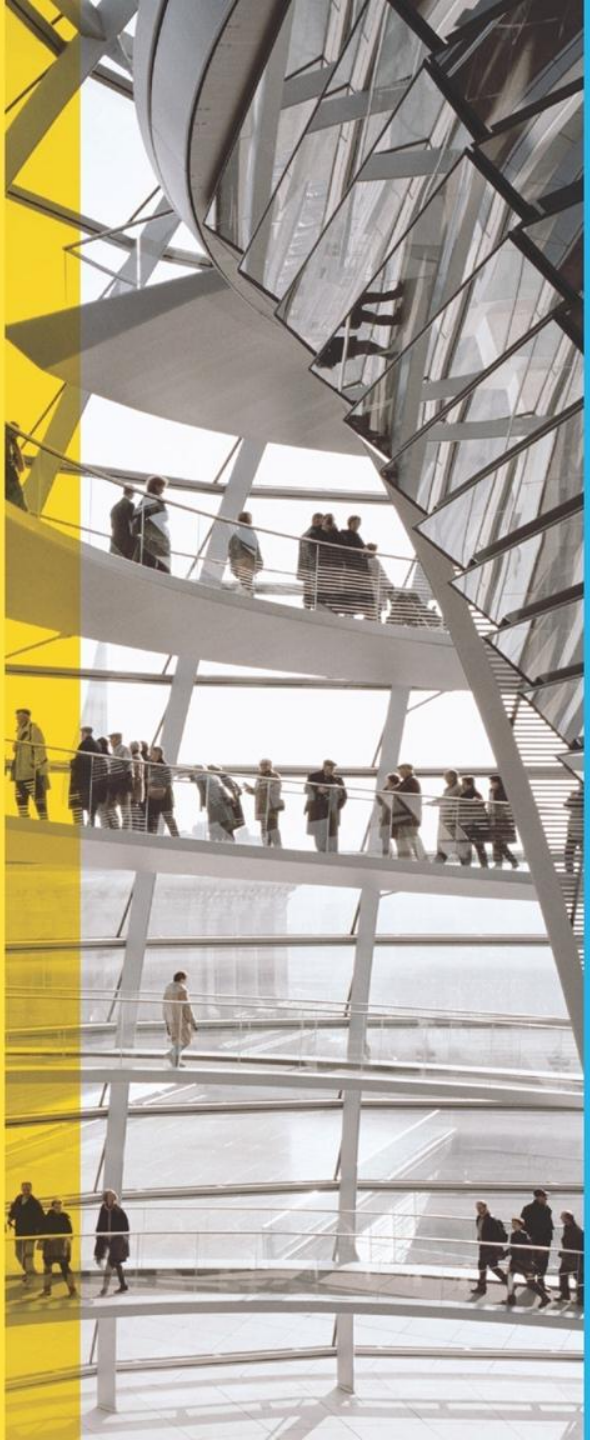
BNY MELLON

Fixed Income Securities

Business L1 Training iNautix



Information Security Identification: Confidential

Course Outline

- Money Market and Participants
- Instruments in Money Market
- What are bonds
- Bond Indentures
- Debt vs. Equity
- Bonds characteristics
- Types of Bonds
- Price-Yield relationship
- Risks in Bonds
- Bond valuation

Introduction

- Have you ever borrowed money?
  - Examples:
  - Buying a car or home
  - Same as people, even company and government need money

NCNB CORP SENIOR SUBORDINATED NOTES
10.200% 07/15/15 REG DTD 07/31/90

How do one raise capital?

Equity – Share Ownership

Shares / Stocks

High return, Liquidity, Capital appreciation, Limited Liability

Debt – Take Loan

Bond Offerings

Low Risk, Poor Hedge against Inflation, Fixed Yield

Founders (friends and family)

Banks

Government

Venture Capitalists

Broker Dealers

Shares and Bonds are fundamental products. Other products are derived

Financial Market

Financial market is commonly distinguish between the “Capital market" and the “Money market”

Capital Market	Money Market
Market for Long Term Debt and Equity securities	Market for short term requirement and deployment of funds
Trading occurs over the counter and exchange traded	Trading occurs over the counter

Money Market Instruments

- Treasury bills
- Commercial paper
- Bankers acceptances
- Certificates of deposit
- Federal funds
- Repurchase agreements

Money Market Instruments

	Pricing	Issuer	Characteristic
Treasury Bills	Discount Paper	US Treasury	"Full Faith and Credit" of the US Government
Commercial Paper		Corporations	Short term corporate debt
Bankers Acceptance		Banks	Finances self-liquidating transaction involving non-US entity
Certificate of Deposit	Interest at Maturity		Borrowing by banks from investors
Federal Funds			Borrowing by Banks from other banks
Repurchase Agreement		Money Market Dealers	Borrowing with financial assets as collateral in order to lend at a higher rate: "Pawnshop Model"

TREASURY BILLS

- Treasury bills are short-term securities issued by the U.S. Treasury and is issued at Discount.

- The Treasury sells bills at regularly scheduled auctions to refinance maturing issues and to help finance current federal deficits.

- Treasury bills are auctioned on a regular calendar basis.
  - > 4 week every Tuesday at 1pm
  - > 13 week every Monday at 1pm
  - > 26 week every Monday at 1pm
  - > Settlement on Thursday

- Four investment characteristics of T-Bills distinguish them from other Money Market products. They are Lack of Default risk, High liquidity, Favorable tax status and Low minimum denomination.

TREASURY BILLS - Auctions

- The Treasury may accept both *competitive* and *noncompetitive* bids, and the price everyone pays is the highest yield paid to any accepted bid.

EXAMPLE

The Treasury auctioned $2.5 billion par value 91-day T-Bills, the following bids were received:

Bidder	Bid Amount	Bid Price
1	$500 million	$0.9940
2	$750 million	$0.9901
3	$1.5 billion	$0.9925
4	$1 billion	$0.9936
5	$600 million	$0.9939

The Treasury also received $750 million in noncompetitive bids. Who will receive T-Bills, what quantity, and at what price?

Contd..

The Treasury accepts the following bids:

Bidder	Bid Amount	Bid Price
1	$500 million	$0.9940
5	$600 million	$0.9939
4	$1 billion	$0.9936

Both the competitive and noncompetitive bidders pay the highest yield—based on the price of 0.9936.

COMMERCIAL PAPER

- Commercial paper is a short-term unsecured promissory note issued by corporations and foreign governments.

- Typically for the financing of accounts receivable, inventories and meeting short-term liabilities.
  - > Maturities on commercial paper rarely range any longer than 270 days

- Issuers are able to efficiently raise large amounts of funds quickly and without expensive Securities and Exchange Commission (SEC) registration by selling paper, either directly or through independent dealers, to a large and varied pool of institutional buyers.

- Like Treasury bills, commercial paper is typically a discount security: the investor purchases notes at less than face value and receives the face value at maturity.

BANKERS ACCEPTANCE

- A Bankers Acceptance, or BA, is a time draft drawn on and accepted by a bank.

- Before acceptance, the draft is not an obligation of the bank; it is merely an order by the drawer to the bank to pay a specified sum of money on a specified date to a named person or to the bearer of the draft.

- Upon acceptance, which occurs when an authorized bank employee stamps the draft "accepted" and signs it, the draft becomes a primary and unconditional liability of the bank.

- Generally involves at least one Non-US entity

CERTIFICATE OF DEPOSITS

- **Certificate of deposit** or **CD** is a time deposit, a financial product commonly offered to consumers by banks, thrift institutions, and credit unions
  - Held until maturity

- CDs of less than $100,000 are called “Small CDs"; CDs for more than $100,000 are called “Large CDs" or “Jumbo CDs".

