
International Financial System

Outline

1. International Monetary System

2. The Euro

3. Uncovered Interest Parity

- Textbook Readings: Ch. 19

International Monetary System

- Main episodes:
 - Gold standard (XIX to WWI)
 - Interwar period
 - Bretton Woods (1944-1971)
 - Post-Bretton Woods

Gold Standard

- Most central banks peg to the gold by end of XIX century
- Why?
 - UK was on gold
 - UK at center of international financial system
- Problem?
 - Impossible to fight deflation
- By mid-1930s, US abandoned the GS due to the Great Depression

Interwar Period

- Gold standard suspended during WWI
- Treaty of Versailles: Crippling war reparations
 - Keynes: The Economic Consequences of the Peace
- WWII
 - Europe, once again, devastated by war

Bretton Woods (1944-1971)

- Exchange rates fixed to the US dollar
 - IMF and World Bank were established
- Capital controls
- Problems?
 - Exchange rate adjustments
 - Difficult to maintain capital controls

Post-Bretton Woods

- In 1973, major currencies started to float against each another
- Free capital mobility
- No longer a ‘system’ (for managing exchange rates)
- Three important developments:
 1. Main advanced economies and euro area are floating
 2. Countries in the Eurozone are within a fixed exchange rate
 3. Some emerging markets maintain a fixed exchange rate

The Euro

- Economic integration, limit risks of another war
- Euro introduced in 1999
 - As of today 19 countries use the euro
 - Low borrowing costs due to German tough stance on inflation
- ECB conducts monetary policy → Inflation target = 2%
 - German model for monetary policy (highly averse to inflation)
- Increased trade integration (moderately)

Competitiveness: Germany vs Italy

- How to measure competitiveness? Unit labor costs

	annual			
	growth rate	1985	1995	
German Labor Productivity (output per hour)	2.0%	100	122	
German hourly wage rates (D-marks per hour)	2.0%	10	12	
German unit labor costs (D-marks per unit of output)		0.10	0.10	
	annual			
	growth rate	1985	1995	
Italian Labor Productivity (output per hour)	1.0%	100	110	
Italian hourly wage rates (Lira per hour)	3.5%	10	14	
Italian unit labor costs (Lira per unit of output)		0.100	0.128	

- Germany has a long history of super-competitiveness

Euro Crisis: Competitiveness

- Unit labor costs continue to grow in Italy whereas they are stable in Germany
 - Before euro, Bank of Italy devalued the lira to avoid becoming uncompetitive → Cut wages through devaluation
- Under Euro area, Italy cannot devalue to regain competitiveness
 - Euro government bonds are no longer risk-free
- German competitiveness is a general problem for all other members of the Euro area

Euro Crisis

- Persistent competitiveness differentials
 - Labor costs adjusted for productivity (unit labor costs) have diverged
- External imbalances
 - Germany → Current account surplus, GIIPS → Current account deficits
- Government debt crisis (Greece 2009)
 - Government deficits increased since 2000 in GIIPS
- By 2013, crisis abated
 - But Italy seems to be turning on red lights

China

- Deng Xiaoping pushed for modernization after the damage from Mao's cultural revolution
 - Recognized that cooperation with the west offered access to developed-world machines and know-how
 - Opened trade with the west and lifting many hundreds of millions of Chinese out of poverty
- China real GDP growth: A 30-year unprecedented boom
 - China's exports to US ballooned and then to Europe
- Result?

Sustained, Strong Growth But Wildly Imbalanced

China versus USA: GDP Components		
	China	U.S.A.
net exports G&S	4%	-4%
investment	49%	15%
govt	13%	20%
consumption	34%	69%
	100%	100%
	China	U.S.A.
exports G&S	31%	13%
imports G&S	27%	17%
health, total	5%	18%
public health	3%	8%

Macroeconomic Principles

Summary

Key Ideas

- Micro vs Macro
- Long Run vs Short Run
- Rational decisions are made at the margin
- Scarcity vs Choice
- Confronting trade-offs: Opportunity costs
- Adam Smith's Invisible Hand = Desirable Outcome
- Great Depression / Market Failures / J.M. Keynes
- Soviet Collapse / Collective Dysfunction
- Conclusion? Invisible Hand, Not Infallible Hand

Microeconomic Fundamentals

- Absolute advantage vs Comparative advantage
- Gains from trade: Opportunity cost
- Demand and supply analysis
 - Downward sloping demand curve
 - Upward sloping supply curve
 - Movement along the curve vs Shifts in the curve
- Goods
 - Substitutes: IBM bonds vs Microsoft bonds
 - Complements: Pizza and coke
 - Public goods: Non-rivalry and non-excludable (e.g. police)

Macro Variables

- GDP
 - GDP vs GNP vs NI
 - $GDP = C + I + G + NX$
 - Final expenditure = Factor Income = Value Added
 - Nominal vs Real
 - Flow vs Stock
- Inflation

$$\Delta P_t / P_{t-1}$$

where $\Delta P_t = P_t - P_{t-1}$

- Unemployment rate

$$\# \text{ of Jobless} / \# \text{ in Labor Force}$$

GDP

- Quarterly: 3-month flow multiplied by 4
- S.A.: Seasonally adjusted
- Annualized growth rate = $[(Q4/Q3)^4 - 1] \times 100$
- GDP components
 - Consumption 70%
 - Investment 15%
 - Government 18% (Exclude transfers)
 - Net exports -3% (EX = 14%, IM = 17%)

Inflation

- CPI: A basket of goods
 - Food = 14%
 - Energy = 8%
 - Core CPI = 79%
 - ❖ Core goods = 19%, Services exc. Energy = 60%, OER = 25%
- Use of price indexes
 - Separate output changes vs price changes
- Avoid hyperinflation or deflation

Unemployment

	Feb-00	Oct-17
U3 unemployment	4.1%	4.1%
U6 Unemployment	7.2%	7.9%
25-54 LFPR	84.4%	81.6%
Hourly Earnings YOY	4.10%	2.30%

Some Key Phrases

- Malthusian dilemma
- Schumpeter: Creative destruction
- Keynes: Financial system flaws and the need for intervention
- Solow growth model
- Potential output
- Natural rate or NAIRU
- Real equilibrium interest rate

Labor Productivity

- Labor productivity:

$$\% \Delta Y / \% \Delta \text{ Hours}$$

- Labor productivity is a function of:

