

## A Macroeconomic Model

News

Review: The Effect of the real rate of interest on investment.

What is a Macroeconomic Model?

The Aggregate Demand Schedule

The Potential Output Schedule

Using the Model to Predict Unemployment and Inflation.

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## Mixed Spending News (New York Times)

November 30, 2009

### Shoppers Showed Up, but Spent on Bargains

By STEPHANIE ROSENBLUM

More consumers flooded the nation's stores on Thanksgiving weekend in search of bargains. But with retailers dangling rock-bottom prices and consumers only biting at less expensive merchandise like small appliances and winter clothes, the average amount spent by each shopper declined from last year.

Some 195 million consumers visited stores and Web sites over the weekend, up from 172 million last year, according to the National Retail Federation, the trade group that reported sales results on Sunday afternoon. Average spending over the weekend, however, fell to \$343.31 a person, from \$372.57 a year ago. Total spending was \$41.2 billion — about the same as last year.

November 29, 2009

### Black Friday Web Shopping Up 11 Pct - Report

By REUTERS

Filed at 3:11 p.m. ET

SAN FRANCISCO (Reuters) - Holiday shoppers in the United States spent some \$505 million online on Black Friday, up 11 percent from last year, with Amazon.com and Walmart.com the most visited sites, according to analytics firm comScore.

## Announcements

Turn in your course journal at your recitation this week.

We will assess only the five journal assignments listed on the web page. Each requires you to find an article and to write a short essay about it.

The recitation assignment for this week is posted on the web page.

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Investment is inversely related to the real rate of interest.

Michele is building a new cinema called Cinema Paradiso and must decide how many screens to install.

Each screen costs \$1,000,000 but the Cinema will hold its value over the coming year.

## Cinema Paradiso

After paying the movie distributor and meeting non-interest expenses, Michele expects to net \$2.00 per ticket.

Screens cost \$1,000,000 each.

How many screens should Michele build?

Number of Screens	Number of Patrons
1	40,000
2	75,000
3	105,000
4	130,000
5	150,000

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Use Your Clicker  
To Answer  
The Following  
Graded Question

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If he nets \$2.00 per patron, the price of a screen is \$1,000,000 and the real rate is 7.5% how many screens should Michele build?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

Number of Screens	Number of Patrons
1	40,000
2	75,000
3	105,000
4	130,000
5	150,000

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## Cinema Paradiso Costs and Benefits

Screens	Patrons	Marginal Benefit	Marginal Cost		
			5.5%	7.5%	10.0%
1	40,000	\$80,000	\$55,000	\$75,000	\$100,000
2	75,000	\$70,000	\$55,000	\$75,000	\$100,000
3	105,000	\$60,000	\$55,000	\$75,000	\$100,000
4	130,000	\$50,000	\$55,000	\$75,000	\$100,000
5	150,000	\$40,000	\$55,000	\$75,000	\$100,000

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## What is a Macroeconomic Model?

A model is a simplified description that captures the essential elements of a situation and allows us to analyze them in a logical way.

A macro model is a simplified description of the forces that determine equilibrium levels of national output, inflation, unemployment and the real rate of interest.

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## What is a Macroeconomic Model?

A Macroeconomic model may be represented by a system of equations.

The equations are solved simultaneously to predict equilibrium values for output, inflation, and other macro variables.

The model is used to predict the effects on the economy of different shocks and changes in monetary and fiscal policy.

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## What is a Macroeconomic Model?

There are lots of different macroeconomic models because ...

Economists disagree about the relative importance of forces at work on the economy.

Economists disagree about the "mechanisms" through which those forces affect output, inflation, unemployment, and the real interest rate.

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## What is a Macroeconomic Model?

We will adopt a very simple model that can be represented by two schedules presented in a single diagram.

The model represents mainstream thinking.

The model is designed to help us think about monetary policy in a logical way.

If you undertake further study in economics, you will learn models that are more detailed.

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## Aggregate Demand Schedule

Aggregate Demand is measured in constant dollars and equals  $C + I + G + NX$ ,

Where  $C$  = Household Consumption  
 $I$  = Investment  
 $G$  = Government Spending  
 $NX$  = Net Exports

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Aggregate Demand is inversely related to the real rate of interest ( $r$ ) because:

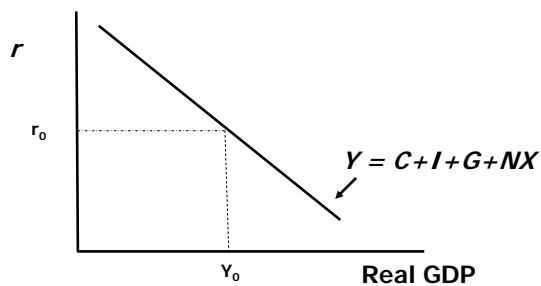
Consumption falls when  $r$  rises because a higher real rate implies a higher cost of financing consumer durable purchases and a higher reward for saving.