FEDERAL FUNDS

- Federal funds are short-term borrowings of immediately available money—funds which can be transferred between depository institutions within a single business day.

- Federal Funds are overnight borrowings between banks and other entities to maintain their bank reserves at the Federal Reserve.

- These loans are usually made for one day only, that is, "overnight”.

REPO

WHAT IS A REPO AGREEMENT?

A repo agreement is a contract in which a security is sold with an agreement on the initiation date to repurchase the security at a higher price on a later date specified in the contract.

In Figure 5.1, we illustrate a repo transaction. Institution X delivers a Treasury note with a market value of $1,000,000 to Institution Y, which delivers to Institution X $1,000,000 in cash (initial transaction, or the opening leg in the figure). For simplicity, we assume that the Treasury note is selling at par. On the same day, Institution X agrees to buy back from Institution Y the same security on the very next day (overnight) at a price of $1,000,138.89 (closing transaction, which occurs the next day).

Definition of REPO

- Repurchase agreement (REPO): a contract to sell a security and then repurchase it at a later date for a specified price.
- We can think of a repo as a collateralized loan, where the collateral is the security. This is because the seller of the security retains the right to receive any interest paid on the security over the term of the repo agreement.
- Repos are one of the largest sectors of the money market (approximately $1 trillion daily).
- The repo market provides attractive returns to money market investors, and an inexpensive source of financing for security holders.

Repo Transaction

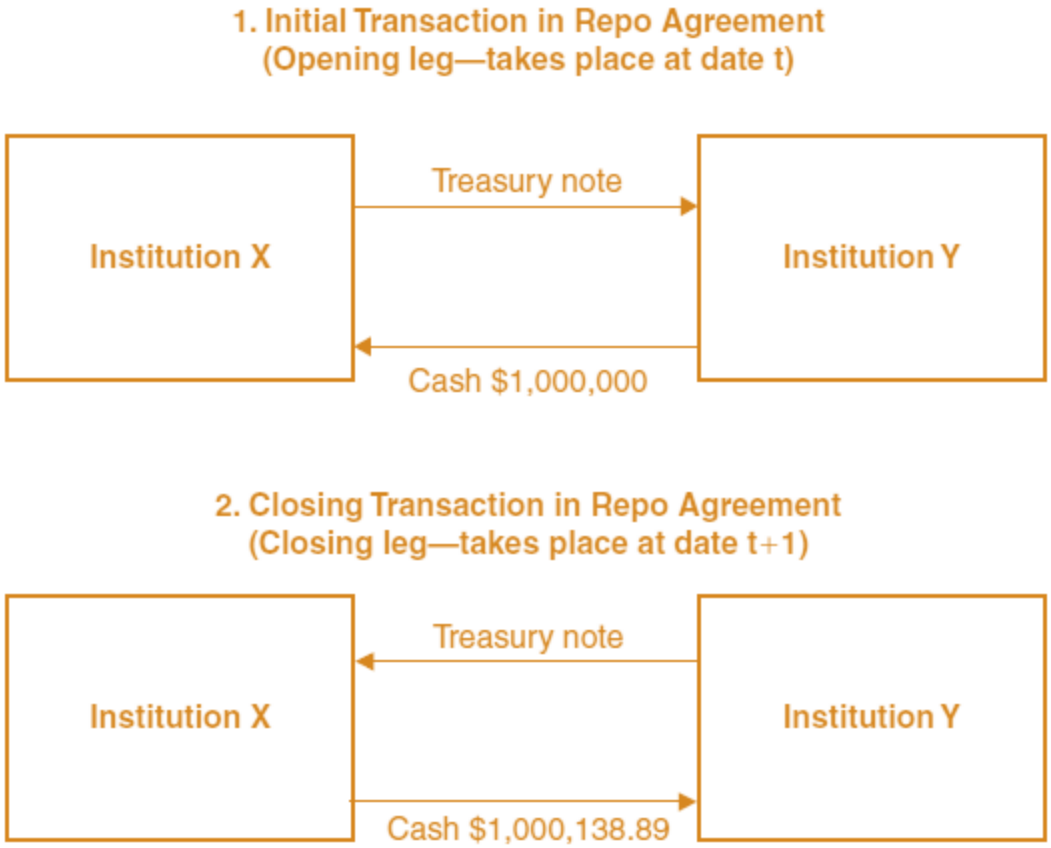


FIGURE 5.1

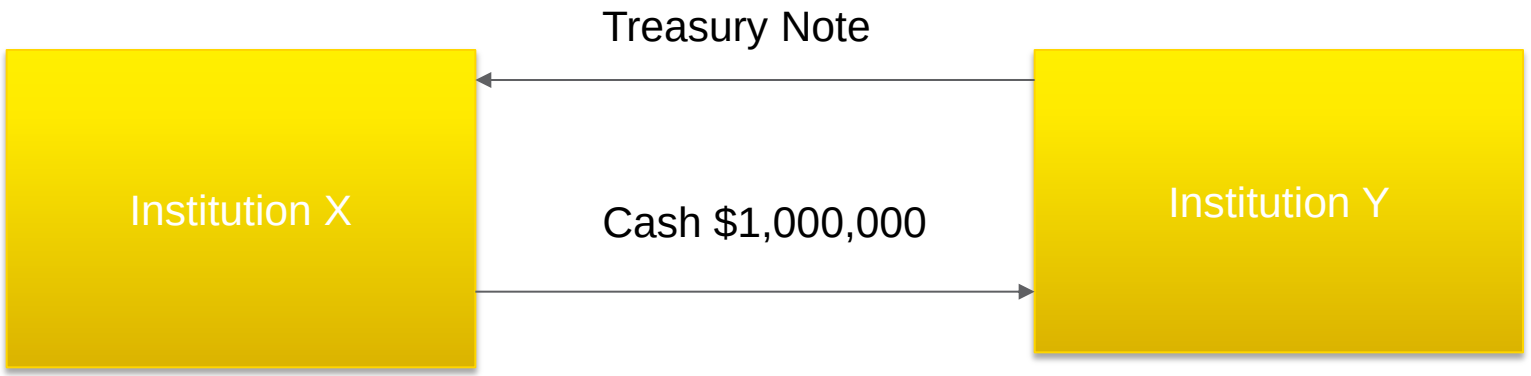
Example of a Repo Transaction (Opening and Closing Legs)

What is a reverse repo agreement?

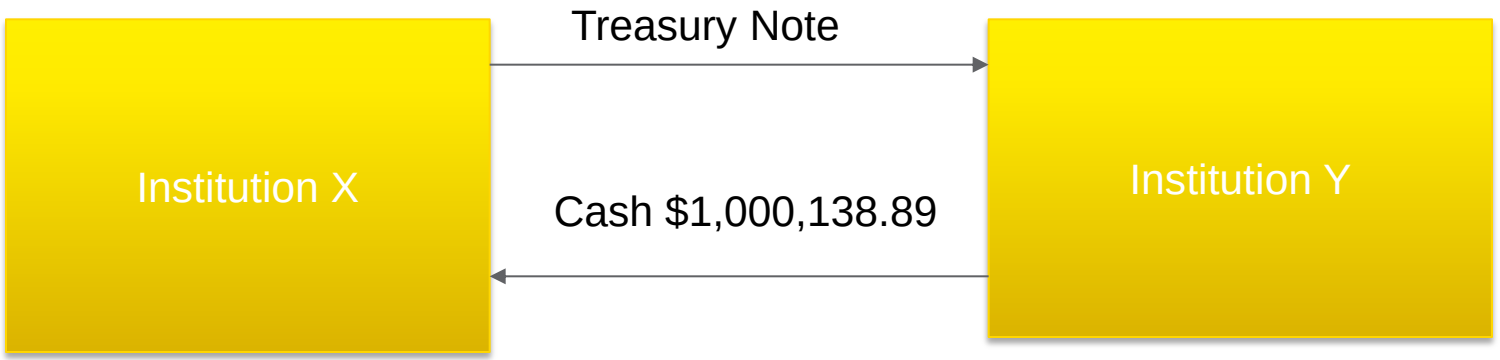
A reverse repo agreement is a contract in which a security is borrowed with an agreement on the initiation date to replace the security at a higher price on a later date specified in the contract – flip side of a repo.

