Report

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Introduction

The COVID-19 pandemic has had a devastating effect on the economy in the United States. In early March 2020, the first lockdowns began and the stock market plunged. After this initial reaction, however, the market recovered.
In this assignment, we assume an intial position of $250,000 in cash on 2020-07-01 and invest 6 stocks using investment advice before 1 July from ETF. We track the value of our portfolio using last close prices through the fall to 2020-12-01. At the end of 2020-12-01, we have a position of $495,201 in cash.
The goal of the final project is only to demonstrate our skill.

Data

In this part, we illustrate how to download and clean the data we need. And the first several rows of our dataset are displayed.

Preparation

- We use tq_exchange() to collect the name of all stocks from three stock exchanges (AMER, NASDAQ, NYSE). This dataset has 7535 rows (7535 stocks) and 7 columns.

symbol	company	last.sale.price	market.cap	ipo.year	sector	industry
GOED	1847 Goedeker Inc.	6.49	$39.66M	2020	Consumer Services	Home Furnishings
XXII	22nd Century Group, Inc	2.15	$298.55M	NA	Consumer Non-Durables	Farming/Seeds/Milling
FAX	Aberdeen Asia-Pacific Income Fund Inc	4.34	$1.07B	1986	n/a	n/a

- Then we use tq_get() to download price of all stocks form 2020-07-01 to 2020-11-30. When we continue to download data on 2020-12-01, the connection of tq_get() failes. This dataset contains 654984 rows and 8 columns.

symbol	date	open	high	low	close	volume	adjusted
BBH	2020-07-01	163.24	165.17	161.39	164.67	29000	164.67
BBH	2020-07-02	166.03	167.15	165.13	165.81	32600	165.81
BBH	2020-07-06	168.45	168.54	166.49	166.97	16700	166.97

- So, we search closing price on 2020-12-01 of the six stocks we are interested in one by one on **YAHOO** website.

date	ZM	CTVA	PINS	UBER	MRNA	PENN
2020-12-01	406.31	38.31	68.21	49.63	141.01	70.03

- Finally we obtain two big datasets and six closing prices on 2020-12-01.

Cleaning

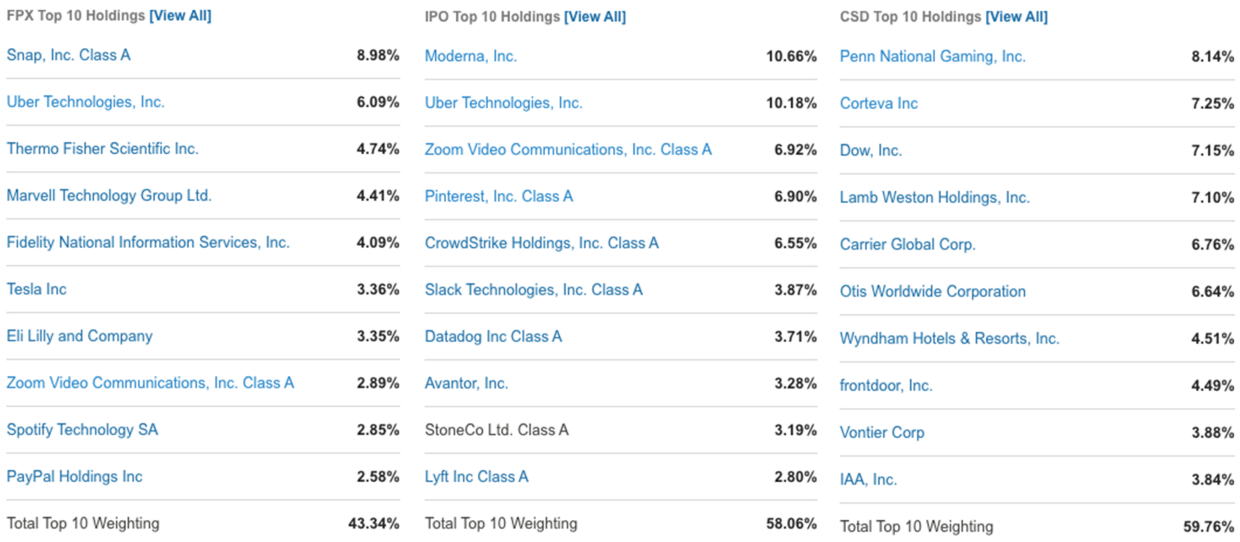
- We eliminate the stocks without full trading days.

