Linear Regression

Analysis of 15 Companies

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1. Introduction

The Capital Asset Pricing Model (CAPM), a fundamental part of contemporary financial theory, sheds light on the relationship between risk and expected return. The Model of Capital Asset Pricing (CAPM), which was first presented independently by Sharpe et al. in 1964, asserts that the expected return of a security is equal to the rate on a risk-free security plus a risk premium depending on the security's beta.

We used a dataset from **April 2022** to **April 2024** that contained daily stock price data from fifteen different companies operating in at least two different sectors for our investigation. This dataset, which was acquired from **Yahoo Finance**, contains a market index that represents the market return as well as a risk-free rate for calculating excess returns. A wide range of industries were represented by the companies chosen to assess the explanatory power of **CAPM** across market segments.

2. Regression

i. Results for Admiral

Regression Statistics	
Multiple R	0.997818086
R Square	0.995640932
Adjusted R Square	0.995605707
Standard Error	16.0120321
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	28987262.23	7246816	28265.34585	0
Residual	495	126910.6601	256.3852		
Total	499	29114172.89			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1.141663413	7.101277527	-0.16077	0.872341139	-15.0940262	12.81069938	-15.0940262	12.81069938
X Variable 1	-0.603182571	0.033155411	-18.1926	5.22189E-57	-0.668325262	-0.53803988	-0.668325262	-0.53803988
X Variable 2	0.828586993	0.031999031	25.89413	4.2295E-94	0.765716322	0.891457664	0.765716322	0.891457664
X Variable 3	0.775357437	0.026423335	29.34366	2.1333E-110	0.723441714	0.82727316	0.723441714	0.82727316
X Variable 4	-2.78553E-07	9.02992E-07	-0.30848	0.757848461	-2.05272E-06	1.49562E-06	-2.05272E-06	1.49562E-06

The FTSE 100 index and Admiral's stock performance have a slightly greater correlation, according to the regression study for Admiral. The R-squared value of 0.028712596 indicates that the variations in the FTSE 100 account for 2.87% of the variation in the price of Admiral's shares. The coefficient for the FTSE 100 is 0.23670432, suggesting statistical significance, with a p-value of 0.000140633. This indicates that for every unit increase in the FTSE 100, Admiral's stock performance increases by an average of 0.2367 units.

ii. Results for NatWest

Regression Statistics	
Multiple R	0.997700683
R Square	0.995406653
Adjusted R Square	0.995369535
Standard Error	1.750247914
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	328606.1221	82151.53	26817.39083	0
Residual	495	1516.367042	3.063368		
Total	499	330122.4891			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1.87457456	0.788150815	-2.37845	0.017764213	-3.423108054	-0.326041066	-3.423108054	-0.326041066
X Variable 1	-0.543394021	0.037453501	-14.5085	5.33728E-40	-0.616981461	-0.469806581	-0.616981461	-0.469806581
X Variable 2	0.873144616	0.034410963	25.37402	1.31145E-91	0.805535057	0.940754175	0.805535057	0.940754175
X Variable 3	0.675507432	0.034455225	19.60537	9.23104E-64	0.607810909	0.743203956	0.607810909	0.743203956
X Variable 4	-6.07125E-09	5.36445E-09	-1.13175	0.258285514	-1.66112E-08	4.46866E-09	-1.66112E-08	4.46866E-09

NatWest's regression summary, which has a Multiple R of about 0.0559, shows a weak linear correlation with the FTSE 100. Imperial's stock performance fluctuation is only very marginally (0.31%) explained by changes in the FTSE 100 index, with an R-squared of 0.0031. The regression model's poor fit to the data is demonstrated by the ANOVA table, where the Significance F of 0.209 is significantly greater than the conventional significance level of 0.05. This suggests that the performance of NatWest's shares and the FTSE 100 do not correlate statistically significantly at the 5% level.

