figure 4.5: GSK LN NEWS 1

GSK LN Equity	Alert	Export to Note	Key Insights
All (23)	Valuation (4)	Estimates (5)	Currency GBP
0 Upcoming Presentation			01/31
Immuno-Oncology 360° Conference on Feb 06 13:00 PM			◇
0 Debt Maturities Approaching			01/31
GBP 8.6B in debt is due within the next 12 months, representing 30.1% of current total debt outstanding and 222.6% of cash balance as of September 30, 2018			▼
0 Pending Management Changes			01/31
Pending changes in 1 top executive position			◇
0 Recent Management Changes			01/31
3 of 21 executives and 1 of 12 board members in role less than one year			◇
0 Negative Credit Outlook			12/06
Issuer Ratings with Negative Outlook: Moody's (Dec 5, 2018), S&P (Dec 6, 2018), Fitch (Apr 11, 2018)			▼
0 High FCF Margin vs History			09/30
LTM FCF is 16.8% of revenue vs 12.5% average over past 5 years, as of September 30, 2018			▲
1 2 9777 8600 Brazil 5511 2395 9000 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2019 Bloomberg L.P. SN 749129 ICT GMT+7:00 H178-1452-0 31-Jan-2019 20:50:03			

Figure 4.6: GSK LN NEWS 2

RB/ LN	GBp	↑	5944.00	+15.00	5944.00 / 5945.00L	L194x200	Val 631.018M	Key Insights
At 10:55 d	Vol 106,406	0 5907.00L	H 5947.00L	L 5890.00L	Val 631.018M			Currency GBP
RB/ LN Equity	Alert	Export to Note	All (19)	Valuation (4)	Estimates (3)	Fundamentals (8)	Industry (1)	News (0)
0 Pending Management Changes			0 Pending Management Changes				03/05	◇
Pending changes in 1 top executive position								
0 Recent Management Changes			0 Recent Management Changes				03/05	◇
1 of 9 executives and 4 of 10 board members in role less than one year								
0 High Insider Activity			0 High Insider Activity				03/05	◇
Individual insiders hold 0.2% of share class, having increased their holdings by 0.2% over the past six months. They disclosed 1,940 shares of open market purchases at an average price of 6213.32 and no open market								
0 Pending Dividends			0 Pending Dividends				04/18	▲
A dividend of GBp 100.20 is payable on May 23, 2019. The stock will trade ex-dividend on Apr 18, 2019.								
0 Low FCF Margin vs History			0 Low FCF Margin vs History				12/31	▼
LTM FCF is 16.8% of revenue vs 20.4% average over past 5 years, as of December 31, 2018								
0 High FCF Margin vs Comps			0 High FCF Margin vs Comps				12/31	▲
LTM FCF is 16.8% of revenue vs 9.0% for comps average, as of December 31, 2018								
416 EDG 11:11 Diamondpeak Holdings Corp.: 8-K 2019/02/27			300) Edit Panel	301) Expand Panel				
415 EDG 11:10 Amesite Inc.: 8-K 2019/03/04								
414 EDG 11:10 Union Acquisition Corp.: 10-K 2019/01/31								
TOPLive: Keep up on events with Bloomberg's live blogs.								TLIV

