

Project Final Report

Stock Analysis - Berkshire Hathaway A

“BRK-A”



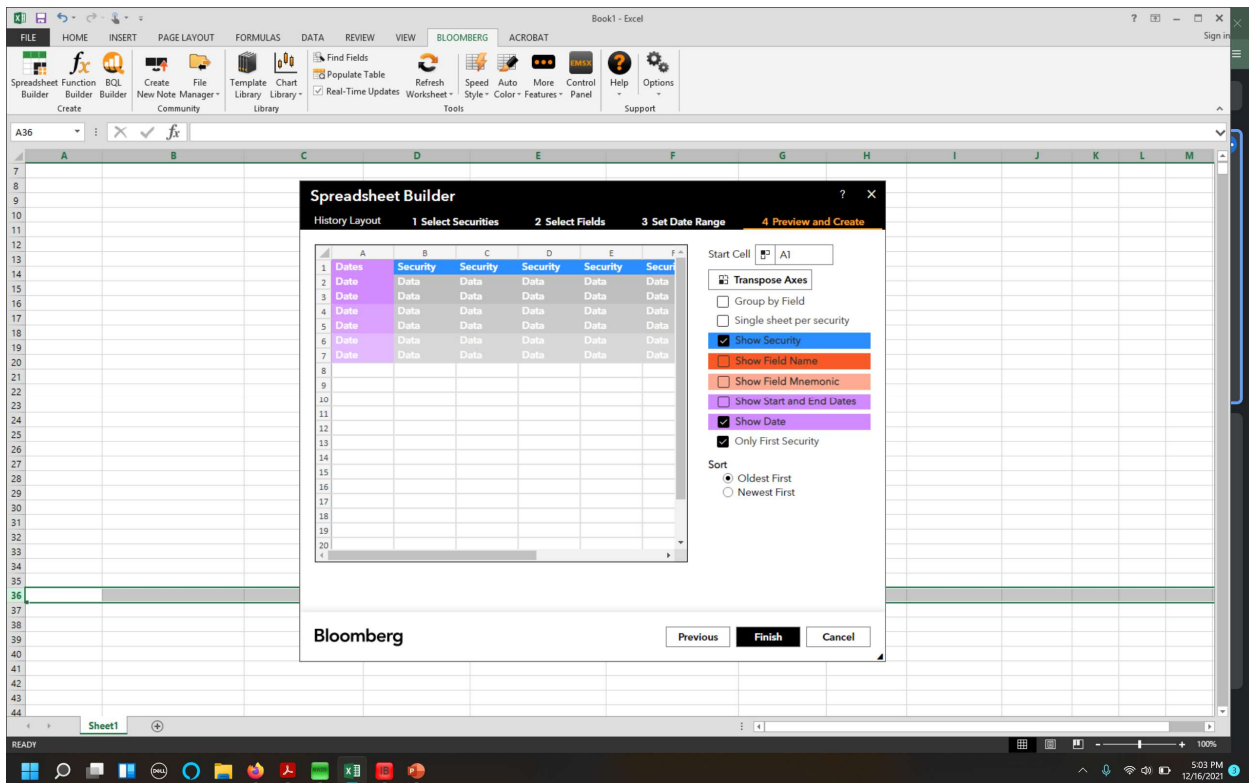
FE511B- Introduction to Bloomberg & Thomson-Reuters

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Fall 2021 Semester

December 16, 2021

For the stock analysis of BRK-A, I have collected data from the Bloomberg terminal.



The screenshot shows the Bloomberg Spreadsheet Builder dialog box in Microsoft Excel. The dialog is titled "Spreadsheet Builder" and is in the "4 Preview and Create" step. It displays a table with the following columns: Dates, Security, Security, Security, Security, Security. The "Start Cell" is set to A1. The "Transpose Axes" checkbox is checked. The "Show Security" checkbox is checked. The "Show Date" checkbox is checked. The "Only First Security" checkbox is checked. The "Sort" options are "Oldest First" (selected) and "Newest First". The "Previous", "Finish", and "Cancel" buttons are visible at the bottom of the dialog.

