

**SOUTH CAROLINA BANKERS SCHOOL
ECONOMICS / MONEY & BANKING
2023 SYLLABUS**

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COURSE OVERVIEW: The purpose of this course is to introduce and develop macroeconomic terms and to provide a framework for interpreting economic variables. Specifically, this course will define key financial and economic terms and overview the key financial markets from the banker's perspective as well as to provide clear and up-to-date coverage of such fundamental topics as the determinants of supply and demand, the various components of interest rates, a brief description of the Federal Reserve System, the determinants of foreign exchange rates, and the primary factors influencing U.S. monetary policy. The course will also include a discussion of the general level of current interest rates, the impact of interest rate changes on a bank's income statement, and the basis for fixed vs. variable rates in a bank's pricing of both loans and deposits. At the conclusion of this course, you should have an analytical framework for interpreting and analyzing macroeconomic data.

CLASS OUTLINE:

- I. Sources of Financial and Economic Information
- II. Keys to Understanding Economic Concepts
- III. What is Economics?
- IV. The Federal Reserve
- V. Twin Goals of Central Bank Monetary Policy (aka The Dual Mandate)
- VI. Key Definitions
- VII. Putting Inflation Into Perspective (or How / Why Inflation is an Economy Killer)
- VIII. The Bond Market
- IX. Term Structure of Interest Rates (aka Determining The Price Of Money)
- X. Lagged Effects of Monetary Policy
- XI. How the Central Bank Controls Money Supply
- XII. Summary / Bringing It All Together

I. SOURCES OF FINANCIAL AND ECONOMIC INFORMATION

TV: CNBC
Fox Business Channel

CNBC World
Bloomberg TV

Internet: www.nytimes.com/ref/business/business-navigator.html
<http://library.law.yale.edu/news/75-sources-economic-data-statistics-reports-and-commentary>
www.econlib.org/library/sourcesUS.html
www.bea.gov
<https://fred.stlouisfed.org/>
www.bloomberg.com
www.wsj.com
www.money.cnn.com

www.nber.org
www.bls.gov
www.federalreserve.gov
www.marketwatch.com
www.cnbc.com
www.finance.yahoo.com

II. KEYS TO UNDERSTANDING ECONOMIC CONCEPTS

- A. Information is the Key Element for examining and understanding Economic Data. Information is Data whose facts and statistics have been collected together and given value through analysis, interpretation, or compilation in a meaningful form.
- B. In general, all Markets operating in a Capitalistic Economic System will constantly be seeking Equilibrium: that unit price when the supply of goods in a particular market matches demand.
- Supply exceeds Demand - surplus or excess inventory. Places downward pressure on price.
 - Demand exceeds Supply - shortage. Places upward pressure on price.
- C. Understand the Market Expectation and factors driving changes to expectations. The Efficient Market Hypotheses contends that organized markets are always in Equilibrium. This theory is based on:
- All historical information is immediately factored into the current market price.
 - All publicly available information is fully reflected into the current market price.
 - Expectations regarding future information have already been acted upon by market participants and therefore is fully reflected into the current market price.
 - Participation by governmental entities is expected to remain constant with historical levels.
- If a market is operating efficiently, market prices will respond only when New Information is different from Market Expectations regarding that Information.

III. WHAT IS ECONOMICS?

Macroeconomics is the study of the aggregate (national) economy. Macroeconomics in General (the “Ground Rules”):

- The Bond Market is directly linked to Current Interest Rates and expectations regarding Future Interest Rates.
- Future Interest Rates are directly tied to inflation expectations and indirectly influenced by demand and supply of obligations of the Federal Government (Treasury Bills, Notes, and Bonds).
- The Stock Market is directly linked to (i) historical corporate profits, (ii) estimated growth of corporate profits, and (iii) new opportunities, anticipated risks and timing associated with achieving the estimated future growth rates.
 - a portion of Capital (“Private Capital”) will always flow to where the Cost is the lowest and the Market Participant’s Risk Adjusted, Inflation Adjusted, and After-Tax Rate of Return is the highest.
 - a portion of Capital (“Public Capital”) will always flow to where the Government Rate of Return is the highest.
- Financial Theory is based on the Maximization of the Risk-Adjusted, Inflation Adjusted, and After-Tax Rate of Return over the long-term being the only goal of all market participants operating in a Capitalistic economic society.
- Time Value of Money: money owned today is worth more than money to be received in the future because (i) money in hand today (a) contains zero risk and (b) can be invested and earn a Rate of Return, (ii) the risk that inflation erodes the value of the money to be received in the future (“Inflation Risk”), and (iii) the risk that the money to be received in the future will not be paid (“Credit / Default Risk”).

IV. THE FEDERAL RESERVE

Central Bank - a banking institution granted the exclusive privilege to lend a government its currency.

Federal Reserve Bank (“Federal Reserve”) - the Central Bank for the United States. The Federal Reserve System was enacted in 1913, with the passing of the Federal Reserve Act.

The Federal Reserve is governed by The Board of Governors (or Federal Reserve Board), a federal government agency that reports to Congress and is located in Washington, D.C. Each member of the Board of Governors is appointed to a non-renewable 14-year term with one term expiring on February 1 of every even numbered year. The long-term nature of the appointment is to reduce short-term political pressure as by law, the appointments must yield a "fair representation of the financial, agricultural, industrial, and commercial interests and geographical divisions of the country". All members of the Board of Governors are appointed by the President and approved by the Senate. Primary roles: (i) regulating commercial banks and (ii) managing monetary policy.

The Federal Open Market Committee ("FOMC") it is the principal organ of United States Monetary Policy. The FOMC is composed of the seven members of the Federal Reserve Board and five of the twelve Federal Reserve Bank presidents (the New York Federal Reserve Bank President has a permanent seat), which oversees Open Market Operations, the principal tool of US monetary policy. The Chairman of the Board of Governors serves as Chairman of the FOMC. Jerome H. Powell is currently the Chairman of the Board of Governors.

Fed Funds – funds deposited by commercial banks at Federal Reserve Banks. Funds in excess of bank reserve requirements can be loaned to other commercial banks that are a member of the Federal Reserve on an overnight basis at the Fed Funds Rate. The Fed Funds Rate is controlled by the FOMC.

Fed Funds Rate – the Target Interest Rate at which FDIC insured depository institutions lend balances at the Federal Reserve to other FDIC insured depository institutions on an overnight basis.

At the scheduled May 2-3, 2023 meeting of the FOMC, the Federal Reserve announced (i) a 25 basis point (0.25%) increase in the Fed Funds Target Interest Rate to a target range for the Fed Funds Rate of between 5.00% - 5.25% and (ii) the FOMC's plan to reduce the size of the Federal Reserve's Balance Sheet (mainly holdings of US Treasury Securities and US Government Agency Debt and US Government Agency Mortgage - Backed Securities). The objective of these actions is to return inflation to the Federal Reserve Target Rate of 2.00%. The Press Release from the May 2-3, 2023 FOMC meeting can be found at: <https://www.federalreserve.gov/newsevents/pressreleases/monetary20230503a.htm>

The next scheduled meeting of the FOMC after the May 2-3, 2023 meeting was June 13-14, 2023.

The next scheduled meeting of the FOMC after this class is July 25-26, 2023.

