MODULE 3

HOW DO I VALUE A BOND?

BOONE BOWLES

Agenda

1. What do we remember from online bootcamp?
2. How do I value a bond?
3. How are interest rates determined?
4. What do I need to remember from all this?



What do we remember from the videos?



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Can we remember how to do the harder questions?

1. What is $85 million today worth 16 years from now? (The interest rate is 6 %).

2. What interest rate would turn $100 million into $260 million in 7 years?

3. What interest rate would turn $100 million into $260 million in 17 years?

4. What is the future value 8 years from now of $100 million to be received next year, $200 million the year after that, and $300 million two years after that? (The interest rate is 5.25 %).

5. What is the present value of that same stream of cash flows?

Can we remember how to do the harder questions?

6. Let's imagine this interesting cash-flow stream:
   - Right now, there will be a cash outflow of $700 million.
   - Next year, there will be another outflow of $700 million.
   - The year after that will have no cash inflow or outflow.
   - The year after that will see a cash inflow of $100 million.
   - The next two years will be the same.
   - Then, the annual cash flow will be $120 million for three straight years.
   - Then, the annual cash flow will be $160 million for three straight years.
   - After this, the annual cash flow is expected to grow a bit faster than the U.S. economy (≈ 3 %).
   - Discount rate = 9 %.

What is the Present Value?

Can we remember how to do the harder questions?

7. A stock pays a dividend of $8 per year forever. If the required rate of return 10%, what is the current price of the stock?

8. The same stock now promises to grow the dividend by 5% per year, what is the price of the stock?

9. Your cousin's friend offers you a perpetuity, he'll pay you $10,000 per year forever, but you decide you'll only pay him $40,000 for this offer. What discount rate did you apply?

How do we characterize bonds?

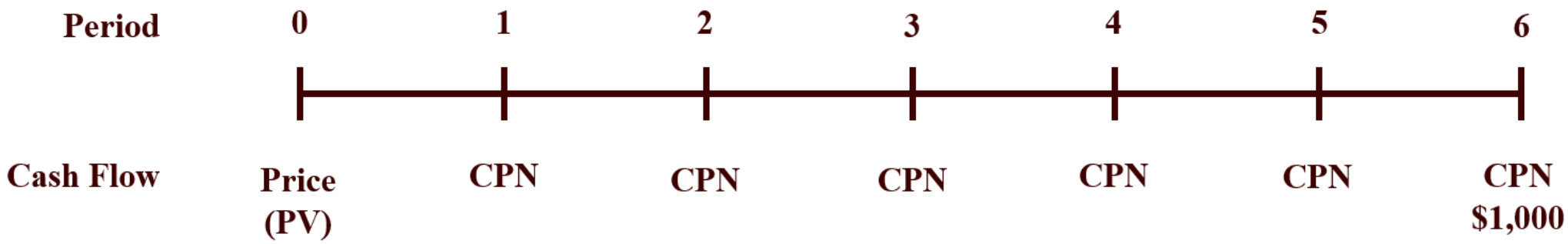
Bonds are simply streams of cash flows… we can value those no problem.

Term or Maturity	→	Time to final principal payment
Coupons	→	Periodic interest payments
Face Value	→	Payment at maturity ($1000)
Price	→	PV of future cash flows
Yield to Maturity (ytm)	→	Interest rate equating price with cash flows

REMEMBER: If you're struggling understanding bonds

- They are loans that a company must pay back to the bank
- Except in this case the bank is the market.

How do we characterize bonds?