1	Dates	BRK/A US Equity	KO US Equity	BAC US Equity	MCO US Equity	AAPL US Equity
2	11/7/2014	134217.7279	42.32	17.36	98.95	27.253
3	11/10/2014	134217.7279	42.39	17.37	99.32	27.208
4	11/11/2014	134217.7279	42.51	17.32	99.31	27.425
5	11/12/2014	134217.7279	42.71	17.29	100.08	27.813
6	11/13/2014	134217.7279	42.79	17.22	100.9	28.205
7	11/14/2014	134217.7279	42.73	17.14	100.47	28.545
8	11/17/2014	134217.7279	42.92	17.09	100.55	28.498
9	11/18/2014	134217.7279	43.53	17.14	101.84	28.868
10	11/19/2014	134217.7279	44.22	17.06	100.6	28.668
11	11/20/2014	134217.7279	44.25	17	100.45	29.078
12	11/21/2014	134217.7279	44.5	17.12	100.94	29.118
13	11/24/2014	134217.7279	44.27	17.18	101.55	29.656
14	11/25/2014	134217.7279	44.43	17.1	99.87	29.4
15	11/26/2014	134217.7279	44.29	17.11	100.17	29.75
16	11/27/2014	134217.7279	44.29	17.11	100.17	29.75
17	11/28/2014	134217.7279	44.83	17.04	101.01	29.733
18	12/1/2014	134217.7279	44.55	16.79	99.67	28.768
19	12/2/2014	134217.7279	44.54	17.15	100.53	28.658
20	12/3/2014	134217.7279	43.8	17.29	100.17	28.983
21	12/4/2014	134217.7279	43.5	17.21	98.97	28.873
22	12/5/2014	134217.7279	43.53	17.68	98.59	28.75
23	12/8/2014	134217.7279	43.14	17.66	97.5	28.1
24	12/9/2014	134217.7279	42.04	17.56	96.05	28.53
25	12/10/2014	134217.7279	41.6	17.38	95.5	27.988
26	12/11/2014	134217.7279	41.53	17.47	96.17	27.905
27	12/12/2014	134217.7279	40.91	17.13	93.47	27.433
28	12/15/2014	134217.7279	40.57	16.85	93.79	27.056
29	12/16/2014	134217.7279	40.39	16.72	92.38	26.686
30	12/17/2014	134217.7279	41.55	17.26	96.67	27.353
31	12/18/2014	134217.7279	42.39	17.53	97.75	28.163
32	12/19/2014	134217.7279	41.95	17.62	97.03	27.945
33	12/22/2014	134217.7279	42.35	17.71	98.38	28.235
34	12/23/2014	134217.7279	42.97	17.93	98	28.135
35	12/24/2014	134217.7279	42.94	17.98	98.29	28.003
36	12/25/2014	134217.7279	42.94	17.98	98.29	28.003
37	12/26/2014	134217.7279	42.96	17.98	97.95	28.498
38	12/29/2014	134217.7279	42.86	18.11	97.56	28.478

Berkshire Hathaway is basically a holding company that owns a stake in many companies. Here, I have extracted data from some of its top holdings also, to show linear regression among them.

Holdings- KO, BAC, MCO, AAPL

DES- Extracted consolidated financial information for Berkshire Hathaway through DES



Company Description

Berkshire Hathaway Inc. is a holding company owning subsidiaries in a variety of business sectors. The Company's principal operations are insurance business conducted nationwide on a primary basis and worldwide on a reinsurance basis. Berkshire's other operations include a railway company, a specialty chemical company, and an international association of diversified businesses.

OVERVIEW

Berkshire Hathaway is the holding company where Warren Buffett, one of the world's richest men, makes his money and spreads his risk. The company invests in a variety of industries. The most important of these are insurance businesses conducted on both a primary basis and a reinsurance basis, a freight rail transportation business and a group of utility and energy generation and distribution businesses. Its core insurance subsidiaries include GEICO, National Indemnity, and reinsurance giant General Re. The company's other

large holdings include Marmon Group, McLane Company, MidAmerican Energy, and Shaw Industries.

Operations

Berkshire Hathaway operates as a holding company with a highly decentralized structure without integrated business functions. Practicing a minimal day-to-day management leadership style, the firm owns a diverse group of companies from a variety of industries, with its core subsidiaries being insurance, reinsurance, freight rail transportation, utilities, and energy generation companies.

The insurance businesses constitute about 85% of total revenue and are conducted through numerous domestic and foreign-based insurance entities. Berkshire's insurance businesses provide insurance and reinsurance of property and casualty and life, accident and health risks worldwide. Its most recognizable holding is GEICO (auto insurance). Sales and service revenues make up over 50% of the insurance business revenue, while about 25% comes from insurance premiums. Around 15% of Berkshire Hathaway revenue comes from its railroad, utilities, and energy subsidiaries.

Company Background

Chairman and CEO Warren Buffett, along with associates, slowly accumulated a majority of shares in the Berkshire Hathaway textile company in the early 1960s. To stabilize revenues and reduce financial risks, Buffett diversified the company with a purchase of Indemnity and National Fire & Marine Insurance Company in 1967. Thus began the long, prosperous road towards profitability and dozens of acquisitions. Buffett still owns about 20% of Berkshire Hathaway's shares.