As of May 4, 2023, the Fed Funds Rate was currently targeted to trade between 5.00% - 5.25% and the Effective Fed Funds Rate was 5.08%. For comparison, as of May 4, 2022, the Fed Funds Rate was targeted to trade between 0.25% - 0.50% and the Effective Fed Funds Rate was 0.33%.

The 1955 - 2022 Historical Average Fed Funds Rate = 4.62% with a high rate of 16.38% in 1981 and a low rate of 0.08% in 2021. Details regarding the history of the Fed Funds Target Interest Rate going back to 2003 can be found at: <https://www.federalreserve.gov/monetarypolicy/openmarket.htm>.

KEY CONCEPT: The Fed Funds Rate influences interest rates associated with both bank assets and liabilities. For Bank Liabilities, changes in the Fed Funds Rate should influence rates on all deposits since (by definition) they are short-term in duration. For Bank Assets, changes in the Fed Funds Rate influences rates on all variable rate loans. While each bank sets its own Prime Rate, the relationship between the Fed Funds Rate and the Prime Rate is closely correlated with the Prime Rate usually +/-3.00% above the Fed Funds Rate. The relationship between the Fed Funds Rate and SOFR / LIBOR is less correlated since SOFR / LIBOR is an international benchmark rate; however, SOFR / LIBOR tends to also track closely with the US Fed Funds Rate since the US has the largest economy in the world. In summary, the Fed Funds Rate has traditionally been the "Base Rate" for pricing associated with all deposits and is the "Base Rate" for all variable rate loans having Prime or SOFR / LIBOR as the benchmark rate.

Discount Rate – the interest rate at which the Federal Reserve lends directly to FDIC insured depository institutions always with debt obligations of the U.S Government as collateral (“Lender of Last Resort”). Historically, the Discount Rate was set at 1.00% above the Fed Funds Rate (the “Discount Rate Spread”); however, the Discount Rate Spread has been below 1.00% since the economic downturn that began in 2008. The Discount Rate Spread was lowered to 0.50% over the Fed Funds Rate at the December 2008 meeting of the FOMC and after several increases, lowered to 0.25% over the Fed Funds Rate at the unscheduled March 15, 2020 meeting of the FOMC. Discount Rate = 5.25% as of 5/4/2023 representing a 0.25% Discount Rate Spread.

Key Borrowing Benchmarks and Money Rates is published daily in the WSJ. This information can be found at the following link:

https://www.wsj.com/market-data/bonds/keyinterestrates?mod=md_bond_view_key_int_rates_full

KEY CONCEPT:

- Economic Units operating in a Capitalistic economic society will always change spending behaviors in response to higher interest rates and higher taxes.
- Economic Units operating in a Capitalistic economic society will not always change spending behaviors in response to lower interest rates and lower taxes.

Reserve Requirement - a Central Bank regulation that sets the minimum percentage of customer deposits and notes that each FDIC member institution must hold in reserve (rather than lend out) as a percentage of specified deposit liabilities. These required reserves are either (i) cash stored physically at the bank or (ii) on deposit at the closest regional Federal Reserve Bank. Interest Rate paid on Reserve Requirements = 0%. The Reserve Requirement has historically been 10%. Effective March 16, 2020, the Federal Reserve reduced the Reserve Requirement Ratio to 0% for all depository institutions in response to the COVID pandemic. The 0% Reserve Requirement remains in effect.

V. TWIN GOALS OF CENTRAL BANK MONETARY POLICY (aka THE DUAL MANDATE)

1. Price Stability (Low Inflation)
2. Full Employment (Maximum Unemployment)

This Mission Statement can be found on Federal Reserve’s website at:

<https://www.federalreserve.gov/faqs/why-is-it-important-to-separate-federal-reserve-monetary-policy-decisions-from-political-influence.htm>

An article from PBS dated September 2019 titled “Why the Federal Reserve Must Remain Above Political Influence” can be found at the following link:

<https://www.pbs.org/newshour/economy/making-sense/why-the-federal-reserve-must-remain-above-political-influence>

This article provides theoretical and empirical economic research showing that economies perform better under Central Banks that are more independent.

WSJ Opinion Article dated January 2022 titled “A Politicized Fed Endangers the Economy” can be found at the following link:

<https://www.wsj.com/articles/a-politicized-fed-endangers-economy-monetary-federal-reserve-powell-balance-sheet-climate-stress-test-social-justice-11642448983>

This article provides an op-ed on the actions from 2022 dating back to 2010 of the Federal Reserve outside of managing Monetary Policy and moving into social and political issues.

VI. KEY DEFINITIONS

Capitalism - An economic system in which (i) private ownership of property exists, (ii) economic units are relatively free to compete with others for their own economic gain, and (iii) the profit motive is basic to economic life.

Government Economic Policy in a Capitalistic Economic System takes one of two forms:

1. Monetary Policy - regulation of economic policy by controlling money supply. This is done (i) by changing short-term interest rates (the fed funds rate), (ii) by influencing supply and demand of obligations (bills, notes, bonds) of the Federal Government, and (iii) by influencing supply and demand of the domestic currency.
2. Fiscal Policy - regulation of the economy via Federal taxation and governmental spending policies.

Monetary Policy (management of the money supply) in the United States is implemented by the Central Bank.

Fiscal Policy (management of spending and taxation) in the United States is implemented jointly by the Legislative Branch of Government and the Executive Branch of Government.

Unemployment Rate - measure of the number of willing and able persons not employed as a percentage of the civilian labor force. The "Natural" Unemployment Rate is always $> 0\%$.

Unemployment Rate expectations can be found at: <https://tradingeconomics.com/united-states/unemployment-rate>

Unemployment Rate information can be found at <https://www.bls.gov/cps/#news>

The monthly Release Date for the Unemployment Rate is on or 1 - 2 days before the first Friday of the month.

	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
Unemployment Rate	6.2%	5.3%	4.9%	4.4%	3.9%	3.7%	8.1%	5.4%	3.6%

Unemployment Rate – April 2023 = 3.4%

Market Expectation – April 2023 = 3.6%

Unemployment Rate – April 2022 = 3.6%

WSJ Article discussing April US Unemployment Report (released on 5/5/2023) can be found at the following link:

<https://www.wsj.com/articles/april-jobs-report-unemployment-rate-economy-growth-2023-a500d302>

Average Annual Unemployment Rate for the United States (1927-2022) = 5.7%.

Average Annual Unemployment Rate for the United States (1990-2022) = 5.9%.

The Unemployment Rate is a national average and will always be different from regional and local unemployment levels due to the uneven distribution of wealth created by a Capitalistic economic society.

Inflation - an increase in the general price level. Inflation occurs when the growth in money supply [best measured by M2] exceeds growth in goods and services provided [or change in GDP].

Demand-Pull Inflation – when inflation is caused by an increase in demand ("Good Inflation"). Demand Pull Inflation is primarily caused by an expanding economy, stimulative Monetary Policy (lowering interest rates, manipulating domestic currency), and stimulative Fiscal Policy (increased government spending, lower tax policies). Inflation starts with the end consumer and pulls backward thru the production process. Demand-Pull Inflation responds well to monetary policy and fiscal policy measures.

Cost-Push Inflation – when inflation is caused by an increase in cost (“Bad Inflation”). Cost-Push Inflation is primarily caused by an increase in the cost of raw materials, and/or an increase in the cost of production, and/or an increase in the cost of transportation. Inflation starts at the beginning of the production process and pushes forward to the end consumer. Cost-Push Inflation is more difficult to manage via monetary policy and fiscal policy measures.