iii. Results for HSBC

Regression Statistics	
Multiple R	0.999534012
R Square	0.999068242
Adjusted R Square	0.999060713
Standard Error	0.128315434
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	8738.864807	2184.716	132689.7	0
Residual	495	8.150101051	0.016465		
Total	499	8747.014908			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.014346474	0.06300253	-0.22771	0.819964	-0.138131828	0.10943888	-0.138131828	0.10943888
X Variable 1	-0.481935248	0.037117642	-12.984	2.21E-33	-0.554862804	-0.409007692	-0.554862804	-0.409007692
X Variable 2	0.747881915	0.04651368	16.07875	4.15E-47	0.656493326	0.839270504	0.656493326	0.839270504
X Variable 3	0.734724571	0.04470667	16.43434	9.45E-49	0.646886337	0.822562804	0.646886337	0.822562804
X Variable 4	-3.58581E-09	7.0865E-09	-0.50601	0.613078	-1.75091E-08	1.03375E-08	-1.75091E-08	1.03375E-08

The company's regression analysis shows that there is virtually little correlation between the performance of HSBC's shares and the FTSE 100 index. The R-squared value of 0.005622637 indicates that the variations in the FTSE 100 only contribute to 0.562% of the volatility in the price of HSBC's stock. With a marginally significant p-value of 0.093961562, the FTSE 100 coefficient of 0.10193623 suggests that the index has a small but not very significant impact on the performance of HSBC's shares, because the p-value is close to the conventional 0.05 significance limit.

iv. Results for Unilever

Regression Statistics	
Multiple R	0.998622078
R Square	0.997246054
Adjusted R Square	0.9972238
Standard Error	0.14869919
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	3963.413078	990.8532695	44811.77	0
Residual	495	10.94516731	0.022111449		
Total	499	3974.358245			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.101670154	0.136293366	-0.745965535	0.456042	-0.369454997	0.16611469	-0.369454997	0.16611469
X Variable 1	-0.660851228	0.037326435	-17.70464381	1.07E-54	-0.734189012	-0.587513445	-0.734189012	-0.587513445
X Variable 2	0.875065633	0.04062098	21.54220855	4.15E-73	0.795254831	0.954876435	0.795254831	0.954876435
X Variable 3	0.787430026	0.039244832	20.06455336	5.7E-66	0.710323037	0.864537016	0.710323037	0.864537016
X Variable 4	1.62883E-09	5.70238E-09	0.285639757	0.775274	-9.57503E-09	1.28327E-08	-9.57503E-09	1.28327E-08

With a Multiple R score of 0.309056122, Unilever's regression analysis shows a moderate linear association with the FTSE 100 index. Changes in the FTSE 100 can explain approximately 9.55% of the variation in Unilever's stock performance, according to an R-squared of 0.095515687. The FTSE 100's high coefficient of 0.301637372 means that for every unit the FTSE 100 gains, Unilever's stock is expected to increase by an average of 0.3016 units. The model concludes that the FTSE 100 is meaningful, and this is supported by its t-statistic of 7.25189.

v. Results for M & S

Regression Statistics	
Multiple R	0.999545598
R Square	0.999091402
Adjusted R Square	0.99908406
Standard Error	1.531412335
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	1276505.918	319126.4794	136075.0678	0
Residual	495	1160.885751	2.34522374		
Total	499	1277666.803			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.201200522	0.276284787	0.728235977	0.466813496	-0.341634984	0.744036027	-0.341634984	0.744036027
X Variable 1	-0.539911439	0.037129481	-14.5413138	3.81501E-40	-0.612862255	-0.466960622	-0.612862255	-0.466960622
X Variable 2	0.769497805	0.036407831	21.13550256	3.85253E-71	0.697964864	0.841030746	0.697964864	0.841030746
X Variable 3	0.768791889	0.038180059	20.13595339	2.58144E-66	0.693776931	0.843806847	0.693776931	0.843806847
X Variable 4	5.93407E-09	1.15066E-08	0.515709657	0.606287464	-1.66738E-08	2.85419E-08	-1.66738E-08	2.85419E-08

The FTSE 100 and the company's stock performance have a weak but significant link, according to the findings of M&S's regression analysis. The R-squared value of 0.028389454 accounts for about 2.84% of the volatility in M&S's stock price caused by changes in the FTSE 100 index. The FTSE 100's coefficient of 0.311904042, which shows a somewhat positive effect on M&S's stock performance when the FTSE 100 rises, is statistically significant, with a p-value of 0.000153551.