Figure 4.7: RB/ LN NEWS 1

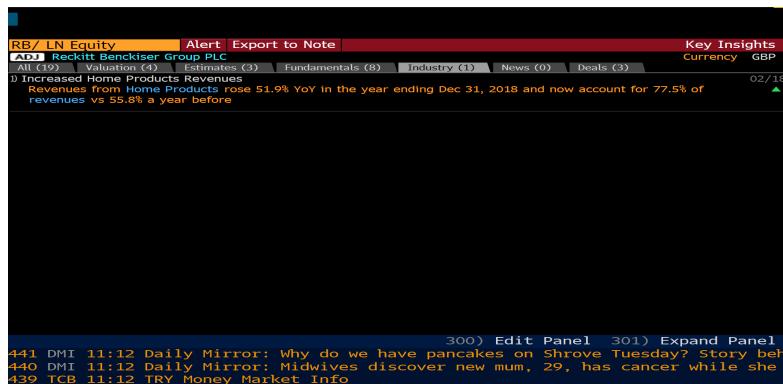


Figure 4.8: RB/ LN NEWS 2



Figure 4.9: DGE LN NEWS 1

Start Date	30/01/2009									
End Date	BATS LN Equity PX_LAST	GSK LN Equity PX_LAST	RB / LN Equity PX_LAST	FERG LN Equity PX_LAST	PSN LN Equity PX_LAST	REL LN Equity PX_LAST	NXT LN Equity PX_LAST	DGE LN Equity PX_LAST	CRDA LN Equity PX_LAST	BKG LN Equity PX_LAST
27/02/2009	870.5	1069	2633.118	849.332	344.25	524.5	1169	819	508.795	1797
31/03/2009	888	1087.5	2559.813	1097.203	345.5	501	1324	786.5	548.929	1613
30/04/2009	980.5	1049	2606.728	1398.032	382.5	504.5	1635	813	563.429	1639
29/05/2009	886.5	1042	2618.457	1184.792	364	498.5	1455	843	545.304	1688
30/06/2009	904	1065.5	2703.141	1330.901	350	452.5	1469	871.5	552.324	1673
31/07/2009	826	1149	2610.055	1526.888	450.25	425.25	1705	938	598.643	1658
31/08/2009	946.5	1203	2788.535	1652.324	492.2	447	1640	954	650.429	1874
30/09/2009	886	1229.5	2988.892	1718.462	456.4	468.3	1792	960	679.429	1963
30/10/2009	853	1250	2966.412	1411.716	403.4	462.2	1795	996	776.268	1943
30/11/2009	869	1257	3029.943	1322.771	413.6	454.6	1976	1025	771.089	1847
31/12/2009	820	1319.5	3280.158	1421.979	469.5	511.5	2083	1084	828.571	2016.5
29/01/2010	800	1216.5	3182.418	1583.304	432.9	500	1963	1055	777.821	2070.5
29/02/2010	742	1214	3180.179	1795.98	394.1	459	1875	1084	592.443	2235.5
31/03/2010	814	1265.5	3535.259	1815.389	465.5	525.5	2164	1106	970.464	2271.5
30/04/2010	833	1211	3326.096	1876.967	476.3	514.5	2295	1115	1042.964	2054
31/05/2010	801	1157	3171.666	1881.528	408	481.6	2079	1055	986.518	2042.5
30/06/2010	763.5	1143	3061.22	1526.888	350	499	2009	1060	1044	2136.5
30/07/2010	810	1111	3054.378	1639.78	353.1	552	2150	1107	1337.107	2194
31/08/2010	819	1221	3189.259	1453.65	363.3	524	1980	1059	1322.714	2216
30/09/2010	876	1254.5	3481.851	1823.577	395.4	538	2216	1096	1534.569	2374.5
29/10/2010	841.5	1221	3412.107	1886.352	341	535	2285	1152	1488.357	2380
30/11/2010	807.5	1212	3323.163	1956.789	338.6	509	2010	1144	1505.929	2330.5
31/12/2010	890	1240	3445.339	2333.095	416.8	541.5	1975	1185	1673.714	2463.5
31/01/2011	884.5	1128.5	3318.276	2482.477	408.6	525.2	1977	1202	1543.214	2305
28/02/2011	1035	1181	3098.361	2441.425	470.4	549.5	1976	1202	1640.571	2462
31/03/2011	1041	1189.5	3129.638	2393.532	445	540	1980	1185	1737.929	2502
29/04/2011	1050	1305.5	3301.261	2621.114	483.1	539	2275	1218	1846.929	2611
31/05/2011	1129	1320	3359.337	2346.779	477.2	551	2270	1204	2014.536	2722
30/06/2011	1288	1334	3362.258	2317.13	566	566	2325	1273	1954.393	2731
29/07/2011	1233	1364	3378.875	2069.681	461.8	554	2375	1245	1974.072	2820.5
31/08/2011	1183	1310.5	3200.988	1826.793	454.3	503	2360	1240	1870.5	2743.5
30/09/2011	1190	1333	3199.033	1832.494	455.5	494.4	2532	1232	1708.929	2728.5