Figure 5.2 illustrates a reverse repo transaction from the perspective of Institution X. Institution X borrows a Treasury note with a market value of $1,000,000 to Institution Y and delivers to Institution Y $1,000,000 cash (initial transaction in the figure). For simplicity, we assume that the Treasury note is selling at par. On the same day, Institution X agrees to sell back to Institution Y the same security on the very next day at a price of $1,000,138.89 (closing transaction, which occurs the next day).

1. Initial Transaction in Reverse Repo Agreement



2. Closing Transaction in Reverse Repo Agreement



Introduction to Bonds

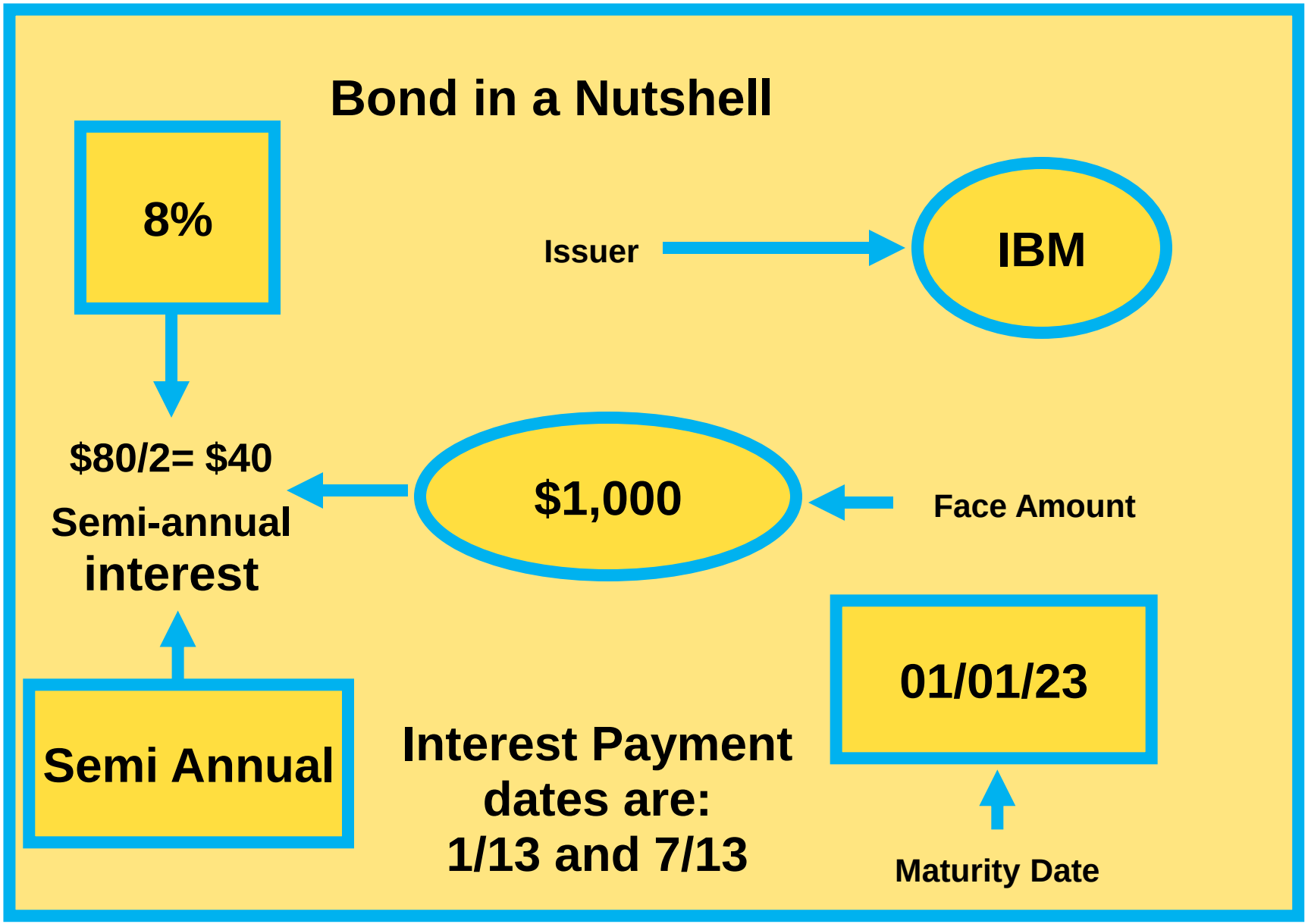
- **Bonds are debt securities sold by a company or government to raise money (Fixed Income Instruments)**
- Bond holder becomes a *Creditor* but not *owner* of bond issuing corporation
- Bond holder receives interest yield in addition to principal amount
- Bonds characterized by finite life span (determined by *Maturity period*)
- **Issuer is responsible for repayment of principal and interest**

Investor	Issuer
▪ More Income ▪ Greater Safety ▪ Known Maturity ▪ Not an Owner ▪ Poor Inflation Hedge	▪ Control Issues ▪ Risk of Default ▪ "Leverage" in a Capital Structure

Bond is the other fundamental product giving fixed returns

Bond Terminology

- **Par Value-** The value of a bond assigned by the issuer; also called face value.
- **Coupon** - Paper that evidences an issuer's promise to pay interest when due
- **Coupon rate-** The interest as a percent of par paid by a bond
- **Premium**. The amount by which a bond sells above its par value
- **Maturity date-** The date on which a bond is to be redeemed and its principal and interest returned to the owner
- **Yield-** The rate of return on an investment, described as a percentage of the amount of the investment



Example:

A bond with a face value of $1,000, a coupon of 8%, and a maturity of 10 years. This means you'll receive a total of $80 ($1,000*8%) of interest per year for the next 10 years.

When the bond matures after a decade, you'll get your $1,000 back

Bond Characteristics: Face value/Par value

- **Face value/Par value**
- Amount received by the investor once the bond matures (normally $1000)

- **Par value is not the price of the bond.**
- A Bond's price fluctuates throughout its life in response to a number of variables.

  Trading at Premium: Bond price > Face value

  Trading at Discount: Bond price < Face value

  Trading at Par: Bond price = Face value

Bond characteristics: Coupon

- **Coupon**
- Fixed amount the bondholder will receive every period

- **Expressed as % age of Par value**
- Example: If a bond pays a coupon of 10% and its par value is $1,000, then it'll pay $100 of fixed payment a year

- **Bond coupon structure**
- Zero-coupon bond: Pay no interest to the holder and are issued at deep discount
- Deferred coupon bonds: Does not pay any interest for few periods
- Floating rate bonds: Interest paid is based on Benchmark like LIBOR

Bond characteristics: Maturity

- Term of Bond’s life.
- Can vary from 90 days to 100 years
- The bond's face value is repaid to the investor
- After maturity, no more interest payments are provided to the investor

Bond Categories

ISSUER BASED CATEGORIES

- **Government Securities-** Issued by The U.S. government from the U.S. Treasury and several government agencies.