- Capital deepening (more machines)
- Labor education (smarter workforce)
- Technological change (smarter machines)

Growth Rates and the Power of Compounding

- How long does it take to double the flow of output?
- A rough rule for growth rates

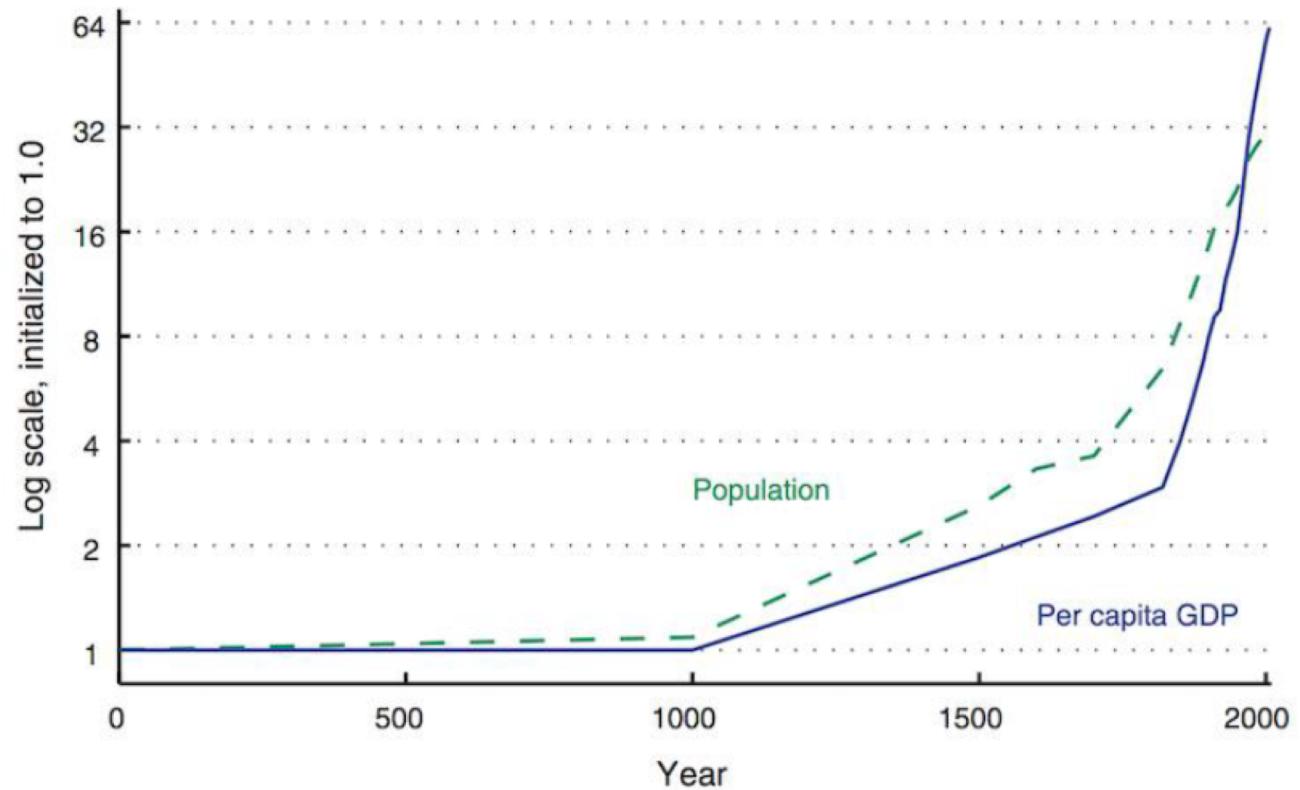
Divide the growth rate into 70

• 2% growth	$70/2 = 35 \text{ years}$	$(1.02)^{35} = 2$
• 3.5% growth	$70/3.5 = 20 \text{ years}$	$(1.035)^{20} = 1.99$
• 5% growth	$70/5 = 14 \text{ years}$	$(1.05)^{14} = 1.98$

Slow Growth

- Here to stay or just a pause?
- Robert Gordon sees four headwinds
- Paul Romer sees a positive outlook

(source for chart: Paul Romer blog, *Economic Growth*, October 12th, 2015)



Key Equations

- LTSG = Growth in labor productivity + Growth in labor force

- Fisher Equation:

$$i = r + \pi$$

- Okun's Law:

$$\% \Delta Y = LTSG - 2 (\Delta U)$$

- Phillips Curve:

$$\pi_t = \pi_e + \alpha (U^* - U_t)$$

- Quantity Equation:

$$\% \Delta M + \% \Delta V = \% \Delta P + \% \Delta Y$$

- Taylor Rule:

$$ff = \pi + 0.5 \times (\pi - \pi^*) + (U^* - U) + r^*$$

- Real Exchange Rate:

$$q_{US/EU} = E_{\$/\epsilon} (P^\epsilon / P^\$)$$

- UIP:

$$i_\epsilon - i_\$ = -\Delta E^e / E$$

- Unit labor costs:

Hourly wage rates/Labor productivity

Financial System

- $S = I$ in a closed economy
- Efficient Markets Hypothesis (EMH)
- Arbitrage eliminates any riskless wagers
- Ex-ante vs ex-post real interest rates
- Duration vs Default
- Loanable funds model assumes $S = I$ and EMH
 - We rejected the model that only includes the corporate market
 - We extended the model to include the market for T-bonds
- Adaptive expectations: Bubbles in financial markets

Great Recession

- Housing bubble from 2001 to 2007
 - House prices kept increasing
 - Credit extended to subprime borrowers
 - Risky bets by financial institutions
- Bear Sterns was merged with JP Morgan
- Lehman Brothers was allowed to fail in September 2008 which trigger the crisis
- AIG was about to fail which would have made the situation worse
- Congress approved a package to inject capital to financial firms