Figure 4.10: Monthly Last Price Data 1

31/10/2011	1251	1400	3125.728	2050.295	497.7	534.5	2556	1289	1819.75	2864.5
30/11/2011	1278	1403.5	3146.254	2167.148	493.2	528	2681	1362	1887.072	2945
30/12/2011	1276	1471.5	3108.135	2431.162	470	519	2737	1406.5	1868.429	3055.5
31/01/2012	1267	1410	3299.706	2505.283	526.5	525	2619	1402	2004.107	2917
29/02/2012	1388	1387	3401.355	2777.819	675.5	590.5	2771	1503.5	2230.929	3177
30/03/2012	1320	1396.5	3453.158	2718.523	640	555	2983	1502.5	2181.214	3150.5
30/04/2012	1281	1425	3567.07	2671.77	628.5	510	2924	1531	2311.714	3159
31/05/2012	1248	1438	3366.159	2517.827	568	478	3059	1547	2313.7	3056.5
29/06/2012	1409	1447	3288.954	2710.541	609	511.5	3199	1642	2343.822	3241.5
31/07/2012	1368	1468.5	3427.745	2626.157	615.5	538	3219	1707	2433.929	3397.5
31/08/2012	1444	1425	3479.548	2889.693	698	590.5	3575	1725	2440.143	3301.5
28/09/2012	1406	1427.5	3484.433	3012.725	758.5	592	3450	1739.5	2511.607	3179.5
31/10/2012	1522	1386.5	3665.254	3089.127	795	606	3566	1771	2279.607	3069.5
30/11/2012	1642	1345.5	3836.299	3303.537	841	642.5	1815	1817	2460.036	3274
31/12/2012	1277	1359	3366.159	3165.148	800	642	2709	1787	2460.7	3212
31/01/2013	1455.5	4107.039	3212.233	842.5	687	4058	1877	2510.572	3283	
28/02/2013	1905	1456	4328.909	3388.532	913.5	709	4199	1980	2684.572	3434.5
29/03/2013	2041	1538.5	4611.378	3569.995	1069	781	4366	2075	2840.964	3527
30/04/2013	2085	1660.5	4589.875	3471.828	1080	752	4359	1964	2566.5	3566
31/05/2013	2117	1713.5	4615.288	3684.522	1220	740.5	4619	1951	2550.964	3623
28/06/2013	2131	1648	4542.956	3308.217	1181	747	4558	1880	2565.464	3367.5
31/07/2013	2295	1680	4572.259	3435.471	1335	849	4964	2054	2580.7	3506
30/08/2013	2119	1645.5	4285.993	3655.015	1099	794.5	4894	1974	2691.822	3355
30/09/2013	2072	1557.5	4417.853	3487.098	1086	833	5160	1965	2749.822	3276.5
31/10/2013	2340	1643.5	4738.44	3665.98	1265	874	5445	1987	2523	3436
29/11/2013	2355	1618.5	4798.062	3596.172	1160	884	5495	1946	2407	3261
31/12/2013	2656	1611.5	4684.683	3615.278	1239	899	5450	2000	2544.75	3238
31/01/2014	2587	1564	4459.881	3464.333	1313	887	6250	1800.5	2498.143	2916
29/02/2014	2741	1671.5	4597.949	3686.411	1446	915.5	6735	1978.5	2613.5	3260
31/03/2014	2620	1593.5	4776.559	3605.911	1346	916	6600	1604	2636.929	3335.5
30/04/2014	2294	1632	4667.09	3611.056	1312	872	6520	1817.5	2668	3417
30/05/2014	2255	1601	4984.745	3509.722	1338	951	6640	1919	2727.036	3600.5
30/06/2014	2418	1564	4984.745	3380.945	1273	940	6475	1866	2279.607	3478
31/07/2014	2451	1436.5	5126.468	3268	1253	954.5	6770	1786	2176.036	3483
29/08/2014	2398	1474.5	5131.355	3417.889	1324	982.5	7095	1775.5	2259.929	3535.5
30/09/2014	2250	1413	5229.095	3641.111	1334	988	6605	1785	2146.322	3488
31/10/2014	2380	1417.5	5131.355	3501.478	1463	1027	6445	1838	2370.44	3547
28/11/2014	2567	1485	5136.242	3789.445	1533	1113	6775	1981	2541.643	3794.5
31/12/2014	2480	1376	5210	3890.778	1578	1100	6820	1848.5	2757.072	3500