- **Corporate Bonds**- Bonds issues by various corporations to borrow money for operations

- **Municipal Bonds**- Bonds issued by states, cities, counties and various districts to raise money to finance their operations or to pay for infrastructure projects.

CONVERTIBLE BONDS

- Bonds convertible into common stock
- Generally lower coupons as there is upside for investors

Bond indenture

CONTRACT BETWEEN THE BONDHOLDER AND THE ISSUER.

LEGAL DOCUMENT STATING WHAT ISSUER CAN AND CANNOT DO.

Affirmative covenants

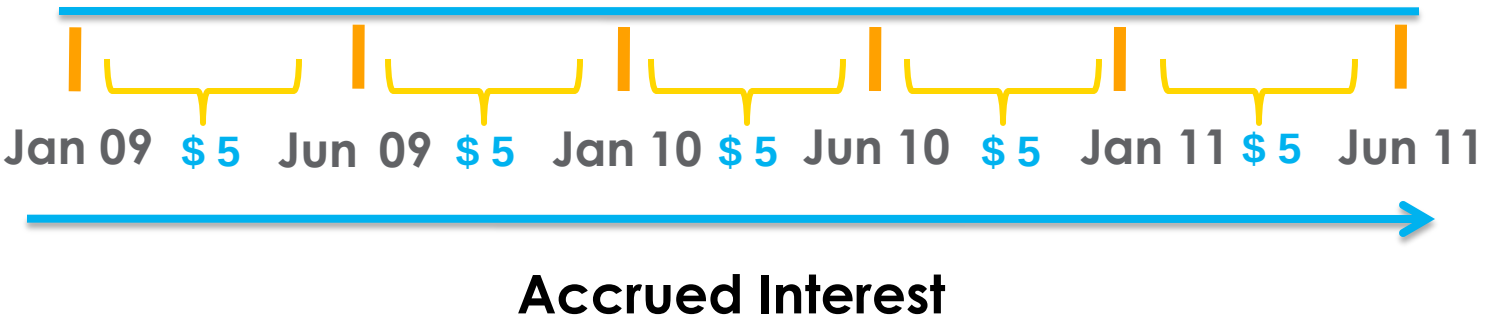
- Issuers promise to the investor
- Paying interest and principal in a timely manner

Negative covenants

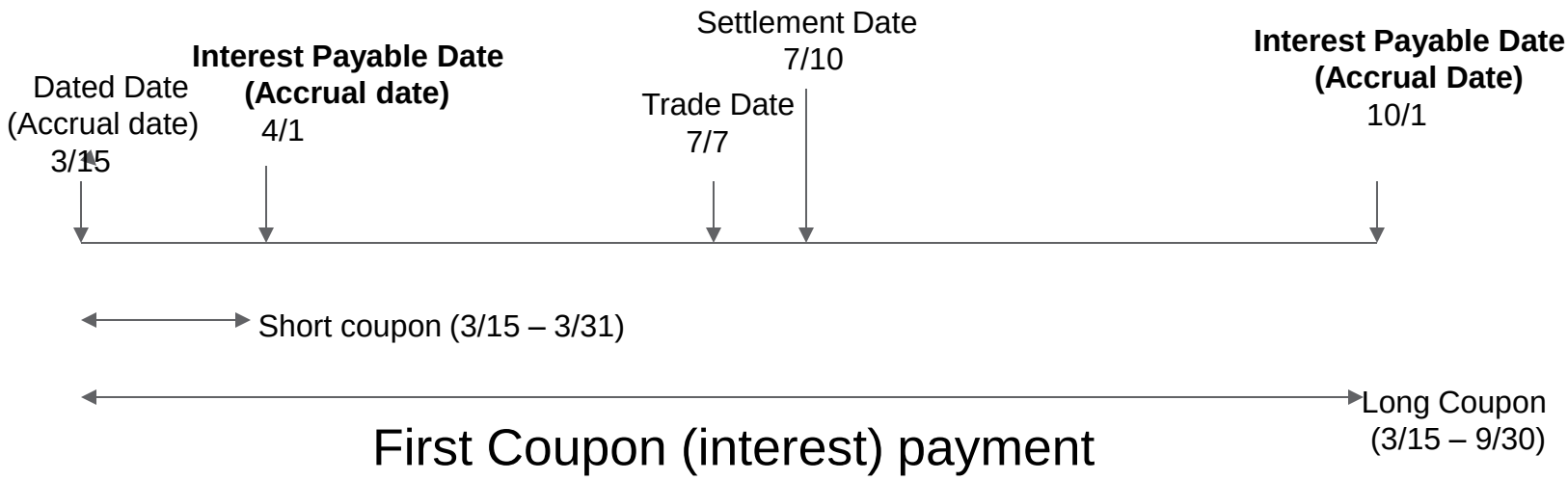
- Restraints put on a borrower
- Restraints including issuing any further debt or security

Accrual Securities

Par Value of $100 – Coupon of 10%, payable Semi Annual



Important Dates for Interest Accruals



Interest Accrual date: Dated Date; Interest Payable Date

Bond Pricing

- Priced as a percentage of par value

90 = 90% X PAR = $900
100 = 100% X PAR = $1,000
120 = 120% X PAR = $1,200

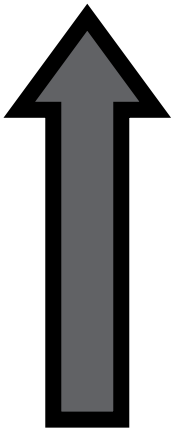
What terms can be used to describe the prices these bonds trade?

Why do bond prices move?

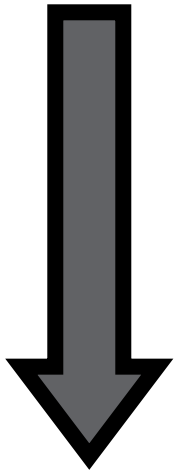
CREDIT QUALITY CHANGES

INTEREST RATE CHANGES

If Interest Rates Rise



Bond Prices Fall



Basis Points

ONE BASIS POINT IS THE MINIMUM INCREMENT

IN TERMS OF EXPRESSING AN INTEREST RATE

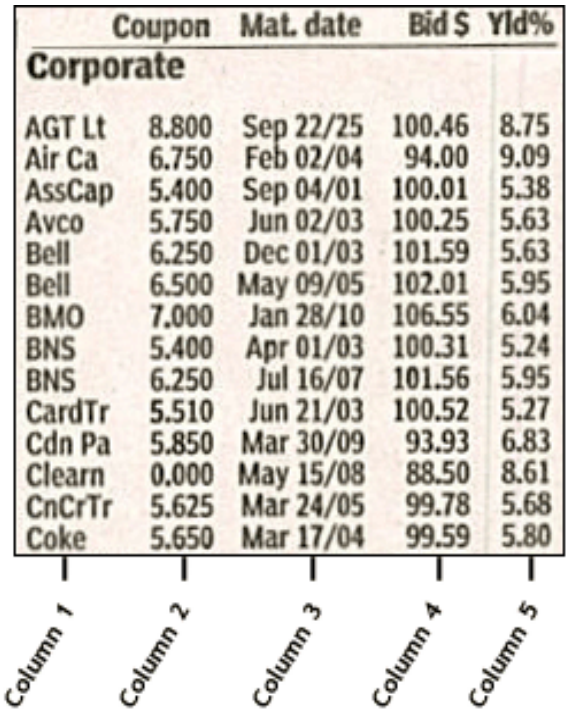
1 basis point = 1/100 of 1%

Bond characteristics: Yield

- Annual Rate of Return investors earn based on a bond's coupon rate and its current market price.
- Overall interest rate earned by an investor who buys the bond today at the market price.
- When you buy a bond at par, yield is equal to the interest rate.
- When bond is trading at par: Yield = coupon rate
- When price deviates then Yield ≠ coupon rate
- **Example:**
- If you buy a one year maturity bond with a 10% coupon at its $1,000 par value, the yield is 10% ($100/$1,000).
- If the price goes down to $800, then the yield goes up to 12.5%. This happens because you are getting the same guaranteed $100 on an asset that is worth $800 ($100/$800).
- Conversely, if the bond goes up in price to $1,200, the yield shrinks to 8.33% ($100/$1,200)