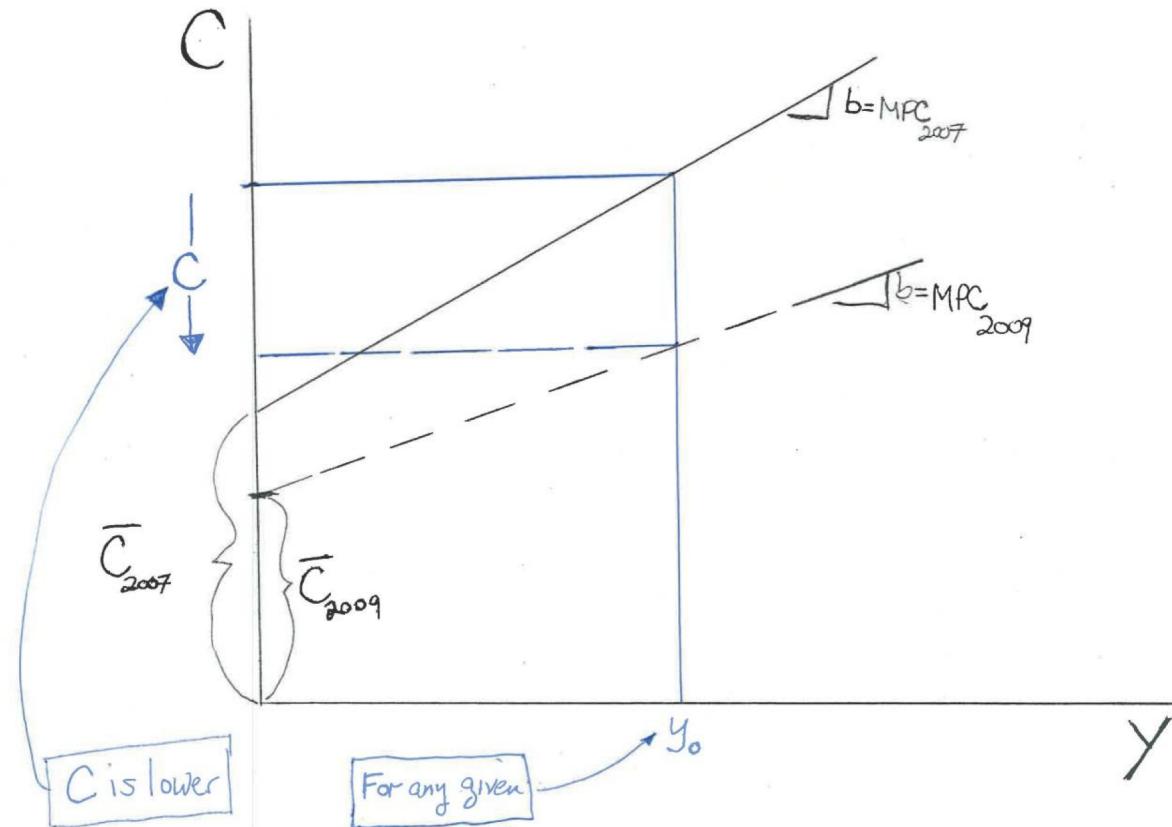
(Short Run) Macroeconomic Models

- Aggregate Expenditure Model
 - Output vs Spending: Inventories swing, price steady
- Aggregate Demand / Aggregate Supply Model
 - Demand vs Supply: Prices and quantities shift
- Expanded Loanable Funds Model
 - T-bills vs T-bonds vs Corporate bonds
 - HH supply funds
 - Government and corporations demand funds
 - Fed buys and sells T-bills to target short-term real interest rate (real FFR)

Aggregate Expenditure Model

- Our AE model is expectations based
- A consumption function is the driver
- Unplanned inventory changes can create a boom/bust cycle
- Responses to inventory changes drive the economy back toward equilibrium
- Key idea: In a year, the level of GDP is mainly determined by the level of aggregate expenditure

- In 2009, falling sentiment drove autonomous spending down
 - In 2009, plunging wealth drove the MPC down

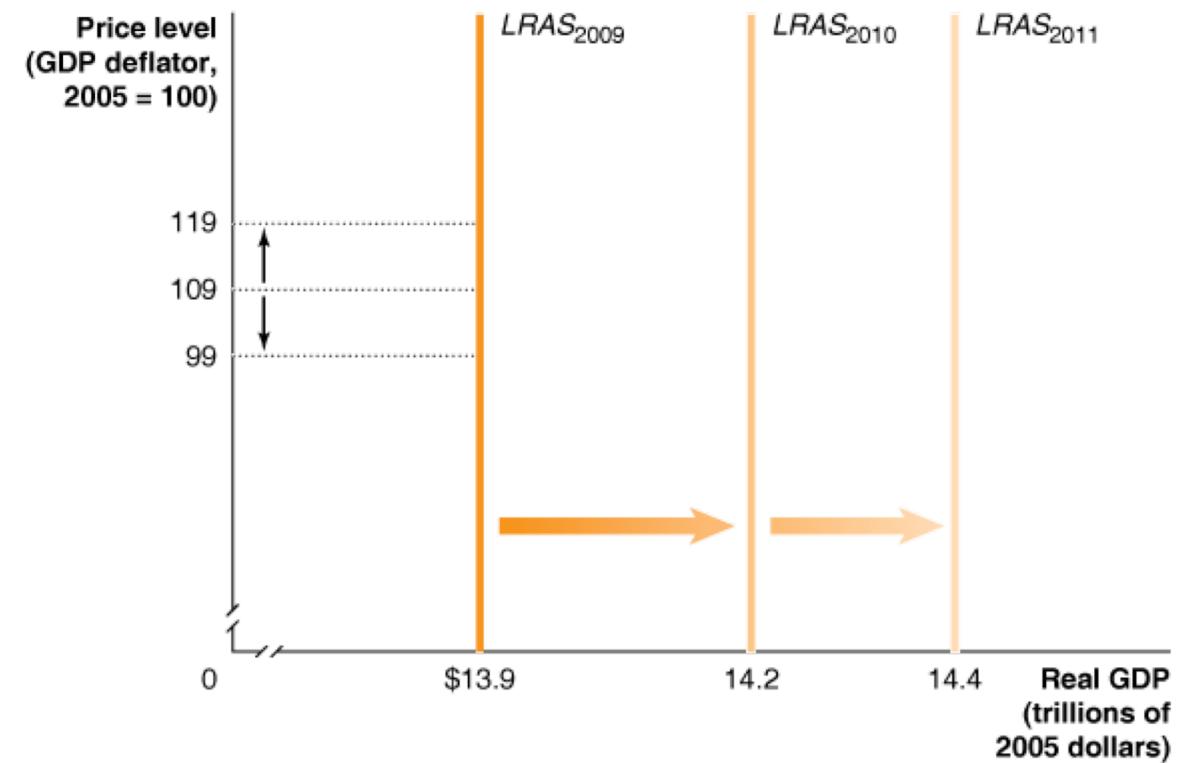


Aggregate Demand

- Downward slope: Wealth / Interest / International-Trade Effects
- Movements along and shifts of the curve
- Shifts in AD:
 - Monetary policy: Interest rates
 - Fiscal policy: Government purchases, Taxes
 - HH income expectations
 - Firms' profit expectations
 - US vs ROW growth rates
 - US exchange value of the dollar