Figure 4.11: Monthly Last Price Data 2

Dates	BATS LN Equity PX_LAST	GSK LN Equity PX_LAST	RB/LN Equity PX_LAST	FERG LN Equity PX_LAST	PSN LN Equity PX_LAST	REL LN Equity PX_LAST	NXT LN Equity PX_LAST	DGF LN Equity PX_LAST	CRDA LN Equity PX_LAST	BKG LN Equity PX_LAST
30/01/2015	2423	1467	5630	4076.556	1592	1156	7235	1970	2751.893	3752
27/02/2015	2617	1541.5	5860	4191.611	1764	1118	7495	1935.5	2826.464	3782
31/03/2015	2639	1546	5800	4214.833	1653	1159	7025	1855.5	2885.822	3485.5
30/04/2015	2519	1514.5	5825	4081.111	1700	1082	7550	1811.5	2915.5	3592.5
29/05/2015	3094	1453.5	5905	4265.5	1962	1085	7520	1815.5	3029.464	3605.5
30/06/2015	3346	1322.5	5488	4288.722	1975	1035	7450	1841	2850.286	3415
31/07/2015	3369	1396	6149	4492.445	2047	1118	7995	1789.5	3148.572	3801
31/08/2015	3372	1340.5	5757	4440.722	2103	1045	7945	1730	2995.286	3479
30/09/2015	3340	1266	5987	4072.333	2008	1132	7610	1770.5	2805.75	3643
30/10/2015	3318	1405	6344	4029.056	1994	1162	8000	1878.5	3001.5	3859.5
30/11/2015	3211	1553.5	6230	4004.111	1915	1198	7920	1710	2970.429	3880
31/12/2015	3688	1373	6381	3806.056	2037	1197	7290	1856.5	3150.643	3771
29/01/2016	3535	1439	6234	3655.389	2036	1230	6925	1884.5	2951.857	3897
29/02/2016	3249	1399.5	6560	3911.889	2184	1242	6765	1859	3078.143	3925.5
31/03/2016	3218	1412	6730	4157.833	2085	1294	5400	1881.5	3147.536	4090
29/04/2016	2995	1459	6654	4033.728	1987	1210	5085	1846	3118.536	4170
31/05/2016	3275	1445	6875	4276.056	2102	1250	5440	1870.5	2940	4198
30/06/2016	3223	1641.5	7490	4059.055	1447	1376	9570	1865.5	3129	4859
29/07/2016	2683	1688	7332	4442.833	1687	1435	5025	2161	3325	4824.5
31/08/2016	2672	1639	7354	4623.333	1824	1445	5525	2108.5	3310	4725
30/09/2016	2580	1643	7265	4596.945	1815	1463	4776	2210.5	3484	4930
31/10/2016	2359	1618.5	7313	4487.167	1694	1461	4816	2179.5	3498	4691.5
30/11/2016	2477	1495.5	6763	4903.056	1700	1375	4901	2005	3262	4393.5
30/12/2016	2808	1562	6886	5237.667	1776	1449	4983	2110	3196	4621.5
31/01/2017	2890	1529	6804	5371.111	1929	1423	5880	2203.5	3348	4899.5
28/02/2017	2944	1648	7311	5168.056	2064	1505	3827	2268	3508	5080
31/03/2017	3207	1658.5	7286	5298.889	2094	1564	4320	2283.5	3564	5300
28/04/2017	3258	1550	7111	5176.445	2330	1566	4305	2246.5	3764	5215
31/05/2017	3256	1703.5	7938	5393.889	2455	1663	4360	2327	3963	5530
30/06/2017	3227	1635.5	7784	4974.833	2242	1660	3856	2268.5	3885	5234
31/07/2017	3496	1514.5	7369	4778.5	2504	1652	3950	2448.5	3701	4713.5
31/08/2017	3741	1533.5	7332	4852.72	2559	1691	4129	2539	3842	4831
29/09/2017	3717	1408.5	6013	5168	2582	1637	5260	2453	3793	4672
31/10/2017	3741	1357.5	6735	5557.5	2802	1733	4921	2572	4184	4871
30/11/2017	3816	1279.5	6486	5626.111	2540	1728	4477	2568.5	4273	4689
29/12/2017	4197	1322.5	6919	5626.111	2738	1739	4525	2725	4424	5018

Figure 4.12: Monthly Last Price Data 3

31/01/2018	3966	1320.4	6803	5738	2500	1558	5092	2659.5	4884	4819
28/02/2018	3854	1307.2	5775	5431.889	2801	1489	4856	2480	4822	4253.5
30/03/2018	3799	1394	6034	5651.445	2530	1465	4759	2412	4568	4131
30/04/2018	4072	1461.4	5702	5890	2715	1554.5	5256	2589	4461	3899
31/05/2018	4246	1524	5761	6166.556	2832	1652.5	5800	2762.5	4662	3869
29/06/2018	3785	1529.8	6239	5333	2533	1622.5	6050	2722	4802	3830
31/07/2018	3733	1581.6	6797	6010	2482	1662.5	5936	2802	5140	4201
31/08/2018	3643	1560.4	6559	6181	2433	1710	5506	2694.5	5100	3721.5
30/09/2018	3679	1538.8	7035	6515	2365	1616	5646	2779	5202	3584.5
31/10/2018	3501	1511.2	6333	5283	2324	1550	5204	2708.5	4820	3930.5
30/11/2018	3226	1621.6	6512	5020	1900	1632.5	4901	2823.5	4876	2750
31/12/2018	3479	1491.2	6013	5017	1930	1616.5	3991	2795	4685	2500
31/01/2019	3753	1477.2	5863	5094	2375	1688.5	4847	2901.5	4821	2687

Figure 4.13: Monthly Last Price Data 4