

FUNDAMENTALS OF PUBLIC FUNDS INVESTING



SESSION 1 | INTRODUCTION TO PUBLIC FUNDS INVESTING

Rick Phillips

President and Chief Investment Officer | FHN Financial Main Street Advisors

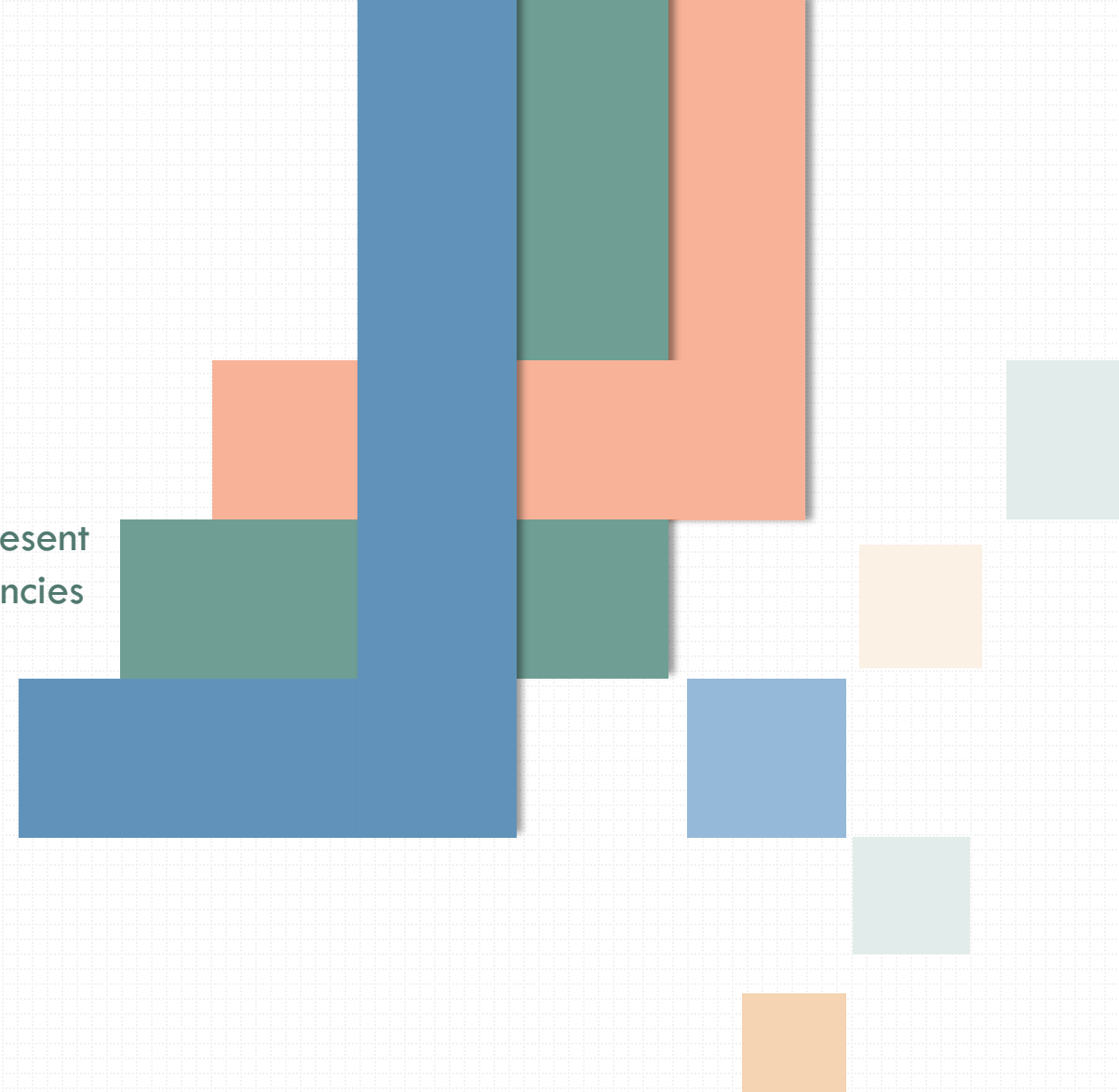
January 12, 2021





Rick Phillips

- City of Las Vegas Investment Officer 1989-1998
- Clark County Chief Investment Officer 1998-2005
- FHN Main Street President & Chief Investment Officer 2005-Present
- Manage/Consult on \$50+ Billion AUM for states and local agencies
- Government Investment Officers Association (GIOA) Founder



SESSION OVERVIEW

- Investment Program Objectives: Safety, Liquidity, Income
- Roles and Responsibilities
- Liability and Ethical Issues
- Terms, Concepts, and Principles





Investment Program Objectives

Investment Program Objectives: Safety, Liquidity, and Income

- 1. Safety of Principal:** Safety of principal is the foremost objective of the [entity's] investment program. Investments by the [designated official] shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio. To attain this objective, diversification of security types, sectors, issuers, and maturities is necessary in order that potential losses on individual securities do not exceed the income generated from the remainder of the portfolio.
- 2. Liquidity:** The investment portfolio shall be structured to timely meet expected cash outflow needs and associated obligations which might be reasonably anticipated. This objective shall be achieved by matching investment maturities with forecasted cash outflows and maintaining an additional liquidity buffer for unexpected liabilities.
- 3. Investment Income:** The investment portfolio shall be designed to **earn a market rate of investment income** in relation to prevailing budgetary and economic cycles, while taking into account investment risk constraints and liquidity needs of the portfolio.

Roles and Responsibilities



Fiduciary and Prudence

California Code 27000.3

(a) **With regard to county funds deposited in the county treasury, the board of supervisors is the agent of the county who serves as a fiduciary and is subject to the prudent investor standard, unless a delegation has occurred pursuant to Section 53607** in which case the county treasurer shall be the agent of the county with respect to these funds, serve as a fiduciary, and be subject to the prudent investor standard and the board of supervisors shall not be the agent, serve as a fiduciary, or be subject to the prudent investor standard.

(b) With regard to funds deposited in the county treasury that are deposited by local agencies other than the county and at the discretion of those local agencies, **the county treasurer serves as a fiduciary subject to the prudent investor standard.**

(c) When investing, reinvesting, purchasing, acquiring, exchanging, selling, or managing public funds, the county treasurer or the board of supervisors, as applicable, shall act with care, skill, prudence, and diligence under the circumstances then prevailing, specifically including, but not limited to, the general economic conditions and the anticipated needs of the county and other depositors, **that a prudent person acting in a like capacity and familiarity with those matters would use in the conduct of funds of a like character and with like aims, to safeguard the principal and maintain the liquidity needs of the county and the other depositors.** Within the limitations of this section and considering individual investments as part of an overall investment strategy, investments may be acquired as authorized by law. Nothing in this chapter is intended to grant investment authority to any person or governing body except as provided in Sections 53601, 53607, and 53635.

California Code 53600.3

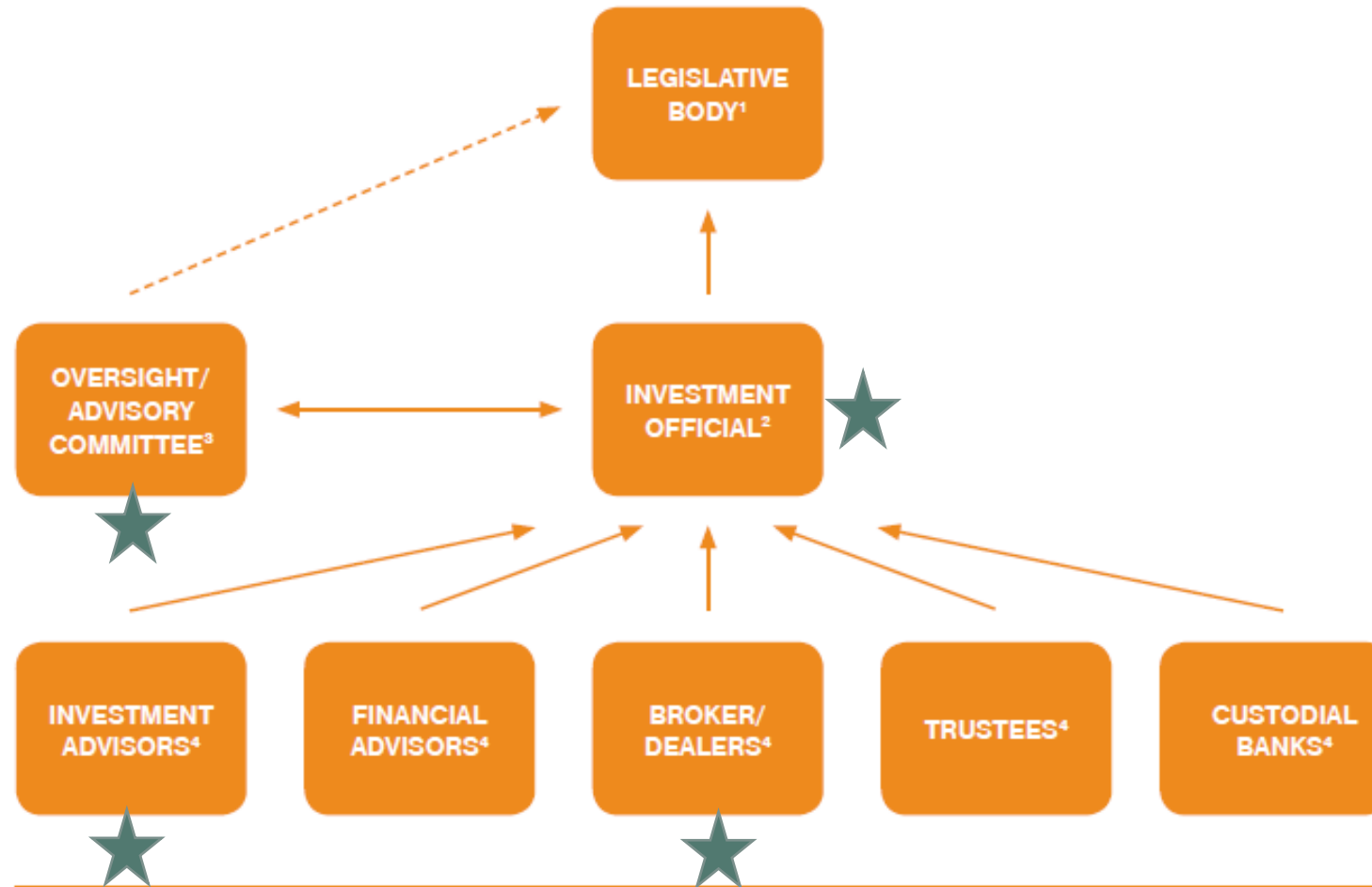
Except as provided in subdivision (a) of Section 27000.3, **all governing bodies of local agencies or persons authorized to make investment decisions on behalf of those local agencies investing public funds pursuant to this chapter are trustees and therefore fiduciaries subject to the prudent investor standard.**

When investing, reinvesting, purchasing, acquiring, exchanging, selling, or managing public funds, a trustee shall act with care, skill, prudence, and diligence under the circumstances then prevailing, including, but not limited to, the general economic conditions and the anticipated needs of the agency, that a prudent person acting in a like capacity and familiarity with those matters would use in the conduct of funds of a like character and with like aims, to safeguard the principal and maintain the liquidity needs of the agency. Within the limitations of this section and considering individual investments as part of an overall strategy, investments may be acquired as authorized by law.

CALIFORNIA PUBLIC FUND **INVESTMENT PRIMER**



PUBLIC FUND INVESTMENT PARTICIPANTS' TYPICAL REPORTING RESPONSIBILITIES



- ¹ Delegates to and provides oversight of the investment official.
- ² Primarily responsible for day-to-day investment.
- ³ Oversight committee provides monitoring/feedback to investment official and legislative body; advisory committee can provide opinions to investment official.
- ⁴ Provides services to investment official.

Types of Investment Programs

- Internally Managed
- Internally Managed with and Investment Advisor Acting in a Consulting Capacity
- Mixture of Internal Management and External Management
- Externally Managed: Non-Discretionary
- Externally Managed: Discretionary

Investment Official (Treasurer, Finance Director, Etc.) Responsibilities

- Investment of Surplus Funds
- Banking and Cash Management
- Custodial and Trustee Relationships
- Bond Issuance
- Reporting
- Segregation of Duties



Treasury Oversight or Advisory Committees



California LEGISLATIVE INFORMATION

California Code 27131: (a) The board of supervisors in each county or city and county **may**, if the county or city and county is investing surplus funds, **establish a county treasury oversight committee**. The board of supervisors, in consultation with the county treasurer, shall determine the exact size of the committee, which shall **consist of from 3 to 11 members**, and the **categories from which the members shall be represented**, as specified in subdivisions (a) to (g), inclusive, of Section 27132. Members shall be nominated by the treasurer and confirmed by the board of supervisors.

(b) In recognition of the state and local interests served by the action made optional in subdivision (a), the Legislature encourages local agencies to continue taking the action formerly mandated by this section. However, nothing in this subdivision may be construed to impose any liability on a local agency that does not continue to take the

RESPONSIBILITIES

While the California Government Code describes in great detail the composition of, as well as restrictions on, the membership of county oversight committees, **it provides minimum guidance regarding the duties of the committees**. The oversight committee shall review and monitor the county treasurer's annual investment policy; it also is required to "cause an annual audit to be conducted to determine the county treasury's compliance" with the California Government Code sections dealing with oversight committees (Sections 27130-27137). While the county treasurer must provide the oversight committee with the county's investment policy, there are no reporting requirements for the committee itself. Source: Investment Primer

Investment Advisors

- Works Exclusively or Primarily with Public Fund Entities
- Registered with the SEC and the State
- Forms ADV Parts 1 and 2
- RFP Process



Investment Adviser Public Disclosure

Welcome to the Investment Adviser Public Disclosure website

INDIVIDUAL **FIRM**

Individual Name/CRD# at Firm Name or CRD/SEC# (optional) in City, State or ZIP (optional) **SEARCH**

For a complete compilation of Investment Adviser Firms currently registered with the SEC and states securities regulators, download the [Investment Adviser Data](#).