Long-Run Aggregate Supply

- In the long run, real GDP determined by the number of workers, the level of technology, and the capital stock
 - None of these elements is affected by the price level
- LRAS curve is a vertical line, at the level of potential or full-employment GDP

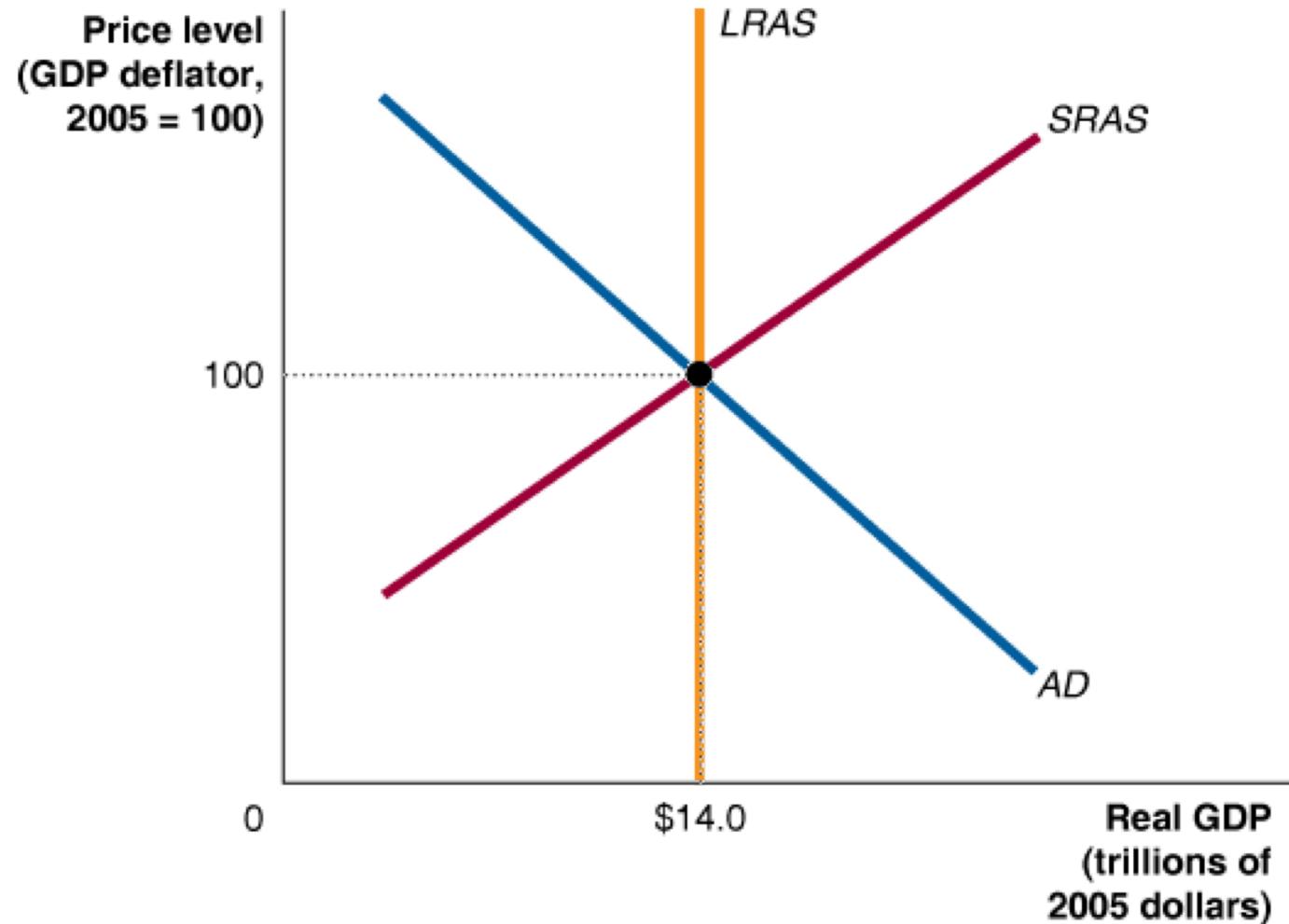


Short-Run Aggregate Supply

- Upward slope reflects sticky wages
 - If I can raise my prices and don't pay higher wages, I can produce more output at a profit
- SRAS shifts when:
 - Input prices change (nominal wages, commodity prices)
 - Factors of production change
 - Technology changes

Long-Run Macroeconomic Equilibrium

- The short-run macroeconomic equilibrium occurs when the AD and SRAS curves intersect
- The long-run macroeconomic equilibrium occurs when the AD and SRAS curves intersect at the LRAS



