MAT 479 Capstone Project

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Visa

- Visa is a multinational financial services corporation based in Foster City, California. It facilitates electronic funds transfers primarily through Visa branded credit, debit and prepaid cards.
- Amazon, the world's largest retailer, stopped accepting Visa credit cards in certain areas of the world due to the high fees. This was resolved February as both companies reached an agreement.
- Most of the world is reopening from the Covid-19 pandemic which will increase travel and spending which directly benefits Visa.

Mcdonalds

- Mcdonald's is a multinational fast food corporations founded in 1940, and is based in San Bernardino, California. They currently have more than 38,000 locations in over 100 countries.
- For the first time in 8 years Mcdonald's expects to open more locations than it closes in the United States.
- Mcdonalds temporarily closed 850 locations in Russia during March due to the Russia - Ukraine conflict.
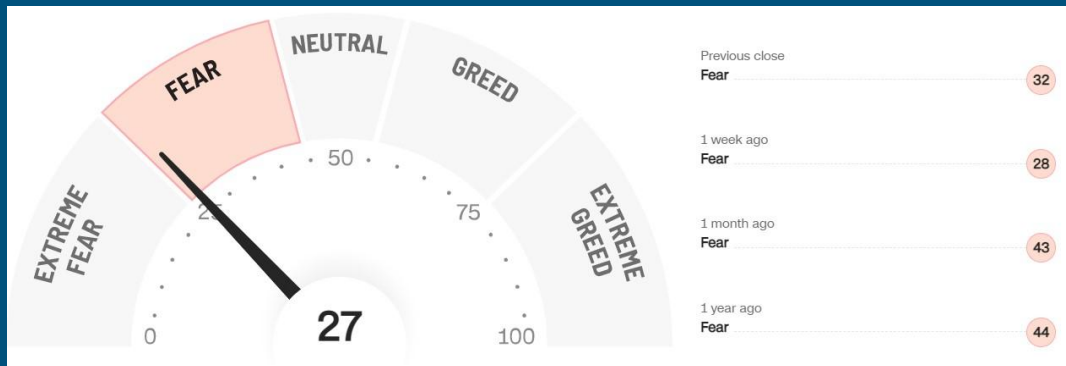
Pfizer

- Pfizer is an American pharmaceutical and biotechnology company founded in 1849 by two German immigrants.
- Pfizer develops and sells hundreds of drugs and treatments; most notably their COVID -19 vaccine that they developed with a German biotech company, BioNTech.
- CDC recommended in March a 4th dose for people over the age of 50. Meanwhile Covid Cases in the United States have gone down dramatically since February.

Overall Market Sentiment

- End of 2021 stocks were at record highs
- Inflation rate is about 8% which is the highest seen in 40 years
- Fed is raising interest rates for the first time since 2018
- GDP was negative in first quarter 2022
- Most stock indexes are down over 10% from their all time highs in November of 2021

NEUTRAL

FEAR

GREED

EXTREME FEAR

EXTREME GREED

50

75

25

0

100

27

Previous close
Fear   32

1 week ago
Fear   28

1 month ago
Fear   43

1 year ago
Fear   44

VISA Data

|	
Initial stock Price (march 31)	$223.95
Percentage of Days stock moved Up	48.3%
Average daily absolute change in price	$3.25
Average Daily stock moves on up days	$3.40
Average Daily stock moves on down days	-$3.10
Average Daily Returns	.0001886
Variance of Daily Returns	.00048612

Visa Binary Model

Average Simulated Stock Price	224.63
Average Call Value at Expiry (4/22)	2.73
Present Value of Call Option	2.73
Iterations	5000
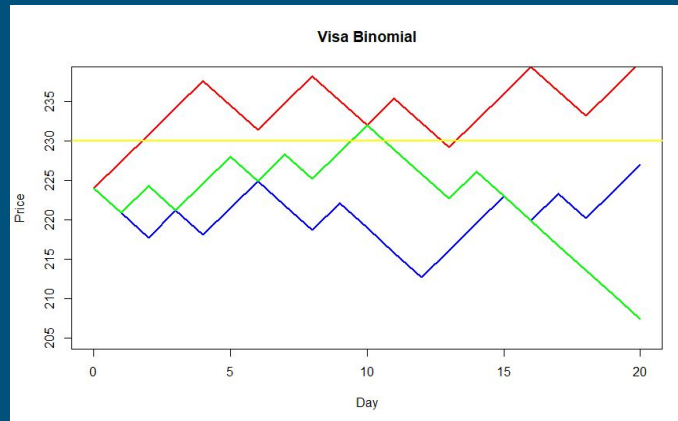
Visa Continuous Model