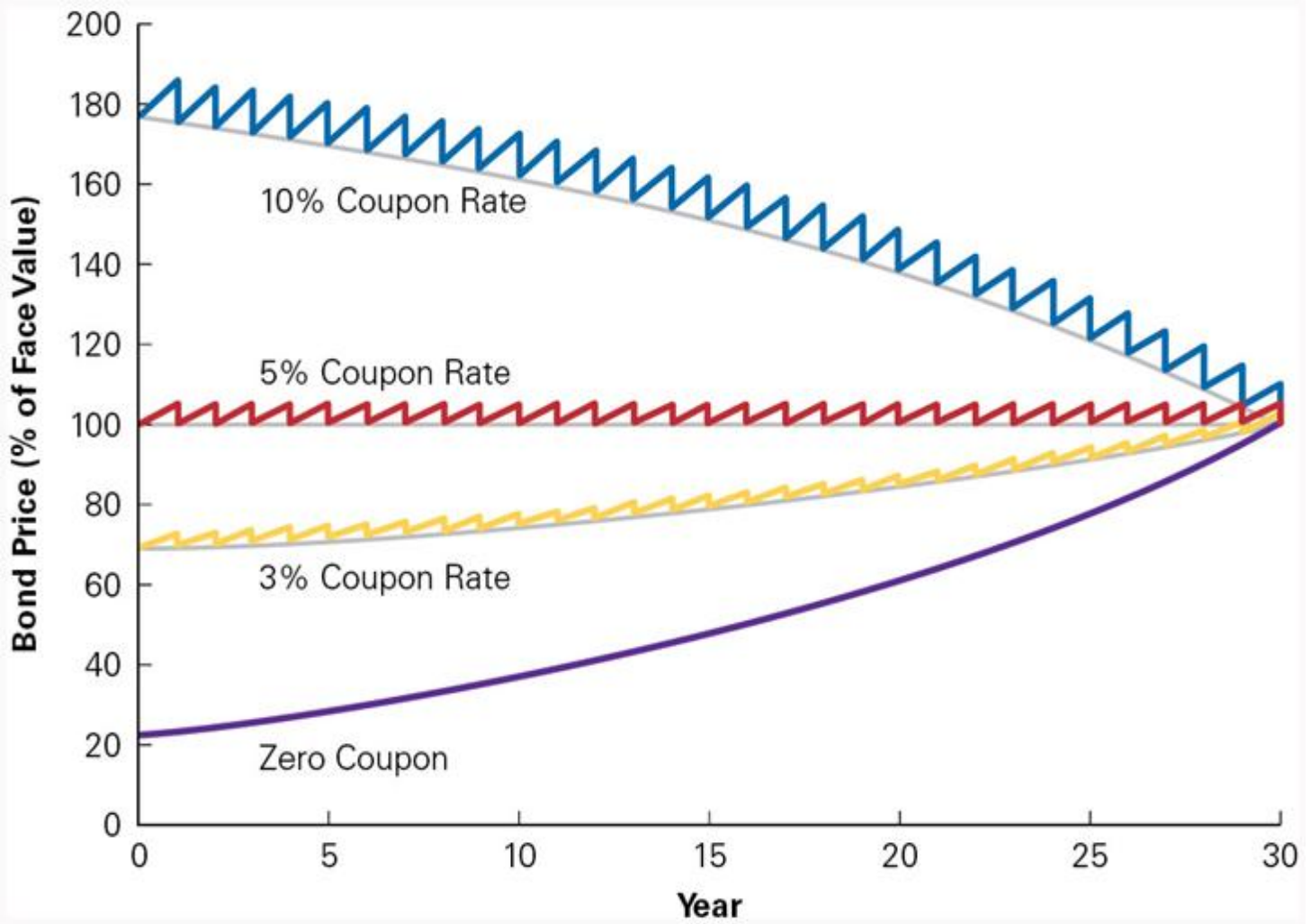


Can we do some bond pricing?