Dynamic Equilibrium

- We don't have a stable price level

- $P = 100$

- We have a stable inflation rate

- $\pi = 2\%$

- We don't have a stable output level

- $Y = \$18$ trillion

- We have a stable growth rate

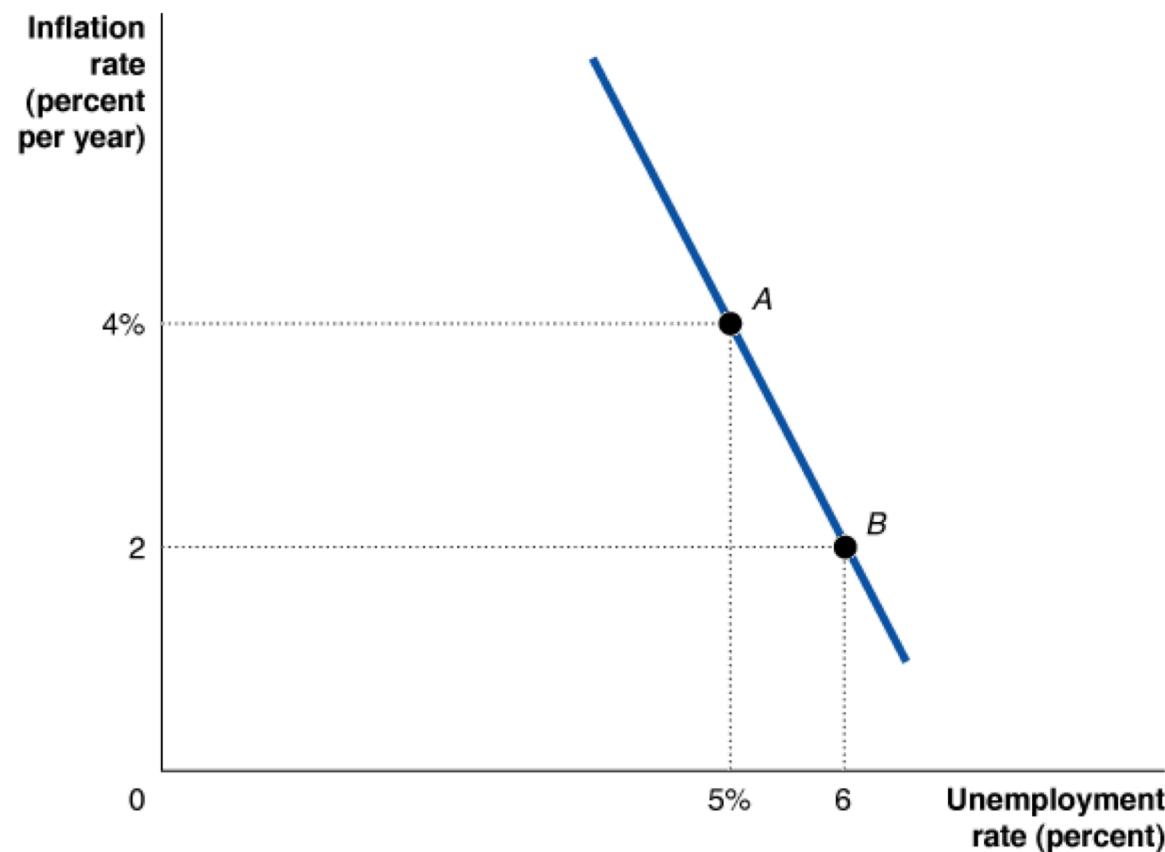
- $\Delta Y_t / Y_{t-1} = 2\%$

AD-AS: Conclusions

- Adverse supply shocks are the worst of both worlds:
 - Inflation accelerates and output falls
- Positive supply shocks are the best of all possible worlds:
 - Inflation rates fall and real GDP growth accelerates
- Adverse demand shocks have good and bad elements:
 - Inflation decelerates as output falls (assuming you are not in or near a deflation)
- Positive demand shocks have good and bad elements:
 - Inflation rates accelerate as real GDP growth accelerates

