



BNY MELLON

# Fixed Income Securities

Business L1 Training iNautix



# 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	Borrowing by banks from investors		
Federal Funds			
Repurchase Agreement	Interest at Maturity		Money Market Dealers

# 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.



# 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.

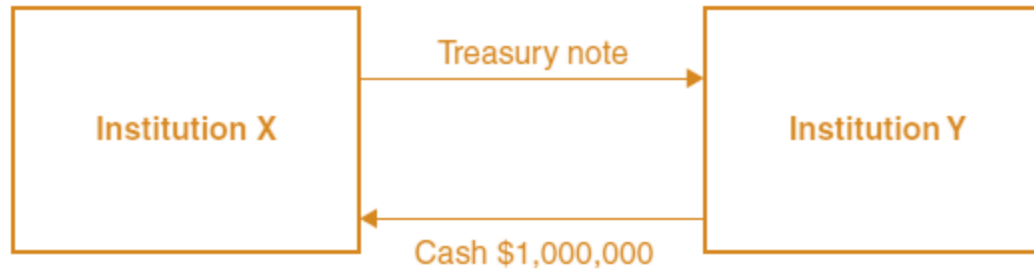
In Figure 5.1, we illustrate a repo transaction. Institution X delivers a Treasury note with a market value of \$1,000,000 to Institution Y, which delivers to Institution X \$1,000,000 in cash (initial transaction, or the opening leg in the figure). For simplicity, we assume that the Treasury note is 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

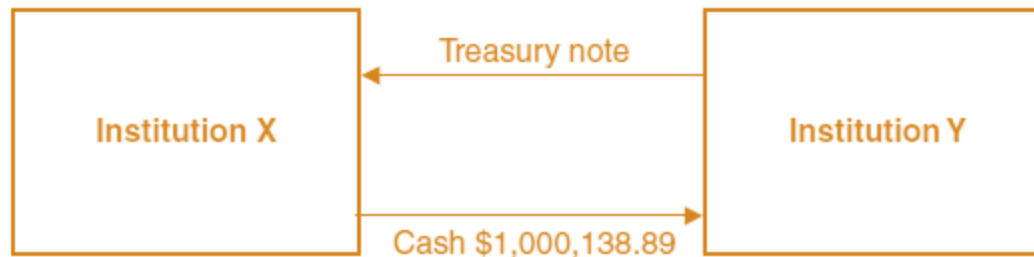
- Repurchase agreement (REPO): a contract to sell a security and then repurchase it at a later date for a specified price.
- We can think of a repo as a collateralized loan, where the collateral is the security. This is because the seller of the security retains the right to receive any interest paid 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

## 1. Initial Transaction in Repo Agreement (Opening leg—takes place at date $t$ )



## 2. Closing Transaction in Repo Agreement (Closing leg—takes place at date $t+1$ )



**FIGURE 5.1**

Example of a Repo Transaction (Opening and Closing Legs)

# 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
<ul style="list-style-type: none"><li>■ More Income</li><li>■ Greater Safety</li><li>■ Known Maturity</li><li>■ Not an Owner</li><li>■ Poor Inflation Hedge</li></ul>	<ul style="list-style-type: none"><li>■ Control Issues</li><li>■ Risk of Default</li><li>■ “Leverage” in a Capital Structure</li></ul>