Understanding Bond Table

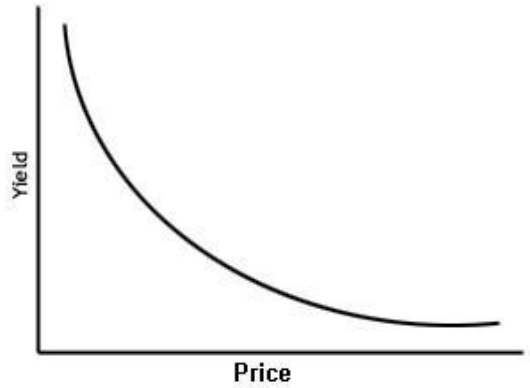
- **Column 1: Issuer** - This is the Company or State or country that is issuing the bond.
- **Column 2: Coupon** - The coupon refers to the fixed interest rate that the issuer pays to the lender.
- **Column 3: Maturity Date** - This is the date on which the borrower will repay the investors their principal. Typically, only the last two digits of the year are quoted: 25 means 2025, 04 is 2004, etc.
- **Column 4: Bid Price** - This is the price someone is willing to pay for the bond. It is quoted in relation to 100, no matter what the par value is. Think of the bid price as a percentage: a bond with a bid of 93 is trading at 93% of its par value.
- **Column 5: Yield** - The yield indicates annual return until the bond matures. Usually, this is the yield to maturity, not current yield



	Coupon	Mat. date	Bid $	Yld%
Corporate				
AGT Lt	8.800	Sep 22/25	100.46	8.75
Air Ca	6.750	Feb 02/04	94.00	9.09
AssCap	5.400	Sep 04/01	100.01	5.38
Avco	5.750	Jun 02/03	100.25	5.63
Bell	6.250	Dec 01/03	101.59	5.63
Bell	6.500	May 09/05	102.01	5.95
BMO	7.000	Jan 28/10	106.55	6.04
BNS	5.400	Apr 01/03	100.31	5.24
BNS	6.250	Jul 16/07	101.56	5.95
CardTr	5.510	Jun 21/03	100.52	5.27
Cdn Pa	5.850	Mar 30/09	93.93	6.83
Clearn	0.000	May 15/08	88.50	8.61
CnCrTr	5.625	Mar 24/05	99.78	5.68
Coke	5.650	Mar 17/04	99.59	5.80

Price and Yield relationship

- **Bond’s price is inversely related to its yield**



- How can high yields and high prices both be good when they can't happen at the same time?

The answer depends on your point of view. If you are a bond buyer, you want high yields. A buyer wants to pay $800 for the $1,000 bond, which gives the bond a high yield of 12.5%. On the other hand, if you already own a bond, you've locked in your interest rate, so you hope the price of the bond goes up. This way you can cash out by selling your bond in the future.

Bond types based on Coupon

- **Zero coupon bonds**
- Makes no coupon payment.
- Trades at discount based on the yield
- Example: Let's say a zero-coupon bond with a $1,000 par value and 10 years to maturity is trading at $600; you'd be paying $600 today for a bond that will be worth $1,000 in 10 years (no interim payments).

- **Fixed rate bonds**
- Interest paid is fixed irrespective of market interest rate changes
- Eg : Coupon rate = 6%

- **Floating rate bonds**
- Interest paid is based on Benchmark like LIBOR
- Eg : Coupon rate = LIBOR + 2%

- **Deferred coupon bonds**
- Does not pay any interest for few periods

Risks in Bonds

- **Interest Rate risk**
- Decline in the price of a bond or a portfolio of bonds due to an increase in market rates.

- **Prepayment or Call Risk**
- Risk is concerned with the holders having their bonds paid off earlier than the maturity date.

- **Reinvestment Risk**
- Risk that the proceeds from the payment of principal and interest, which have to be reinvested at a lower rate than the original investment.

- **Credit Risk**
- Default Risk - Risk that the issuer will go belly up and not be able to pay its obligations of interest and principle.

- Credit Spread Risk – How the spread of an issue over the treasury curve will react.

- Downgrade Risk – Risk that the credit rating agencies downgrade the issue

Credit quality

Bond ratings determines company's credit risk

Major rating agencies in the U.S.: Moody's, Standard and Poor's and Fitch Ratings.

Safer investments, have a high rating, while risky companies have a low rating.

Bond Rating		Grade	Risk
Moody's	S&P/ Fitch		
Aaa	AAA	Investment	Highest Quality
Aa	AA	Investment	High Quality
A	A	Investment	Strong
Baa	BBB	Investment	Medium Grade
Ba, B	BB, B	Junk	Speculative
Caa/Ca/C	CCC/CC/C	Junk	Highly Speculative
C	D	Junk	In Default

How to invest in Bonds?

- Open an account with a bond broker.
- Individual bonds
- Enormous variety of individual bonds to choose from.
- To buy a new issue, you will be provided with security's offering statement or prospectus.
- You can also buy and sell already issued bonds in a secondary market.
- Information about a bond are provided by credit rating agencies.

- **Bond Funds**
- Managed by professionals
- Allows investor to diversify risk across broad range of issues.

- **Money Market fund (short term - High liquid pooled investment)**
- Includes US treasuries, Municipal Bonds, Certificates of deposits of major commercial banks.
- Generally consisting of securities with less than three month maturities

Embedded options

- Grant the issuer or bondholder certain rights in order to dispose of or redeem a bond.
- Options carry some sort of value, they can have a dramatic effect on the price of a security's cash flow as well as its total return.

- **Callable bond**
- Allows the issuer to call the bonds prior to maturity
- If prevailing rate make it economically feasible for the issuer to replace the existing issue

- **Puttable bond**
- Allows the bondholder to sell the bond back to the issuer at a certain price before its maturity.
- As interest rate rise, it helps the bondholders to sell their current issue and reinvest at higher rate.

- **Convertible option**
- Allows the bondholders to exchange their current bond with equity in the same firm using convertible bonds.
- If the equity of the firm is outperforming, the bonds can be converted allowing the holder to realize a higher return.

Bond valuation

- The fundamental principle of valuation is that the value is equal to the present value of its expected cash flows.
- The valuation process involves the following three steps:
- Estimate the expected cash flows.
- Determine the appropriate interest rate or interest rates that should be used to discount the cash flows.
- Calculate the present value of the expected cash flows found in step one by using the interest rate or interest rates determined in step two.