You can **search for an Investment Adviser firm** on this website and view the registration or reporting form ("Form ADV") that the adviser filed. This website will also search **FINRA's BrokerCheck system** and indicate whether an entity is a Brokerage firm. Investment advisers file Form ADV to register with the SEC and/or the states. Some advisers that do not have to register with the SEC or the states ("Exempt Reporting Advisers") must nonetheless complete some of the questions in Form ADV for purposes of reporting to the SEC and/or the states. Form ADV contains information about an investment adviser and its business operations. Additionally, it contains disclosure about certain disciplinary events involving the adviser and its key personnel.

You can also **search for an individual investment adviser representative** and view that individual's professional background and conduct, including current registrations, employment history, and disclosures about certain disciplinary events involving the individual. The information about investment adviser representatives that appears on this website is collected from individual Investment Adviser Representatives, Investment Adviser firm(s), and/or securities regulator(s) as part of the securities industry's registration and licensing process. Individuals that are Registered Representatives of a Brokerage firm that are listed in **FINRA's BrokerCheck system** will also appear in search results.

Investment Advisor Due Diligence

Securities and Exchange Commission

INDIVIDUAL

FIRM

FHN Financial Main Street

We found 16 results

FHN FINANCIAL MAIN STREET ADVISORS, LLC
(FHN FINANCIAL MAIN STREET ADVISORS, LLC...)
CRD#: 133719/SEC#: 801-63805
10655 PARK RUN DRIVE SUITE 120
LAS VEGAS, NV 89144 (+1)

IA Investment Adviser Firm

Disclosures ⓘ N/A

MORE DETAILS >

INDIVIDUAL

FIRM

Richard Phillips

We found 1 result

RICHARD LEE PHILLIPS
CRD#: 1600180
FHN FINANCIAL MAIN STREET ADVISORS, LLC
| CRD#: 133719
LAS VEGAS, NV 89144

IA Investment Adviser

Disclosures ⓘ No

Years of Experience 15

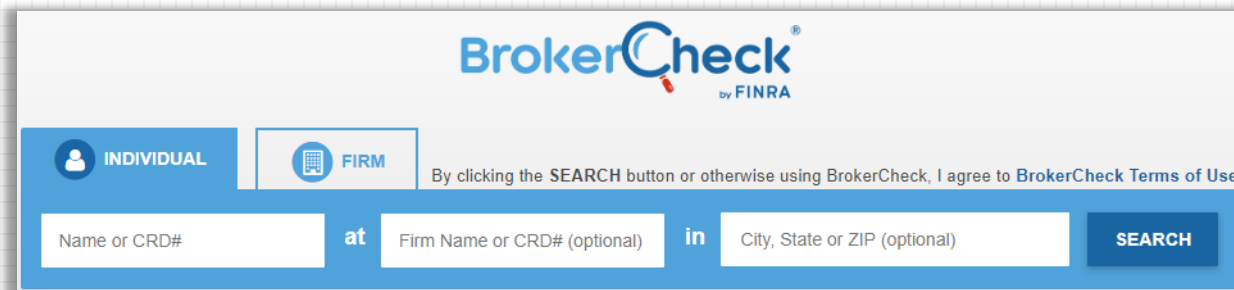
MORE DETAILS >

 Alex Padilla California Secretary of State					
Entity Number	Registration Date	Status	Entity Name	Jurisdiction	Agent for Service of Process
201004210339	02/10/2010	ACTIVE	FHN FINANCIAL MAIN STREET ADVISORS, LLC	NEVADA	C T CORPORATION SYSTEM (C0168406)

Broker/Dealers

Broker/dealer is a generic term for brokers and/or dealers. Both are financial intermediaries that help individuals and entities with money to invest (savers or investors), connect with those needing capital to build and sustain enterprises (spenders, borrows, or users of capital). Firms can act as both a broker and a dealer.

Broker	Dealer
<ul style="list-style-type: none">■ Executes customers' orders■ Charges a commission■ Must disclose the amount of commission	<ul style="list-style-type: none">■ Participates in the trade as a principal■ Charges a markup or markdown■ Makes a market in the security■ Must disclose the fact that they are a market maker, but not the amount of the markup or markdown



The image shows the BrokerCheck by FINRA search interface. At the top is the "BrokerCheck by FINRA" logo. Below the logo are two tabs: "INDIVIDUAL" (selected) and "FIRM". A disclaimer text reads: "By clicking the SEARCH button or otherwise using BrokerCheck, I agree to BrokerCheck Terms of Use". The search form consists of three input fields: "Name or CRD#" (with a dropdown arrow), "at Firm Name or CRD# (optional)", and "in City, State or ZIP (optional)". A blue "SEARCH" button is located to the right of the third field.



Liabilities and Ethical Issues

Fiduciary Responsibilities and Personal Liability

Treasury and Investment Positions	Fiduciary Responsibility	Personal Liability
Board of Supervisors/City Council/Etc.	X	X
County Administrator/City Manager	X	X
County Treasurer	X	X
City Treasurer/Finance Director/CFO/Etc.	X	X
Chief Investment Officer	X	X
Investment Officer	X	X
Investment Analyst	X	X
Treasury Oversight Committee	X	
Finance/Investment Committee	X	
Staff Accountants		
Auditors: Internal and External		
Investment Advisors	X	

Selected Government Codes Dealing with Responsibilities & Liabilities : 820, 1708, 1714, 3060, 41006, 53679

Checks and Balances...Internal Controls...Legal vs. Suitable

Orange County 1994



1995 Wymer Fraud Institutional Treasury Management



1995 Vista

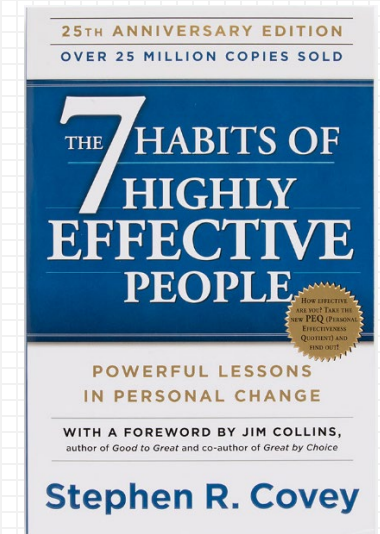
- Experienced Finance Director invested the portfolio
- Began taking gratuities from broker
- Invested in interest-only strips, equity mutual funds and limited partnerships
- Finance Director pleads guilty to fraud after millions in losses



Terms, Concepts, and Principles

The 7 Habits of Highly Effective Investment Programs

1. **You Have a Detailed Asset/Liability Matching Model** (aka: Cash Flow Model)
2. **You Have a Responsible Amount of Interest Rate Risk and Credit Risk**
3. **You Don't Try to Time the Market**
4. **You Love Losses and Hate Gains** (the unrealized kind)
5. **You Follow GAAP** (Generally Accepted Accounting Principles)
6. **You Benchmark Your Investment Program and Portfolio in Multiple Ways**
7. **You Provide Quality, Timely, Transparent Reporting**



Terms, Concepts, and Principles

The Investment Portfolio is the Only Area of State and Local Governments Where Income Can Be Generated Without Charging Taxes or Fees to the Citizenry



Financial Markets Overview



Details of Debt Instruments



Time Value of Money



Relationship of Risk and Return

Financial Markets Overview: Purposes of Capital

Barter



System

Suppliers of Capital:
Retail Investors &
Institutional Investors

**Capital Markets Channel:
Savings & Investments**

Users of Capital:
Businesses,
Governments &
Individuals

Primary Markets and Secondary Markets

Financial Markets Overview: Market Sectors

- Fixed Income
- Equity
- Foreign Exchange
- Commodities
- Futures
- Derivatives
- Interbank Lending
- Cryptocurrency



Types of Financial Markets: Exchanges

Exchange:

- **Examples: NYSE, CME, CBOE**
- **Highly organized market**
- **Centrally-cleared trades**
- **Securities: equities, commodities, forex, futures, and options**
- **Standardized instruments**
- **High degree of transparency and trades are publicly disseminated**
- **Typically a higher degree of liquidity in exchange-traded securities**



Types of Financial Markets: Over-the-Counter

- **Examples:** Bonds, swaps, credit default swap, bulletin board stocks, derivatives
- **Transactions done directly between two parties**
- **Market makers in OTC drive liquidity**
- **Allows for customization of securities to fit both parties' needs**
- **Exposure to counterparty risk**



Financial Markets Overview: Regulation



Time Value of Money: “I Want More Money and I Want It Sooner”

Future Value

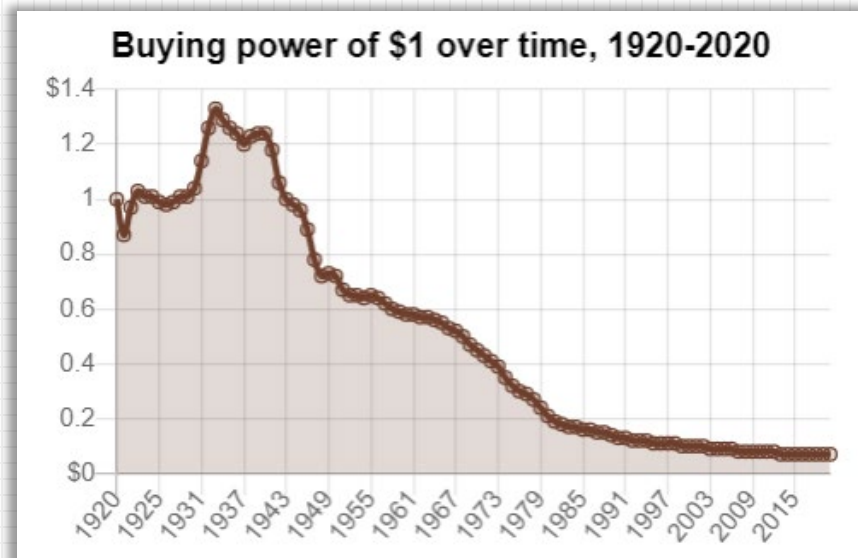
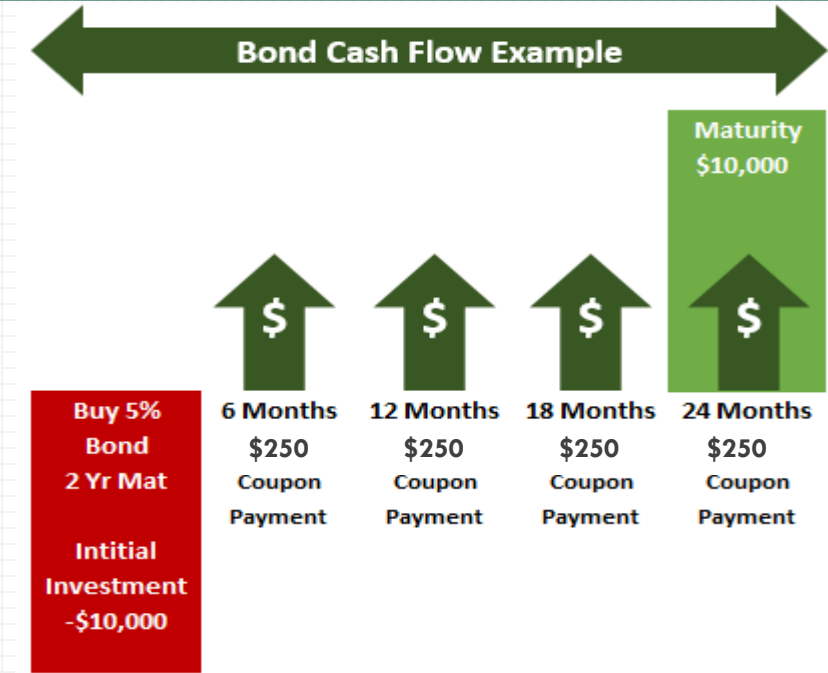
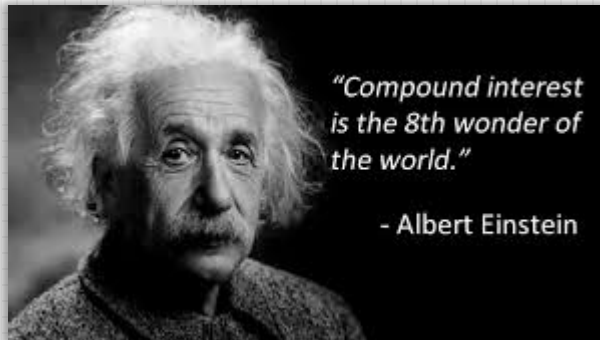
$\text{Present Value} \times (1 + \text{Interest Rate } 5\%) = \text{Future Value}$
 $\$100 \times 1.05 = \105