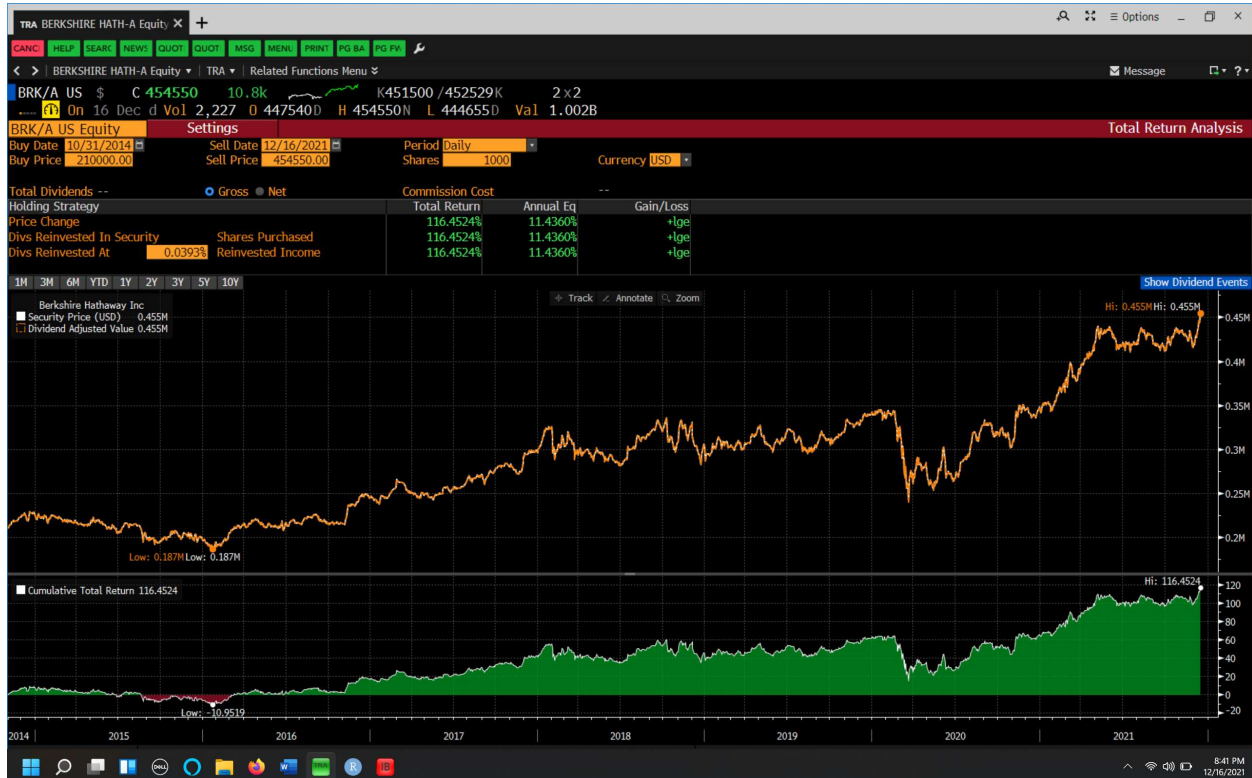
FA - Extracted the Company Fundamentals through FA function.

In Millions of USD	2017 Y	2018 Y	2019 Y	2020 Y	Current/LTM	2021 Y Est	2022 Y Est
Market Capitalization	489,552.0	502,146.0	551,833.8	537,026.4	673,057.4		
Cash & Equivalents	328,871.0	321,847.0	412,214.0	457,173.0	494,720.0		
+ Preferred & Other	3,658.0	3,797.0	3,772.0	8,172.0	8,595.0		
+ Total Debt	102,587.0	97,490.0	109,250.0	122,364.0	114,965.0		
Enterprise Value	266,926.0	281,586.0	252,641.8	210,389.4	301,897.4		
Revenue, Adj	239,933.0	247,837.0	254,616.0	245,510.0	268,677.0	294,667.0	294,894.0
Growth %, YoY	11.5	3.3	2.7	-3.6	9.0	20.0	0.1
Gross Profit, Adj	45,502.0	54,609.0	56,198.0	53,580.0	59,528.0		
Margin %	19.0	22.0	22.1	21.8	22.2		
EBITDA, Adj	32,270.0	45,255.0	44,808.0	40,974.0	44,763.0		
Margin %	13.4	18.3	17.6	16.7	16.7		
Net Income, Adj	14,457.0	24,781.0	24,334.6	21,922.0	25,420.0	26,248.0	28,054.5
Margin %	6.0	10.0	9.6	8.9	9.5	8.9	9.5
EPS, Adj	8,790.51	15,075.48	14,893.12	13,748.78	16,653.78	22,447.40	19,940.65
Growth %, YoY	-17.8	71.5	-1.2	-7.7	25.2	63.3	-11.2
Cash from Operations	45,728.0	37,400.0	38,687.0	39,773.0	42,172.0		
Capital Expenditures	-11,708.0	-14,537.0	-15,979.0	-13,012.0	-12,740.0		
Free Cash Flow	34,020.0	22,863.0	22,708.0	26,761.0	29,432.0		

Through fundamentals, we see that the market capitalization of BRK-A has increased from \$489552M USD in 2017 to \$673057M USD currently. Total debt in 2017 was \$102587M USD and currently, the debt has marginally increased to \$114965M USD. The latest EPS or the earnings per share has been \$16653 USD with a growth of 25.2% YOY. The net income in 2017 was \$14457M USD and currently, it is \$25420M USD. The cash from operations has decreased marginally from \$45728M USD to \$42172M USD, still, BRK-A has a ton of money and more than some countries' GDP. The stock is trading at a P/E ratio of 26.27. Normally its P/E ratio ranges from 19-25, but given the bull market scenario its P/E is 26.27 currently. The Price per Book ratio or P/B ratio is low as the number of investors are less given the high price of the stock. The P/B ratio is 1.38. There are total 1.38M outstanding shares.