Worksheet in Bonds

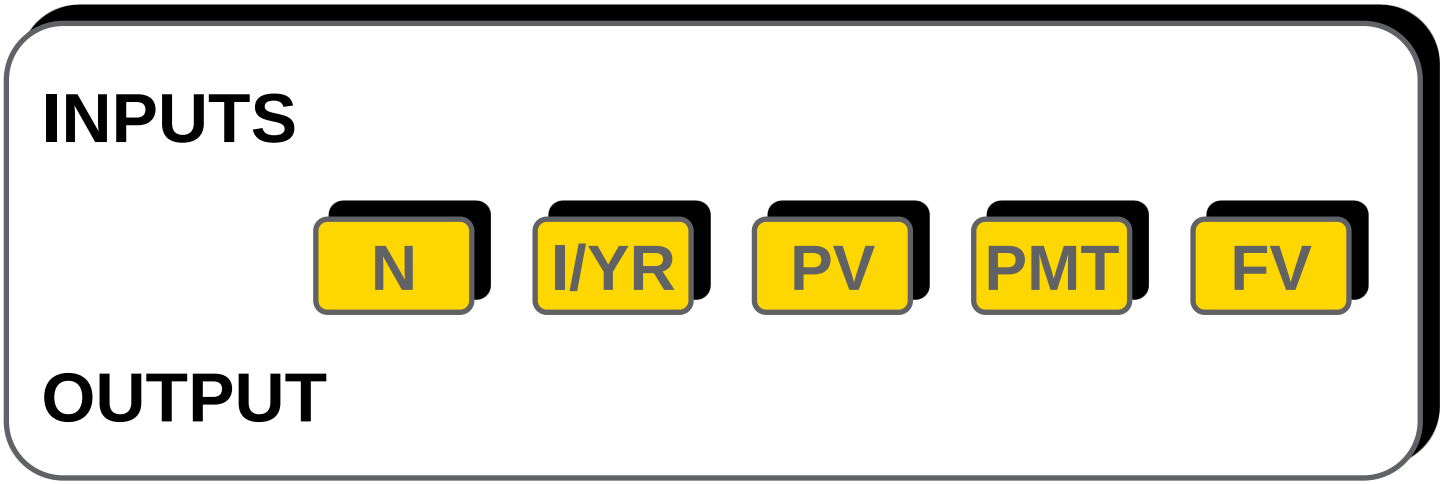
Bond valuation : Example 1

- **Example of bond valuation:**
- Find the value of a 10-year, 10% annual coupon bond when kd = 10%.

- PV of par value = 1000 / (1.10^10) = 385.54
- PV of coupon pmt = 100/1.1 + 100/(1.10^2) + .+100/(1.10^10) = 614.46
- Bond price = PV of par + PV of coupon pmt = 614.46 + 385.54 = 1000

Bond valuation Example - 2

- What would happen if interest rate falls by 3% ie. Interest rate = 7%



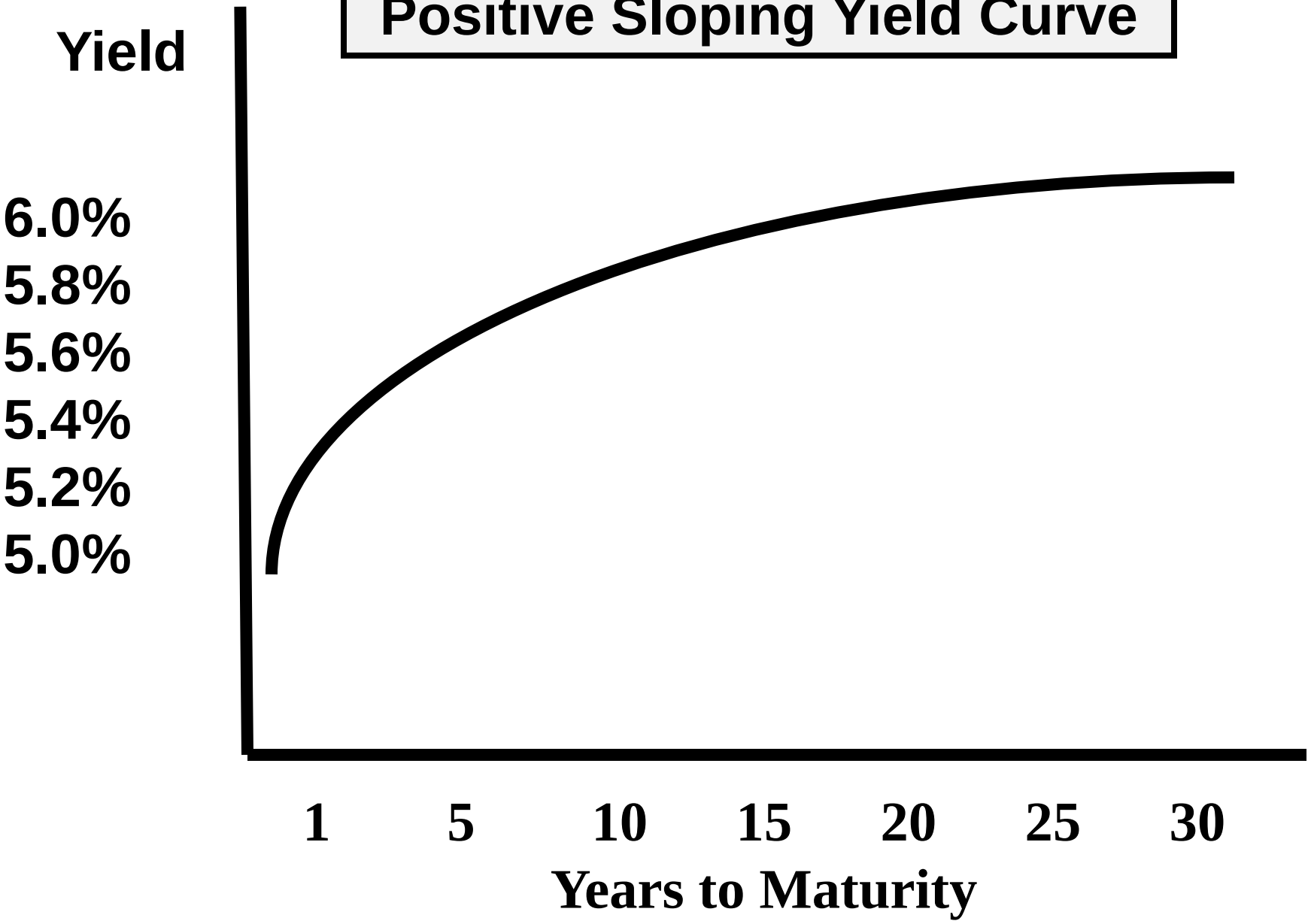
- When yield(7%) decreases below the coupon rate(10%), the bond's value rises above par. The bond sells at a premium.