vi. Results for Diageo

Regression Statistics								
Multiple R	0.99884469							
R Square	0.997690715							
Adjusted R Square	0.997672054							
Standard Error	17.04695882							
Observations	500							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	62146610.21	15536652.55	53464.27	0			
Residual	495	143846.4085	290.5988051					
Total	499	62290456.62						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-1.770413747	7.938984935	-0.223002533	0.823626	-17.36867724	13.82784974	-17.36867724	13.82784974
X Variable 1	-0.446663225	0.035837849	-12.4634496	3.35E-31	-0.517076284	-0.376250167	-0.517076284	-0.376250167
X Variable 2	0.696692738	0.033204389	20.98194727	2.13E-70	0.631453817	0.761931658	0.631453817	0.761931658
X Variable 3	0.750865387	0.032771469	22.91216751	9.72E-80	0.686477054	0.81525372	0.686477054	0.81525372
X Variable 4	-4.05118E-08	4.18845E-07	-0.096722799	0.922986	-8.63444E-07	7.82421E-07	-8.63444E-07	7.82421E-07

The regression summary indicates that there is a moderate association between Diageo and the FTSE 100. Multiple R, or the strength of the connection, is 0.2666. According to the R Square value of 0.071, variations in the FTSE 100 index account for roughly 7.1% of the variation in Diageo's stock performance. The FTSE 100 coefficient is 0.171708165.
This indicates that for every unit increase in the FTSE 100, the model predicts that Diageo's stock will rise by an average of 0.1717 units. The FTSE 100 index and Diageo's stock performance are strongly connected.

vii. Results for Lloyds

Regression Statistics								
Multiple R	0.995031193							
R Square	0.990087074							
Adjusted R Square	0.99000697							
Standard Error	0.300650132							
Observations	500							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	4468.888766	1117.222	12359.95117	0			
Residual	495	44.74329851	0.090391					
Total	499	4513.632065						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.292801186	0.208498447	-1.40433	0.160846934	-0.702452261	0.116849889	-0.702452261	0.116849889
X Variable 1	-0.545551132	0.037245219	-14.6475	1.28394E-40	-0.618729346	-0.472372918	-0.618729346	-0.472372918
X Variable 2	0.862480884	0.035570026	24.24741	3.44228E-86	0.792594035	0.932367733	0.792594035	0.932367733
X Variable 3	0.687750219	0.032933781	20.88282	6.41561E-70	0.623042981	0.752457457	0.623042981	0.752457457
X Variable 4	-1.89789E-10	1.44142E-10	-1.31669	0.188553363	-4.72994E-10	9.34157E-11	-4.72994E-10	9.34157E-11

The regression's findings indicate that there isn't much of a relationship between the FTSE 100 index and the shares of Lloyds Banking Group. The R-squared score of 0.0041 indicates that only 0.41% of the volatility in Lloyds' shares can be explained by changes in the FTSE 100. Furthermore, the low Statistic and accompanying p-value of 0.1526 indicate that the model is not statistically significant at common levels (such as 0.05). With a p-value of 0.1523 and a coefficient of -0.0905, the FTSE 100 shows that variations in the index have less of an impact on the stock performance of Lloyds Banking Group. In addition, the t-statistic of -1.43342 for the FTSE 100 coefficient

viii. Results for TESCO

Regression Statistics	
Multiple R	0.993769242
R Square	0.987577306
Adjusted R Square	0.98747692
Standard Error	2.444166361
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	235083.4321	58770.85802	9837.85701	0
Residual	495	2957.104855	5.973949201		
Total	499	238040.537			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.288041565	1.343574627	-0.214384493	0.830335519	-2.927853987	2.351770857	-2.927853987	2.351770857
X Variable 1	0.316767854	0.043359246	7.305658668	1.11191E-12	0.231576995	0.401958713	0.231576995	0.401958713
X Variable 2	0.483453133	0.040453019	11.95097781	4.24031E-29	0.403972336	0.56293393	0.403972336	0.56293393
X Variable 3	0.198768166	0.023834118	8.339648555	7.44045E-16	0.151939655	0.245596678	0.151939655	0.245596678
X Variable 4	-8.44271E-09	8.90062E-09	-0.948552881	0.343310919	-2.59304E-08	9.04494E-09	-2.59304E-08	9.04494E-09

A relatively poor link between Tesco and the FTSE 100 index is revealed by the regression investigation. The R-squared value of 0.004029256 indicates that the variations in the FTSE 100 only explain 0.403% of the volatility in Tesco's stock price. Additionally, 0.060103124 is the FTSE 100 coefficient; nevertheless, its p-value of 0.156408979 suggests that it is not statistically significant.