Present Value

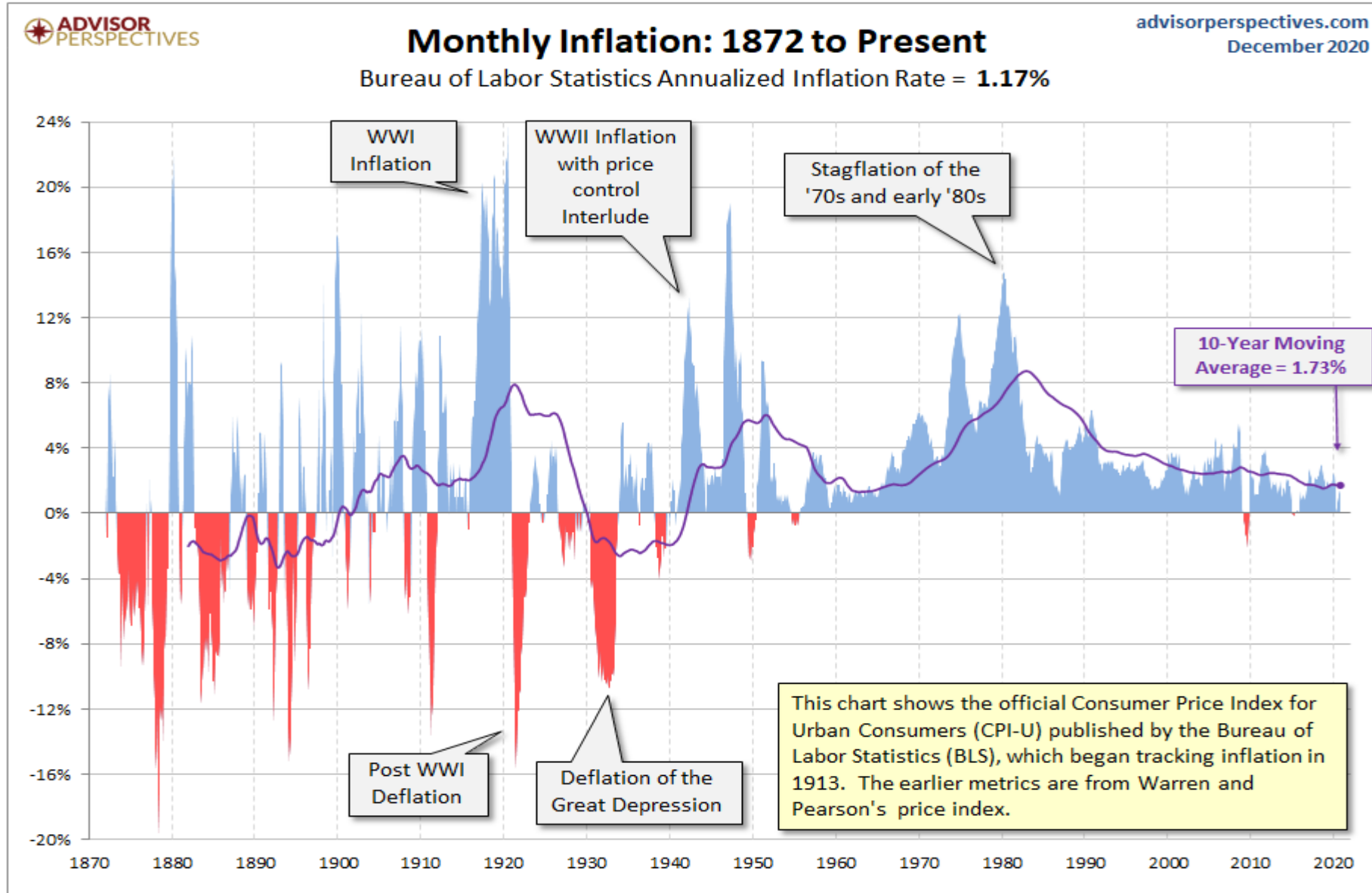
$\text{Future Value} / (1 + \text{Interest Rate } 5\%) = \text{Present Value}$
 $\$105 / 1.05 = \100

Compounding

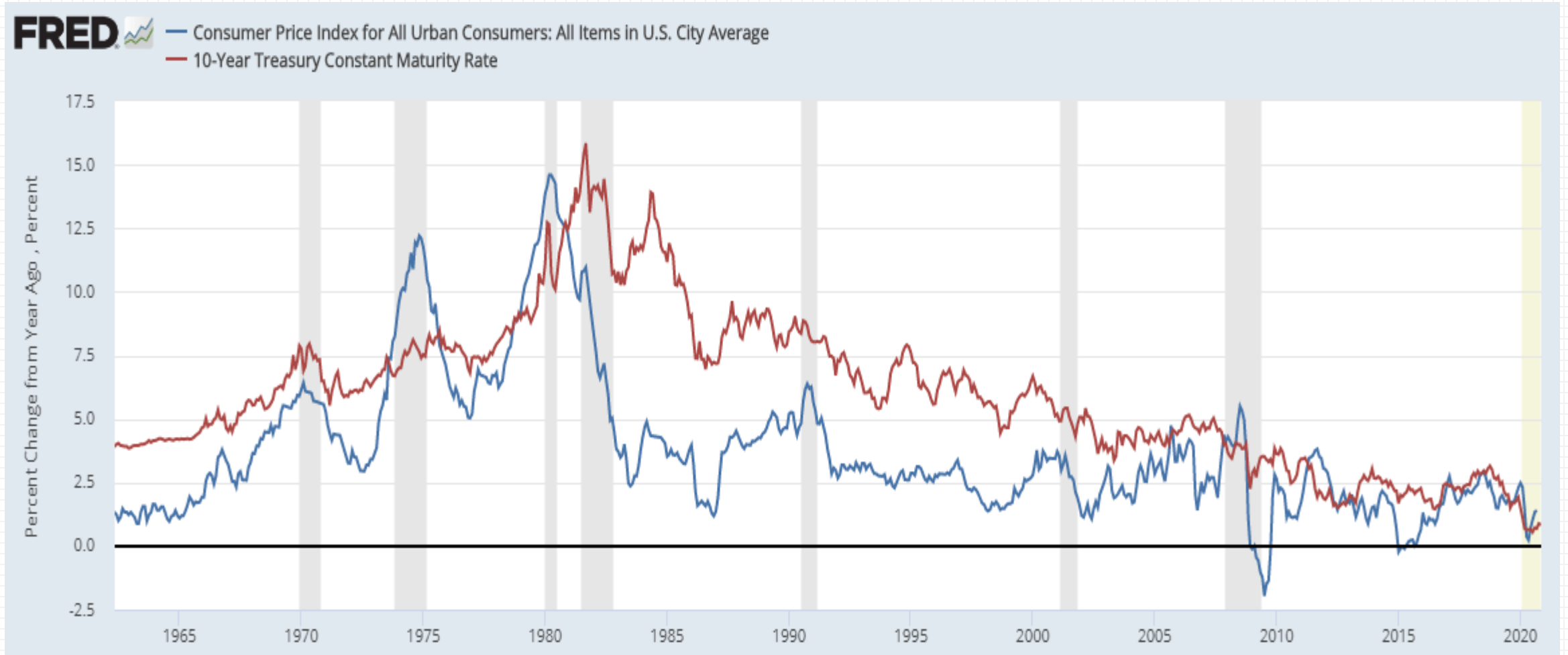
$\text{Present Value} \times (1 + \text{Interest Rate})^{\# \text{ of Periods}} = \text{FV}$
 $\$100 \times (1.025)^2 = \105.0625



Time Value of Money: Inflation



Time Value of Money: Inflation vs. Rates



Time Value of Money: Rates in the “Upside Down”

Selected Developed Countries' Global Sovereign Yields % (sorted by 10-Year Yields)								
Country	Policy Rate	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	30-Year
Germany	-0.50	-0.76	-0.79	-0.85	-0.82	-0.75	-0.64	-0.24
Switzerland	-0.75	-0.98	-0.86	-0.85	-0.82	-0.77	-0.64	-0.42
Austria	-0.50	-0.73	-0.77	-0.76	-0.75	-0.68	-0.49	0.01
Finland	-0.50	-0.86	-0.79	-0.77	-0.75	-0.64	-0.46	-0.11
Belguim	-0.50	-0.70	-0.79	-0.77	-0.73	-0.61	-0.07	0.27
France	-0.50	-0.70	-0.75	-0.76	-0.71	-0.61	-0.39	0.30
Portugal	-0.50	-0.66	-0.75	-0.64	-0.49	-0.31	-0.04	0.66
Spain	-0.50	-0.68	-0.64	-0.61	-0.44	-0.30	0.00	0.81
Japan	-0.10	-0.15	-0.16	-0.15	-0.13	-0.11	0.01	0.61
United Kingdom	0.10	-0.08	-0.13	-0.13	-0.10	-0.01	0.17	0.71
Italy	-0.50	-0.48	-0.45	-0.30	-0.02	0.20	0.56	1.42
Canada	0.25	0.20	0.25	0.30	0.44	0.51	0.71	1.26
Isreal	0.10	0.01	0.08	0.21	0.30	0.49	0.86	1.96
New Zealand	0.25	0.11	0.20		0.28	0.46	0.86	
United States	0.25	0.08	0.12	0.17	0.37	0.63	0.90	1.63
Australia	0.10	0.03	0.08	0.10	0.34	0.59	0.98	1.95
South Korea	0.50	0.56	0.86	0.97	1.34		1.66	1.75

As of: 12/12/20

Details of Debt Instruments: Types

- **U.S. Treasury Obligations**
- **U.S. GSE/Federal Agency Obligations**
- **Commercial Paper**
- **Certificates of Deposit (Negotiable/Non-Negotiable)**
- **Corporate Securities**
- **Certificates of Deposit Placement Services**
- **Time Deposits**
- **Bank Deposits**
- **Bankers' Acceptances**
- **Money Market Mutual Funds**
- **Mutual Funds**
- **Local Government Investment Pools**
- **Joint Power Authority Pools**
- **Mortgage-Backed Securities**
- **Asset-Backed Securities**
- **Repurchase Agreements**
- **Municipal Securities**
- **Supranational Securities**
- **Securities Lending/Reverse Repurchase Agreements**
- **Guaranteed Investment Contracts/Collateralized Investment Agreements**
- **Foreign Securities**
- **Futures**

Details of Debt Instruments: Structures – Discount

Issuer Information		Identifiers	
Name	TREASURY BILL	ID Number	9127965G0
Industry	Treasury (BCLASS)	CUSIP	9127965G0
Security Information		ISIN	US9127965G05
Issue Date	12/03/2020	SEDOL 1	BMHSTG9
Interest Accrues		FIGI	BBG00YC67P41
1st Coupon Date		Issuance & Trading	
Maturity Date	12/02/2021	Disc @ Issue	.110000
Floater Formula	N.A.	Risk Factor	.966
Workout Date		Amount Issued	38988 (MM)
		Amount Outstanding	38988 (MM)
Cpn Frequency		Minimum Piece	100
Mty/Refund Type	NORMAL	Minimum Increment	100
Calc Type	DISCOUNT	SOMA Holdings	12.79
Day Count	ACT/360		
Market Sector	US GOVT		
Country	US	Currency	USD
TENDERS ACCEPTED: \$34001MM.			

Trader	RICK PHILLIPS		
At	FHN FINANCIAL MAIN STREET ADV LLC		
		CUSIP	9127965G0
		NYSE SYMB	N.A.
BUY	1000 M	of B	12/02/21
Discount	0.989011	Yield	1.010331
Price	99.00000000	Round	
Settlement	12/02/20		
Ratings	S&P N.A.	Moody's N.A.	Fitch N.A.
Notes			
Trade Numbers			
View Amounts in	USD		
Total Cost	USD 990,000.00		

Details of Debt Instruments: Structures – Fixed Rate

Issuer Information		Identifiers	
Name	US TREASURY N/B	ID Number	91282CAX9
Industry	Treasury (BCLASS)	CUSIP	91282CAX9
Security Information		ISIN	US91282CAX92
Issue Date	11/30/2020	SEDOL 1	BLH34M8
Interest Accrues	11/30/2020	FIGI	BBG00Y9116P1
1st Coupon Date	05/31/2021	Issuance & Trading	
Maturity Date	11/30/2022	Issue Price	99.920165
Floater Formula	N.A.	Risk Factor	1.959
Workout Date	11/30/2022	Amount Issued	63769 (MM)
Coupon	.125	Amount Outstanding	63769 (MM)
Cpn Frequency	S/A	Minimum Piece	100
Mty/Refund Type	NORMAL	Minimum Increment	100
Calc Type	STREET CONVENTION	SOMA Holdings	12.18
Day Count	ACT/ACT		
Market Sector	US GOVT		
Country	US	Currency	USD
TENDERS ACCEPTED: \$56000MM.			