Investment

In this part, we use online investment advice that was available at the beginning of July 2020 to make investment decisions and then track our investments through the fall until 1 December.

Online Advice

We search some big fund companies and look at their top ten holdings on **ETF** website.



FPX Top 10 Holdings [View All]

Snap, Inc. Class A	8.98%
Uber Technologies, Inc.	6.09%
Thermo Fisher Scientific Inc.	4.74%
Marvell Technology Group Ltd.	4.41%
Fidelity National Information Services, Inc.	4.09%
Tesla Inc	3.36%
Eli Lilly and Company	3.35%
Zoom Video Communications, Inc. Class A	2.89%
Spotify Technology SA	2.85%
PayPal Holdings Inc	2.58%
Total Top 10 Weighting	43.34%

IPO Top 10 Holdings [View All]

Moderna, Inc.	10.66%
Uber Technologies, Inc.	10.18%
Zoom Video Communications, Inc. Class A	6.92%
Pinterest, Inc. Class A	6.90%
CrowdStrike Holdings, Inc. Class A	6.55%
Slack Technologies, Inc. Class A	3.87%
Datadog Inc Class A	3.71%
Avantor, Inc.	3.28%
StoneCo Ltd. Class A	3.19%
Lyft Inc Class A	2.80%
Total Top 10 Weighting	58.06%

CSD Top 10 Holdings [View All]

Penn National Gaming, Inc.	8.14%
Corteva Inc	7.25%
Dow, Inc.	7.15%
Lamb Weston Holdings, Inc.	7.10%
Carrier Global Corp.	6.76%
Otis Worldwide Corporation	6.64%
Wyndham Hotels & Resorts, Inc.	4.51%
frontdoor, Inc.	4.49%
Vontier Corp	3.88%
IAA, Inc.	3.84%
Total Top 10 Weighting	59.76%

Figure 1: These three pictures show the top ten holdings of three fund(First Trust U.S. Equity Opportunities ETF, Renaissance IPO ETF and First Trust International Equity Opportunities ETF).

Portfolio

From figure 1, we choose 6 companies that we are interested in and give them different weights. Assume an initial position of $250,000 in cash starting on 1 July 2020. After buying these 6 stocks, we still have $1.59. The holdings are listed in here:

company	share	amount	percent
Maderna	1218	75016.62	30 %
Zoom	193	50012.09	20 %
Uber	1643	49996.49	20 %
Corteva	924	24984.96	10 %
Pinterest	1074	25002.72	10 %
Penn	783	24985.53	10 %
Total		249998.41	100 %

Then we use donut chart to see the proportions of each sector.

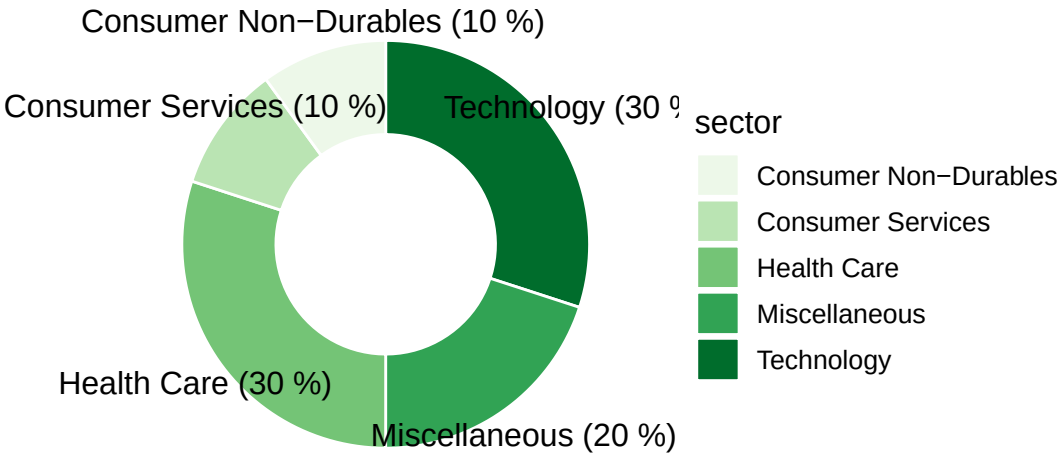


Figure 2: This shows the proportions of each sector.

As we can see from Figure2, the investment is concentrated in technology and health care sectors.