Investment spending falls when  $r$  rises because  $r$  is a cost of investing.

Net exports fall when  $r$  rises because an increase in  $r$  leads to an appreciation of the dollar making exports more expensive and imports cheaper.

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Aggregate Demand is Inversely Related to the Real Rate of Interest.



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## Potential Output Schedule

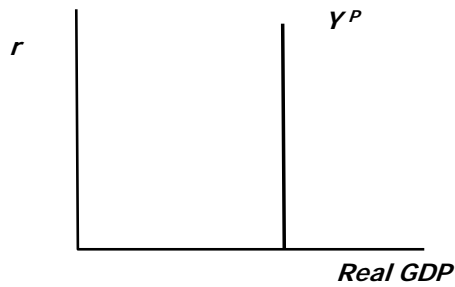
Potential output is the output level associated with full employment of labor and capital.

Potential output does not vary with the real rate of interest.

Potential output increases over time as the economy grows.

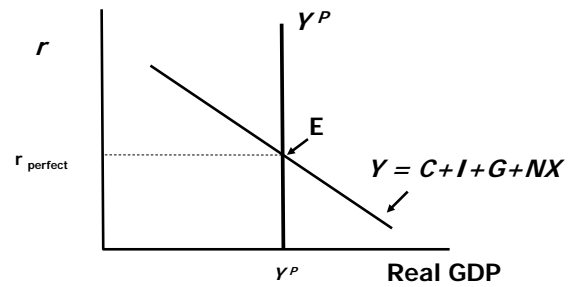
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Potential Output ( $Y^P$ ) Does Not Vary with the Real Rate of Interest.



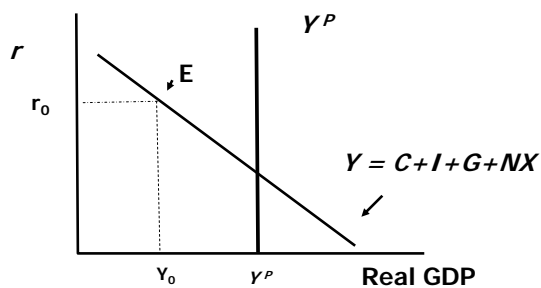
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Aggregate Demand and Potential Output



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If the real rate is  $r_0$ , aggregate demand will not support potential output.



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Accounting for Inflation in the Model

Inflation tends to increase when the economy operates above potential output.

Inflation tends to remain unchanged when the economy is below but not too far below potential output.

Inflation tends to fall when the economy is far below potential output.

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## Accounting for Inflation

When the economy is operating at or above potential, resources are very scarce.

When resources are very scarce, their equilibrium prices rise.

Rising resource prices translate into rising output prices and into accelerated growth in the general level of prices.

Hence the inflation rate increases.

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## Accounting for Inflation

When the economy is operating below potential, resources are not scarce.

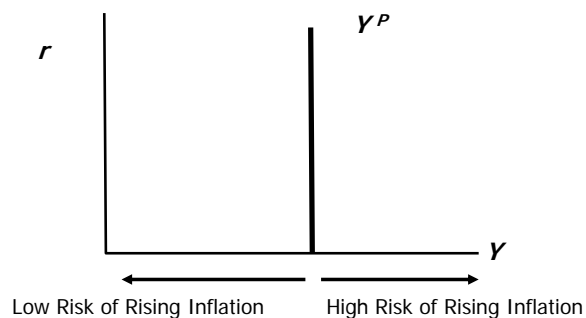
When resources are not scarce, their prices do not rise.

There is therefore no tendency for the general level of prices to grow more rapidly.

Hence the inflation rate does not increase.

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## Inflation Zones



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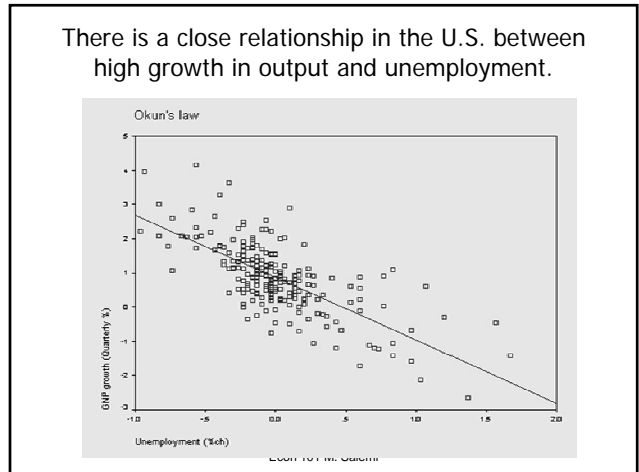
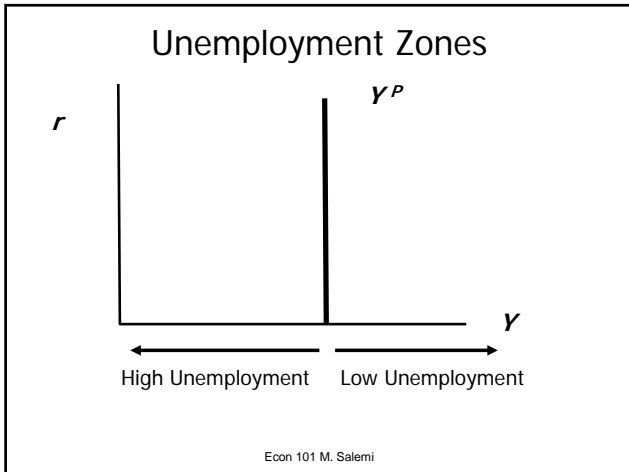
## Accounting for Unemployment