Trader	RICK PHILLIPS				
At	FHN FINANCIAL MAIN STREET ADV LLC			CUSIP	91282CAX9
				NYSE SYMB	N.A.
BUY	1000	M	of T 0 1/8	11/30/22	Issuer US TREASURY
					Dated 11/30/20
Price	100-01	Yield	0.109047		Round Price
Settlement	12/14/20	(T+1 for calendar 'US')			
Ratings	S&P N.A.	Moody's	Aaa	Fitch	N.A.
Notes					
Trade Numbers					
View Amounts in USD					
Principal		USD	1,000,312.50		
Accrued	(14 days)		48.08		
Total		USD	1,000,360.58		

Cash Flows		Present Values		Distressed Analysis	
Price	100-01	Settlement	12/14/20	Issue	11/30/2020
Yield	0.109047	to Worst	11/30/22	Maturity	11/30/2022
				Face Amt	1000 M
Payment Date	Interest	Principal	Total		
05/31/2021	625.00	0.00	625.00		
11/30/2021	625.00	0.00	625.00		
05/31/2022	625.00	0.00	625.00		
11/30/2022	625.00	1,000,000.00	1,000,625.00		

Details of Debt Instruments: Structures – Floating Rate

Issuer Information				Identifiers	
Name	FARMER MAC			ID Number	BM7425390
Industry	Government Sponsored (BCLASS)			CUSIP	31422B3T5
Security Information				ISIN	UN31422B3T56
Mkt Iss	DOMESTIC MTN			Bond Ratings	
Country	US	Currency	USD		
Rank	Unsecured	Series			
Coupon		Type	Floating		
Formula	O/N SOFR +3.0000				
Day Cnt	ACT/360	Iss Price	100.00000		
Maturity	09/01/2021				
BULLET					
Iss Sprd					
Calc Type	(1421)FLOAT RATE NOTE				
Pricing Date	11/24/2020				
Interest Accrual Date	12/01/2020				
1st Settle Date	12/01/2020				
1st Coupon Date	03/01/2021				
Issuance & Trading					
Amt Issued/Outstanding					
USD		20,000.00 (M) /			
USD		20,000.00 (M)			
Min Piece/Increment					
1,000.00 / 1,000.00					
Par Amount		1,000.00			
Book Runner		MIZ-sole			
Exchange		NOT LISTED			

Coupon Information				
Benchmark	SOFRRATE	Benchmark Freq	O/N	
Fix Frequency	Daily	Next Coupon Date	03/01/2021	
Paying Agent		Prev Coupon Date	12/01/2020	
Pay Calendars	US	Cap	Floor	
Refix Calendars	GT	Margin	+3	Reset Days Prior 1
First Irreg Cpn	Normal	Current Coupon	.11	Lockout 2
Last Irreg Cpn	Normal	Cpn Conv	Foll-Unad...	Cpn Freq Quarterly
<input checked="" type="radio"/> Table View <input type="radio"/> Chart View				
Past Coupon Resets			Margin History	
Accrual Start	Rate		Date	Margin
12/12/2020				
12/11/2020	0.11000			
12/10/2020	0.11000			
12/09/2020	0.10000			
12/08/2020	0.11000			
12/05/2020	0.12000			
12/04/2020	0.11000			

Details of Debt Instruments: Structures – Floating Rate



Details of Debt Instruments: Structures – Fixed to Float

Issuer Information				Identifiers	
Name	WELLS FARGO BANK NA			ID Number	ZS7547194
Industry	Banking (BCLASS)			CUSIP	94988J5X1
Security Information				ISIN	US94988J5X19
Mkt Iss	Global			Bond Ratings	
Country	US	Currency	USD	Moody's	Aa2
Rank	Sr Unsecured	Series	BKNT	S&P	A+
Coupon	2.897000	Type	Variable	Fitch	AA-
Cpn Freq	S/A			DBRS	AA
Day Cnt	30/360	Iss Price	100.00000	Issuance & Trading	
Maturity	05/27/2022			Amt Issued/Outstanding	
CALL 05/27/21@100.00				USD	1,100,000.00 (M) /
Iss Sprd	+68.00bp vs T 2 1/4 04/30/21			USD	1,100,000.00 (M)
Calc Type	(1010)FIX-TO-FLOAT BONDS			Min Piece/Increment	
Pricing Date	05/20/2019			250,000.00 / 1,000.00	
Interest Accrual Date	05/28/2019			Par Amount	1,000.00
1st Settle Date	05/28/2019			Book Runner	WFS
1st Coupon Date	11/27/2019			Reporting	TRACE
CALLABLE ON 5/27/21					

FRN Coupon Formula					
Date	Formula	Day Count	Freq	Cap	Floor
05/28/2019	2.897000% Fixed	30/360	S/A		
05/27/2021	US0003M +0.610000%	ACT/360	QTL		

Details of Debt Instruments: Structures – Callable



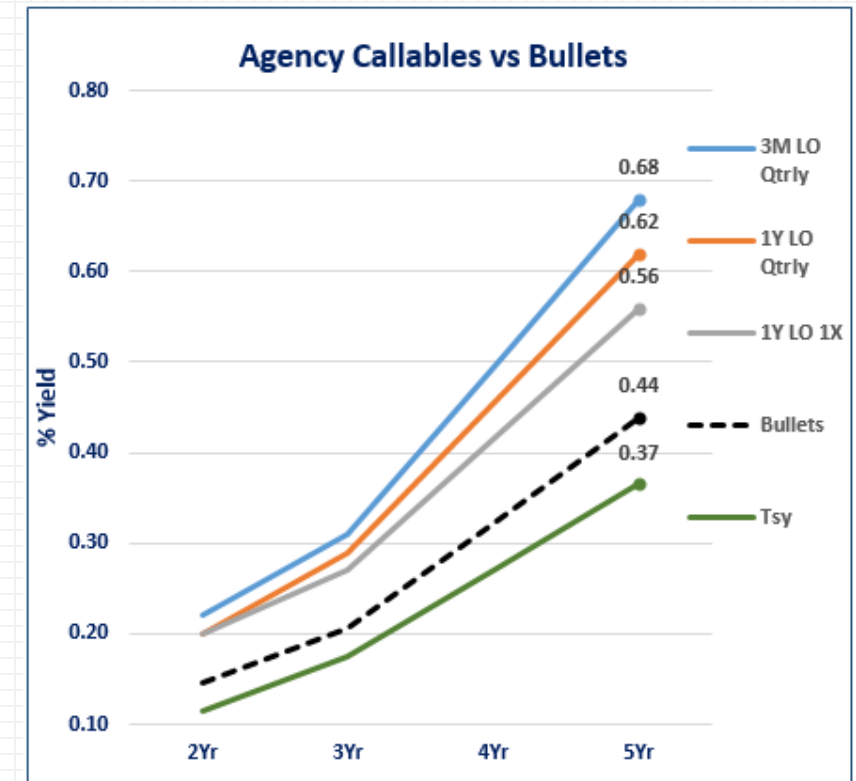
Details of Debt Instruments: Structures – Callable

When you purchase a callable bond, you are selling a call option to the issuer. This gives them the right to call the bond when it is advantageous for them, not you.

5 Year Securities: Callables' Lockouts 1 Year

Instrument	Number of Calls	Yield
Treasury	0	.37%
Agency/GSE Bullet	0	.44%
One-Time Call	1	.56%
Discrete Call (quarterly)	15	.62%
Continuous Call*	1,450	.72%

*10 Day Call Notice



Structure	Bullet	1X	1Y Qtrly	Qtrly
# of Calls	0	1	15	19

Over the long run, bullets (non-callables) have outperformed callables.

Details of Debt Instruments: Structures – Callable (Yield to Call)

Buy Callable at a Premium

FNMA 0 ⁵/₈ 12/30/25 Corp

Settings ▾

Yield and Spread Analysis

No Notes

95 Buy

90 Sell

1) Yield & Spread

2) Yields

3) Graphs

4) Pricing

5) Description

6) Custom

7) Calls

Settlement Date 12/30/20

Price 101.00

Blend

Full Screen

YTC (3135GABA8)

Date

Price

Yield

Yield to Maturity 12/30/2025 100.00 0.4227

Yield to Custom 06/30/2021 100.00 -1.3614

Yield to Next Call 06/30/2021 100.00 -1.3614

Yield to Worst Call 06/30/2021 100.00 -1.3614

May be called quarterly starting 06/30/2021

Date

Price

Yield

Treas Crv

Spr

Adj Dur

Risk

06/30/21 100.0000 -1.3614 0.077 -1.438 0.503 0.508

09/30/21 100.0000 -0.7027 0.079 -0.782 0.752 0.759

12/31/21 100.0000 -0.3722 0.084 -0.456 1.000 1.010

03/31/22 100.0000 -0.1738 0.092 -0.266 1.248 1.260

06/30/22 100.0000 -0.0414 0.101 -0.142 1.496 1.511

09/30/22 100.0000 0.0532 0.109 -0.056 1.743 1.760

12/31/22 100.0000 0.1242 0.120 0.004 1.989 2.009

03/31/23 100.0000 0.1795 0.134 0.045 2.236 2.258

06/30/23 100.0000 0.2237 0.148 0.075 2.482 2.507

09/30/23 100.0000 0.2598 0.163 0.097 2.727 2.754

Buy Callable at a Discount

FNMA 0 ⁵/₈ 12/30/25 Corp

Settings ▾

Yield and Spread Analysis

No Notes

95 Buy

90 Sell

1) Yield & Spread

2) Yields

3) Graphs

4) Pricing

5) Description

6) Custom

7) Calls

Settlement Date 12/30/20

Price 99.00

Blend

Full Screen

YTC (3135GABA8)

Date

Price

Yield

Yield to Maturity 12/30/2025 100.00 0.8296

Yield to Custom 06/30/2021 100.00 2.6515

Yield to Next Call 06/30/2021 100.00 2.6515

Yield to Worst Call 12/30/2025 100.00 0.8296

May be called quarterly starting 06/30/2021

Date

Price

Yield

Treas Crv

Spr

Adj Dur

Risk

06/30/21 100.0000 2.6515 0.077 2.575 0.493 0.489

09/30/21 100.0000 1.9753 0.079 1.896 0.742 0.734

12/31/21 100.0000 1.6373 0.084 1.553 0.990 0.980

03/31/22 100.0000 1.4353 0.092 1.343 1.238 1.226

06/30/22 100.0000 1.3004 0.101 1.200 1.486 1.471

09/30/22 100.0000 1.2043 0.109 1.095 1.733 1.715

12/31/22 100.0000 1.1321 0.120 1.012 1.979 1.960

03/31/23 100.0000 1.0761 0.134 0.942 2.226 2.203

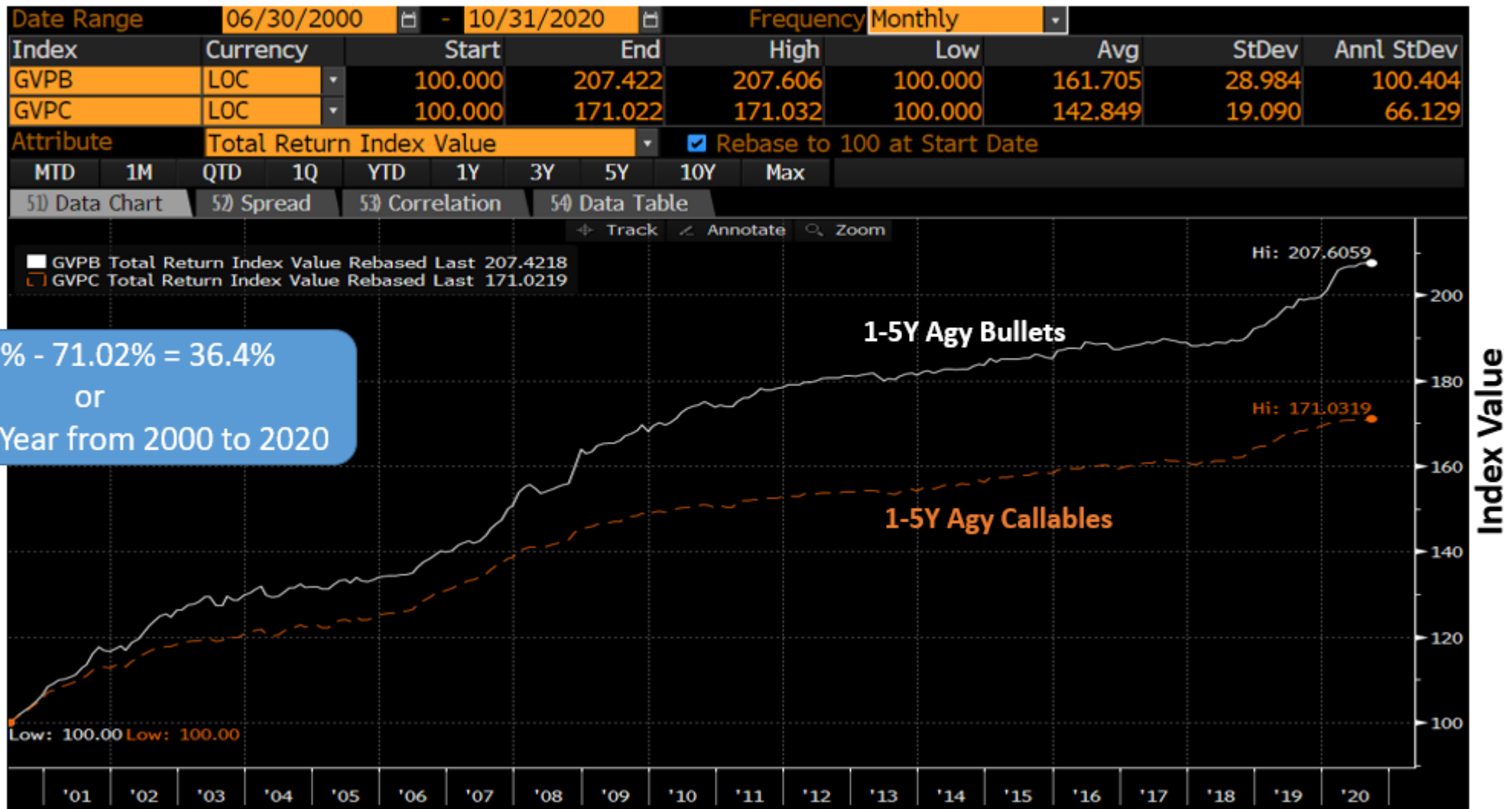
06/30/23 100.0000 1.0312 0.148 0.883 2.472 2.447