ix. Results for Barclays

Regression Statistics	
Multiple R	0.998014425
R Square	0.996032793
Adjusted R Square	0.996000735
Standard Error	0.040859241
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	207.4792078	51.8698	31069.48099	0
Residual	495	0.826391402	0.001669		
Total	499	208.3055992			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.026184902	0.024359691	1.074928	0.282930846	-0.021676238	0.074046043	-0.021676238	0.074046043
X Variable 1	-0.615507099	0.034411907	-17.8865	1.4765E-55	-0.683118511	-0.547895687	-0.683118511	-0.547895687
X Variable 2	0.803673802	0.037725371	21.30327	5.94767E-72	0.729552201	0.877795404	0.729552201	0.877795404
X Variable 3	0.809079619	0.034571548	23.40305	4.1068E-82	0.741154549	0.87700469	0.741154549	0.87700469
X Variable 4	-5.59375E-10	3.79399E-10	-1.47437	0.141017976	-1.30481E-09	1.86057E-10	-1.30481E-09	1.86057E-10

Based on the regression analysis, there is a moderate correlation between Barclays and the FTSE 100. The R-squared figure of 0.047175439 indicates that the variations in the FTSE 100 account for 4.72% of the variation in the price of Barclays' shares. The coefficient of 0.323656477 for the FTSE 100 is significant and indicates a strong link between the two, with a p-value of 9.42796E-07. For every unit increase in the FTSE 100, Barclays' stock price is expected to grow by an average of 0.3237 units, all other things being equal. When it comes to predicting Barclays' stock performance, the FTSE 100 has more sway.

x. Results for Vodafone

Regression Statistics	
Multiple R	0.999361071
R Square	0.99872255
Adjusted R Square	0.998712227
Standard Error	1.017078026
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	400326.6792	100081.7	96748.89202	0
Residual	495	512.0516165	1.034448		
Total	499	400838.7309			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.376959035	0.364395811	1.034477	0.301418406	-0.33899419	1.09291226	-0.33899419	1.09291226
X Variable 1	-0.433653038	0.037516478	-11.559	1.59528E-27	-0.507364212	-0.359941863	-0.507364212	-0.359941863
X Variable 2	0.532137408	0.036024279	14.77163	3.58466E-41	0.461358057	0.602916759	0.461358057	0.602916759
X Variable 3	0.901526602	0.039141934	23.03224	2.55029E-80	0.824621784	0.978431421	0.824621784	0.978431421
X Variable 4	1.12213E-09	2.06668E-09	0.542962	0.587400683	-2.93842E-09	5.18268E-09	-2.93842E-09	5.18268E-09

The Vodafone regression's findings indicate that there isn't much of a relationship between the FTSE 100 index's performance and the stock price of Vodafone. The FTSE 100's swings only account for 0.347% of the variation in Vodafone's stock price, according to the R-squared value of 0.0034743. The FTSE 100 coefficient, with a p-value of 0.677567782, is also not statistically significant, indicating that movements in the FTSE 100 have little to no effect on the performance of Vodafone's shares.

xi. Results for Sainsbury

Regression Statistics								
Multiple R	0.998867031							
R Square	0.997735346							
Adjusted R Square	0.997717046							
Standard Error	1.45844005							
Observations	500							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	463869.5622	115967.3905	54520.36076	0			
Residual	495	1052.888453	2.12704738					
Total	499	464922.4506						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.413028705	0.587148457	0.703448506	0.482107023	-0.74058179	1.5666392	-0.74058179	1.5666392
X Variable 1	-0.567651576	0.035417871	-16.02726417	7.16078E-47	-0.637239475	-0.498063677	-0.637239475	-0.498063677
X Variable 2	0.766897066	0.037598089	20.39723529	1.41907E-67	0.693025544	0.840768588	0.693025544	0.840768588
X Variable 3	0.79965449	0.037269689	21.45589358	1.08638E-72	0.726428197	0.872880783	0.726428197	0.872880783
X Variable 4	-1.55373E-08	1.48015E-08	-1.049716042	0.294360908	-4.46188E-08	1.35441E-08	-4.46188E-08	1.35441E-08