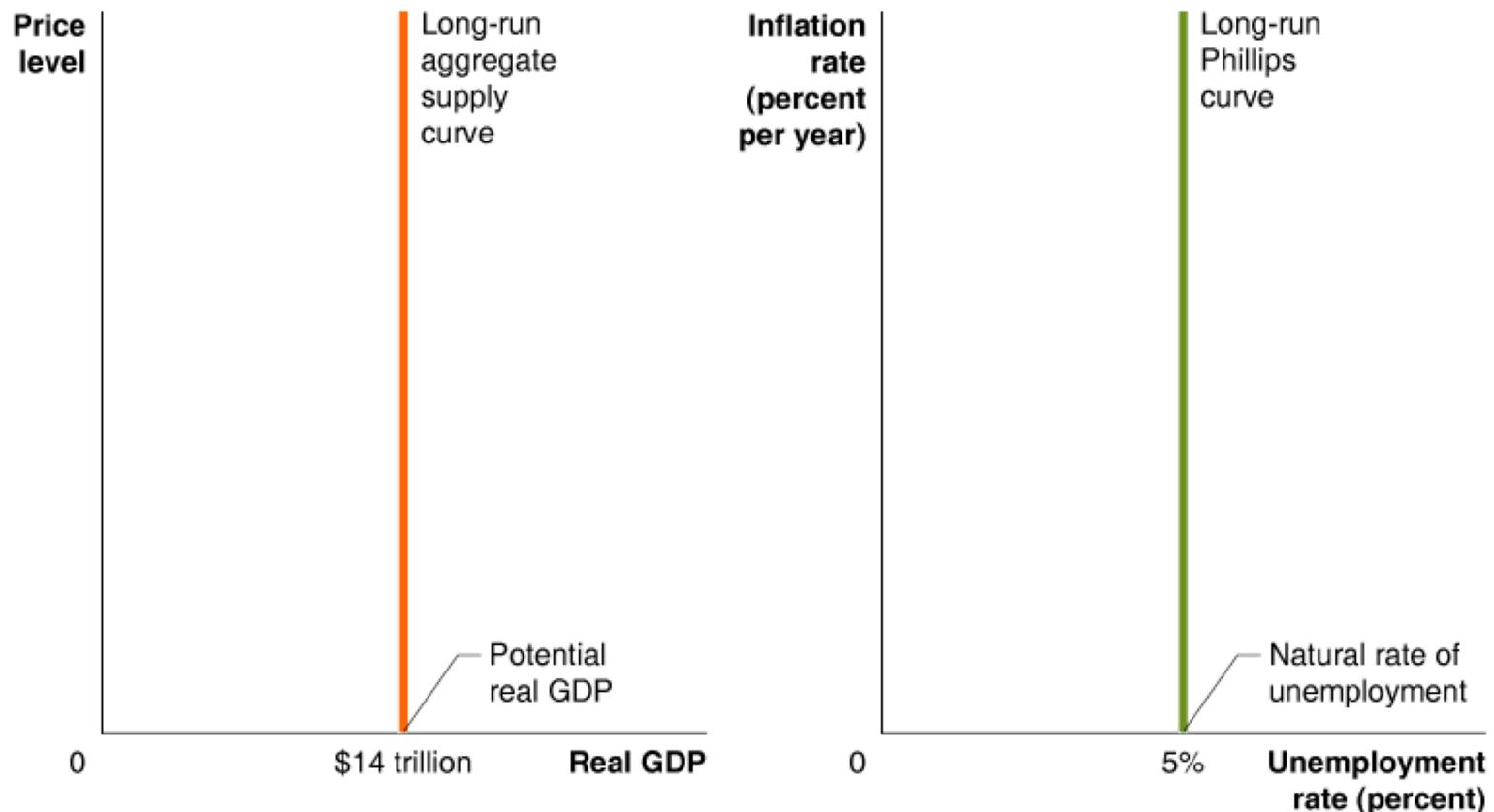
Phillips Curve

- Short-run trade-off between U and π



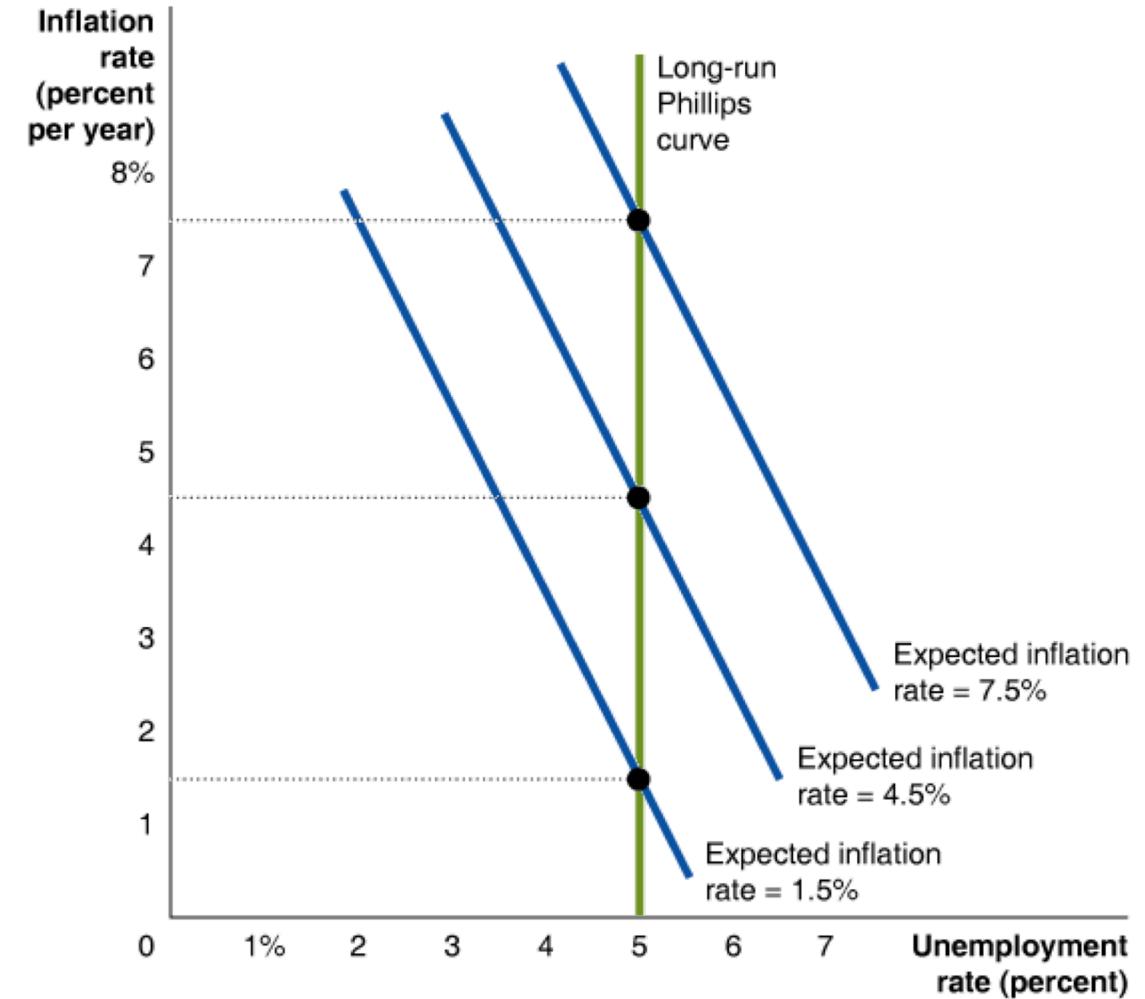
Long-Run Phillips Curve

- In the long run, employment is determined by output, which in long run does not depend on the price level
- A vertical long-run AS curve is compatible with a vertical long-run PC



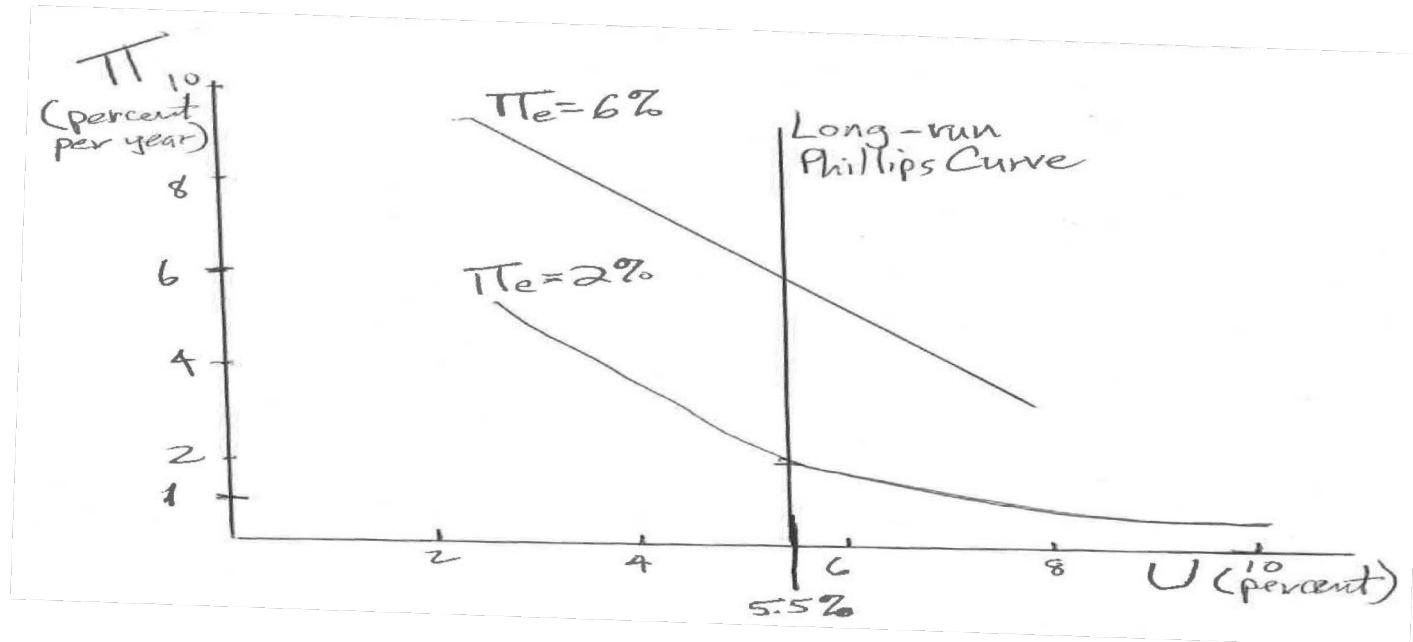
A Short-Run Phillips Curve For Every Inflation Rate