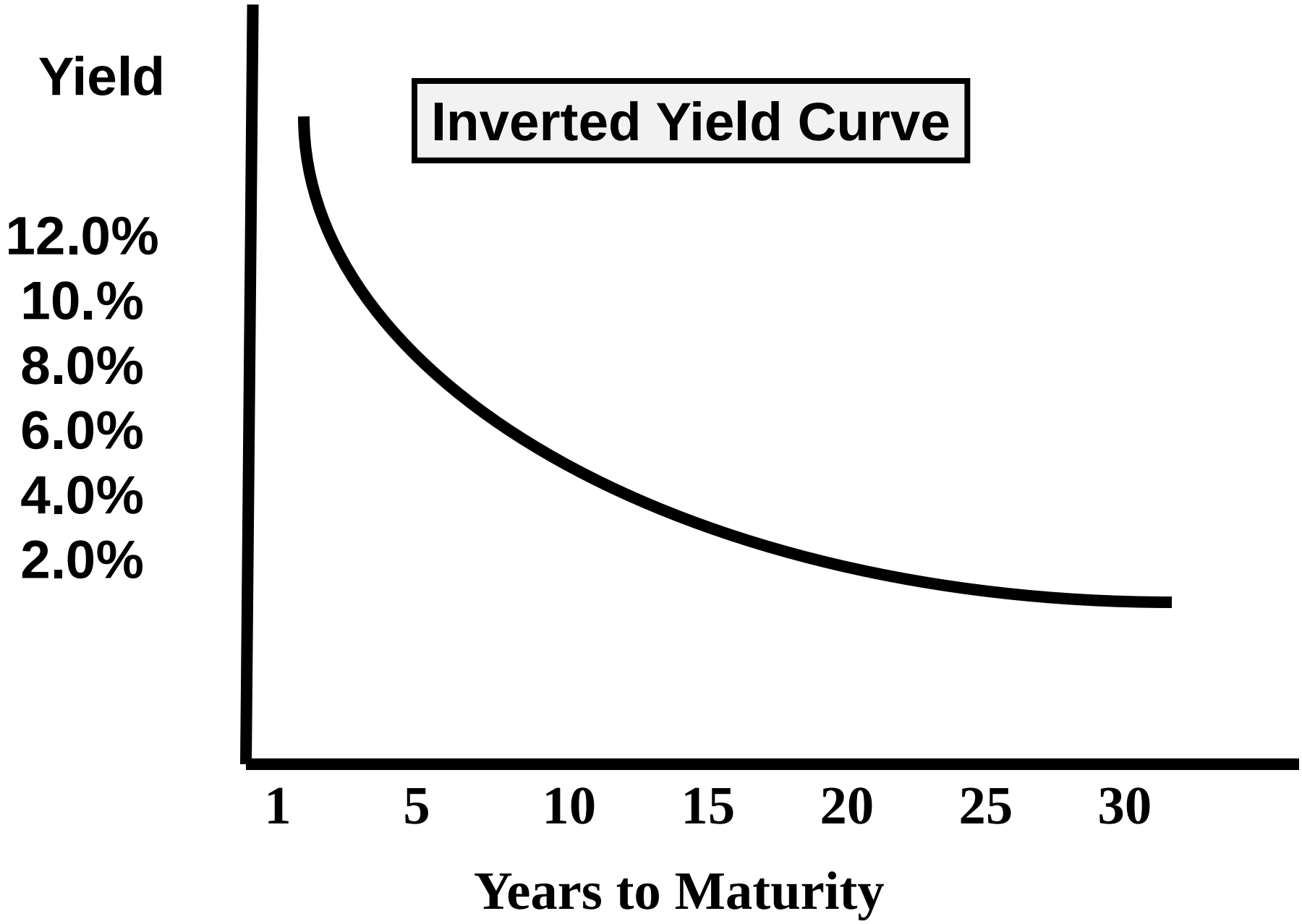
ADDITIONAL INFORMATION

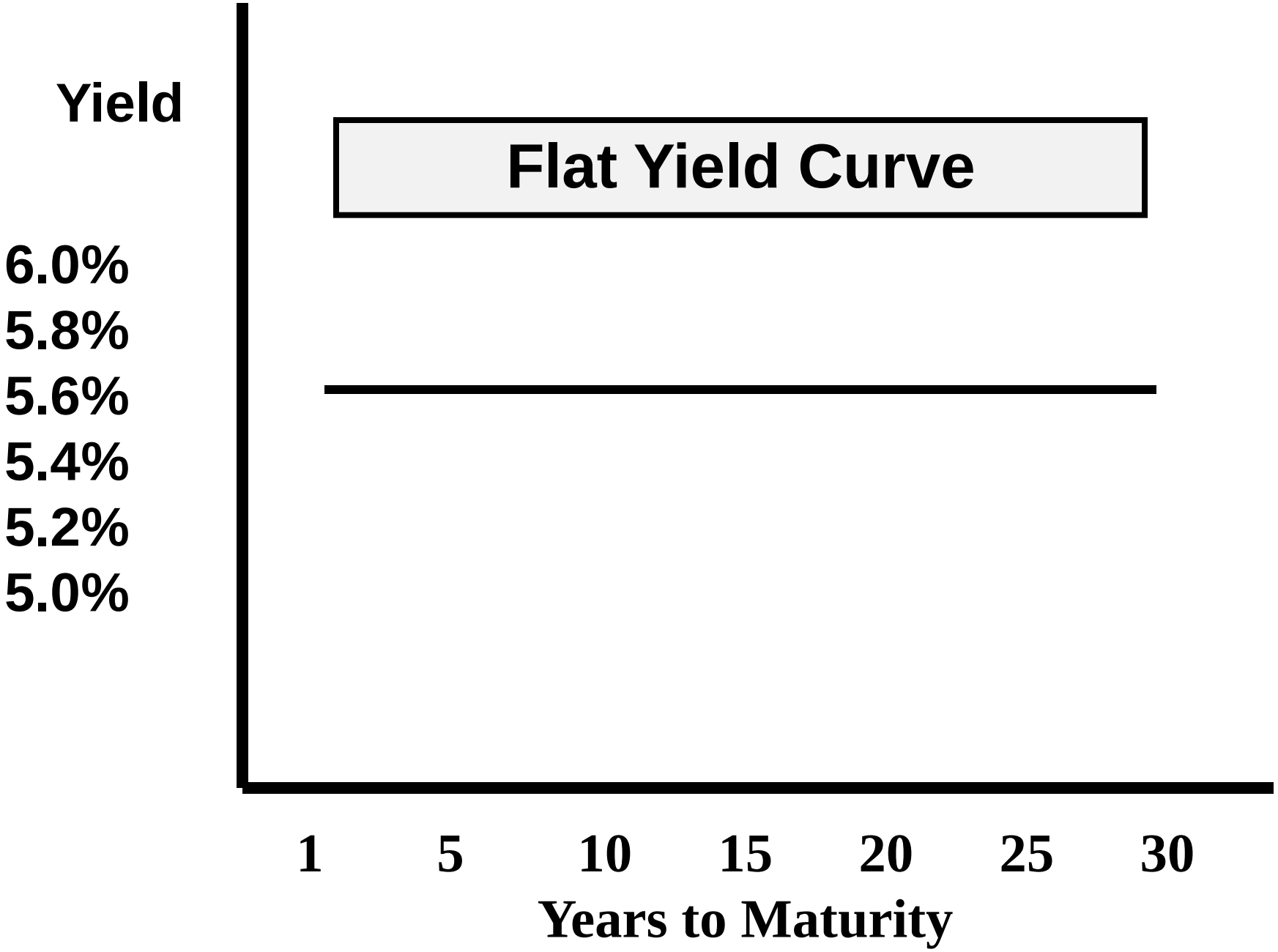
Yield Curves

A GRAPHIC REPRESENTATION OF INTEREST RATES

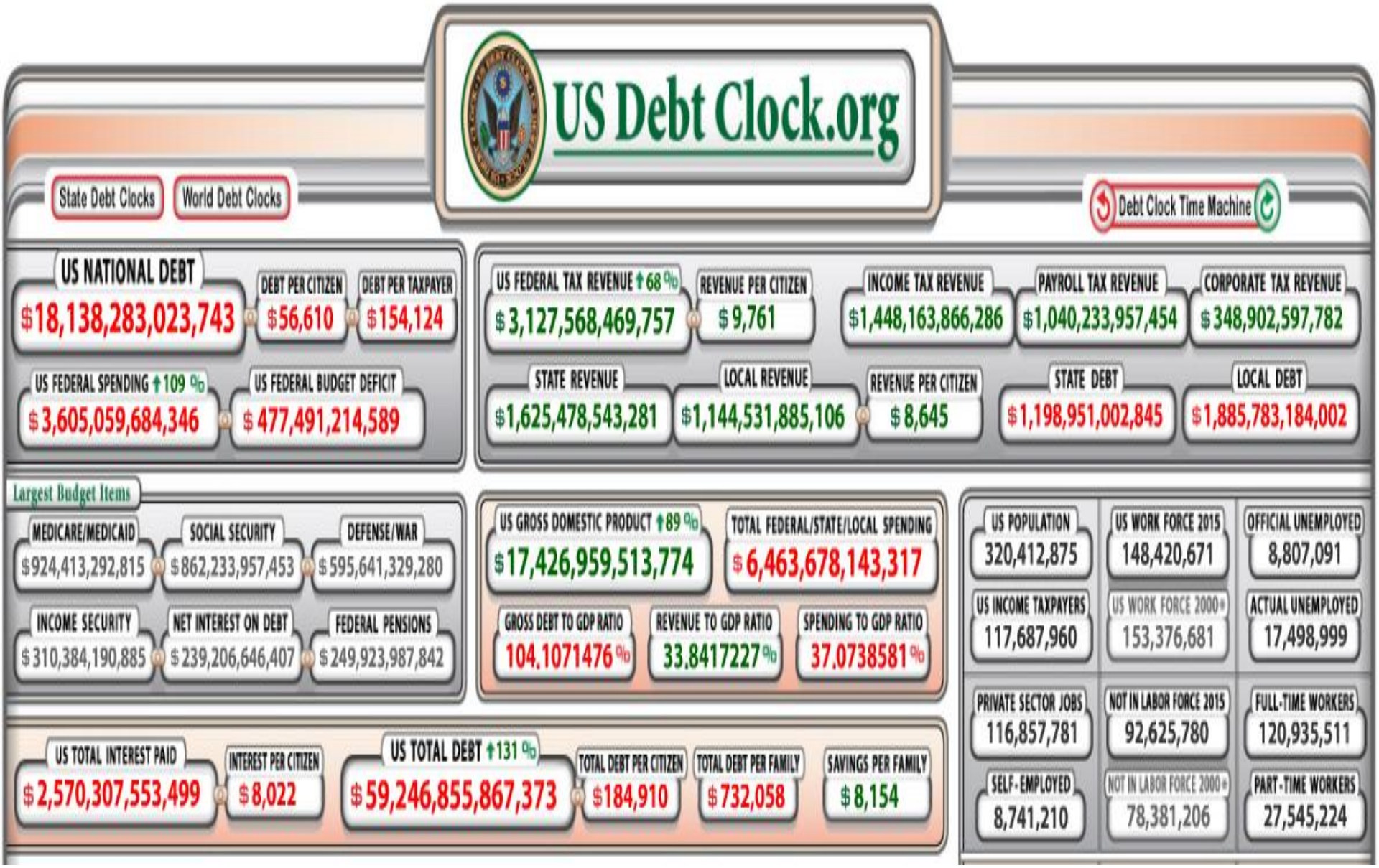
Positive Sloping Yield Curve



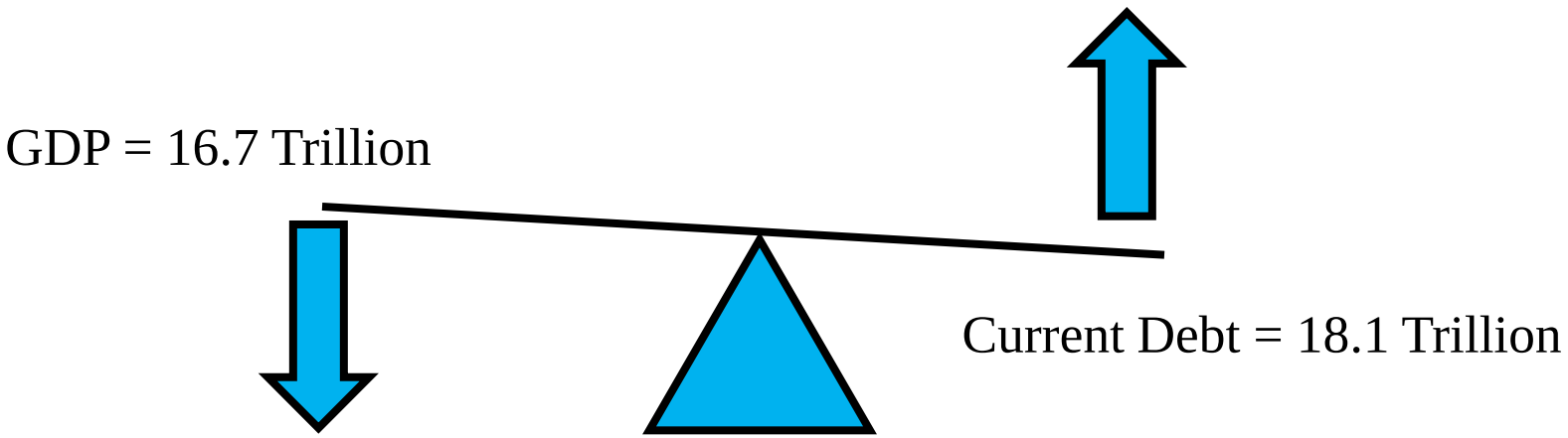

Yield
Inverted Yield Curve
12.0%
10.%
8.0%
6.0%
4.0%
2.0%
1
5
10
15
20
25
30
Years to Maturity


Yield
Flat Yield Curve
6.0%
5.8%
5.6%
5.4%
5.2%
5.0%
1
5
10
15
20
25
30
Years to Maturity

Government Debt



http://www.youtube.com/watch?v=OTSQozWP-rM&feature=player_embedded


GDP = 16.7 Trillion
Current Debt = 18.1 Trillion


United States National Debt
And the Presidents Responsible for It
$8,000,000,000,000
$7,000,000,000,000
$6,000,000,000,000
$5,000,000,000,000
$4,000,000,000,000
$3,000,000,000,000
$2,000,000,000,000
$1,000,000,000,000
(One Trillion)
$0
Democrat
Republican
Roosevelt
Truman
Eisenhower
Kennedy
Johnson
Nixon
Ford
Carter
Reagan
Bush
Clinton
Bush
WW II
Korean War
Viet Nam War
Debt data from Encarta
1938
1940
1942
1944
1946
1948
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004

U.S. Funding of Debt

T- BILLS

- **Short term < 1 year**

T-NOTES