Monetary Policy and Oil - petroleum-based products are the primary raw material in a variety of end uses. In general, the price of oil fluctuates with market conditions; however, the price of oil is determined by oil producers / oil exporting countries and not by Central Bankers. So for a net oil importer like the United States, the US Central Bank cannot control or directly influence oil prices but can only hope to indirectly influence oil prices by controlling economic growth (demand / output).

Deflation - a decrease in the general price level. Deflation is caused by either:

1. technological advances (considered good since increase in quantity sold > decrease in price)
2. increased productivity (considered good since increase in quantity sold > decrease in price) or
3. a reduction in demand (considered bad due to a decrease in both quantity sold and price).

Consumer Price Index (“CPI”) - measure of the average change in prices over time ("Inflation").

CPI (Inflation / Deflation) expectations can be found at <https://tradingeconomics.com/united-states/inflation-cpi>

CPI (Inflation / Deflation) information can be found at <https://www.bls.gov/cpi/>

The monthly Release Date for CPI varies but is usually during the 3rd week of the month, between the 13th and 19th of the month.

Primary Components of CPI:	December 2022
Shelter	34.4% (was 32.9% in December 2021)
Transportation	16.7%
Food & Beverage	14.4%
Medical	8.2%
Energy	6.9%
Education & Communication Service	5.8%
Recreation	5.4%
Household Furnishings & Supplies	4.4%
Apparel	2.5%
Other	1.3%

“Core” CPI - statistical measure of the average change in prices of a specified set of consumer goods and services over time ("Inflation") but excluding goods and services with high price volatility, primarily food / beverage (13.5% of 2022 CPI) and energy (6.9% of 2022 CPI) prices. So Core CPI comprised 79.6% of Total CPI during 2022.

Core CPI expectations can be found at <https://tradingeconomics.com/united-states/core-inflation-rate>

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Average U.S. Inflation Rate	1.6%	0.1%	1.3%	2.1%	2.4%	1.8%	1.2%	4.7%	8.0%

Periods of Deflation in United States: 1921 - 1922, 1926 - 1928, 1929 - 1932, 1938, 1949, 1954, and 2009.

Inflation Rate – April 2023 = 4.9%

Market Expectation - April 2023 = 5.0%

Inflation Rate – April 2022 = 8.3%. Inflation Rate in 2022 peaked at 9.1% in June. This was the highest since 1981 when the Inflation Rate averaged 10.3%.

Core Inflation Rate – April 2023 = 5.5%

Market Expectation - April 2023 = 5.5%

Core Inflation Rate – April 2022 = 6.2%. Core Inflation Rate in 2022 peaked at 6.6% in September. This was the highest since 1980 when the Core Inflation Rate averaged 12.4%.

Since 2012, US Central Bank Target Inflation Rate = 2.00%

Average Annual Inflation Rate for the United States (1914-2022) = 3.5%.

Average Annual Inflation Rate for the United States (1990-2022) = 2.6%.

WSJ Article discussing April US Inflation Rate (released on 5/10/2023) can be found at the following link:

https://www.wsj.com/articles/us-inflation-april-2023-consumer-price-index-48f0eac5?mod=hp_lead_pos1

CPI is a national average and will always be different from regional and local inflation levels due to the uneven distribution of wealth created by a Capitalistic economic society. The variance between the national average and regional / local Inflation Rates may be significant or subtle with the variance usually associated with the +/- 34% (1/3rd) impact from housing / housing improvements.

Gross Domestic Product (GDP) - measure of the total market value of all goods and services produced in an economy within a given time period ("Output"). Factors influencing GDP:

1. +/-Consumer Expenditures: expenditures by households, individuals, and nonprofit economic units for durable goods, nondurable goods, and services
2. +/-Business Expenditures: expenditures by businesses on fixed investments and changes in business inventories
3. +/-Government Expenditures: expenditures by federal, state and local governmental units
4. +/-Net Exports: Exports minus Imports. Trade Deficit / Surplus - the excess / shortfall of imports over exports. A negative number indicates that imports exceeded exports.

GDP is released monthly but provides 3 figures related to the previous calendar quarter: (i) 1st / Advance or Initial Estimate, (ii) 2nd Estimate, and (iii) 3rd / Final Estimate.

GDP expectations can be found at <https://tradingeconomics.com/united-states/gdp-growth>

GDP information can be found at <https://www.bea.gov/data/gdp/gross-domestic-product>

The monthly Release Date for GDP is on or 1 - 2 days before the last Friday of the month.

Components of GDP	1975	2000	2010	2020	2022
Consumer Expenditures	62.5%	68.2%	70.5%	67.6%	68.2%
Business Expenditures	14.5%	17.9%	12.4%	17.2%	18.2%
Governmental Expenditures	22.9%	17.6%	20.7%	18.3%	17.4%
Net Exports	0.1%	- 3.7%	- 3.6%	- 3.1%	- 3.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Economic Growth - measured by the change in GDP of a particular economy.

U.S. GDP Growth Rate:	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
	2.7%	1.7%	2.3%	2.9%	2.3%	-2.8%	5.9%	2.1%

GDP Growth Rate = 1Q 2023 = (1st / Advance Estimate) = 1.1%
Market Expectation – 1Q = 2.0%
GDP Growth Rate – 1Q 2022 (3rd / Final Estimate) = -1.6%

Optimal Average Annual Growth Rate for Real GDP = between 3.00% - 4.00%.

Average Annual United States Real GDP Growth (1948 – 2022) = 3.1%.

Average Annual United States Real GDP Growth (1990 – 2022) = 2.4%.

WSJ Article discussing the 1st Estimate for GDP for the 1st Quarter of 2023 (released on 4/27/2023) can be found at the following link:

<https://www.wsj.com/articles/us-gdp-economic-growth-first-quarter-2023-2ff4348c?page=1>

The 3rd / Final Estimate for GDP for the 1st Quarter of 2023 was released on 6/30/2023.

VII. PUTTING INFLATION INTO PERSPECTIVE (OR HOW / WHY HIGH INFLATION IS AN ECONOMY KILLER)

Interest Rate – the cost or price of money expressed as an annual percentage (%). Also referred to as the “Actual” or “Nominal” Interest Rate. This is the rate discussed daily and quoted in the media.

In Finance & Economics, “Real” means “Adjusted For Inflation”

Real Rate of Return = Actual / Nominal Interest Rate – Inflation Rate

Rate of Return from the S&P 500 Market Index for 1Q 2023 = 7.5%.

Real Rate of Return from S&P 500 Market Index for 1Q 2023 = 2.6% calculated as Actual / Nominal Rate of Return of 7.5% minus the April 2023 Inflation Rate of 4.9%.

KEY CONCEPT: Maximization of the Real Rate of Return is the primary goal of all investors / providers of capital operating in a Capitalistic economic society. The Real Rate of Return incorporates how much inflation has occurred and subtracts that out, providing a more truthful measurement of the return being obtained. Economies having a high Real Rate of Return attract both domestic and international capital, increasing the Standard of Living throughout society.

Real Wage Growth Rate = Actual / Nominal Wage Growth Rate – Inflation Rate

Average United States Hourly Earnings Growth Rate for the period April 2022 – April 2023 = 4.4%

Real United States Hourly Earnings Growth Rate = -0.5% calculated as the April 2023 Actual / Nominal United States Hourly Earnings Growth Rate of 4.4% minus the April 2023 Inflation Rate of 4.9%.