- A SRPC for every level of π^e
 - Each SRPC intersects the LRPC at the π^e rate
 - $\Delta\pi \uparrow \rightarrow U \downarrow$ only if the increase in π is unexpected
- When $\pi = \pi^e$, $U = U^*$ —i.e. the long-run Phillips curve



Zero Bound is a Problem for Disinflation and PC

- π declines are much smaller as you approach zero
- There is no divine coincidence
 - PLOGs can exist without producing deflation
 - Therefore, a central bank focused just on π will not ease as much as a dual mandate central bank

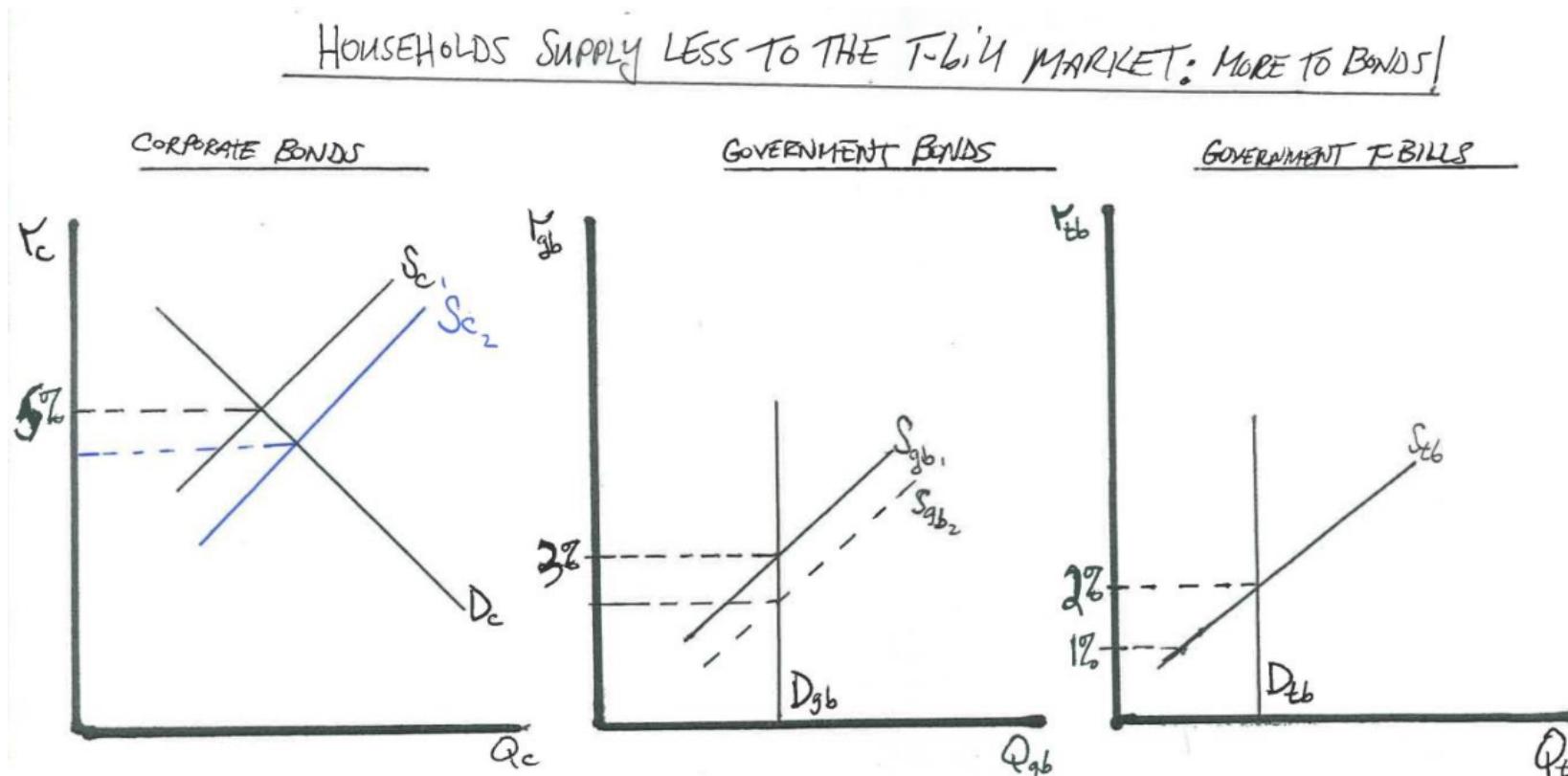


Monetary Policy

- Goals:
 - Keep inflation low
 - Keep real growth strong
 - Must protect the financial system
- Tools:
 - OMO primary tool in ‘normal’ times to achieve goals
 - Fed sets a target for the FFR and expects to influence other interest rates
 - FFR: Interest rate banks charge each other to borrow reserves
- Contractionary and expansionary MP

Example: Expansionary Monetary Policy

- Fed sets short rate to influence other rates (faced by HH and firms)
- Indirectly attempts to influence output and inflation



Rules vs Discretion

- We know the Fed wants low inflation, high employment, strong growth and safe banks
- Should they actively pursue these goals?
 - Policy discretion
- Or should we impose a rule on the Fed?
 - Policy rules

The Quantity Theory of Money vs The Taylor Rule

- Quantity Equation: $M \times V = P \times Y$
- Quantity Theory of Money: $\% \Delta M = \% \Delta P + \% \Delta Y$ requires V stable