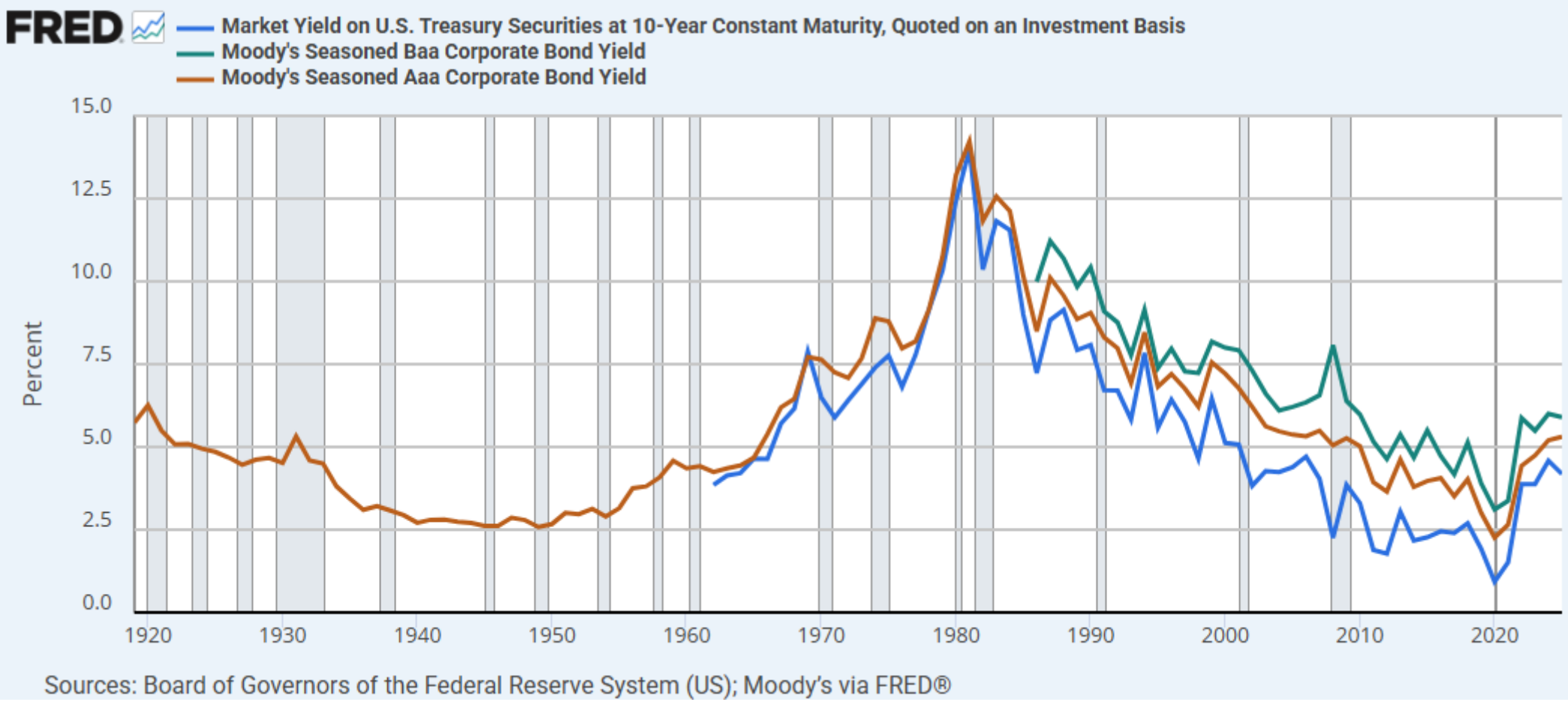


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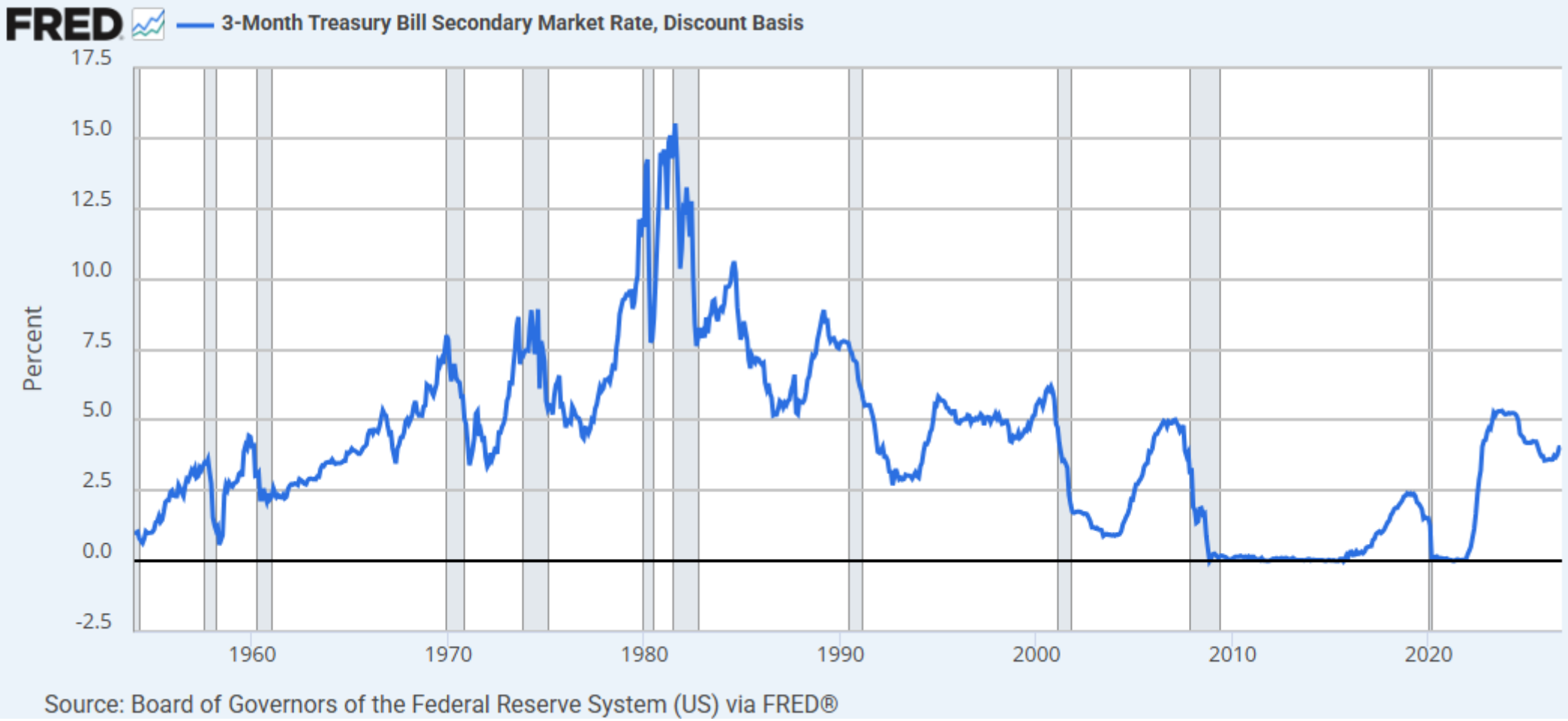
Last thing on bond prices for now.