Average Simulated Stock Price	225.26
Average Call Value at Expiry (4/22)	5.73
Present Value of Call Option	5.73
Iterations	5000
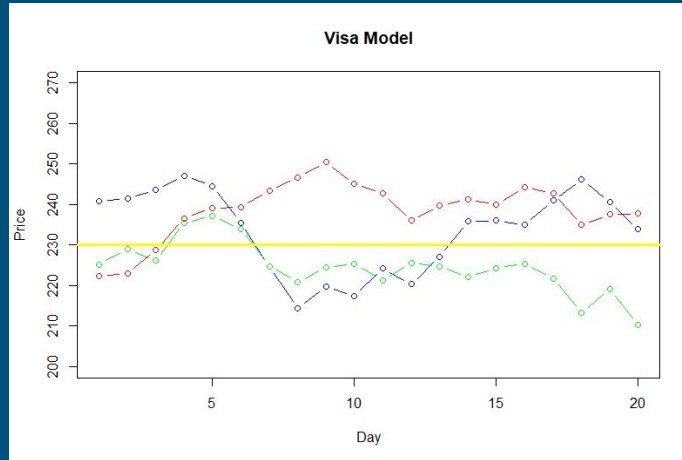
Comparing to Visa Market Price

|	
Binary Model	2.73
Continuous Model	5.73
Black Scholes	5.21
Market bid, ask price	(1.54, 3.40)
MARKET PRICE (4/22 $230 call)	3.25

On April 22, Visa's closing price was 208.17, so the call expired worthless.

McDonalds Data

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Initial Stock price (march 31)	249.03
Percentage of Days stock moved Up	35.0%
Average daily absolute change in price	$2.35
Average Daily stock moves on up days	$2.90
Average Daily stock moves on down days	-$2.06
Average Daily Returns	-.00126
Variance of Daily Returns	.0001717

McDonald's Binary Model

Average Simulated Stock Price	244.24
Average Call Value at Expiry (4/22)	.64
Present Value of Call Option	.64
Iterations	5000
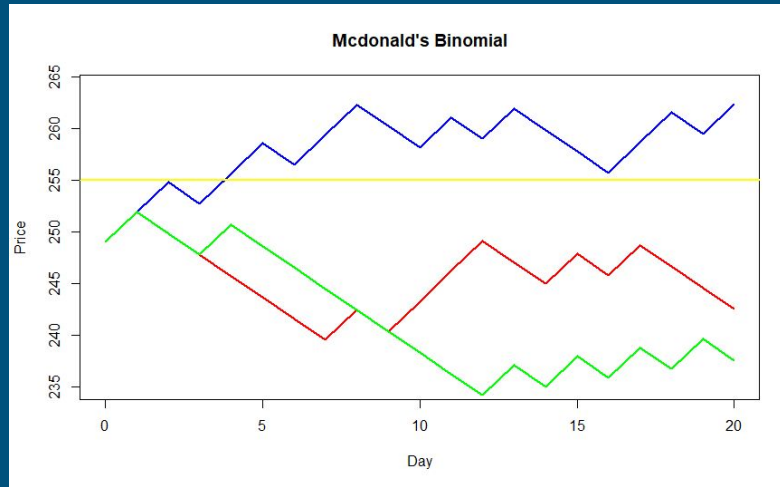
Mcdonald's Continuous Model