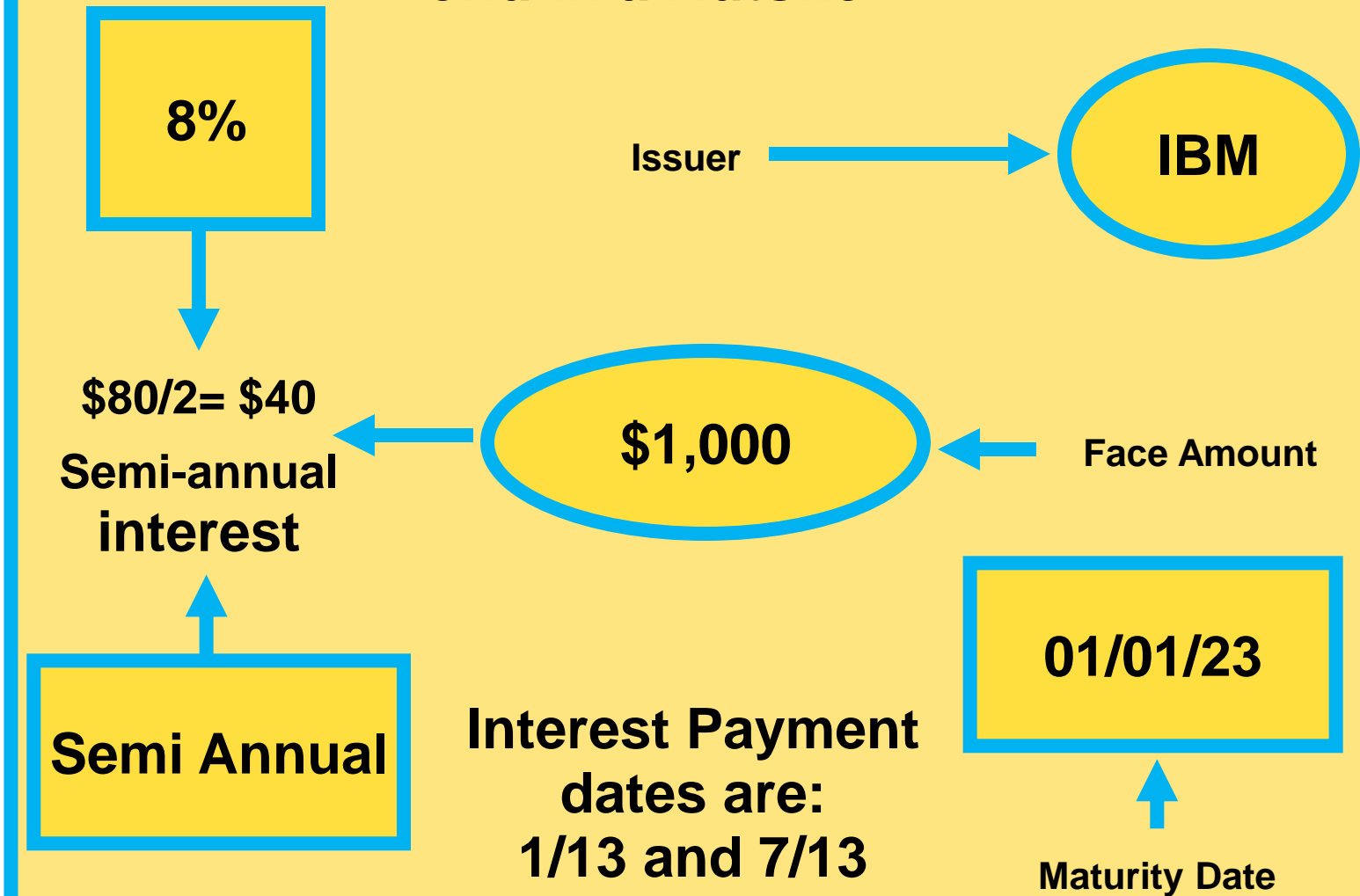
**Bond is the other fundamental product giving fixed returns**



# 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

## Bond in a Nutshell



## 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 ( $\$1,000 \times 8\%$ ) 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