09/30/23 100.0000 0.9946 0.163 0.832 2.717 2.690

Callable Bonds Have Large Reinvestment Risk

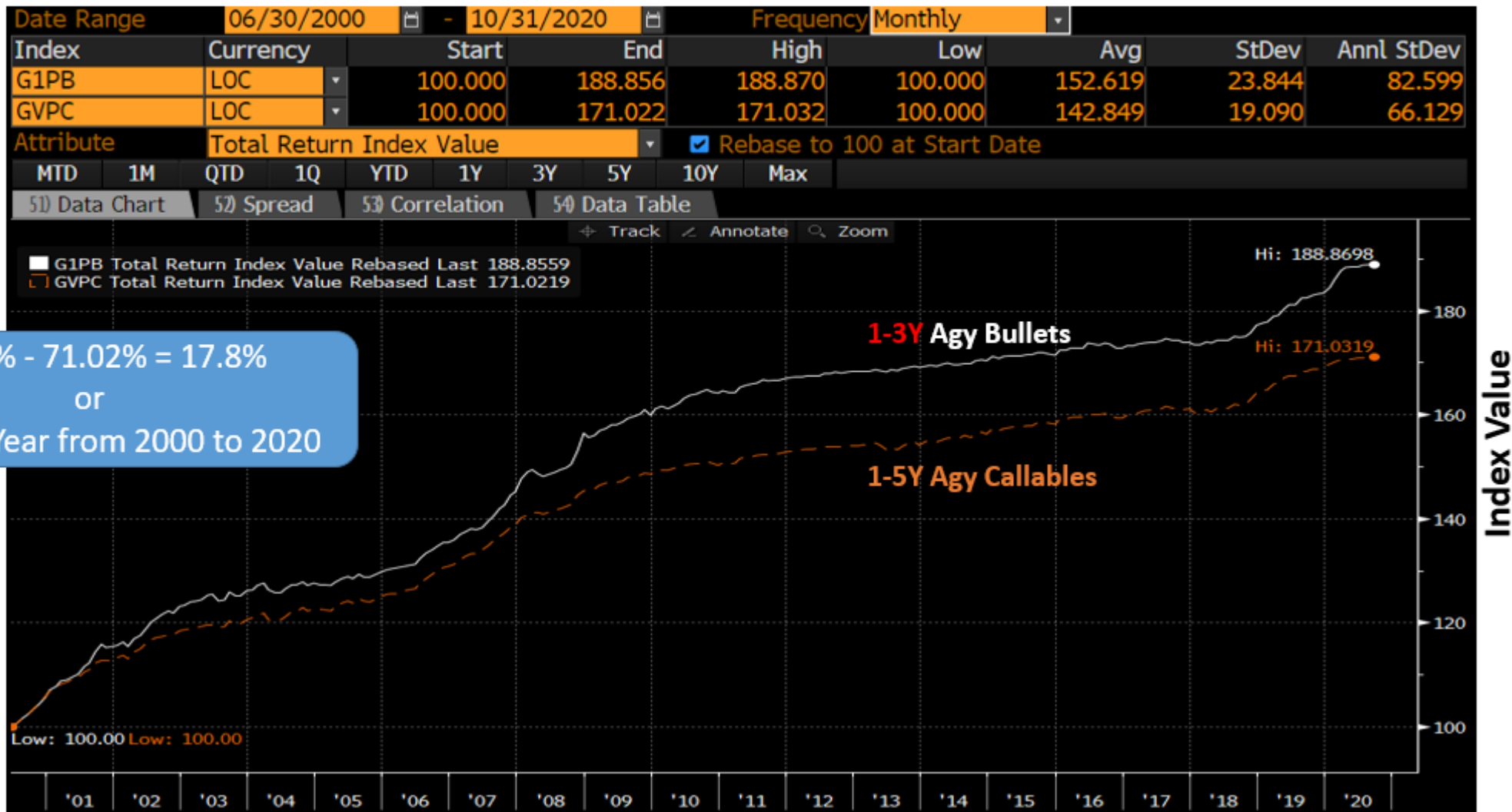
Details of Debt Instruments: Structures – Callables vs. Bullets

Bullets vs. Callables Return Comparison



Details of Debt Instruments: Structures – Callables vs. Bullets

Bullets vs. Callables Return Comparison

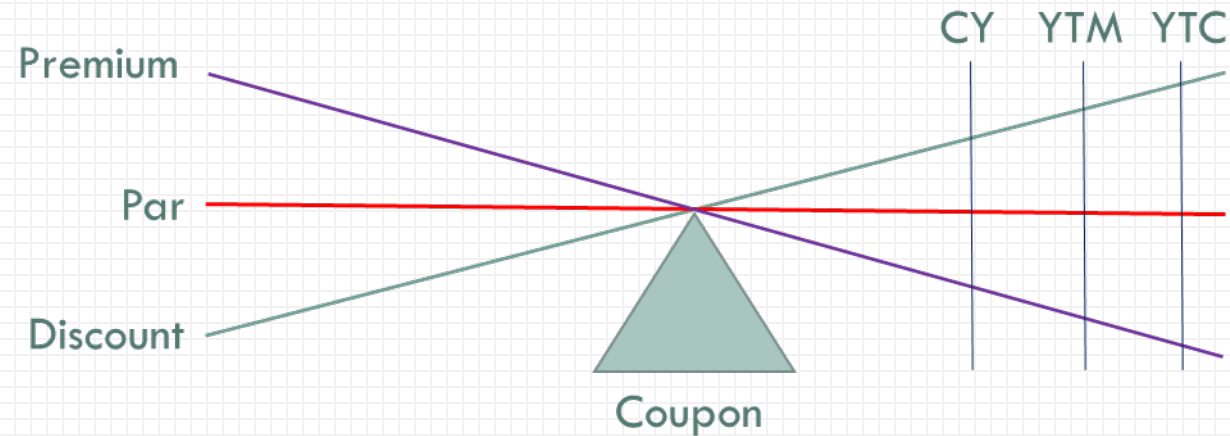


88.86% - 71.02% = 17.8%

or

.89% Per Year from 2000 to 2020

Relationship of Risk and Return: Interest Rate Risk...aka: Duration



Current Yield (CY) = Annual Coupon Payments / Current Bond Price

Yield To Maturity (YTM) = Discount rate derived in DCF calculation; the market rate of return

Yield To Call (YTC) = Similar to YTM calculation, but using first call date as the maturity date and the call price as the redemption amount

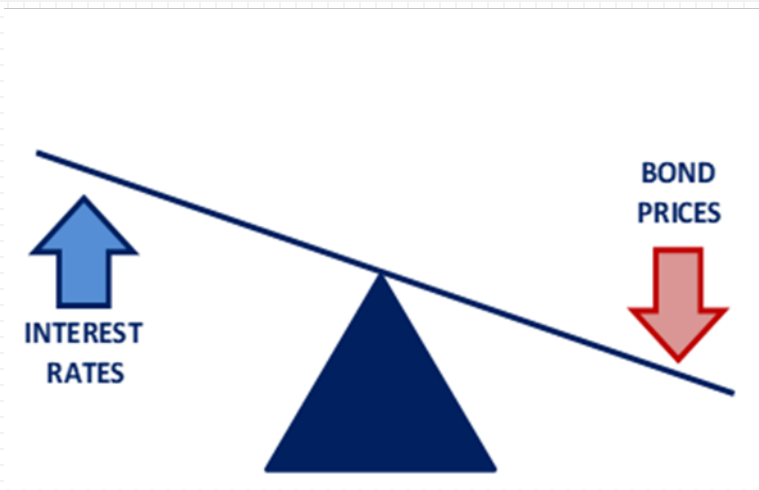
Yield To Worst (YTW) = The lower of YTM or YTC

Relationship of Risk and Return: Interest Rate Risk and Credit Risk



Which Risk Has the
Largest Long-Term
Impact on My
Investment Income?

Interest Rate Risk



Credit Risk



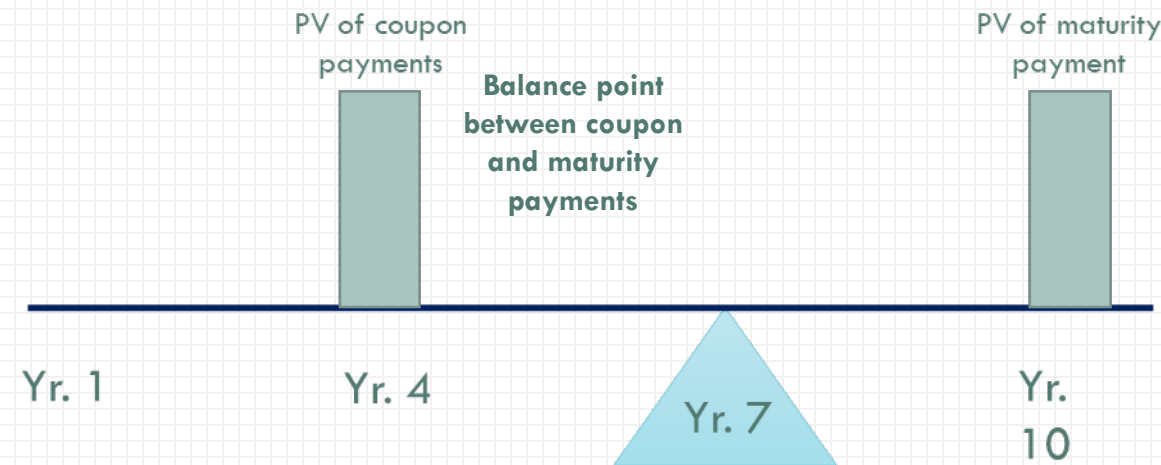
Relationship of Risk and Return: Interest Rate Risk...aka: Duration

Duration: A measure of the timing of the cash flows, such as the interest payments and the principal repayment, to be received from a given fixed income security. This calculation is based on three variables: term to maturity, coupon rate, and yield to maturity. The duration of a security is a useful indicator of its price volatility for given changes in interest rates. There are three primary types of duration: Macaulay Duration, Modified Duration, and Effective Duration.

- **Macaulay Duration** was developed in 1938 by Frederic Macaulay, this form of duration measures the number of years required to recover the true cost of a bond, considering the present value of all coupon and principal payments received in the future. Thus, it is the only type of duration quoted in “years.” Interest rates are assumed to be continuously compounded.
- **Modified Duration** expands or modifies Macaulay duration to measure the responsiveness of a bond’s price to interest rate changes. It is defined as the percentage change in price for a 100 basis point change in interest rates. The formula assumes that the cash flows of the bond do not change as interest rates change (which is not the case for most callable bonds).
- **Effective Duration** (sometimes called option-adjusted duration) further refines the modified duration calculation and is particularly useful when a portfolio contains callable securities. Effective duration requires the use of a complex model for pricing bonds that adjusts the price of the bond to reflect changes in the value of the bond’s “embedded options” (e.g., call options or a sinking fund schedule) based on the probability that the option will be exercised. Effective duration incorporates a bond’s yield, coupon, final maturity and call features into one number that indicates how price-sensitive a bond or portfolio is to changes in interest rates.

Relationship of Risk and Return: Interest Rate Risk...aka: Duration

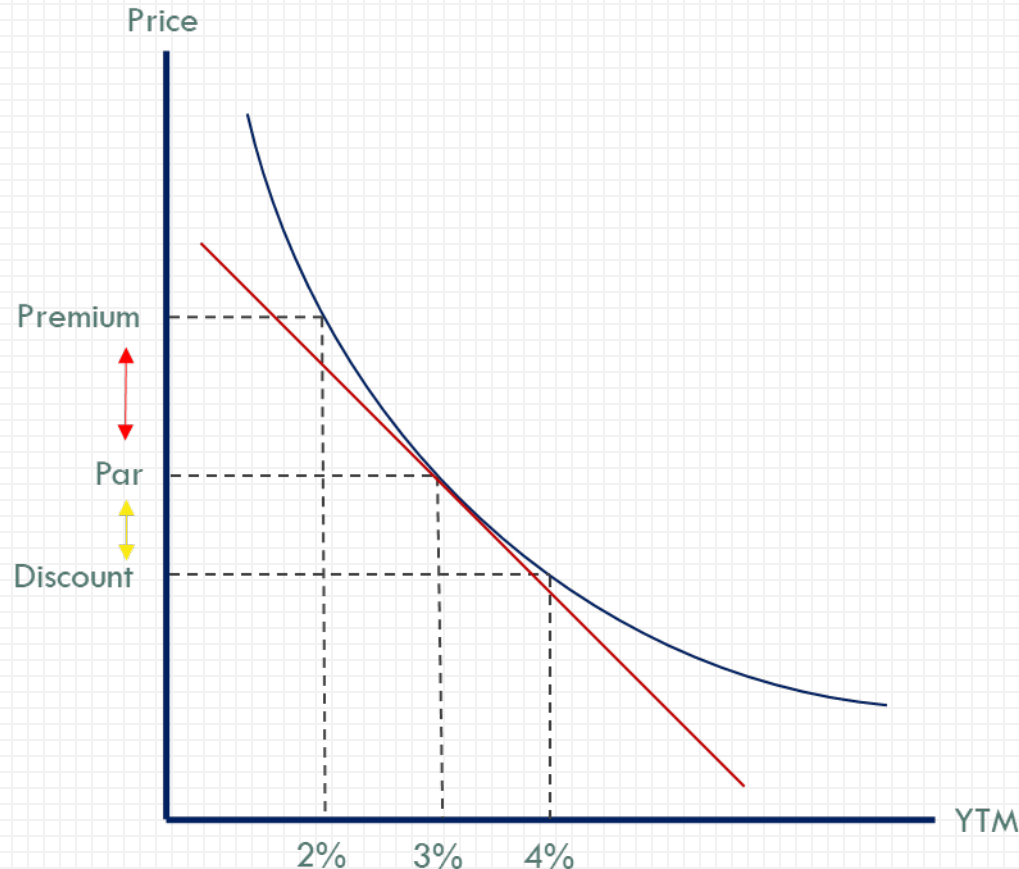
- **Duration** is the holding period at which the present value of the periodic interest payments is the same as the present value of the maturity payment