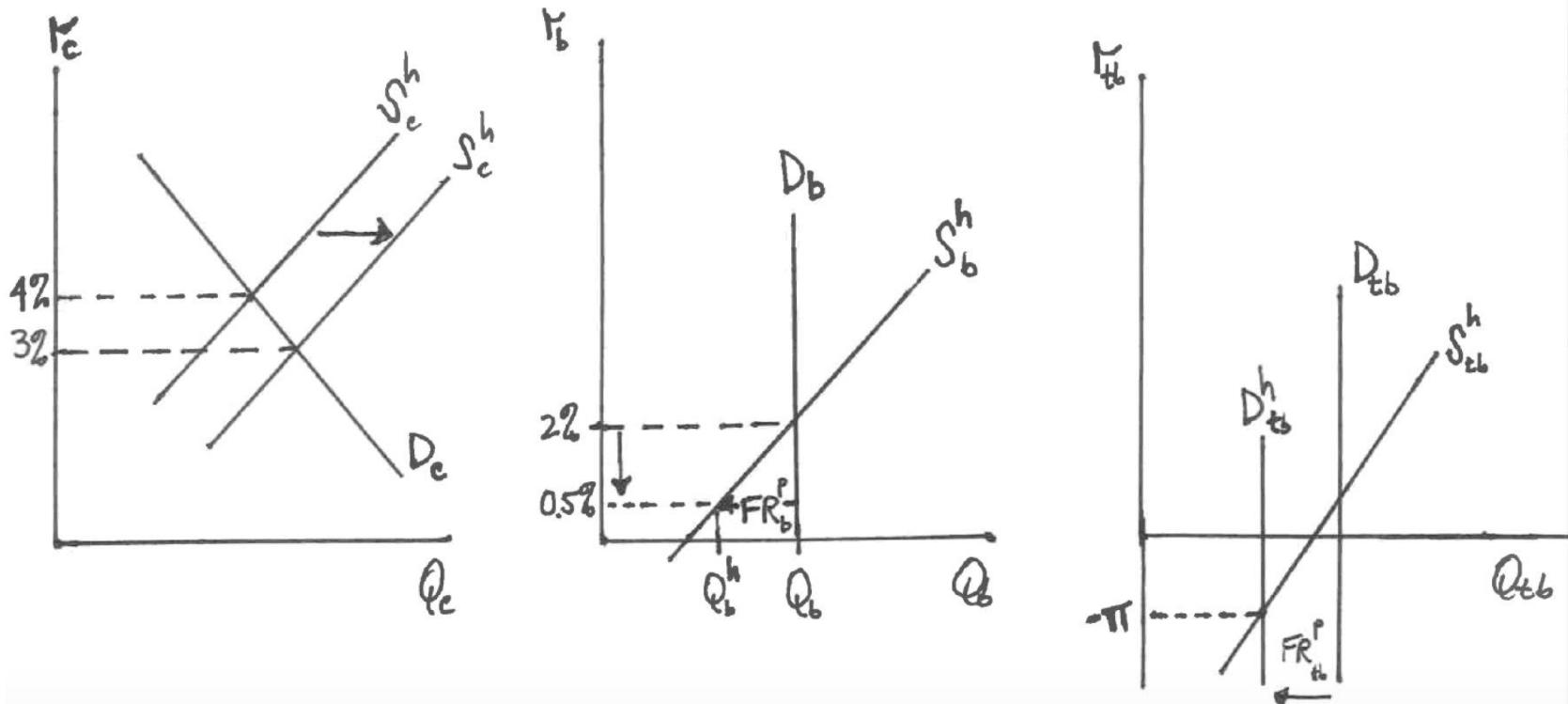
- John Taylor's rule replaces money targeting

$$ff = \pi + 0.5 \times (\pi - \pi^*) + (U^* - U) + r^*$$

- What do we do when the Taylor rule signals the need for negative FFR?
 - Zero lower bound problem

- By directly buying T-bonds (QE), Fed attempts to lower long rates

- THE FRB BUYS T-BONDS
- HOUSEHOLDS ACCEPT A LOWER REAL RATE AS THEY NEED TO BUY FEWER T-BONDS
- HOUSEHOLDS SHIFT OUT THEIR SUPPLY CURVE FOR RISKY BONDS



Size of the Government and Cyclical Fiscal Policy

- The long run question:
 - How big should the government be?
 - What percent of GDP should be public vs private?
- The business cycle question:
 - Should we manipulate government spending or tax rates to make economy grow faster or more slowly in the short run?
- Before hitting the ZLB for FFR, most economists agreed on letting monetary policy to handle cyclical issues

Fiscal Policy

- Government a preferred provider of public goods
 - Free-rider problem
- Nations have different sizes of government
- Laffer curve
 - Super high tax rates destroy incentives and may lower revenues
- Expansionary and contractionary fiscal policy
 - Multiplier
- When monetary policy confronts the ZLB, fiscal policy may make sense

Discretionary Fiscal Policy? Only in the Worst of Times

- Monetary policy is more nimble, and so better suited to manage the macroeconomy (steer the bus)
- Fiscal stimulus
 - Policies that give money away are very easy to enact but very hard to take back
- Fiscal policy is a product of Congress and the White House so:
 - It is always highly politicized
 - It takes TOO much time

Thinking About the Economy From a Global Perspective

- Economies are connected by flows of G&S and financial assets
- Balance of payments
 - Current account, financial account, capital account
 - It always has to balance
- $S = I + CA$ in an open economy
- Net Foreign Asset position is a stock that shows the ‘net debtor’ or ‘net lender’ status of countries
 - ROA of US-owned foreign assets higher than ROA of foreign-owned US assets by, even though US is a net debtor

Exchange Rates

- Nominal exchange rates vs Real exchange rate
 - Relative price of currencies vs Relative purchasing power
- Appreciation vs Depreciation
- Equilibrium in the forex market
 - Shifts in curves
 - Currency movements reflect supply/demand for tradable goods and for assets
- Purchasing Power Parity vs Uncovered Interest Parity
- Exchange rate regimes

A Nation Actually Has Four Monetary Policy Options

- Target the money supply
- Target an interest rate
- Target its exchange rate
- Join a monetary union, give up its currency and surrender control of interest rates to an international authority

International Financial System

- Main episodes of the international monetary system
 - Gold standard (XIX to WWI)
 - Interwar period
 - Bretton Woods (1944-1971)
 - Post-Bretton Woods
- Euro and the euro crisis
- China