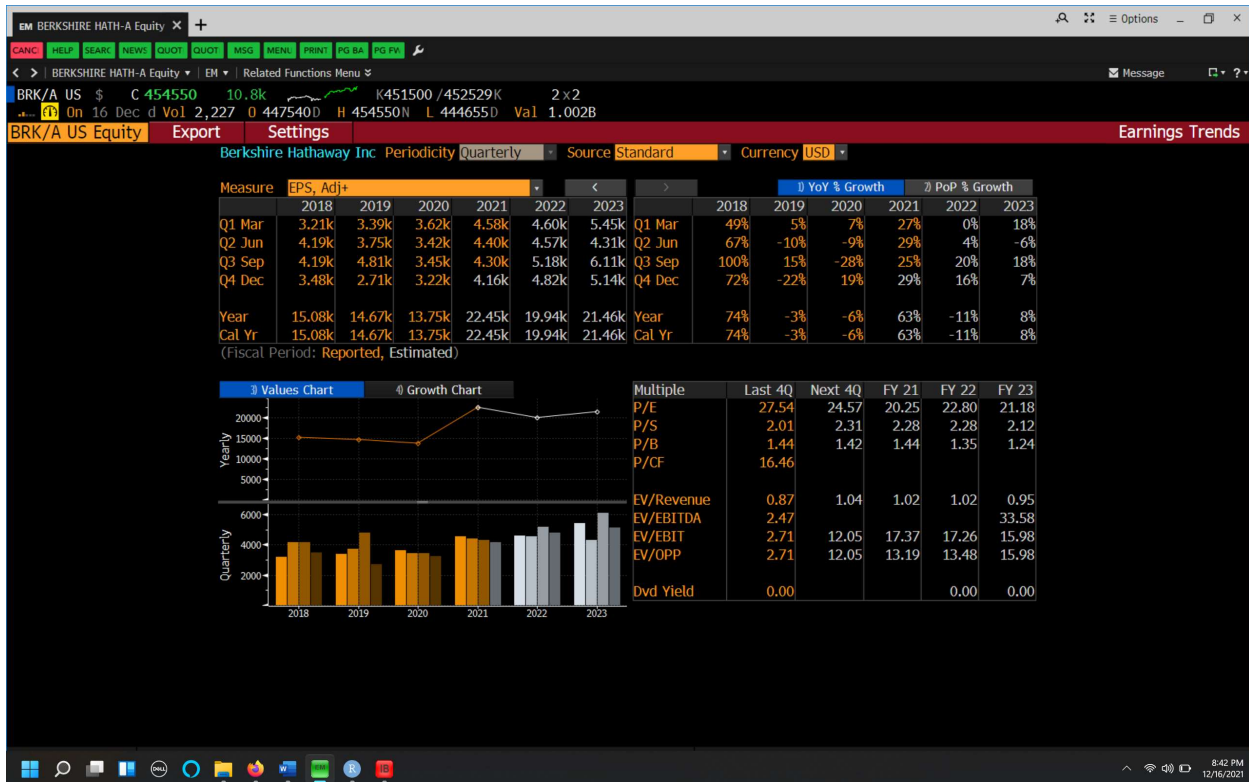
TRA- Total Return Analysis (TRA) function provides a rich set of options for calculating returns between a start date and an end date.

In the last 7 years, the stock has given 116.4524% returns. The company DOES NOT yield ant dividends to its shareholders as they use that money to buy more businesses. The company's annual return is 11.43% which is pretty decent looking at the magnitude of the company. The daily volumes are very low 20-30shares are traded daily and sometimes 2227 shares are traded. Whenever, BRK-A releases quarterly results, we see a spike in the volumes.