Result

Now we hold 1218 shares of Maderna, 193 shares of Zoom, 1643 shares of Uber, 924 shares of Corteva, 1074 shares of Pinterest and 783 shares of Penn National Gaming and $1.59 in cash. We track our investments using last close prices through the fall to 2020-12-01 and calculate the value of our portfolio every day.

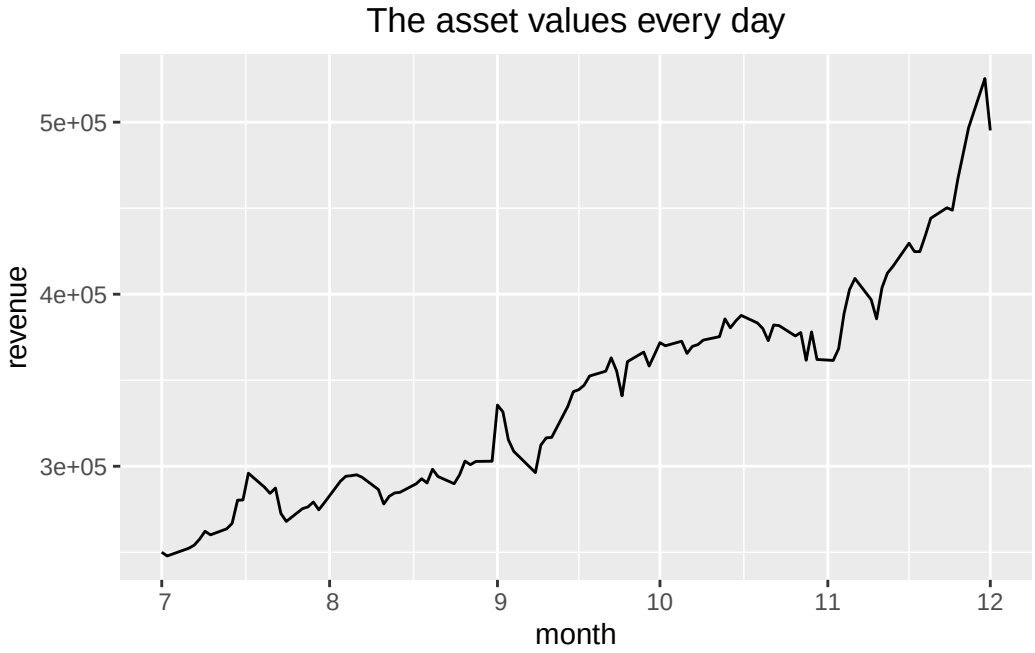


Figure 3: This shows the asset value from 2020-07-01 to 2020-12-01

date	total	ZMr	CTVAr	PINSr	UBERr	MRNAr	PENNr
2020-12-01	495201.2	78417.83	35398.44	73257.54	81542.09	171750.2	54833.49

Assume an initial position of $250,000 in cash starting on 1 July 2020. At the end of 2020-12-01, we have a position of $495,201 in cash.

Shiny

In shiny we not only display the result of our portfolio, but also show close prices of the indexes and some other stocks.
- You can choose from the sidebar to see the information of all stocks and our portfolio.
- Information of all stocks contains the index information and various prices of a single stock from 2020-07-01 to 2020-12-01. In control box you can choose which period and stock to display.
- We use tables and dynamic plots to show our portfolio.
- We provide a way to build your own portfolio. You can choose 3 stocks and set different proportions, then track your portfolio.

Click here go to shiny app

Inference

- The main packages I use:
  1.Matt Dancho and Davis Vaughan (2020). tidyquant: Tidy Quantitative Financial Analysis. R package version 1.0.2. https://CRAN.R-project.org/package=tidyquant
  2.Hadley Wickham, Romain François, Lionel Henry and Kirill Müller (2020). dplyr: A Grammar of Data Manipulation. R package version 1.0.2. https://CRAN.R-project.org/package=dplyr
  3.Alboukadel Kassambara (2020). ggpubr: 'ggplot2' Based Publication Ready Plots. R package version 0.4.0. https://CRAN.R-project.org/package=ggpubr
  4.Stefan Milton Bache and Hadley Wickham (2014). magrittr: A Forward-Pipe Operator for R. R package version 1.5. https://CRAN.R-project.org/package=magrittr
  5.Hadley Wickham (2020). tidyr: Tidy Messy Data. R package version 1.1.2. https://CRAN.R-project.org/package=tidyr
- The data I use is downloaded from YAHOO.
- The online investment I use is from ETF