- At this point in time, investors are 'immune' to a change in interest rates because reinvesting coupon payments will exactly offset the change in present value of the maturity payment

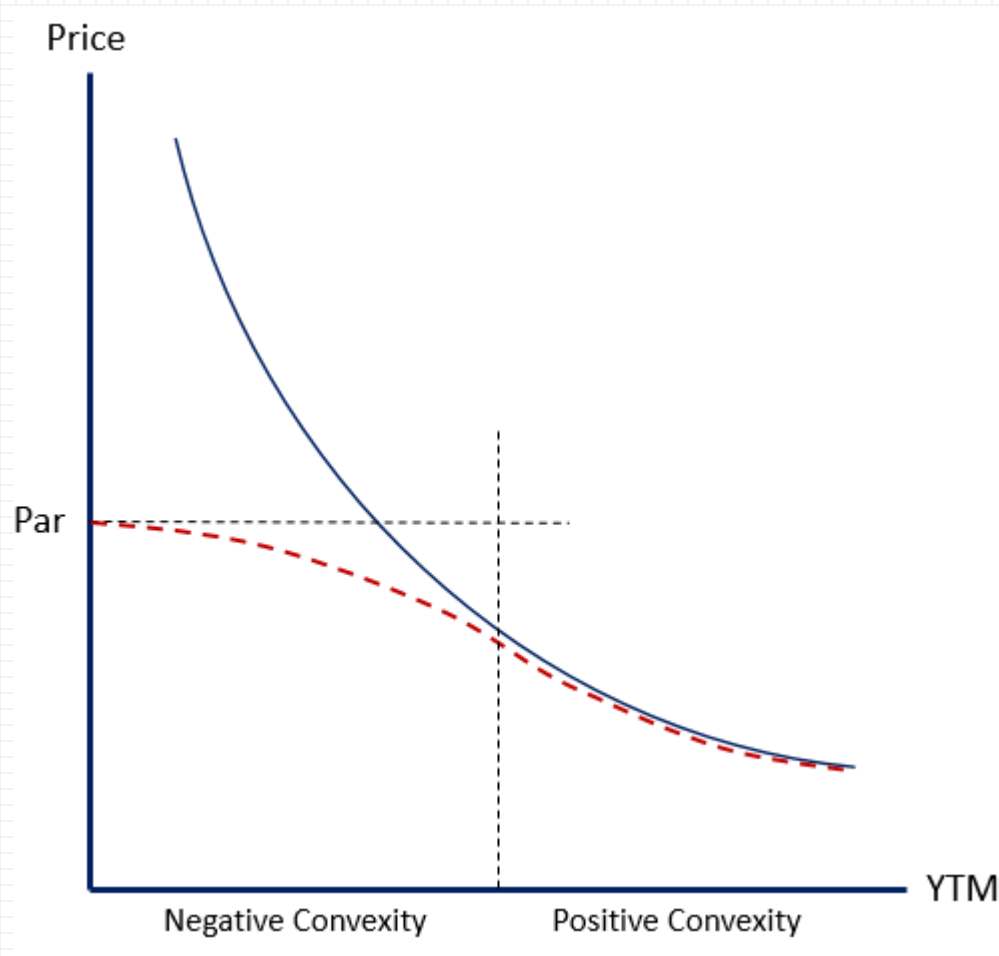
Relationship of Risk and Return: Interest Rate Risk – Convexity

$$\Delta \text{Bond Price} \approx -\text{Modified Duration}(\Delta \text{YTM}) + \frac{1}{2} \text{Convexity}(\Delta \text{YTM})^2$$



- Because duration is a linear assumption, it miscalculates the change in the price of a bond given a change in the yield to maturity
- Duration underestimates the bond price when yields fall and overestimates the bond price when yields rise
- Convexity measures the curvature of the price/yield relationship of a bond
- One can better estimate the change in price, given a change in the yield to maturity, by adding a convexity adjustment to the previous formula

Relationship of Risk and Return: Interest Rate Risk – Convexity/Callables



- As interest rates drop, callable bonds become (more) negatively convex and duration decreases
- If the bond's coupon is higher than a comparable bullet security, the issuer will call back the bond and the investor will have to reinvest at lower rates
- As interest rates rise, callable bonds act like normal bullet bonds and may become positively convex

Relationship of Risk and Return: Yield Curve Sweet Spot

Benchmark Treasury Modified Sharp Ratio Analysis
1/31/1990 to 12/31/2019

Maturity	Avg Yield	Avg Duration	Modified Sharp Ratio	% Return of 10Yr / % 10Yr Risk
3 Mon T-Bill	2.71	0.24		61% / 3%
6 Mon T-Bill	2.84	0.48	0.269	64% / 6%
1 Yr T-Bill	2.97	0.97	0.263	67% / 12%
Sweet Spot 2 Yr T-Note	3.26	1.90	0.291	74% / 24%
3 Yr T-Note	3.48	2.85	0.269	79% / 36%
5 Yr T-Note	3.87	4.45	0.260	88% / 56%
10 Yr T-Note	4.41	7.96	0.214	100% / 100%

$(\text{Avg Yield} - \text{Risk Free Yield}) / \text{Avg Duration} = \text{MSR}$

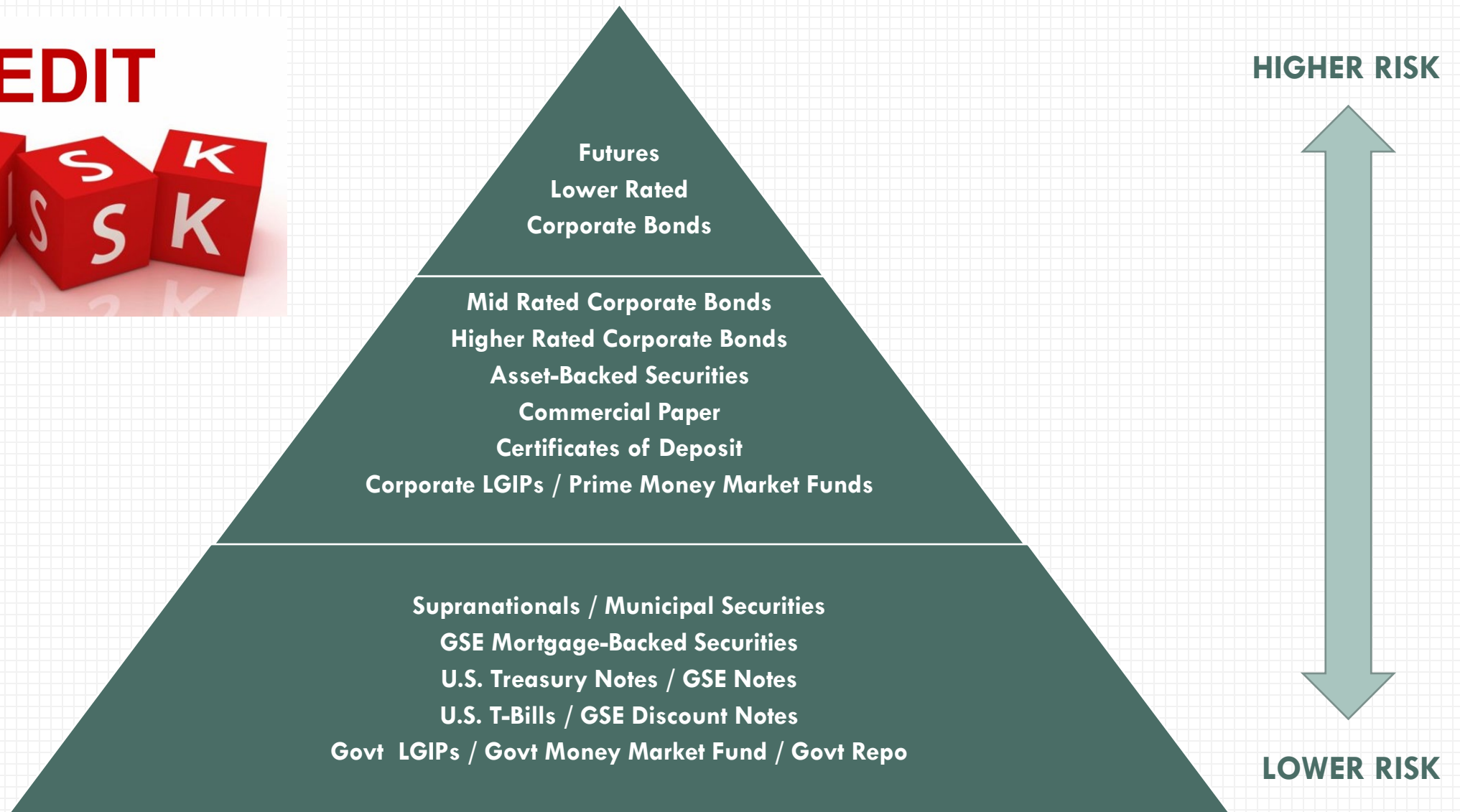
$(3.26\% \text{ 2Y} - 2.71\% \text{ 3M}) / 1.90 \text{ 2Y} = .291$

3.26% 2Y / 4.47% 10Y = 74% 1.90 2Y / 7.96 10Y = 24%
Yield Comparison Duration Comparison

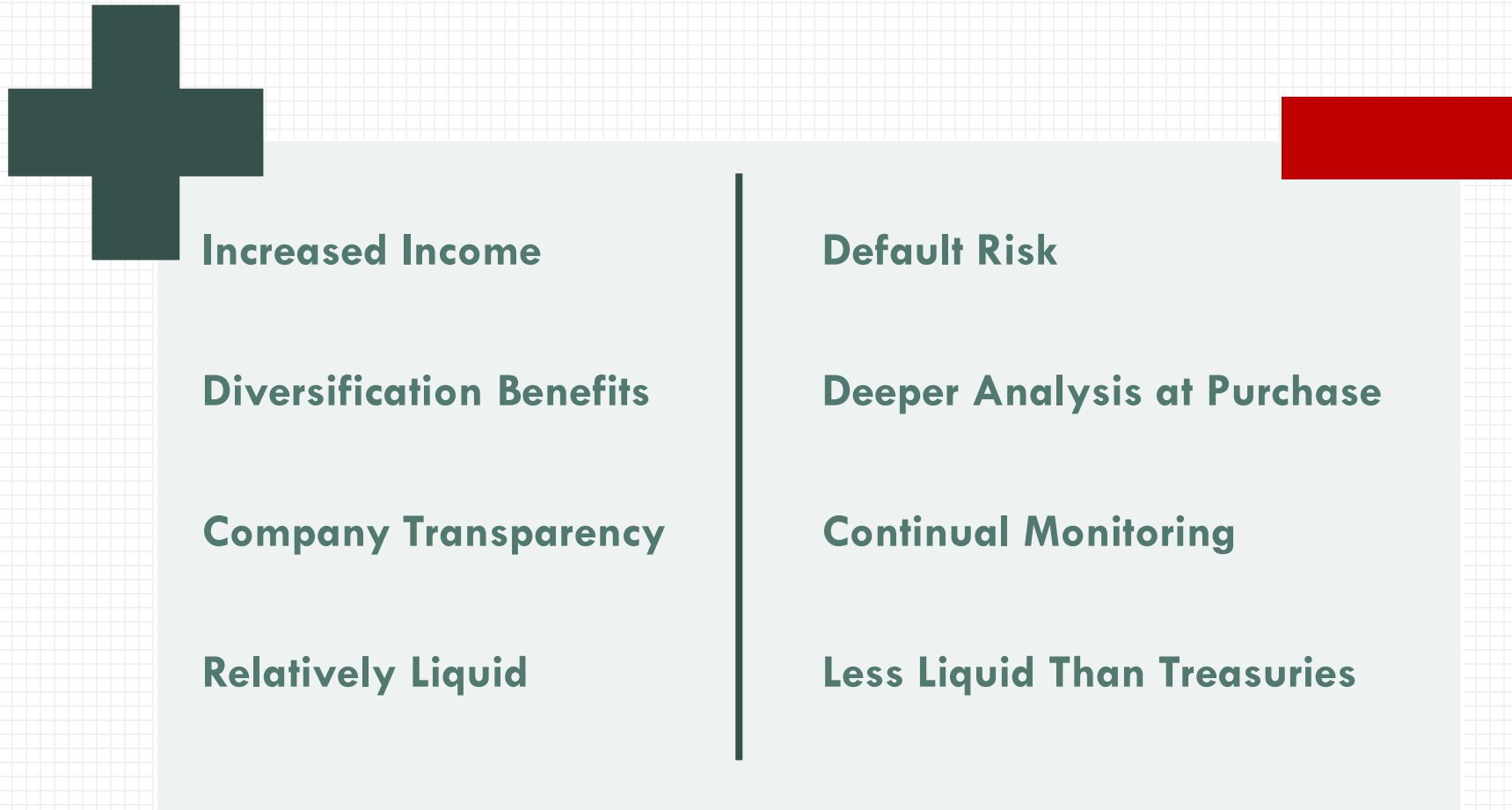
Average U.S. Treasury Curve 1990 to Present