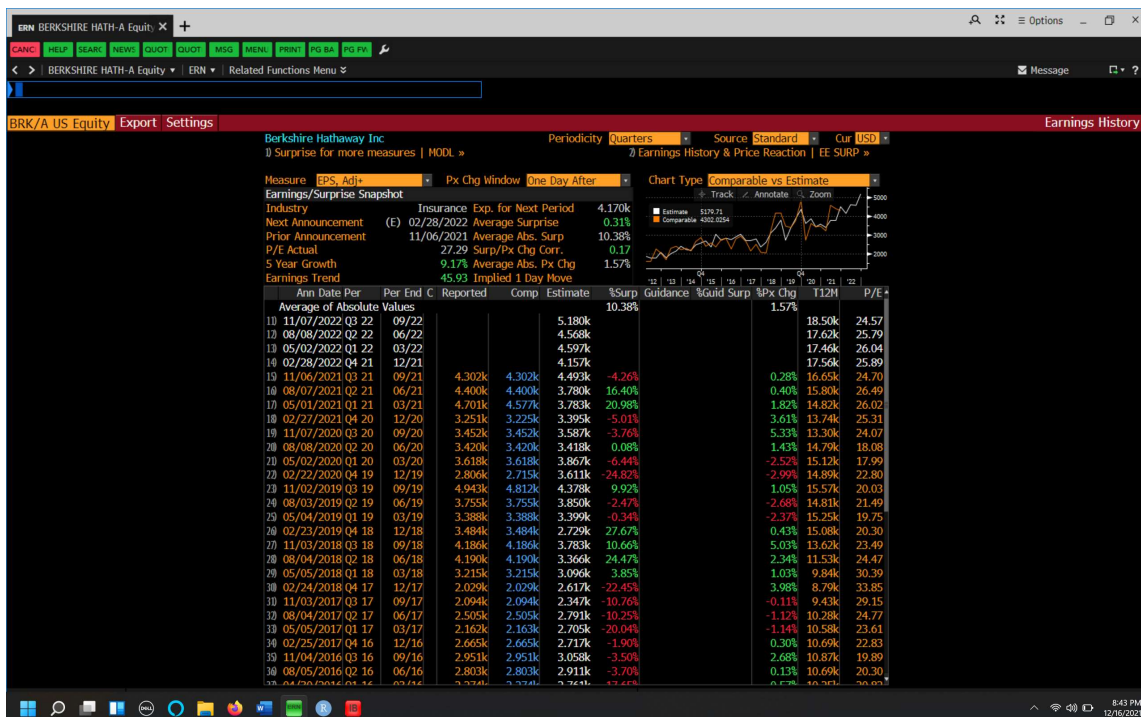
EM

We see that quarterly projected EPS for the Q1 Mar 2022 is 4.60K and for Q1 2023 is 5.45K. For Q2 June 2022 projected EPS is 4.57K and for Q2 Jun 2023 projected EPS is 4.31K. For Q3 Sept 2022 projected EPS is 5.18K and for Q3 Sept 2023 projected EPS is 6.11K. For Q4 Dec 2022 projected EPS is 4.82K and for Q4 Dec 2023 projected EPS is 5.14K.



SURP-Surprise Analysis was used to analyze historical data on earnings surprises and share price changes

Most of the times, we see a positive surprise in BRK-A results. In Q1 2021, we saw a nearly +20% surprise when the company reported 4.701K beating the street estimates of 4.577K



GF – Graph Fundamentals

In this graph, the brown line represents Revenues and the blue line represents Earnings per share over the 5 year time period. We see that at most of the times the earnings per share and revenue go hand in hand and any positive effect in either of them is a positive effect in other. When the revenue dips, the Earnings per share also dips.



Berkshire holds investment stakes in American Express (\$18.3 billion), Apple (\$120.4 billion), Bank of America (\$33.4 billion), Coca-Cola (\$31.3 billion), and Coca-Cola (\$21.9 billion).

Its operating segments have included Insurance (including corporate and other; accounts for about 30% of sales), Manufacturing (about 25%), and McLane Company (nearly 20%). Service and retailing, as well as BNSF, and Berkshire Hathaway Energy each accounts for around 10%. Among its products, grocery and convenience store distribution, and services accounts for the most sales with about 15% and over 10%, respectively.

Financial Performance

The company's revenue decreased 4% from \$254.6 billion in 2019 to \$245.5 billion in 2020.

In 2020, the company had a net income of \$43.3 billion, a 47% decrease from the previous year.

The company's cash at the end of 2020 was \$48.4 billion. Operating activities generated \$39.8 billion, while investing activities used \$37.8 billion, primarily for purchases of US treasury bills and fixed maturity securities. Financing activities used another \$18.3 billion.

DATA ANALYSIS USING R

project511.R

Rishabh Rawat

2021-12-16

```
options(scipen = 999)

library(ggplot2)
library(quantmod)

## Warning: package 'quantmod' was built under R version 4.1.2
## Loading required package: xts
## Loading required package: zoo
##
## Attaching package: 'zoo'
## The following objects are masked from 'package:base':
##
##   as.Date, as.Date.numeric
## Loading required package: TTR
## Registered S3 method overwritten by 'quantmod':
##   method           from
##   as.zoo.data.frame zoo
```

```
library(xts)
library(rvest)
library(tidyverse)

## -- Attaching packages ----- tidyverse
1.3.1 --

## v tibble 3.1.4      v dplyr 1.0.7
## v tidyr  1.1.3      v stringr 1.4.0
## v readr  2.0.1      v forcats 0.5.1
## v purrr  0.3.4

## Warning: package 'dplyr' was built under R version 4.1.2

## -- Conflicts -----
tidyverse_conflicts() --
## x dplyr::filter()      masks stats::filter()
## x dplyr::first()       masks xts::first()
## x readr::guess_encoding() masks rvest::guess_encoding()
## x dplyr::lag()         masks stats::lag()
## x dplyr::last()        masks xts::last()

library(PerformanceAnalytics)

##
## Attaching package: 'PerformanceAnalytics'

## The following object is masked from 'package:graphics':
##
##   legend

library(corrplot)

## corrplot 0.90 loaded

library(GGally)

## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg      ggplot2

library(gridExtra)

##
## Attaching package: 'gridExtra'

## The following object is masked from 'package:dplyr':
##
##   combine

library(factoextra)

## Warning: package 'factoextra' was built under R version 4.1.2
```

```
## Welcome! Want to learn more? See two factoextra-related books at
https://goo.gl/ve3WBa
```

```
library(plotly)
```

```
##
```

```
## Attaching package: 'plotly'
```

```
## The following object is masked from 'package:ggplot2':
```

```
##
```

```
## last_plot
```

```
## The following object is masked from 'package:stats':
```

```
##
```

```
## filter
```

```
## The following object is masked from 'package:graphics':
```

```
##
```

```
## layout
```

```
brk<-read.csv("BRK-A.csv")
```

```
brk<-data.frame(brk)
```

```
head(brk)
```

```
##      Date  Open  High  Low Close Adj.Close Volume
## 1 1/2/2001 71500 74600 71500 72400    72400    1230
## 2 1/3/2001 72400 73000 70000 70000    70000     680
## 3 1/4/2001 69900 70600 68300 69000    69000     650
## 4 1/5/2001 68600 68600 67500 67800    67800     270
## 5 1/8/2001 67600 68600 66200 67700    67700     550
## 6 1/9/2001 67900 69300 66500 66800    66800     390
```

```
#Exploratory Analysis
```

```
#Converting Date into appropriate format
```

```
head(brk$Date)
```

```
## [1] "1/2/2001" "1/3/2001" "1/4/2001" "1/5/2001" "1/8/2001" "1/9/2001"
```

```
strDates <- c(brk$Date)
```

```
brk$Date <- as.Date(strDates, "%m/%d/%Y")
```

```
#Performing Linear regression
```

```
data<- read.csv("Book1.csv")
```

```
head(data)
```

```
##      Dates BRK.A.US.Equity KO.US.Equity BAC.US.Equity MCO.US.Equity
## 1 11/7/2014      134217.7      42.32      17.36      98.95
## 2 11/10/2014      134217.7      42.39      17.37      99.32
## 3 11/11/2014      134217.7      42.51      17.32      99.31
## 4 11/12/2014      134217.7      42.71      17.29     100.08
## 5 11/13/2014      134217.7      42.79      17.22     100.90
```

```
## 6 11/14/2014      134217.7      42.73      17.14      100.47
## AAPL.US.Equity
## 1      27.253
## 2      27.208
## 3      27.425
## 4      27.813
## 5      28.205
## 6      28.545
```