The history of interest rates



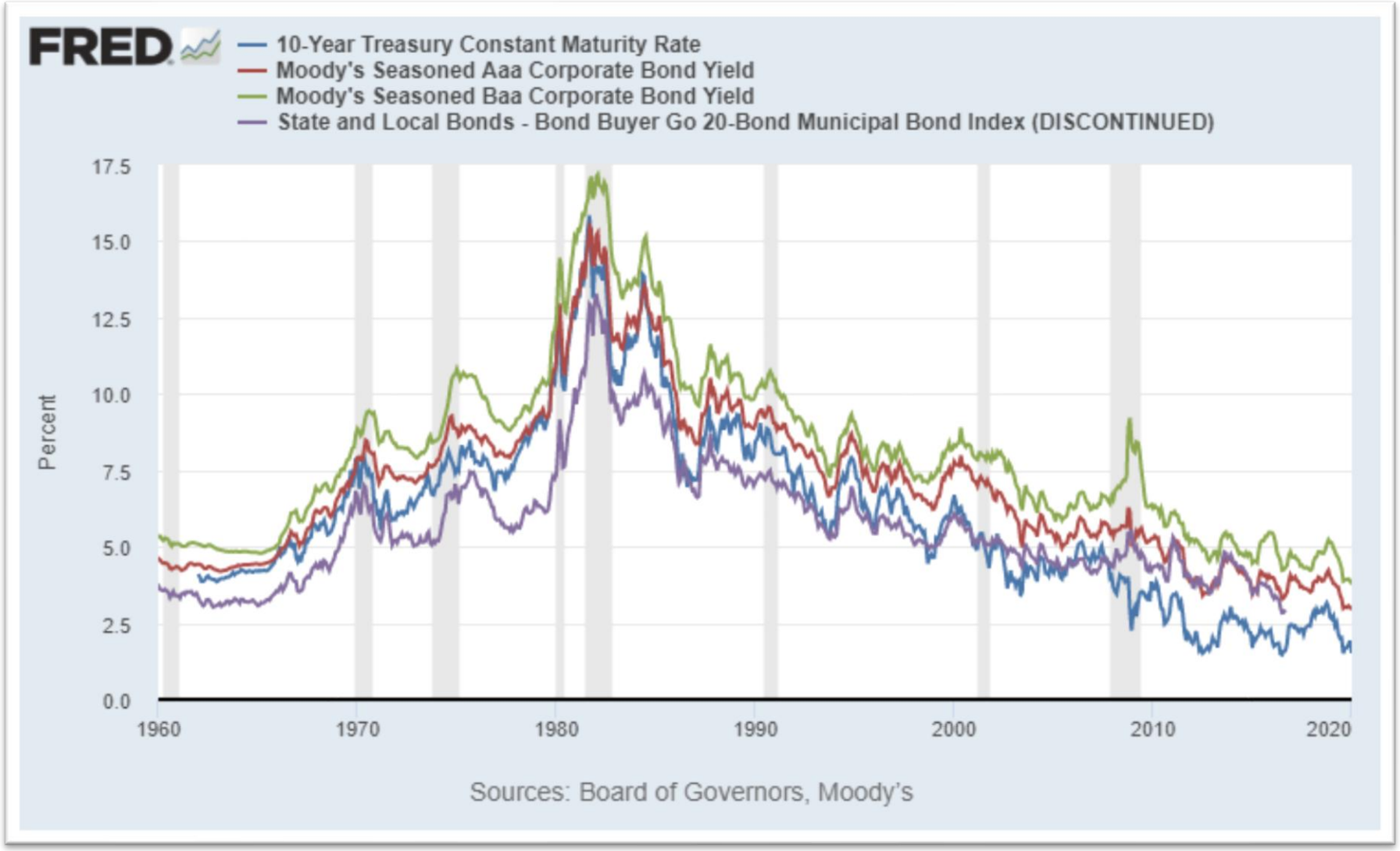
Interest rates and recessions



Can we do some bond pricing?



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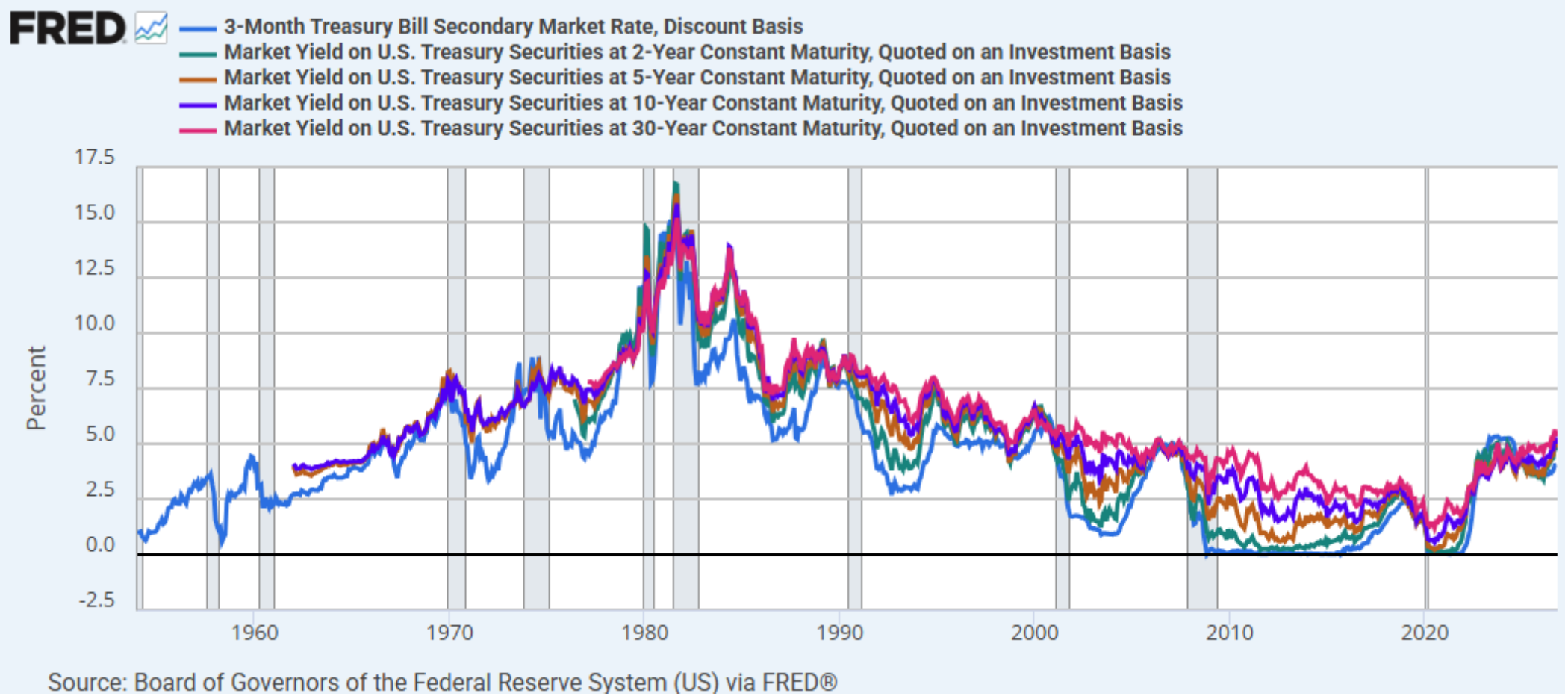

FRED
10-Year Treasury Constant Maturity Rate
Moody's Seasoned Aaa Corporate Bond Yield
Moody's Seasoned Baa Corporate Bond Yield
State and Local Bonds - Bond Buyer Go 20-Bond Municipal Bond Index (DISCONTINUED)
Percent
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1960
1970
1980
1990
2000
2010
2020
Sources: Board of Governors, Moody's

Credit Ratings.