Relationship of Risk and Return: Credit Risk



Relationship of Risk and Return: Credit Risk – Pros/Cons

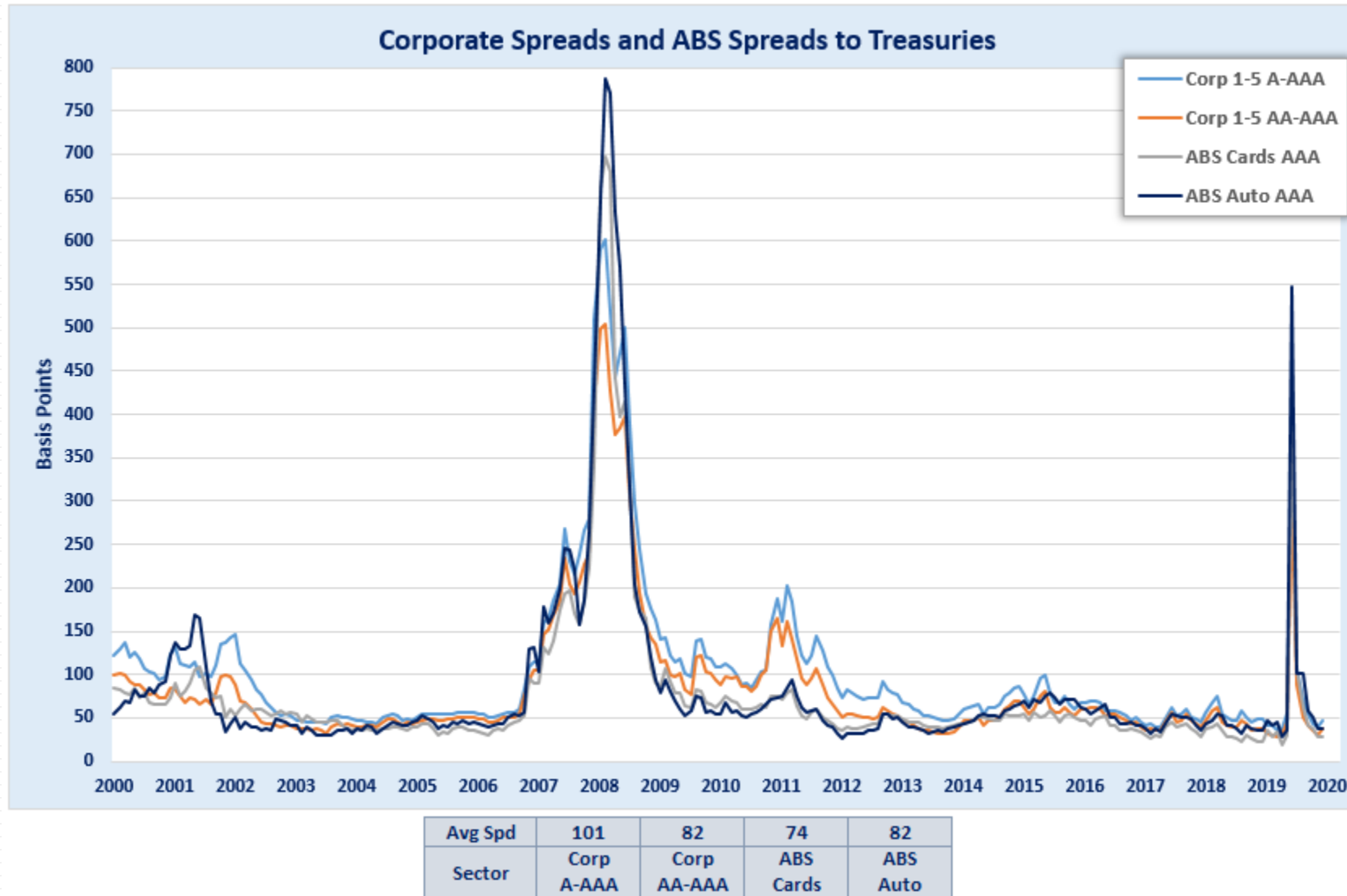


Relationship of Risk and Return: Credit Rate Risk – Yield Curve Tradeoffs

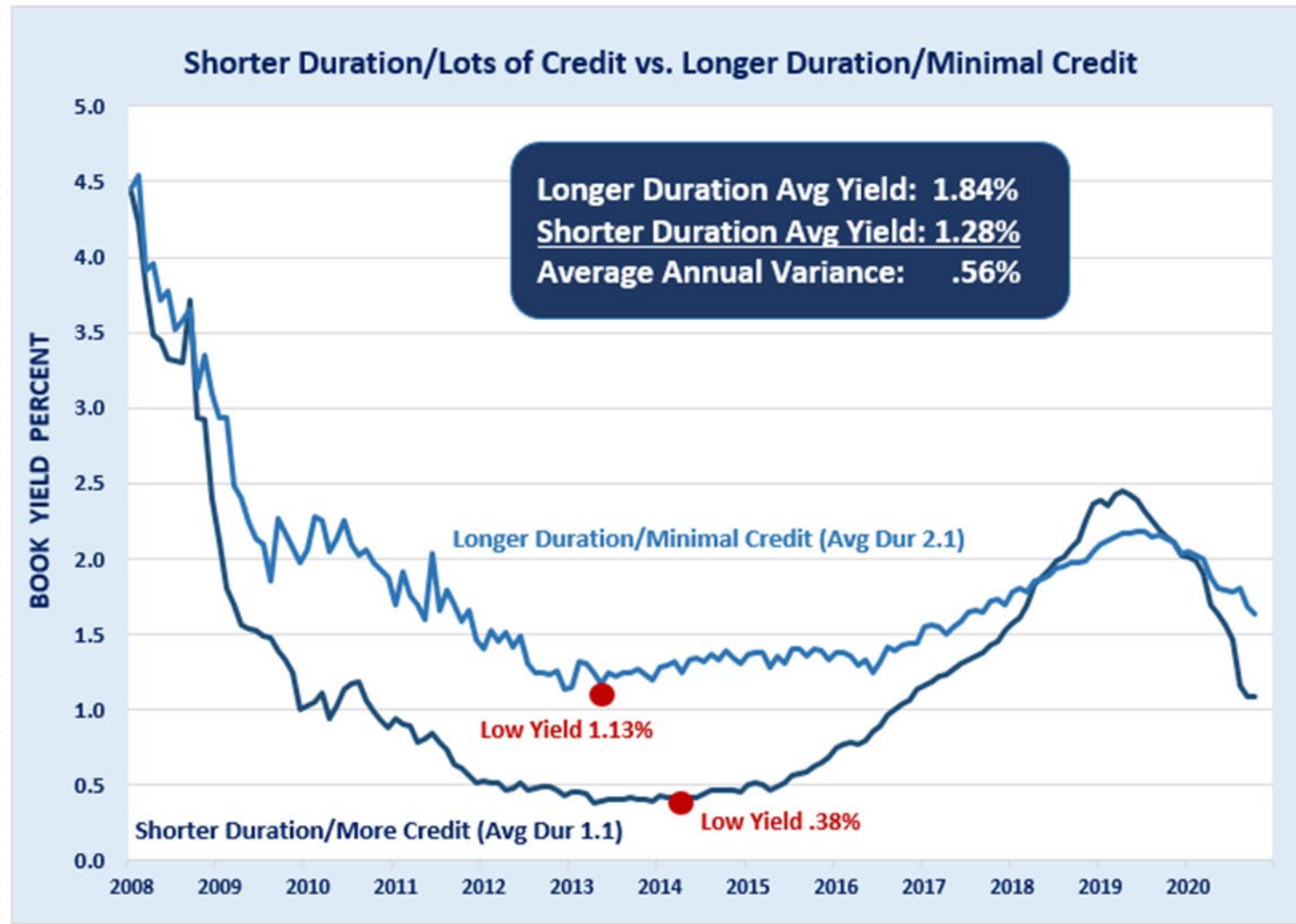
Moody's		S&P		Fitch		
Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	
Aaa	P-1	AAA	A-1+	AAA	A1+	Prime
Aa1		AA+		AA+		High Grade
Aa2		AA		AA		
Aa3		AA-		AA-		
A1		A+	A+	Upper Medium Grade		
A2		A	A		A1	
A3		A-	A-			
Baa1	P-2	BBB+	A-2	BBB+	A2	Lower Medium Grade
Baa2	P-3	BBB	A-3	BBB	A3	
Baa3		BBB-		BBB-		
Ba1	Not Prime	BB+	B	BB+	B	Non Investment Grade Speculative
Ba2		BB		BB		
Ba3		BB-		BB-		
B1		B+		B+		Highly Speculative
B2		B		B		
B3		B-	B-			
Caa		CCC+	C	CCC	C	Substantial Risks
Ca		CCC				Extremely Speculative
C		CCC-				In Default, with little prospect for recovery



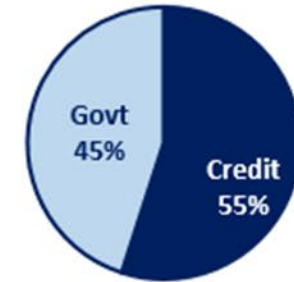
Relationship of Risk and Return: Is Credit Worth the Risk?



Relationship of Risk and Return: Interest Rate Risk vs. Credit Risk



Shorter Duration
(Avg Dur 1.1)



Longer Duration
(Avg Dur 2.1)



Relationship of Risk and Return: Liquidity Risk

Bid/Offer				Ask YTM	Bid/Offer				Ask YTM
4 Actives	5 Bills	6 Notes	7 TIPS	8 Strips	9 Sprds	10 Curves	11 FRN	12 Bfly	13 WI
20 T/0-1	22 T/1-2	23 T/2-4	24 T/4-7	25 T/7-10	26 T/10-30				
31) 1 1/2 420	99-30 5/8 / 100-03 3/8	-3.982	- 01 3/4			54) 1 3/8 820	100-13 5/8 / 100-18 5/8	-0.101	--
32) 1 1/8 420	100-00 1/8 / 100-04 3/4	-1.322	- 00 3/8			55) 1 3/8 920	100-15 3/4 / 100-21 3/8	-0.160	+ 00 3/8
33) 1 3/8 420	100-01 3/4 / 100-07	-2.226	+ 01 3/8			56) 2 920	100-26 3/4 / 100-31 7/8	-0.082	+ 01
34) 2 3/8 420	100-01 1/4 / 100-07 7/8	-1.675	- 00 3/4			57) 1 3/8 920	100-16 7/8 / 100-22 3/4	-0.111	- 00 +
35) 8 3/4 520	100-20 1/4 / 101-04 7/8	-2.472	- 00 3/8			58) 2 3/4 920	101-05 7/8 / 101-11 3/4	-0.108	+ 00 5/8
36) 3 1/2 520	100-09 1/8 / 100-13 3/4	-0.714	- 00 5/8			59) 1 5/8 020	100-22 5/8 / 100-28 1/4	-0.075	- 00 1/8
37) 1 1/2 520	100-01 5/8 / 100-08 1/4	-1.028	- 00 3/8			60) 1 3/4 020	100-27 5/8 / 101-00 3/8	-0.055	- 00 1/8
38) 1 3/8 520	100-04 5/8 / 100-11 1/4	-1.044	- 00 1/8			61) 1 3/8 020	100-20 3/4 / 100-25 3/8	-0.040	+ 00 1/4
39) 1 1/2 520	100-03 5/8 / 100-10 3/4	-0.813	+ 01 +			62) 2 7/8 020	101-16 5/8 / 101-20 +	-0.052	+ 00 3/4
40) 2 1/2 520	100-09 / 100-14	-0.514	+ 00 +			63) 2 5/8 N20	101-14 + / 101-21 1/4	-0.139	+ 01 +
41) 1 1/2 620	100-06 3/4 / 100-13 1/8	-0.701	+ 03 3/8			64) 1 3/4 N20	100-29 1/4 / 101-02	-0.016	--
42) 1 7/8 620	100-11 / 100-15 7/8	-0.298	+ 00 1/8			65) 2 N20	101-06 / 101-10 +	-0.059	+ 00 3/8
43) 1 5/8 620	100-10 3/8 / 100-16 1/8	-0.579	+ 01 1/8			66) 1 5/8 N20	100-30 3/8 / 101-03 3/8	-0.088	+ 02 1/8
44) 2 1/2 620	100-15 1/4 / 100-20 7/8	-0.356	+ 00 +			67) 2 3/4 N20	101-20 3/4 / 101-25 3/4	-0.048	+ 00 7/8
45) 1 1/2 720	100-09 3/4 / 100-15 3/4	-0.325	+ 00 1/4			68) 1 7/8 D20	101-04 7/8 / 101-11 1/8	-0.089	+ 01 +
46) 2 720	100-17 7/8 / 100-24 3/8	-0.427	+ 02 1/2			69) 2 3/8 D20	101-18 + / 101-23 1/8	0.009	+ 01
47) 1 5/8 720	100-13 1/4 / 100-18 5/8	-0.231	- 01 5/8			70) 1 3/4 D20	101-04 / 101-08 +	0.011	+ 00 3/4
48) 2 5/8 720	100-24 3/4 / 100-30 3/4	-0.437	+ 01 3/4			71) 2 1/2 D20	101-22 / 101-25 7/8	0.015	- 01 1/8
49) 8 3/4 820	102-30 / 103-05 +	-0.192	- 00 3/8			72) 2 121	101-11 / 101-16 3/8	0.034	- 00 1/8
50) 2 5/8 820	100-26 1/4 / 101-00 3/8	-0.227	+ 01 5/8			73) 2 1/8 121	101-17 1/4 / 101-22 3/8	0.035	+ 00 1/4
51) 1 1/2 820	100-14 5/8 / 100-20 3/8	-0.294	+ 02			74) 1 3/8 121	100-30 3/8 / 101-02 1/4	0.058	+ 00 1/8
52) 2 1/8 820	100-23 3/4 / 100-28 3/4	-0.153	- 00 1/4			75) 2 1/2 121	101-26 7/8 / 101-31	0.078	- 01 3/4
53) 2 5/8 820	100-29 7/8 / 101-01 7/8	-0.061	- 00 5/8			76) 7 7/8 221	106-10 1/4 / 106-24	-0.024	- 03 7/8