KEY CONCEPT: Maximization of the Real Earnings Growth Rate (aka the “Return on Me” or “ROM”) is the primary goal of all persons working in a Capitalistic economic society. The Real Earnings Growth Rate (“ROM”) incorporates how much inflation has occurred and subtracts that out, providing a more truthful measurement of the wage increase being obtained. Having a high Real Earnings Growth Rate leads to a higher Standard of Living throughout society. Having a low Real Earnings Growth Rate leads to deepening levels of poverty, income inequality, and social unrest.

Real GDP Growth Rate = Actual / Nominal GDP Growth Rate – Inflation Rate

GDP Growth Rate = 1Q 2023 = (1st / Advance Estimate) = 1.1%

Real GDP Growth Rate for 1Q 2023 = -3.8% calculated as Actual / Nominal GDP Growth Rate of 1.1% minus the April 2023 Inflation Rate of 4.9%.

KEY CONCEPT: Maximization of the Real GDP Growth Rate is the primary goal of all economies operating in a Capitalistic economic society. The Real GDP Growth Rate incorporates how much inflation has occurred and subtracts that out, providing a more truthful measurement of economic growth. Economies having a high Real GDP Growth Rate attract both domestic and international capital and can afford to pay higher wages, increasing the Standard of Living throughout society.

Stagflation – combination of low economic growth and high unemployment with high inflation.

Recession - two consecutive calendar quarters of negative GDP growth. Recessions are a normal (albeit unpleasant) part of the business / economic cycle. Average Duration of Recessions occurring since 1900 = 12 – 18 months.

Depression - a severe economic downturn that lasts greater than 12 - 18 months.

VIII. THE BOND MARKET

Understanding of the Bond Market is critical to bankers as (i) banks are limited by Federal law to investments in bonds, (ii) government bonds must be used as collateral in all borrowings from the Federal Reserve and (iii) bonds and loans are essentially the same thing so they both react to market events the same way.

Key Bond Definitions:

Bond - a creditor relationship with a borrowing entity whereby the borrowing entity promises to make specified payments at specified future dates and to repay the principal amount borrowed at or before the maturity date of the bond. Along with cash flow, repayment of Bonds is usually supported by collateral serving as a secondary source of repayment.

Par Value - stated or face value of a Bond, typically \$100 or \$1,000 per bond. Treasury Notes and Bonds along with Corporate Bonds are issued at Par (Face) Value with the price then fluctuating on the open market based on current market conditions.

Coupon Interest Rate – the stated annual interest rate on a Bond. The Coupon Interest Rate is determined at the Issue Date and always stays fixed for the life of the Bond (“Fixed Rate”).

Yield-to-Maturity (“YTM”) - term used to determine the Rate of Return received if a Fixed Rate interest-bearing asset is purchased after the Issue Date at a Market Price other than Par Value and is held to its Maturity Date.

Maturity Date – a date determined at the Issue Date on which the Par Value of a Bond must be repaid.

Premium - the amount by which a bond trades above par value. A bond will sell at a Premium when the Market Interest Rate is less than the Coupon Interest Rate (i.e – Market Interest Rates drop after the Coupon Interest Rate is fixed in conjunction with the Issue Date).

Discount - the amount by which a bond trades below par value. A bond will sell at a Discount when the Market Interest Rate is greater than the Coupon Interest Rate (i.e – Market Interest Rates rise after the Coupon Interest Rate is fixed in conjunction with the Issue Date).

Financial Return from a Bond = Interest Income (Coupon Interest Rate) +/-
Price Appreciation or Premium (+) / Price Depreciation or Discount (-).

KEY CONCEPT: Bonds are issued at Par (Face) Value. The value of the bond is determined by the stated interest rate (Coupon Interest Rate) plus the bond's time to maturity with the market price of a bond driven by changes in domestic interest rates after the bond is issued. Bond Prices and Interest Rates are inversely related. When market interest rates rise, bond prices fall and when market interest rates fall, bond prices rise. The price of a bond and interest rates move inversely to each other in order to keep the Yield-To-Maturity in the marketplace as close to the Coupon Interest Rate as possible.

IX. TERM STRUCTURE OF INTEREST RATES (aka DETERMINING THE PRICE OF MONEY)

Determinants of Market Interest Rates

Nominal / Actual Domestic Interest Rate (r_d) = $r^* + IP + MRP + DRP + LP$

Risk Free Rate of Return (r^*) = Treasury Yield for the investment time period.

+ The Financial Risks in investing in domestic bonds:

Inflation Premium (IP) – to compensate for the reduction in return / purchasing power caused by inflation. Calculated as the average expected inflation rate for the go-forward investment time period (Expected Inflation is rarely the same as Current Inflation).

Time / Maturity Risk Premium (MRP) - to compensate for (i) additional market risk / uncertainty embodied in long-term securities, (ii) opportunity cost since the investor will be unable to change investment options, and (iii) psychological cost to compensate for the human trait of favoring present consumption over future consumption. By definition, the MRP is always positive (present) but increases during periods of uncertainty / distress and decreases during periods of economic recovery / prosperity. The longer the time to maturity, the more things that can go wrong.

Credit / Default Risk Premium (DRP) – to compensate for the risk that either interest and/or principal will not be repaid by the issuer of a bond, creating a payment default). The Credit / Default Risk Premium is specific to the issuer of the bond and cannot be eliminated. Bond Ratings attempt to quantify the Credit / Default Risk associated with a Publicly Traded Bond. Publicly Traded Bonds are rated from AAA (Best), AA, A, BBB, BB, B, CCC, CC, C (Worst) with D signifying a Bankruptcy. Investment Grade Bonds have a bond rating of between AAA – BBB. Junk / Speculative Bonds have a rating of between BB - C.

Spread – quantification of the Credit / Default Risk Premium, spread is the difference in Bond Yields between bonds having different Bond Ratings. Major categories are: U.S. Government Bonds, Investment Grade Corporate Bonds, Speculative / Junk Corporate Bonds. Spread quantifies the Credit / Default Risk Premium with the magnitude of the spread increasing in periods of economic uncertainty / distress and contracting during periods of economic recovery / prosperity.

Interest Rate Yields and Spreads over Treasury Yields for Various Bond Benchmarks published in the WSJ can be found at the following link:

https://www.wsj.com/market-data/bonds/benchmarks?mod=md_bond_view_tracking_bond_full

Liquidity Premium (LP) - to compensate for (i) the cost and / or (ii) loss incurred in converting investments back into cash. By definition, the LP increases the longer the time to maturity.

Term Structure of Interest Rates

The Term Structure of Interest Rates measures the relationship between length of time to maturity and the level of interest rates (yield), holding constant all other factors.

The Treasury Yield Curve (published daily) is a graphic representation of the Term Structure of Interest Rates and is calculated as:

Risk Free Rate of Return (r^*) + Inflation Premium (IP) + Time / Maturity Risk Premium (MRP)

since (i) the Default Risk Premium (DRP) and Liquidity Premium (LP) are 0.00% for obligations of the U.S. Government. This is due to the fact that the U.S. Government has the ability to print money and/or raise taxes to pay all debt, eliminating default and enhancing liquidity. It should be noted; however, that the ability of the U.S. Government to print money by issuing additional debt is dependent upon (i) market willingness to purchase the debt and (ii) the Executive and Legislative Branches of Government electing to increase the debt ceiling and/or define verifiable sources of repayment (two choices are to raise taxes and/or to reduce expenses).