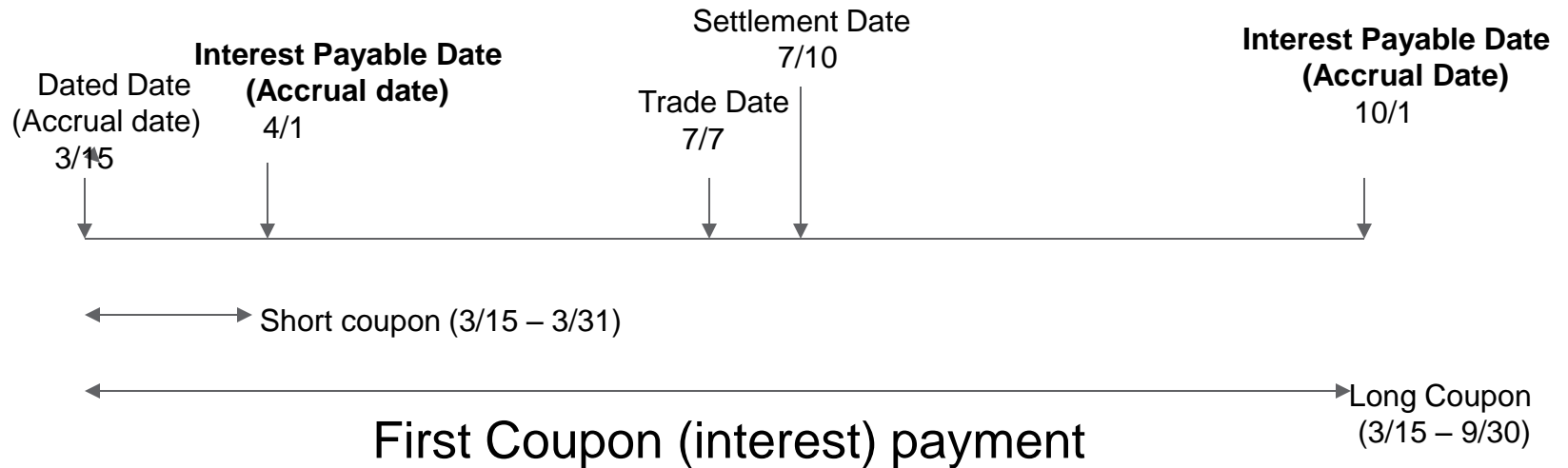
# Accrual Securities

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



Accrued Interest

# Important Dates for Interest Accruals



Interest Accrual date: Dated Date; Interest Payable Date

# Bond Pricing

- Priced as a percentage of par value

$$90 = 90\% \times \text{PAR} = \$900$$

$$100 = 100\% \times \text{PAR} = \$1,000$$

$$120 = 120\% \times \text{PAR} = \$1,200$$

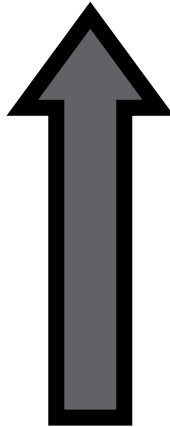
**What terms can be used to describe the prices these bonds trade?**

# Why do bond prices move?

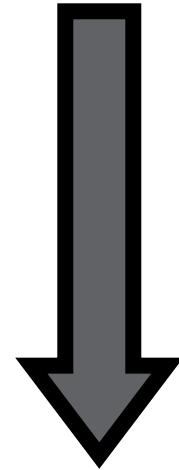
**CREDIT QUALITY CHANGES**

**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:  $\text{Yield} = \text{coupon rate}$
- When price deviates then  $\text{Yield} \neq \text{coupon rate}$
- **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%
<b>Corporate</b>				
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