- **1 – 10 years**

T- BONDS

- **10 – 30 years**

Collateralized Mortgage Obligations (CMOs)

Municipal Bonds

Municipal Bonds

DEBT OBLIGATIONS OF STATE AND LOCAL GOVERNMENTS.

NOT BACKED BY THE FEDERAL GOVERNMENT

SUBJECT TO BOTH DEFAULT RISK AND INTEREST-RATE RISK

GENERALLY FAVORED BY HIGH INCOME INVESTORS

SHIFTING OF COSTS FROM FEDS TO STATES/CITIES/COUNTIES

General Obligation Bonds

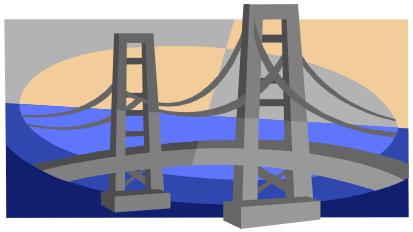
BACKED BY THE GENERAL TAXING POWER OF THE ISSUE

Taxes levied include: income, property, sales, and real estate

Generally viewed as very safe

Revenue Bonds

- **Backed by the revenues of a specific project or facility**
- **Not backed by taxes**



Bonds issued will be paid using:

Hotel taxes

Sales taxes

Downtown Property Taxes

Other city revenue

Corporate Bonds

- **May be unsecured or secured.**
- **Secured bonds are backed by collateral.**

Type of Issue	Key Words to Look for in the bond description:
General Obligation Bond	State of… County of… City of… Township of… School district of…
Revenue Bond	Turnpike, bridge, tunnel, airport Hospital/healthcare Water/sewer College/dormitory Authority

Questions

Thank You