#Data Description -

```
y <- data$BRK.A.US.Equity
x1 <- data$KO.US.Equity
x2 <- data$BAC.US.Equity
x3 <- data$MCO.US.Equity
```

#scatterplots

```
plot(y ~ x1, xlab = "Apple closing price", ylab = "BRK Closing Price", main =
"Scatterplot") # somewhat linear
```



```
plot(y ~ x2, xlab = "BOA closing price", ylab = "BRK Closing Price", main =
"Scatterplot") # almost linear
```



```
plot(y ~ x3, xlab = "Amex closing price", ylab = "BRK Closing Price", main =
"Scatterplot") # almost linear
```

```
#Linear regression
```

```
linear.model1 <- lm(formula = y ~ x1)
abline(linear.model1, col = "red")
print(linear.model1)
```

```
##
## Call:
## lm(formula = y ~ x1)
##
## Coefficients:
## (Intercept)          x1
##    -412844         14497
```

```
summary(linear.model1)
```

```
##
## Call:
## lm(formula = y ~ x1)
##
## Residuals:
##    Min      1Q  Median      3Q     Max
## -132698 -48553  15943  45294 114959
##
```

```

## Coefficients:
##           Estimate Std. Error t value      Pr(>|t|)
## (Intercept) -412844.3   12328.1  -33.49 <0.0000000000000002 ***
## x1           14496.9     261.3   55.48 <0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 56120 on 1853 degrees of freedom
## Multiple R-squared:  0.6242, Adjusted R-squared:  0.624
## F-statistic: 3078 on 1 and 1853 DF, p-value: < 0.00000000000000022

linear.model2 <- lm(formula = y ~ x2)
abline(linear.model2, col = "red")
print(linear.model2)

##
## Call:
## lm(formula = y ~ x2)
##
## Coefficients:
## (Intercept)          x2
##      -3421         10486

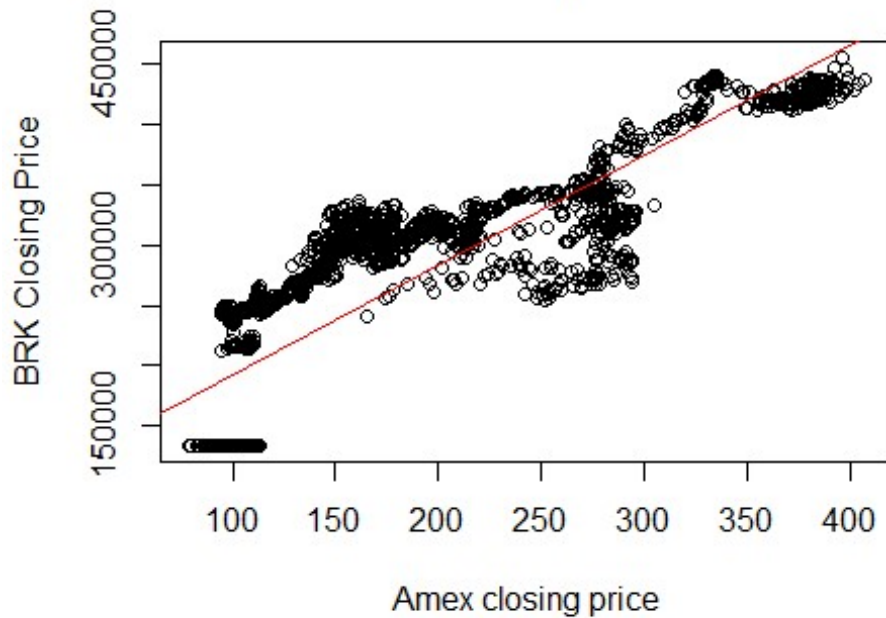
summary(linear.model2)

##
## Call:
## lm(formula = y ~ x2)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -68748 -20296  -881   16523  74366
##
## Coefficients:
##           Estimate Std. Error t value      Pr(>|t|)
## (Intercept) -3420.76   2180.59  -1.569      0.117
## x2           10485.61     80.43  130.368 <0.0000000000000002 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 28700 on 1853 degrees of freedom
## Multiple R-squared:  0.9017, Adjusted R-squared:  0.9016
## F-statistic: 1.7e+04 on 1 and 1853 DF, p-value: < 0.00000000000000022

linear.model3 <- lm(formula = y ~ x3)
abline(linear.model3, col = "red")