Column 1

Column 2

Column 3

Column 4

Column 5

# 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



# 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

# ADDITIONAL INFORMATION

# Government Debt



# US Debt Clock.org

State Debt Clocks

World Debt Clocks



## US NATIONAL DEBT

**\$18,138,283,023,743**

DEBT PER CITIZEN

**\$56,610**

DEBT PER TAXPAYER

**\$154,124**

US FEDERAL SPENDING **↑109 %**

**\$3,605,059,684,346**

US FEDERAL BUDGET DEFICIT

**\$477,491,214,589**

US FEDERAL TAX REVENUE **↑68 %**

**\$3,127,568,469,757**

REVENUE PER CITIZEN

**\$9,761**

INCOME TAX REVENUE

**\$1,448,163,866,286**

PAYROLL TAX REVENUE

**\$1,040,233,957,454**

CORPORATE TAX REVENUE

**\$348,902,597,782**

STATE REVENUE

**\$1,625,478,543,281**

LOCAL REVENUE

**\$1,144,531,885,106**

REVENUE PER CITIZEN

**\$8,645**

STATE DEBT

**\$1,198,951,002,845**

LOCAL DEBT

**\$1,885,783,184,002**

## Largest Budget Items

MEDICARE/MEDICAID

**\$924,413,292,815**

SOCIAL SECURITY

**\$862,233,957,453**

DEFENSE/WAR

**\$595,641,329,280**

INCOME SECURITY

**\$310,384,190,885**

NET INTEREST ON DEBT

**\$239,206,646,407**

FEDERAL PENSIONS

**\$249,923,987,842**

US GROSS DOMESTIC PRODUCT **↑89 %**

**\$17,426,959,513,774**

TOTAL FEDERAL/STATE/LOCAL SPENDING

**\$6,463,678,143,317**

GROSS DEBT TO GDP RATIO

**104.1071476 %**

REVENUE TO GDP RATIO

**33.8417227 %**

SPENDING TO GDP RATIO

**37.0738581 %**

US POPULATION

**320,412,875**

US WORK FORCE 2015

**148,420,671**

OFFICIAL UNEMPLOYED

**8,807,091**

US INCOME TAXPAYERS

**117,687,960**

US WORK FORCE 2000\*

**153,376,681**

ACTUAL UNEMPLOYED

**17,498,999**

PRIVATE SECTOR JOBS

**116,857,781**

NOT IN LABOR FORCE 2015

**92,625,780**

FULL-TIME WORKERS

**120,935,511**

SELF-EMPLOYED

**8,741,210**

NOT IN LABOR FORCE 2000\*

**78,381,206**

PART-TIME WORKERS

**27,545,224**

US TOTAL INTEREST PAID

**\$2,570,307,553,499**

INTEREST PER CITIZEN

**\$8,022**

US TOTAL DEBT **↑131 %**

**\$59,246,855,867,373**

TOTAL DEBT PER CITIZEN

**\$184,910**

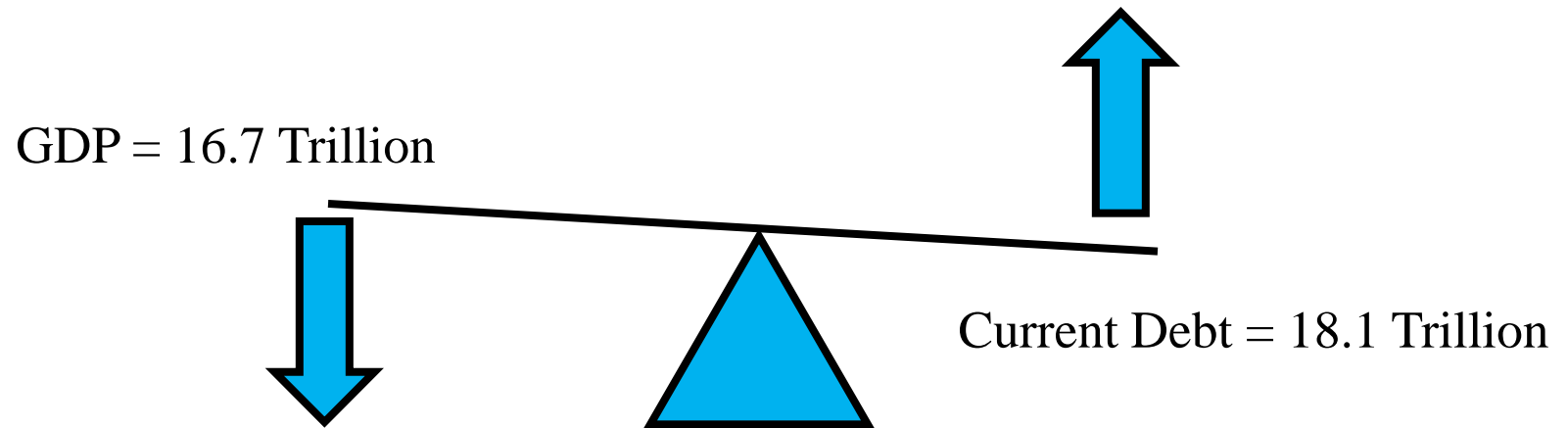
TOTAL DEBT PER FAMILY

**\$732,058**

SAVINGS PER FAMILY

**\$8,154**

[http://www.youtube.com/watch?v=OTSQozWP-rM&feature=player\\_embedded](http://www.youtube.com/watch?v=OTSQozWP-rM&feature=player_embedded)



# Questions

# Thank You