Source: Bloomberg as of 4/7/20

9) BUY 1000 M of T 1 5/8 07/31/20

Price 100-18 5/8 Yield -0.231367

Settlement 04/08/20 (T+1 for calendar 'US')

9) SELL 1000 M of T 1 5/8 07/31/20

Price 100-13 1/4 Yield 0.300747

Settlement 04/08/20 (T+1 for calendar 'US')

53 Basis Point Bid/Offer Spread!!

Relationship of Risk and Return: Market Timing Risk

S&P Dow Jones Indices

A Division of **S&P Global**



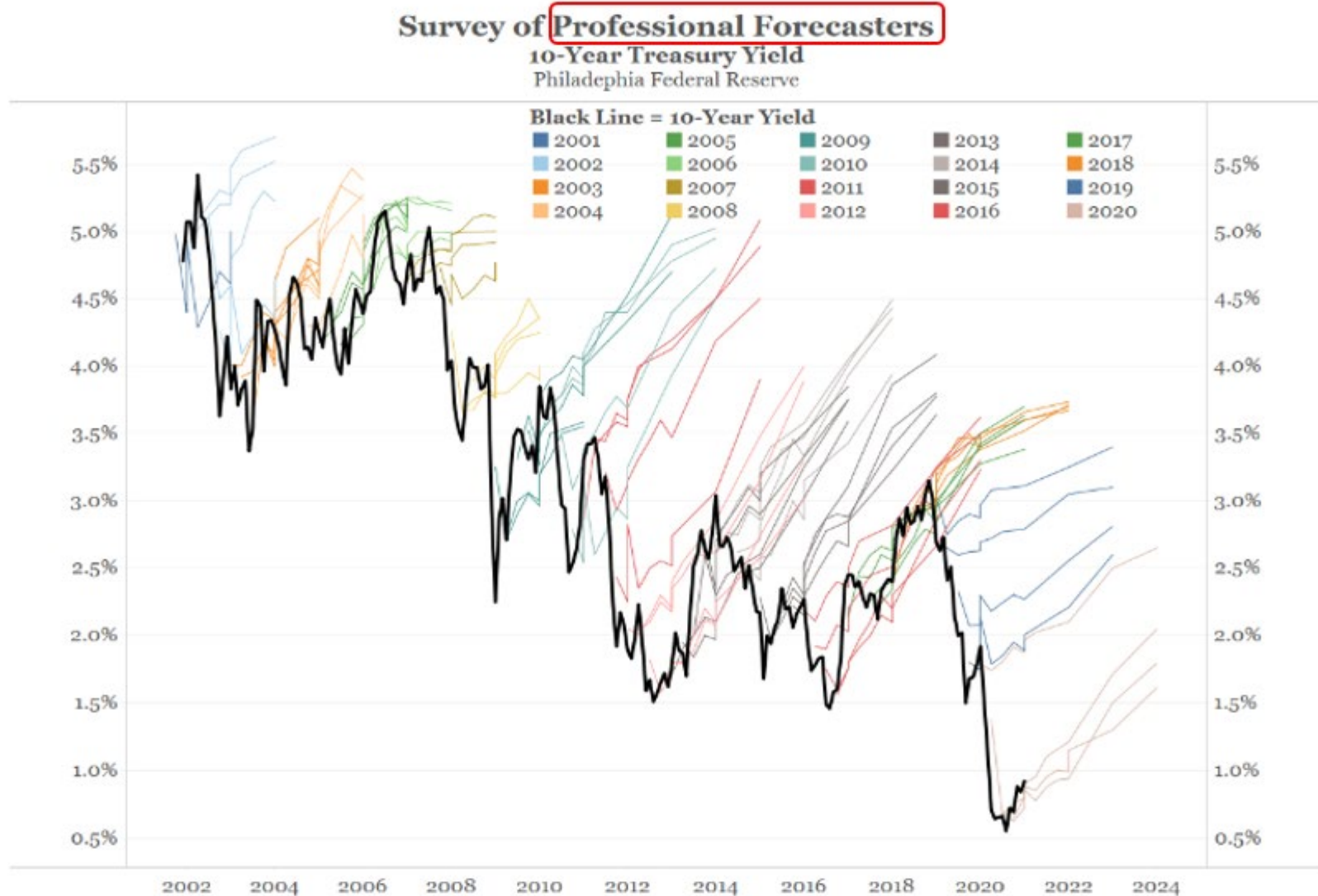
SPIVA U.S. Scorecard

Mid-Year 2020

Report 11: Percentage of Fixed Income Funds Outperformed by Benchmarks

FUND CATEGORY	COMPARISON INDEX	1-YEAR (%)	3-YEAR (%)	5-YEAR (%)	10-YEAR (%)	15-YEAR (%)
Government Long Funds	Barclays US Government Long	91.67	98.18	96.36	98.75	98.08
Government Intermediate Funds	Barclays US Government Intermediate	62.96	89.47	82.61	81.82	88.46
Government Short Funds	Barclays US Government (1-3 Year)	68.00	76.00	79.31	75.00	83.78
Investment-Grade Long Funds	Barclays US Government/Credit Long	97.59	97.70	98.89	98.39	98.15
Investment-Grade Intermediate Funds	Barclays US Government/Credit Intermediate	49.74	49.50	47.18	50.85	68.45
Investment-Grade Short Funds	Barclays US Government/Credit (1-3 Year)	90.11	90.53	70.79	47.46	74.24
High Yield Funds	Barclays US Corporate High Yield	67.95	87.68	95.22	97.16	99.21
Mortgage-Backed Securities Funds	Barclays US Aggregate Securitized - MBS	79.17	88.00	81.48	81.48	95.65

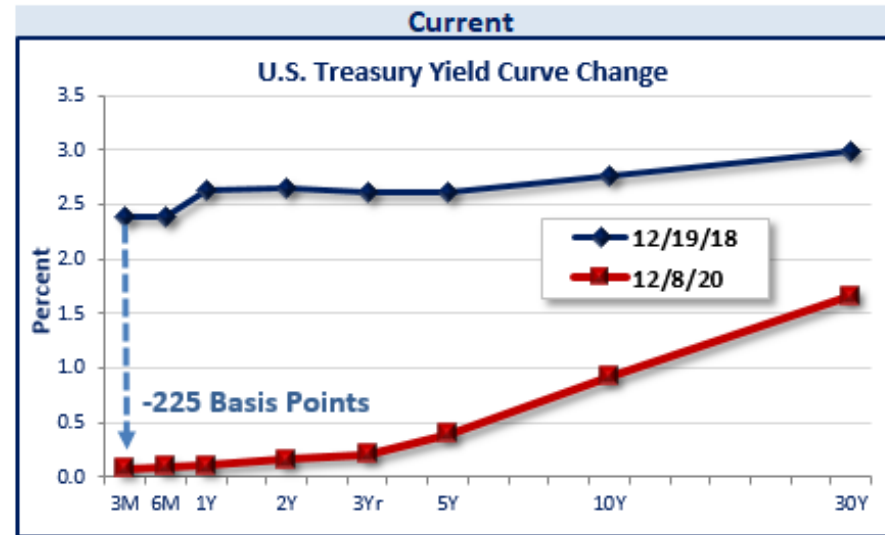
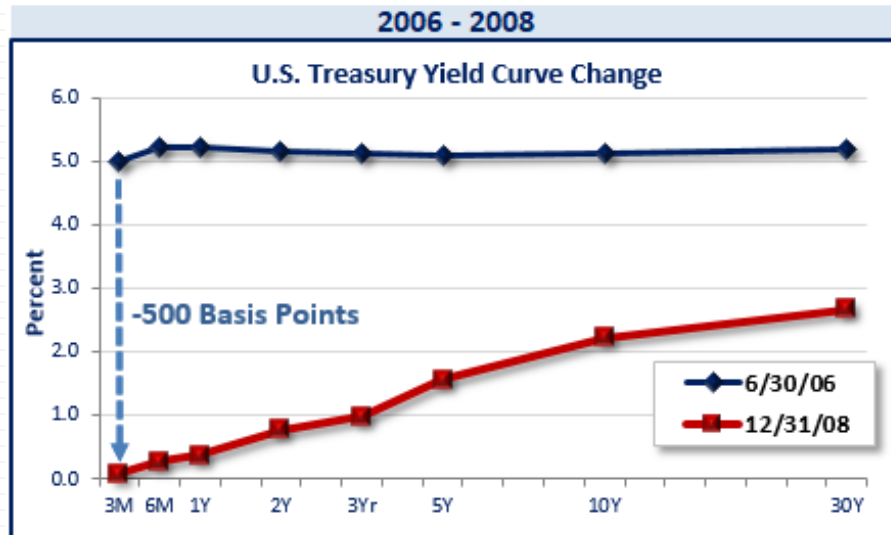
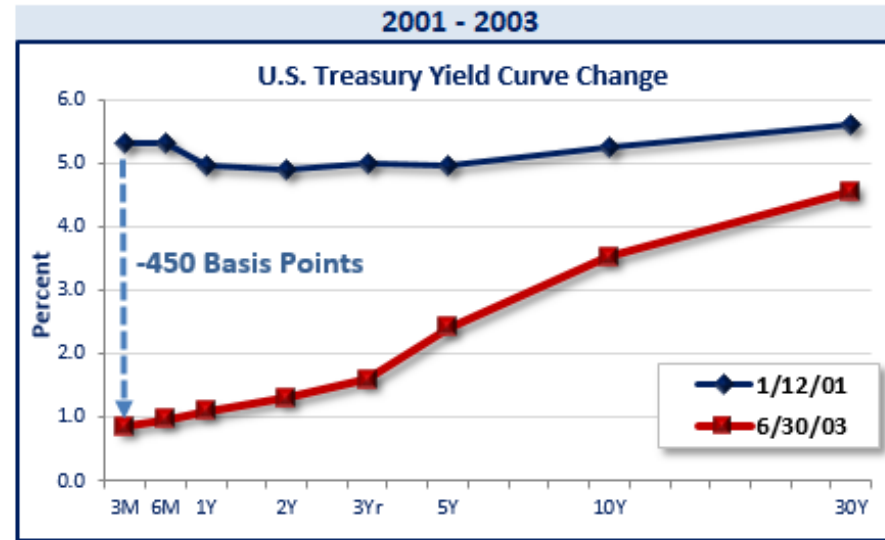
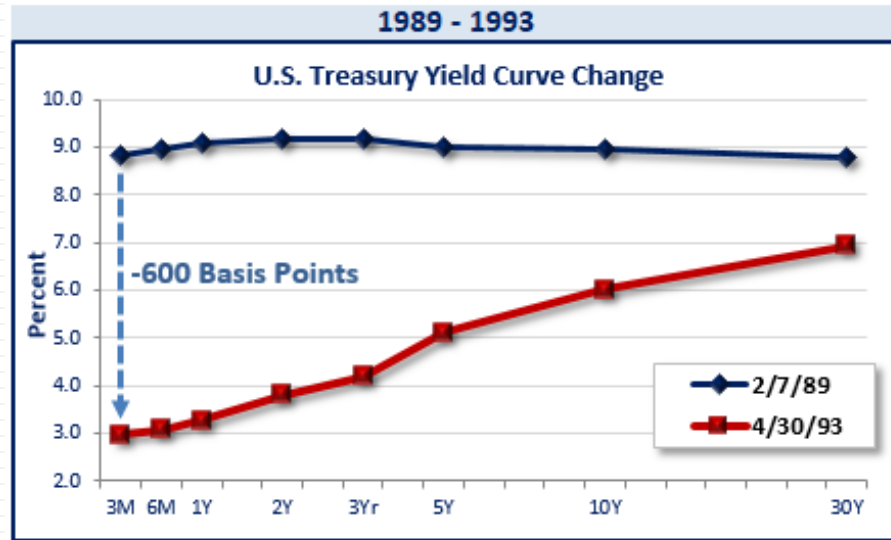
Relationship of Risk and Return: Market Timing Risk



Data Source: Federal Reserve Bank of Philadelphia
<https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/data-files>

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Relationship of Risk and Return: Market Timing Risk



Relationship of Risk and Return: Market Timing Risk

How Long Until the Recession?

When the **10Yr/3M** U.S. Treasury Curve Inverts 10 Consecutive Trading Days

Date of 10 Day Inversion	Consecutive Trading Days Inverted	Date of Next Recession	Days to Next Recession
1/10/1969	24	Dec 1969	325
6/14/1973	177	Nov 1973	140
12/8/1978	91	Jan 1980	389
11/7/1980	102	Jul 1981	236
6/6/1989	30	Jul 1990	390
7/31/2000	135	Mar 2001	213
8/1/2006	217	Dec 2007	487
6/6/2019	41	Feb 2020	268
Average	102		306

1/10/1969 = Inverted for 24 days, went positive for 33 days, then inverted again for 53 days

6/6/1989 = Inverted for 30 days, went positive for 9 days, then inverted again for 26 days

6/6/2019 = Inverted for 41 days, went positive for 1 day, then inverted again for 65 days



Session 1 Quiz Show



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THANK YOU

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