KEY CONCEPT: Since the Time / Maturity Risk Premium (MRP) is always positive, the Yield Curve is used to measure market expectations concerning Future Inflation (IP) which determines the price of money at specified future dates.

Yield Curve can be found at <https://www.wsj.com/market-data/bonds> or https://www.gurufocus.com/yield_curve.php. WSJ Yield Curve includes the Current Year Yield Curve (2023) and Last Year's Yield Curve (2022). Gurufocus.com Yield Curve includes the Current Year Yield Curve (2023), Last Year's Yield Curve (2022), and Yield Curve from Two Years Ago (2021).

See Attachment titled "Historical Yield Curve Patterns" for a graphic representation of the US Treasury Yield Curve as of 5/5/23, 5/11/2022, 5/28/2021, 5/28/2020, 7/5/2019, 7/6/2018, 5/5/2017, and 6/8/2016. Note the Y Coordinate (the Fed Funds Rate), the X Coordinate (Time), and the changing Slope of the Curve throughout time as represented on each of the graphs.

Yield Curve Patterns:

The FOMC determines the Fed Funds Rate (the shortest short-term interest rate (overnight)). Market expectations concerning inflation, along with governmental intervention in the bond market and currency / foreign exchange market in an attempt to pursue national macroeconomic goals and objectives, determine medium and long-term interest rates. In summary, Treasury Bonds having a Maturity Date of less than 10 years are more sensitive to Federal Reserve policy / influence, while Treasury Bonds having a Maturity Date of 10 years or greater are more sensitive to Inflation Expectations.

Ascending - occurs when short-term rates are lower than long-term rates. An Ascending Yield Curve is generally a leading indicator of a period of Economic Prosperity (positive GDP) as market participants expect interest rates to rise due to Inflation. An ascending Yield Curve is the predominant Yield Curve and has been in effect approximately 85% of the time.

Flat - occurs when short-term rate equal long-term rates, meaning market participants expect interest rates to remain the same. A Flat Yield Curve is not a normal Yield Curve pattern as it is generally an indicator that the market is in a period of transition / confused as to future direction.

Inverted – occurs when short-term rates exceed long-term rates. An inverted Yield Curve is generally a leading indicator of a period of Economic Distress (Negative GDP) as market participants expect interest rates to decline due to Deflation. The Federal Reserve defines an Inverted Yield Curve using the yield differential between the 2-Month Treasury Bill and the 10-Year Treasury Note since inversion of the yield between the 2-Month Treasury Bill and the 10-Year Treasury Note has occurred prior to each recession since 1960. Warning is between 6 – 18 months (average). **Although an Inverted Yield Curve is the rarest of the Yield Curve Patterns, it is probably the most important and should never be ignored!!!**

KEY CONCEPT: The goal is for the Yield Curve to be “Slightly Ascending” meaning LT Rates are marginally higher than ST Rates, indicating an “Acceptable Level of Inflation” in the economy. “Acceptable Level of Inflation” can be defined as (i) US Central Bank Target Inflation Rate of 2.00% and/or (ii) Average Annual Inflation Rate for the United States (1914-2022) of 3.5%.

At the trough of a business cycle, short-term rates move permanently below long-term rates and the Yield Curve becomes Ascending. With an Ascending Yield Curve, companies and individuals are encouraged to borrow, output rises, and growth intensifies, all of which should increase Inflation Expectations and create a “Sharply Ascending” Yield Curve. The Time / Maturity Risk Premium (MRP) is always positive so risk adverse investors sell short-term securities and reinvest in long-term securities to maximize the Real Rate of Return. For short-term securities, price decreases and yield increases. For long-term securities, price increases and yield decreases. Hopefully these market forces create a “Slightly Ascending” Yield Curve. If a “Slightly Ascending” Yield Curve does not occur via market forces, continued direct intervention by the Central Bank to “force” short-term rates higher and / or long-term rates lower will be required.

At the peak of the business cycle, if intervention by the Central Bank does not create the “Slightly Ascending” Yield Curve, the Yield Curve becomes Flat at a high interest rate level. With a Flat Yield Curve, companies and individuals are not encouraged to borrow, output slows, and growth slows / stalls, all of which should increase Deflation Expectations and create a Descending Yield Curve. The Time / Maturity Risk Premium (MRP) is always positive so risk adverse investors sell long-term securities and reinvest in short-term securities to maximize the Real Rate of Return. For short-term securities, price increases and yield decreases. For long-term securities, price decreases and yield increases. Hopefully these market forces create a “Slightly Ascending” Yield Curve. If a “Slightly Ascending” Yield Curve does not occur via market forces, continued direct intervention by the Central Bank to “force” short-term rates higher and / or long-term rates lower will be required.

KEY CONCEPT: ST Rates (<10 years) are influenced by BOTH (i) Central Bank intervention and (ii) market participants. LT Rates (>10 years) are influenced by primarily by market participants and secondarily by Central Bank intervention. As such, ST Rates change more frequently than LT Rates.

X. LAGGED EFFECTS OF MONETARY POLICY

Recognition Lag – time between when the problem arises and when it is recognized. Created by dependence on historical (backward-looking) statistics for decision making.

Implementation Lag – time between when the problem is recognized and when a solution is put in place to solve the problem.

Impact Lag – time between when the solution is put in place and when the impact is felt in the economy. Impact can be immediate, gradual, or long-term in nature depending upon market conditions. On average, the Impact Lag associated with Monetary Policy = 3-6 months.

XI. HOW THE CENTRAL BANK CONTROLS MONEY SUPPLY

Primary Tools

1. **Controls** Short-Term Interest Rates via the FOMC. The Federal Reserve controls the short-term end of the yield curve (via the Fed Funds Rate). The FOMC meets eight times a year and the meeting lasts for 2 days. Announcements from the meeting are made at 2:30 on Day 2 of the meeting.
2. **Influences** Intermediate Term and Long-Term Interest Rates on Governmental Notes and Bonds via its Trading Desk. Prices and Interest Rates associated with intermediate term and long-term bonds are determined by market participants.

Private Capital Investors will be looking to maximize their Rate of Return over a long-term time period.

Private Capital Speculators will be looking to maximize their Rate of Return over a short-term time period.

Public Capital Participants are from the Domestic Country and Other Foreign Governments. Public Capital will always flow in an attempt to satisfy national goals (domestic and foreign) and economic objectives. If the goal is to stimulate the economy / spur growth (GDP) and/or increase inflation, the Central Bank will want to decrease short-term, intermediate term and long-term interest rates by:

1. Decreasing the Fed Funds Rate, lowering short-term interest rates
2. Decreasing intermediate-term interest rates and long-term interest rates by buying domestic Government Obligations (Bond Price increases, Interest Rate decreases).

If the goal is to slow down the economy / slow growth (GDP) and/or reduce inflation, the Central Bank will want to increase short-term, intermediate term and long-term interest rates by:

1. Increasing the Fed Funds Rate, raising short-term interest rates
2. Increasing intermediate-term interest rates and long-term interest rates by selling domestic Government obligations (Bond Price decreases, Interest Rate increases).