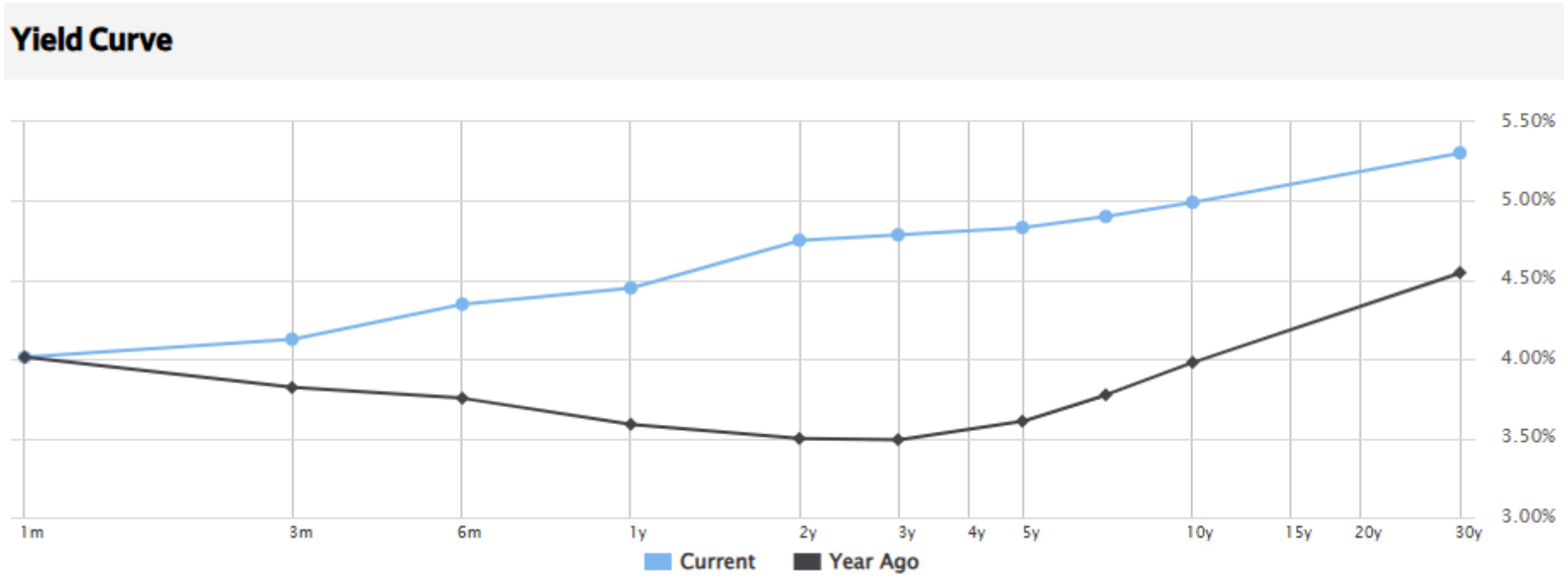
Moody's	S&P	Fitch	
Aaa	AAA	AAA	Prime
Aa1	AA+	AA+	High grade
Aa2	AA	AA	
Aa3	AA-	AA-	
A1	A+	A+	Upper medium grade
A2	A	A	
A3	A-	A-	
Baa1	BBB+	BBB+	Lower medium grade
Baa2	BBB	BBB	
Baa3	BBB-	BBB-	
Ba1	BB+	BB+	Non-investment grade speculative
Ba2	BB	BB	
Ba3	BB-	BB-	
B1	B+	B+	Highly speculative
B2	B	B	
B3	B-	B-	
Caa1	CCC+	CCC	Substantial risk
Caa2	CCC		Extremely speculative
Caa3	CCC-		Default imminent with little prospect for recovery
Ca	CC	CC	
	C	C	
C / /	D	D	In default

"Junk"

Term Structure of Interest Rates



Term Structure of Interest Rates



What did we learn here?

1. What do we remember from online bootcamp?
    - TVM, Perpetuity, Discount Rate.

2. How do I value a bond?
    - Use a timeline and calculator.

3. How are interest rates determined?
    - Supply-Demand for bonds.
    - Yield Curves and Risk.

4. What do I need to remember from all this?
    - All of it.





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