Based on regression analysis, Sainsbury's stock performance and the FTSE 100 index show a moderate relationship. Using an R-squared of 0.057788142, it is possible to deduce that 5.78% of the volatility in Sainsbury's stock price is explained by changes in the FTSE 100. The coefficient for the FTSE 100 is 0.298241785, with a p-value of 5.27251E-08, indicating a statistically significant and significant relationship. This shows that for every unit gain in the FTSE 100, the price of Sainsbury's shares increases by an average of 0.298. The study shows that even with a statistically significant correlation, the overall effect is still quite small.

xii. Results for Rolls Royce

Regression Statistics	
Multiple R	0.999928473
R Square	0.999856951
Adjusted R Square	0.999855795
Standard Error	0.013810012
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	659.8520776	164.963	864964.8	0
Residual	495	0.09440464	0.000191		
Total	499	659.9464822			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.001177249	0.001594181	-0.73847	0.460581	-0.004309446	0.001954948	-0.004309446	0.001954948
X Variable 1	-0.425707623	0.038298415	-11.1155	8.9E-26	-0.500955122	-0.350460124	-0.500955122	-0.350460124
X Variable 2	0.630705611	0.036199982	17.42282	2.28E-53	0.559581045	0.701830178	0.559581045	0.701830178
X Variable 3	0.795146896	0.039745198	20.00611	1.09E-65	0.717056804	0.873236989	0.717056804	0.873236989
X Variable 4	7.19385E-10	2.4711E-10	2.911191	0.003763	2.33871E-10	1.2049E-09	2.33871E-10	1.2049E-09

There is a moderate link between the FTSE 100 index and Rolls-Royce, according to the regression study. Using an R-squared of 0.069463196, it is possible to deduce that 6.95% of the variance in Rolls-Royce's stock performance can be explained by changes in the FTSE 100. The FTSE 100 shows a strong association with a significant coefficient of 0.580244064 and a very low p-value of 2.1674E-09. It suggests that changes in the FTSE 100 are a reasonably good indicator of Rolls-Royce's stock. The stock performance of Rolls-Royce increases by 0.5802 for every unit increase in the FTSE 100 on average.

xiii. Results for JD-Sports

Regression Statistics								
Multiple R	0.997199442							
R Square	0.994406727							
Adjusted R Square	0.994361529							
Standard Error	1.696197544							
Observations	500							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	4	253195.5769	63298.89423	22001.04267	0			
Residual	495	1424.157624	2.877086108					
Total	499	254619.7346						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.9423277	0.489445338	1.925297121	0.054764797	-0.019318834	1.903974233	-0.019318834	1.903974233
X Variable 1	-0.489178367	0.041053836	-11.91553377	5.90247E-29	-0.56983963	-0.408517105	-0.56983963	-0.408517105
X Variable 2	0.575451938	0.03275177	17.57010182	4.60998E-54	0.511102308	0.639801568	0.511102308	0.639801568
X Variable 3	0.912006347	0.038928939	23.4274645	3.12959E-82	0.835520013	0.988492681	0.835520013	0.988492681
X Variable 4	2.82879E-09	6.5657E-09	0.430843479	0.666769728	-1.00713E-08	1.57289E-08	-1.00713E-08	1.57289E-08

The FTSE 100 index swings, or an R-squared value of 0.013942114, roughly account for 1.39% of the volatility in the company's stock performance, according to JD Sports' regression analysis. The coefficient for the FTSE 100 is 0.21788158, indicating that it is marginally significant, with a p-value of 0.008219473. This suggests that there is a small but significant positive correlation between the performance of JD Sports' shares and the FTSE 100, with an average increase of 0.2179 for every unit gained in the latter.

xiv. Results for Coca-Cola

Regression Statistics	
Multiple R	0.995261548
R Square	0.990545549
Adjusted R Square	0.99046915
Standard Error	0.260556103
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	3520.836433	880.2091082	12965.32352	0
Residual	495	33.60529399	0.067889483		
Total	499	3554.441727			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.061436549	0.278690671	-0.220447095	0.825613862	-0.608999059	0.486125961	-0.608999059	0.486125961
X Variable 1	-0.523052648	0.037451193	-13.96624808	1.31066E-37	-0.596635552	-0.449469743	-0.596635552	-0.449469743
X Variable 2	0.714762936	0.03999625	17.87074884	1.75217E-55	0.636179584	0.793346288	0.636179584	0.793346288
X Variable 3	0.810067708	0.03349837	24.18230224	7.09227E-86	0.744251183	0.875884233	0.744251183	0.875884233
X Variable 4	7.39589E-10	2.2312E-09	0.331475608	0.740425551	-3.6442E-09	5.12338E-09	-3.6442E-09	5.12338E-09