3. **Influences** the value of the Domestic Currency.

If the goal is to stimulate the economy / spur growth (GDP) and/or increase inflation, the Central Bank will want to decrease short-term, intermediate term and long-term interest rates by buying the domestic currency, causing the currency to appreciate. When the domestic currency appreciates (strengthens) relative to a foreign currency:

1. the cost to foreign buyers of domestic made goods increases and
2. the cost to domestic buyers of foreign made goods decreases.

This will stimulate imports that will cause a trade deficit in the domestic economy as imports will exceed exports which (by itself) should place downward pressure on domestic interest rates over the long-term.

If the goal is to slow down the economy / slow growth (GDP) and/or reduce inflation, the Central Bank will want to increase short-term, intermediate term and long-term interest rates by selling the domestic currency, causing the currency to depreciate. When the domestic currency depreciates (weakens) relative to a foreign currency:

1. the cost to foreign buyers of domestic made goods decreases and
2. the cost to domestic buyers of foreign made goods increases.

This will stimulate exports that will cause a trade surplus in the domestic economy as exports will exceed imports which (by itself) should place upward pressure on interest rates over the long-term.

Secondary Tools

4. **Controls** the Discount Rate via the FOMC. Historically, the Discount Rate was set at 1.00% above the Fed Funds Rate (the “Discount Rate Spread”); however, the Discount Rate Spread has been below 1.00% since the economic downturn that began in 2008. Current Discount Rate = 5.25% as of 5/4/2022, a 0.25% spread over the Fed Funds Rate.

If the goal is to stimulate the economy / spur growth (GDP) and/or increase inflation, the Central Bank will decrease the spread between the Discount Rate and the Fed Funds Rate.

If the goal is to slow down the economy / slow growth (GDP) and/or reduce inflation, the Central Bank will increase the spread between the Discount Rate and the Fed Funds Rate.

5. **Adjusts** the Reserve Requirement. The Reserve Requirement is a Central Bank regulation that sets the minimum percentage of customer deposits and notes that each FDIC insured commercial bank must hold in reserve (rather than lend out) as a percentage of specified deposit liabilities. Historically 10%, effective March 26, 2020, the Federal Reserve reduced the Reserve Requirement Ratio to 0% for all depository institutions in response to the COVID pandemic. The 0% Reserve Requirement remains in effect.

If the goal is to stimulate the economy / spur growth (GDP) and/or increase inflation, the Central Bank will decrease the reserve requirement, increasing the supply of loanable funds to stimulate bank lending and investing.

If the goal is to slow down the economy / slow growth (GDP) and/or reduce inflation, the Central Bank will increase the reserve requirement, decreasing the supply of loanable funds to slow bank lending and investing.

6. **Intensifies** management of the Loan to Deposit Ratio. The Loan-to-Deposit Ratio is the amount of a bank's loans divided by the amount of its deposits at any given time. The higher the ratio, the more the bank is relying on borrowed funds, which are generally more costly than most types of deposits, increasing the level of operational risk. Break Even = 1.00x.

If the goal is to stimulate the economy / spur growth (GDP) and/or increase inflation, the Central Bank will recommend / require FDIC Insured Institutions to increase their Loan-to-Deposit Ratio, increasing the supply of loanable funds to stimulate bank lending and investing.

If the goal is to slow down the economy / spur growth (GDP) and/or reduce inflation, the Central Bank will recommend / require FDIC Insured Institutions to decrease their Loan-to-Deposit Ratio, reducing the supply of loanable funds to slow bank lending and investing.

XII. SUMMARY / BRINGING IT ALL TOGETHER

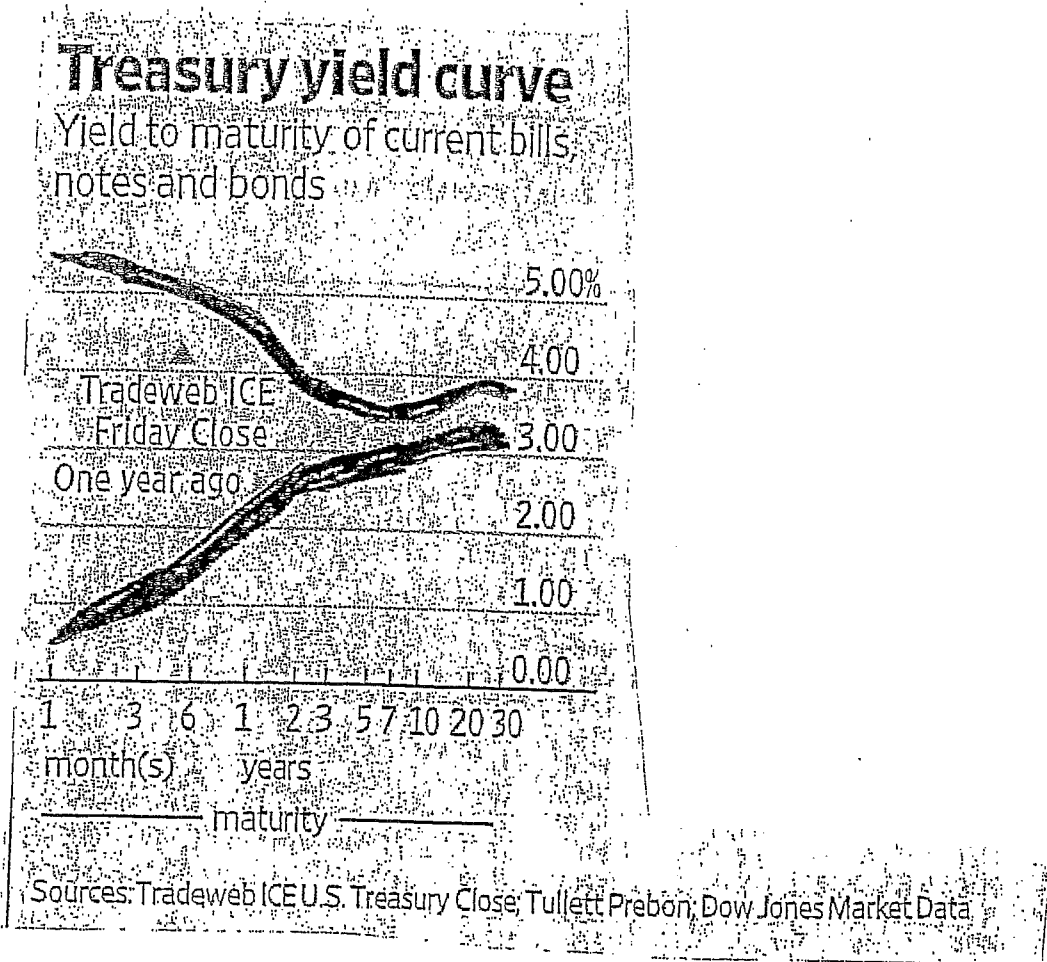
If the macroeconomic goal is to stimulate the economy:

- the Central Bank will lower the Fed Funds Rate to lower short-term interest rates.
- the Central Bank will buy medium-term and long-term bonds, pushing price up and yields down.
- the Central Bank will buy the domestic currency, causing the currency to appreciate (strengthen) which will cause a trade deficit in the domestic economy as imports will exceed exports which (by itself) should place downward pressure on domestic interest rates over the long-term.
- the Central Bank will decrease the Reserve Requirement, increasing the supply of loanable funds to stimulate bank lending and investing.
- the Central Bank will increase the Loan-to-Deposit Ratio, increasing the supply of loanable funds to stimulate bank lending and investing.