```


Scatterplot



```
print(linear.model3)
```

```
##  
## Call:  
## lm(formula = y ~ x3)  
##  
## Coefficients:  
## (Intercept)          x3  
##  102321.8           904.2
```

```
summary(linear.model3)
```

```
##  
## Call:  
## lm(formula = y ~ x3)  
##  
## Residuals:  
##    Min       1Q   Median       3Q      Max   
## -99637 -52922  10835   43327  92886   
##  
## Coefficients:  
##              Estimate Std. Error t value Pr(>|t|)      
## (Intercept) 102321.75   2575.13   39.73 <0.0000000000000002 ***  
## x3           904.19     12.76   70.88 <0.0000000000000002 ***  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##
```

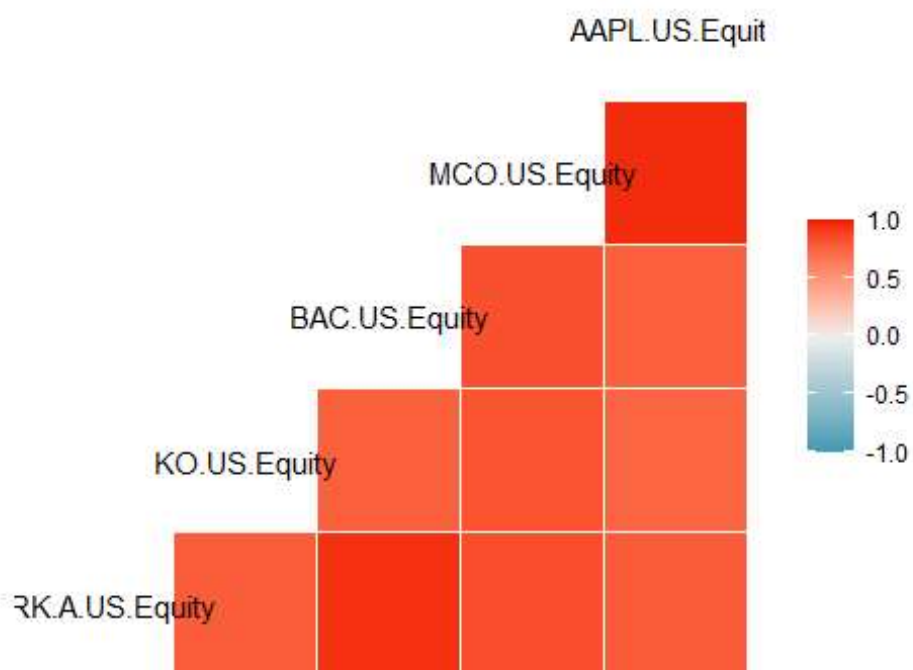
```
## Residual standard error: 47520 on 1853 degrees of freedom
## Multiple R-squared: 0.7306, Adjusted R-squared: 0.7304
## F-statistic: 5025 on 1 and 1853 DF, p-value: < 0.00000000000000022
```

```
# corrplot of holdings and BRK_A [STRONG CORRELATION]
```

```
ggcorr(data)
```

```
## Warning in ggcorr(data): data in column(s) 'Dates' are not numeric and were
```

```
## ignored
```



```
a<-read.csv("annual.csv")
strDate <- c(a$Date)
date<- as.Date(strDate, "%m/%d/%Y")
a$MarketCap<- as.numeric(gsub("[^[:digit:]]", "", a$MarketCap))
```