Unemployment tends to increase when the economy operates below potential output.

Unemployment falls when the economy operates at or above potential output.

Above potential output, workers may be willing to provide "overtime" labor.

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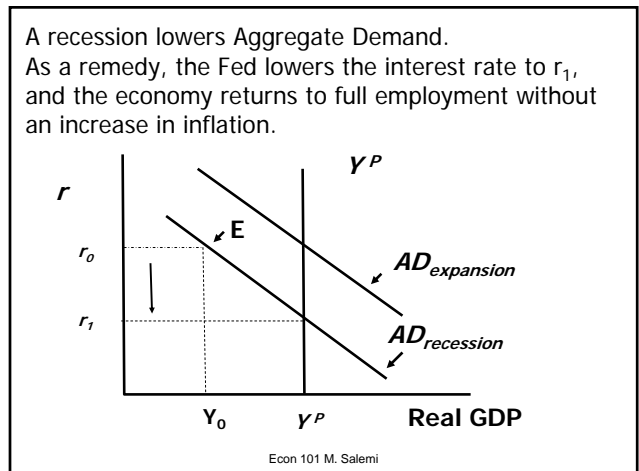
## Monetary Policy

Monetary Policy in the United States has a dual mandate.

The Primary Objective is to keep the inflation rate low and stable.

Provided the Primary Objective is met, the Secondary Objective is to keep the economy operating near full employment.

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## Choosing the Right Value for the Real Rate Involves Complications

Shocks are constantly hitting aggregate demand.

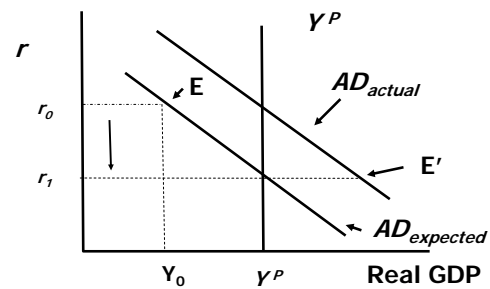
Some shocks push demand higher, some shocks push demand lower.

The Federal Reserve never knows the position of the aggregate demand schedule for sure.

Setting the interest rate at  $r_1$  risks inflation.

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If the Fed lowers the interest rate to  $r_1$  and there is a positive demand shock, the economy will end up in the inflation zone.



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## Additional Complications

Shocks are constantly hitting the production sector as well.

A good example is a change in the price of petroleum.

The Federal Reserve never knows the potential output for sure.

Overestimating potential output risks inflation.

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## Modeling the Current Recession

The fall in housing prices triggered the current recession.

The recession was much deeper than normal because financial firms failed.

As the recession deepened, consumers lost confidence in economic growth and reduced spending.

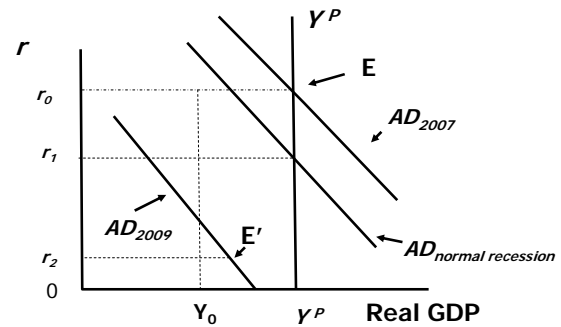
## Modeling the Current Recession

Normal Federal Reserve Policy cannot provide a remedy for the recession.

Banks and other lenders have been afraid to lend even though the Fed has taken steps to provide them with cash.

As we will see in next week's lecture, the current recession has required a combination of fiscal and monetary policy.

Modeling the Current Recession. Monetary policy alone is unable to provide a remedy.



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## What Have We Learned?

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## A Macroeconomic Model

A macro model is a simplified description of the forces that determine equilibrium levels of national output, inflation, unemployment and the real rate of interest.

The AD schedule is inversely related to the real rate of interest.

The Potential Output Schedule represents the full-employment level of real GDP.

When the economy ends up to the left of the PO schedule, unemployment rises and inflation falls. To the right of the PO schedule, unemployment falls and inflation rises.

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