If the macroeconomic goal is to slow down the economy:

- the Central Bank will raise the Fed Funds Rate to increase short-term interest rates.
- the Central Bank will sell medium-term and long-term bonds, pushing price down and yields up.
- the Central Bank will sell the domestic currency, causing the currency to depreciate (weaken) which will cause a trade surplus in the domestic economy as exports will exceed imports which (by itself) should place upward pressure on domestic interest rates over the long-term.
- the Central Bank will increase the Reserve Requirement, decreasing the supply of loanable funds to slow bank lending and investing.
- the Central Bank will decrease the Loan-to-Deposit Ratio, decreasing the supply of loanable funds to slow bank lending and investing.

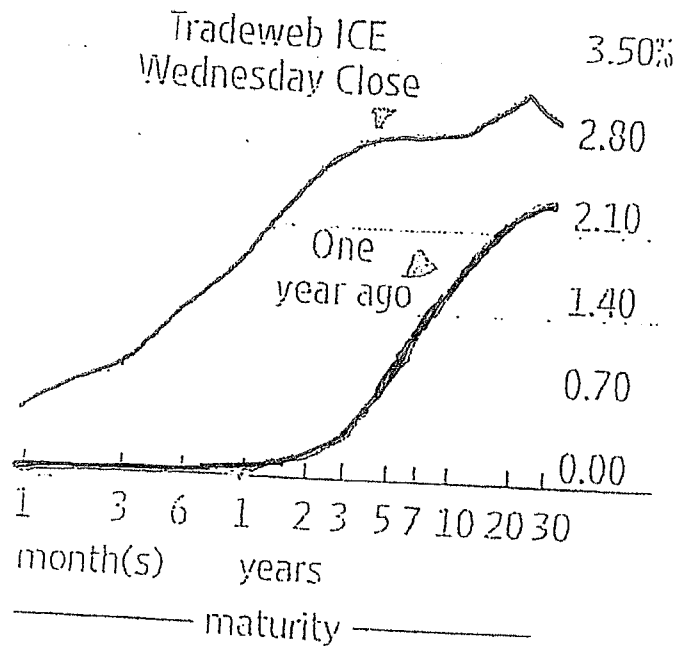
As of 5/5/2023



As of 5/11/2022

Treasury yield curve

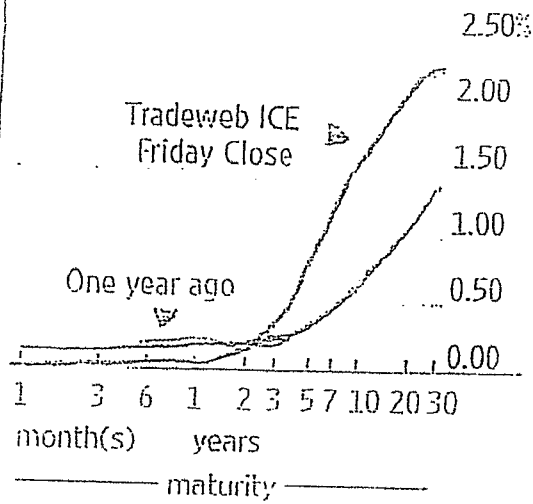
Yield to maturity of current bills, notes and bonds