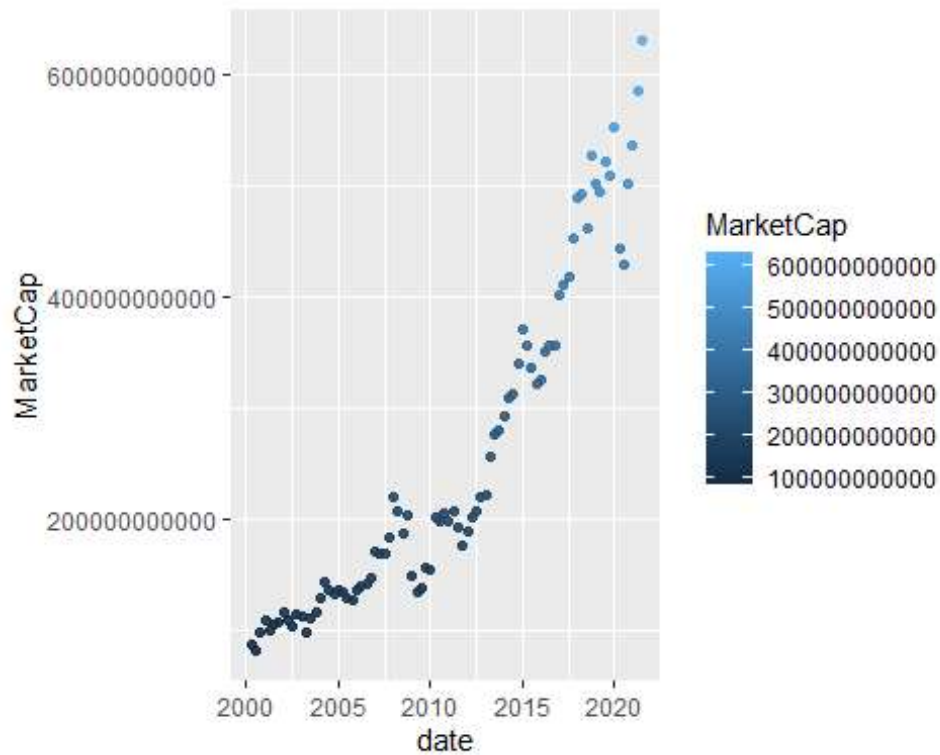
```
summary(brk)
```

```
##      Date      Open      High      Low
## Min.   :2001-01-02  Min.   : 60000  Min.   : 61700  Min.   : 59000
## 1st Qu.:2006-03-26  1st Qu.: 89986  1st Qu.: 90419  1st Qu.: 89600
## Median :2011-06-11  Median :123898  Median :124900  Median :122985
## Mean   :2011-06-12  Mean   :168130  Mean   :169193  Mean   :166960
## 3rd Qu.:2016-08-29  3rd Qu.:222934  3rd Qu.:223963  3rd Qu.:221827
## Max.   :2021-11-15  Max.   :441063  Max.   :445000  Max.   :439132
##      Close      Adj.Close      Volume
```

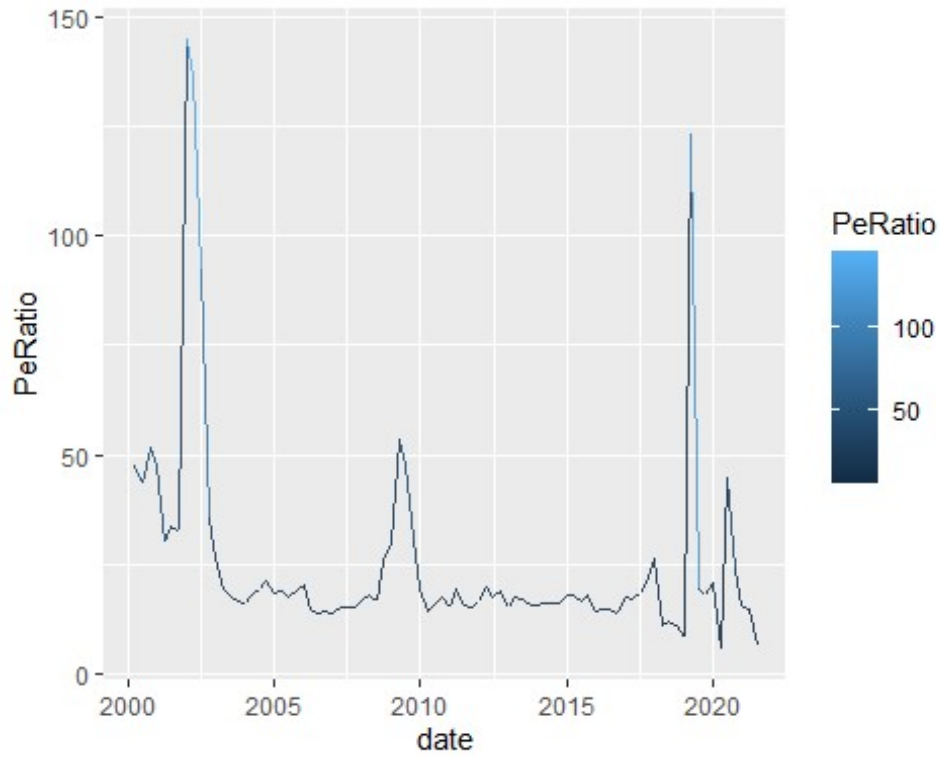
```
## Min. : 61200 Min. : 61200 Min. : 1.0
## 1st Qu.: 90000 1st Qu.: 90000 1st Qu.: 4.0
## Median :123932 Median :123932 Median : 210.0
## Mean :168110 Mean :168110 Mean : 355.7
## 3rd Qu.:222910 3rd Qu.:222910 3rd Qu.: 500.0
## Max. :439460 Max. :439460 Max. :27402.0
```

#Market cap , PE ratio, PB Ratios

```
ggplot(data = a, mapping = aes(x = date, y = MarketCap)) +  
  geom_point(alpha = 0.9, aes(color = MarketCap))
```



```
ggplot(data = a, mapping = aes(x = date, y = PeRatio)) +  
  geom_line(alpha = 0.9, aes(color = PeRatio))
```



```
ggplot(data = a, mapping = aes(x = date, y = PbRatio)) +  
  geom_line(alpha = 0.9, aes(color = PbRatio))
```