Average Simulated Stock Price	244.74
Average Call Value at Expiry (4/22)	1.45
Present Value of Call Option	1.45
Iterations	5000
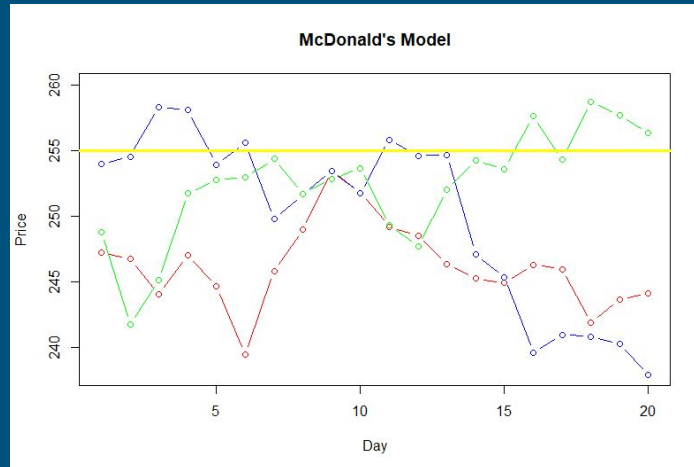
McDonald's Model

Comparing to Mcdonald's Market Price

Binary Model	.64
Continuous Model	1.45
Black Scholes	2.78
Market bid, ask price	(1.42, 1.69)
MARKET PRICE (4/22 $255 call)	1.97

On April 22, Closing price was 250.17, so the call expired worthless.

Pfizer Data

|	
Initial Stock price (March 31)	52.44
Percentage of Days stock moved Up	45.0%
Average daily absolute change in price	$0.76
Average Daily stock moves on up days	$0.77
Average Daily stock moves on down days	-$0.75
Average Daily Returns	-.001287
Variance of Daily Returns	.0003189

Pfizer Binary Model

Average Simulated Stock Price	51.42
Average Call Value at Expiry (4/22)	.55
Present Value of Call Option	.55
Iterations	5000
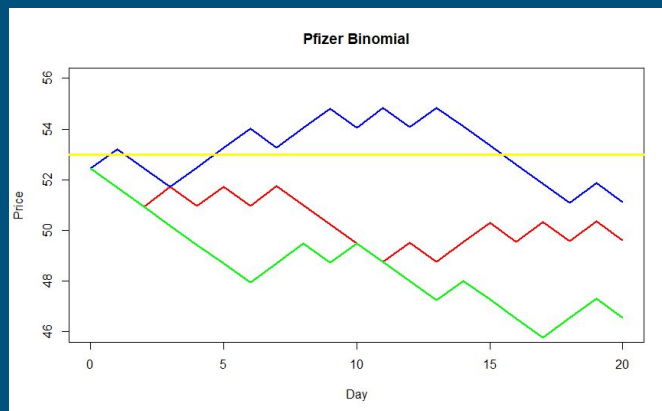
Pfizer Continuous Model

Average Simulated Stock Price	51.51
Average Call Value at Expiry (4/22)	.84
Present Value of Call Option	.84
Iterations	5000
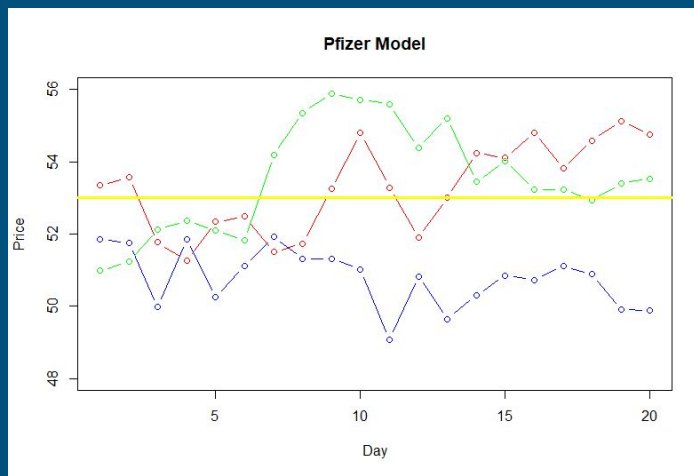
Comparing to Pfizer Market Price

Binary Model	.55
Continuous Model	.84
Black Scholes	1.22
Market bid, ask price	(.80, .88)
MARKET PRICE (4/22 $53 call)	.85

On April 22, Closing price was 48.13, so the call expired worthless.

Sources

Wikipedia for brief descriptions of the company.

Visa - https://www.cnbc.com/2022/02/17/amazon-and-visa-reach-global-truce-over-credit-card-fees.html

Mcdonalds - https://www.cnbc.com/2022/03/08/mcdonalds-will-temporarily-close-850-restaurants-in-russia-nearly-2-weeks-after-putin-invaded-ukraine.html

Pfizer - https://www.pfizer.com/