As of 5/28/2021

Treasury yield curve

Yield to maturity of current bills, notes and bonds

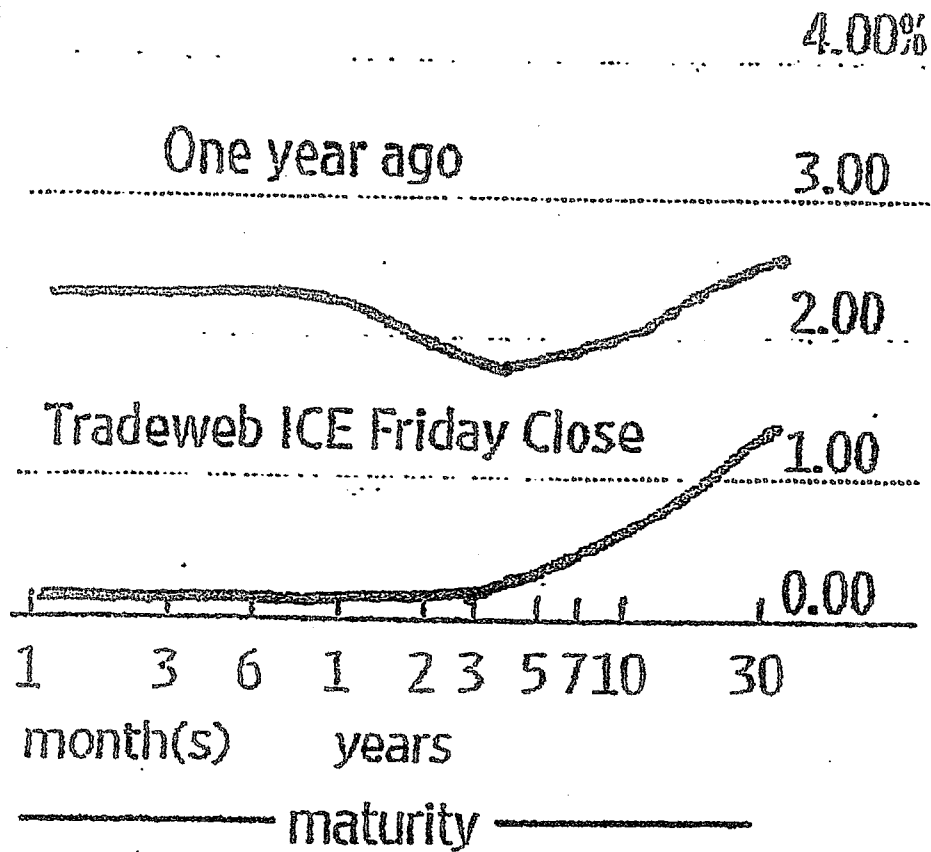


Sources: Tradeweb ICE U.S. Treasury Close; Tullett Prebon; Dow Jones Market Data

As of 5/28/2020

Treasury yield curve

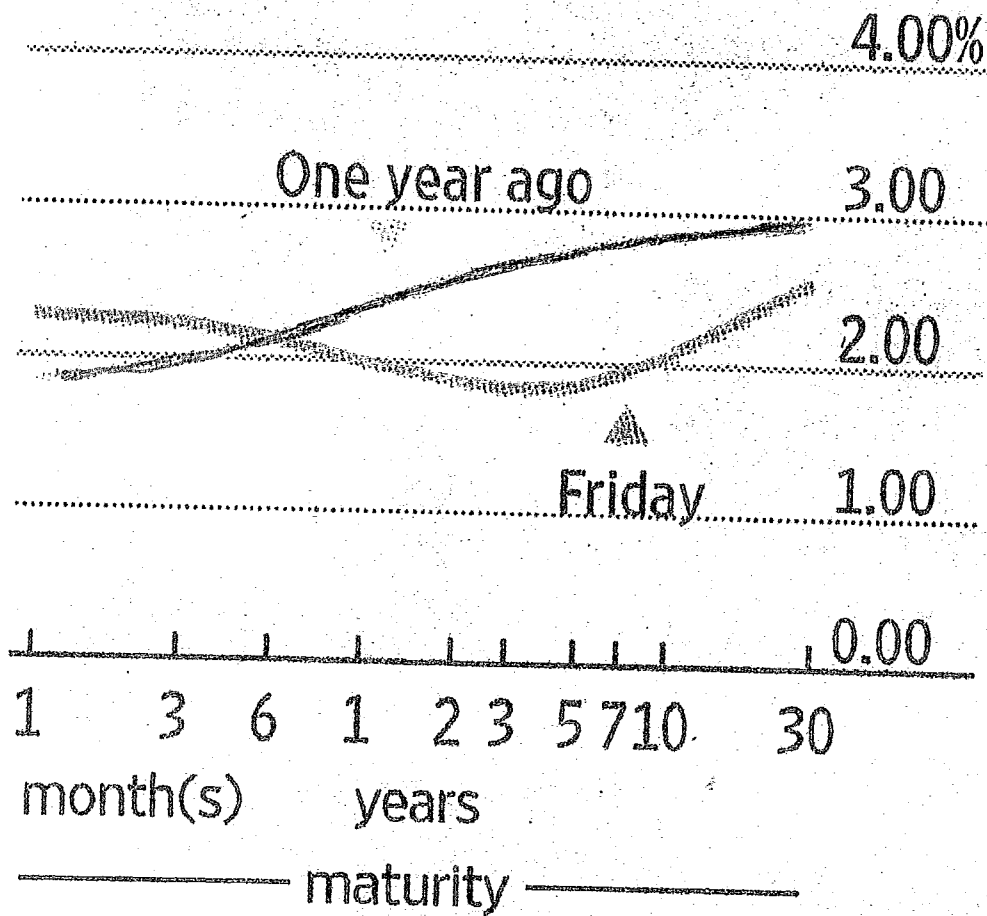
Yield to maturity of current bills, notes and bonds



As of July 5, 2019

Treasury yield curve

Yield to maturity of current bills, notes and bonds

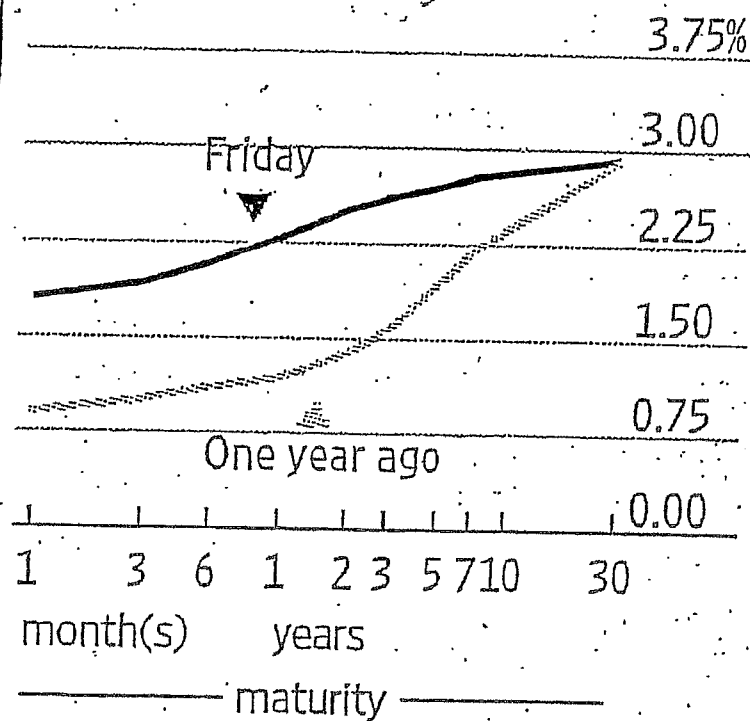


Sources: Ryan ALM; Tullett Prebon; Dow Jones Market Data

As of July 6, 2018

Treasury yield curve

Yield to maturity of current bills, notes and bonds

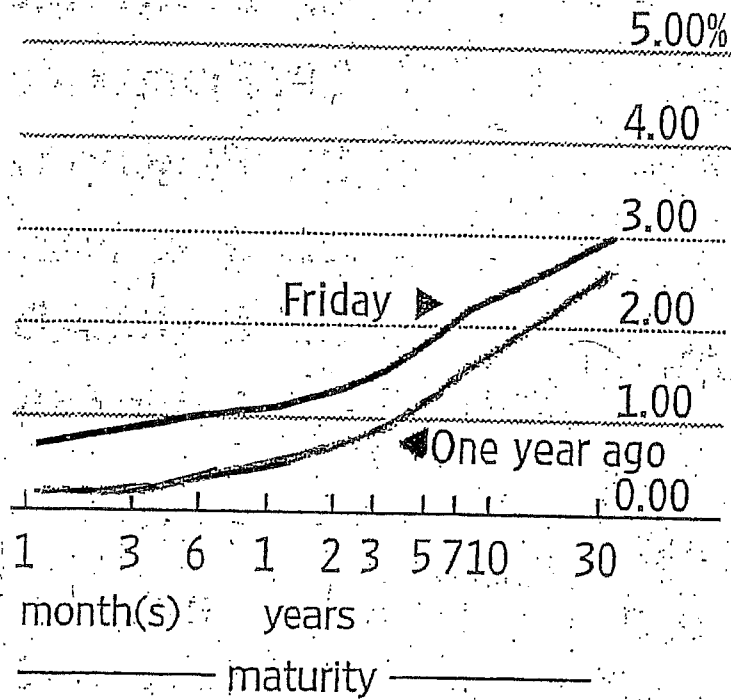


Sources: Ryan ALM; Tullett Prebon; WSJ Market Data C

As of May 5, 2017

Treasury yield curve

Yield to maturity of current bills, notes and bonds

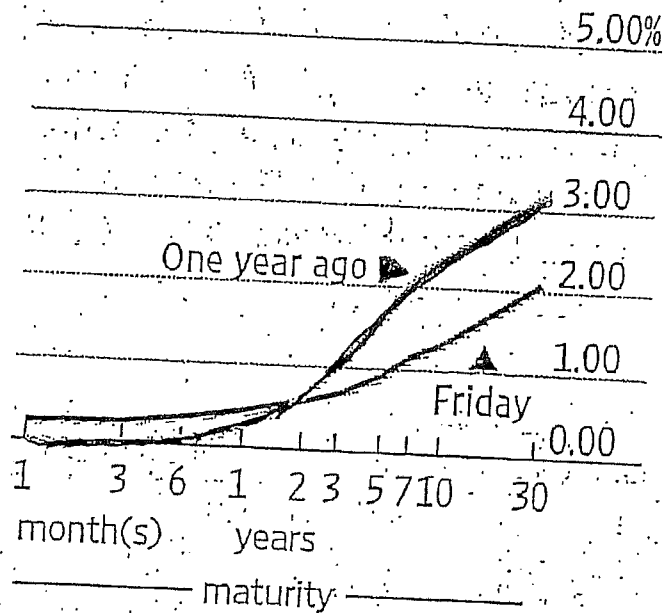


Sources: Ryan ALM; Tullett Prebon; WSJ Market Data

As of July 8, 2016

Treasury yield curve

Yield to maturity of current bills, notes and bonds



Sources: Ryan ALM; Tullett Prebon; WSJ Market Data Group