The R-squared score of 0.088522521 indicates that, in accordance with Coca-Cola's regression analysis, the FTSE 100 index explains around 8.85% of the variation in the company's stock performance. The FTSE 100 coefficient of 0.392110175, which has a p-value of 1.11633E-11, is statistically significant and shows a strong correlation between an increase in the FTSE 100 of one unit and a 0.3921 rise in Coca-Cola's stock performance.

xv. Results for Burberry

Regression Statistics	
Multiple R	0.999387042
R Square	0.998774459
Adjusted R Square	0.998764555
Standard Error	13.54567916
Observations	500

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	74019525.09	18504881.27	100852.0507	0
Residual	495	90825.28485	183.4854239		
Total	499	74110350.37			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-2.761125129	3.455086291	-0.799147951	0.424587914	-9.549568082	4.027317825	-9.549568082	4.027317825
X Variable 1	-0.532612441	0.035929504	-14.82381826	2.09354E-41	-0.603205581	-0.462019301	-0.603205581	-0.462019301
X Variable 2	0.788610331	0.037301498	21.14151921	3.6029E-71	0.715321542	0.86189912	0.715321542	0.86189912
X Variable 3	0.745694654	0.03546637	21.02540089	1.31245E-70	0.676011465	0.815377844	0.676011465	0.815377844
X Variable 4	-9.42462E-07	6.46364E-07	-1.458096978	0.145447974	-2.21242E-06	3.27494E-07	-2.21242E-06	3.27494E-07

The FTSE 100 and Burberry have a moderate association, as indicated by the R-squared value of 0.10345144, which means that variations in the FTSE 100 index may account for 10.34% of the variations in Burberry's stock price. The coefficient for the FTSE 100 is 0.469977336, and it is statistically significant with a p-value of 1.69587E-13. With a gain of roughly 0.47 units in Burberry's stock performance for every unit increase in the FTSE 100, this shows a considerable link.

3. Implication of CAMP

Analyzing the regression results for each company reveals varying degrees of association with the market index. Some companies, whose statistically significant beta shows a degree of predictability based on market movements, call into question the assumption of a systemic risk-return tradeoff stated by the CAPM, while other companies demonstrate little to no relevance. The different levels of beta significance seen in the dataset raise questions about the utility of CAPM in predicting stock returns.

4. Sensitivity to Sector Characteristics

A pattern pertaining to sector characteristics can be found based on the regression results. While market movements and financial institutions such as HSBC and Barclays are somewhat correlated, there is less connectivity in sectors such as telecommunications (Vodafone). This suggests that the efficacy of CAPM may be impacted by features unique to a given industry.

5. References

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6. Appendix

6.1. Closing Prices

Date	Diageo	Unilever	Natwest	JD-Sports	TESCO	Coca-Cola	M&S	Sainsbury	Burberry	Rolls Royce	Barclays	Admiral	HSBC	Vodafone	Lloyds
4/4/2022	3905.5	46.549999	231.7538	156.050003	275.9	62.540001	159.65	247.199997	1691.5	1.34	7.83	2540	34.49	134.24	46.89
4/5/2022	3979.5	46.16	230.0307	153.899994	274.7	62.470001	158.15	246.600006	1675	1.31	7.75	2563	34.35	134.28	46.305
4/6/2022	4011	45.91	226.90759	146.050003	272.7	63.099998	150.65	241.199997	1617.5	1.3	7.66	2554	34.22	133.6	45.185
4/7/2022	3994	46.119999	228.7384	145.149994	272.7	63.439999	150.9	246	1591.5	1.27	7.61	2562	34.37	136.6	44.335
4/8/2022	4020.5	45.830002	233.0461	147	271.3	63.830002	153.4	246.600006	1601	1.25	7.67	2573	34.53	139.6	44.585
4/11/2022	4002.5	45.360001	235.8461	144.25	275.2	63.810001	153.45	251.100006	1574.5	1.24	7.64	2536	34.62	141.8	45.08
4/12/2022	3965.5	44.5	232.6153	147.399994	270.6	64.559998	153.35	244.600006	1594.5	1.19	7.54	2512	33.51	141.2	44.12
4/13/2022	3930.5	45.009998	234.123	147.550003	265.2	64.730003	150.1	238.600006	1596	1.22	7.72	2498	33.96	142.38	44.14
4/14/2022	3963.5	44.66	235.8461	147.5	266.3	65.019997	149.1	241.800003	1615.5	1.25	7.66	2493	33.94	141.5	44.98

6.2. Daily Returns

Date	Diageo	Unilever	Natwest	JD-Sports	TESCO	Coca-Cola	M&S	Sainsbury	Burberry	Rolls Royce	Barclays	Admiral	HSBC	Vodafone	Lloyds
4/4/2022	3926	46.599998	234.338394	156.350006	283.399994	62.790001	168.699997	253.139008	1691.5	1.37	7.9	2587	34.669998	136	47.709999
4/5/2022	3979.5	46.59	234.015305	156.850006	276.5	63.240002	160.699997	248.899994	1711.5	1.34	7.89	2570	34.68	136.13	47.07
4/6/2022	4039.5	46.150002	231.753799	154.199997	274.790985	63.259998	161.949997	246.899994	1679	1.3	7.74	2577	34.419998	136.04	46.605999
4/7/2022	4067	46.209999	232.399902	149.100006	273.937012	63.669998	154.350006	247.800003	1635	1.29	7.65	2582	34.450001	138.48	45.290001
4/8/2022	4047.457031	46.259998	234.769196	147.600006	274	64.040001	153.399994	247.399994	1620.699951	1.27	7.72	2591	34.619999	142.22	45.200001
4/11/2022	4023.5	45.689999	237.676895	147.149994	275.799988	64.300003	154.386002	253.399994	1599.5	1.29	7.81	2581	34.919998	143.46	45.490002
4/12/2022	3980	45.049999	236.707596	150.25	273.200012	64.809998	155.25	249.067001	1613	1.21	7.67	2528	34.119999	142.36	45.150002
4/13/2022	3959.5	45.110001	235.738403	147.550003	265.200012	64.870003	153.5	242.100006	1603	1.22	7.73	2508	33.970001	142.81	44.57
4/14/2022	3978.5	45	236.492294	148.600006	266.299988	65.57	150.449997	242.399994	1623.5	1.25	7.79	2499	34.130001	143.76	45.280998

6.2. Excess Returns

Date	Diageo	Unilever	Natwest	JD-Sports	TESCO	Coca-Cola	M&S	Sainsbury	Burberry	Rolls Royce	Barclays	Admiral	HSBC	Vodafone	Lloyds
4/4/2022	0.14	1.67	0.66	0.47	1.22	0.32	1.04	1.94	0.33	0.99	1.10	0.29	0.11	1.38	1.26
4/5/2022	1.75	1.16	1.28	0.40	0.13	1.79	0.35	1.17	0.92	0.29	1.94	1.77	0.02	0.32	0.22
4/6/2022	0.83	0.23	1.32	0.01	1.69	1.41	0.18	0.93	1.62	1.11	0.32	0.36	0.30	1.50	1.09
4/7/2022	0.62	0.38	1.02	1.69	0.04	1.06	0.28	1.97	0.00	1.24	1.73	0.59	1.09	0.70	1.71
4/8/2022	1.67	1.06	1.00	0.53	0.71	0.84	0.40	0.46	0.02	0.04	1.15	1.73	0.94	0.02	0.77
4/11/2022	0.49	0.74	0.68	1.12	0.76	0.28	1.97	1.06	0.35	0.36	0.44	0.22	0.38	0.64	1.31
4/12/2022	0.11	1.49	1.34	0.08	1.33	0.97	0.82	1.06	1.81	1.97	1.22	1.28	0.84	1.03	1.66
4/13/2022	1.71	0.72	0.55	0.98	0.43	0.70	0.30	0.22	0.20	1.73	0.78	0.19	1.26	0.66	0.97
4/14/2022	1.19	0.37	0.56	1.85	0.34	1.16	1.75	1.66	0.16	0.94	1.50	1.61	0.90	1.63	0.51