Saving, Investment and Capital Markets I

The World of Finance and its Macroeconomic Significance

October 2nd, 2019

SAIS comes to Homewood
Two events today:

American Foreign Policy in the Trump Era and Beyond

lunch beginning at 1130 am (Levering Hall)

speakers: 12 pm to 1:15 pm

Speakers: Hal Brands, Adria Lawrence, Matthias Matthijs, Andrew Mertha

(Four Spring 2021 SAIS taught undergrad courses at Homewood, introduced)

America and the Future of Great Power Competition

Bloomberg 272 5:00pm to 6:30pm

Moderator: Hal Brands; Speakers: Richard Fontaine and Robert Work

Automakers Resort to $4,100 Discounts to Clear Old Inventory (1)

- Average incentive spending set 3Q record, J.D. Power says
- September sales pace is expected to slow due to holiday timing

By Gabrielle Coppola

(Bloomberg) -- Automakers probably avoided a quarterly decline in U.S. retail sales for the first time in almost two years, but only by spending big on incentives to clear old cars and trucks from dealers' lots.

- Retail sales were likely flat during the three-month period, according to researchers J.D. Power and LMC Automotive, but average incentive spending rose an estimated 6% to more than $4,100 per vehicle, a third quarter record. Old model-year vehicles accounted for 90% of quarterly sales, the slowest sell-down on record.

Key Insights

- J.D. Power's findings are a potential knock against what analysts

What is finance?
Finance describes…

- The management, creation and study of:
- Money.
- Banking
- Credit
- Investments
- Assets and Liabilities

The World of Finance: Four Key Functions

Matching Savers and Borrowers

Banks, bond markets, stock markets and all the other avenues for financial transactions provide the arena in which deals are struck between those with extra cash and those in need of cash

Risk-sharing

Investors can spread their money over different assets, reducing their risk while maintaining a high expected return on their investment

Liquidity

The financial system allows savers to convert their investments into cash.

Information

The prices of financial securities represent beliefs about the future. This aggregation of information makes funds flow to the right firms.

We begin with our output/income equation

$$Y = C + I + G + NX$$

We assume a closed economy, so no net exports:

$$Y = C + I + G$$

We rearrange terms:

$$I = Y - C - G$$

We define two new terms:

$$S_{PRIVATE} = Y + TR - C - T$$

$$S_{PUBLIC} = T - G - TR$$

Note: TR ≡ transfer payments T≡ Taxes

Let's consider the Government budget balance

Government money flows:

gov't collects taxes ≡ T

gov't buys goods and services ≡ G

gov't transfers funds to retirees etc. ≡ TR

Government balance: $S_{public} = T - (G + Tr)$

Gov't Budget Surplus: $T > G + Tr$

Gov't Budget Deficit: $T < G + Tr$

OUR FLOW MODEL:
SAVING = INVESTMENT

$S = S_{Private} + S_{Public}$

$S_{PRIVATE} = Y + TR - C - T$ $S_{PUBLIC} = T - G - TR$

$S = Y + TR - C - T + T - G - TR$

$S = Y - C - G$

(recall that $I = Y - C - G$)

$S = I$ SAVING = INVESTMENT

S = I But recall that I = Ip + Iu

If we all save more, we may finance great investment
OR
We may generate a surge in unwanted inventory accumulation

- Suppose entrepreneurs want funds to finance building factories that make zinc air batteries?
- We will soon see that their willingness to pay higher interest rates for investment funds will lift both S and I: GOOD NEWS
- Suppose, instead, that consumers become very pessimistic, amid news that suggest the world may soon go to war
- In this *bearish* case, as consumers save more of their income and spend less, companies' sales would be below expectations and I_u would rise: BAD NEWS
- Note: in both cases S = I

Hubbard: The market for loanable funds

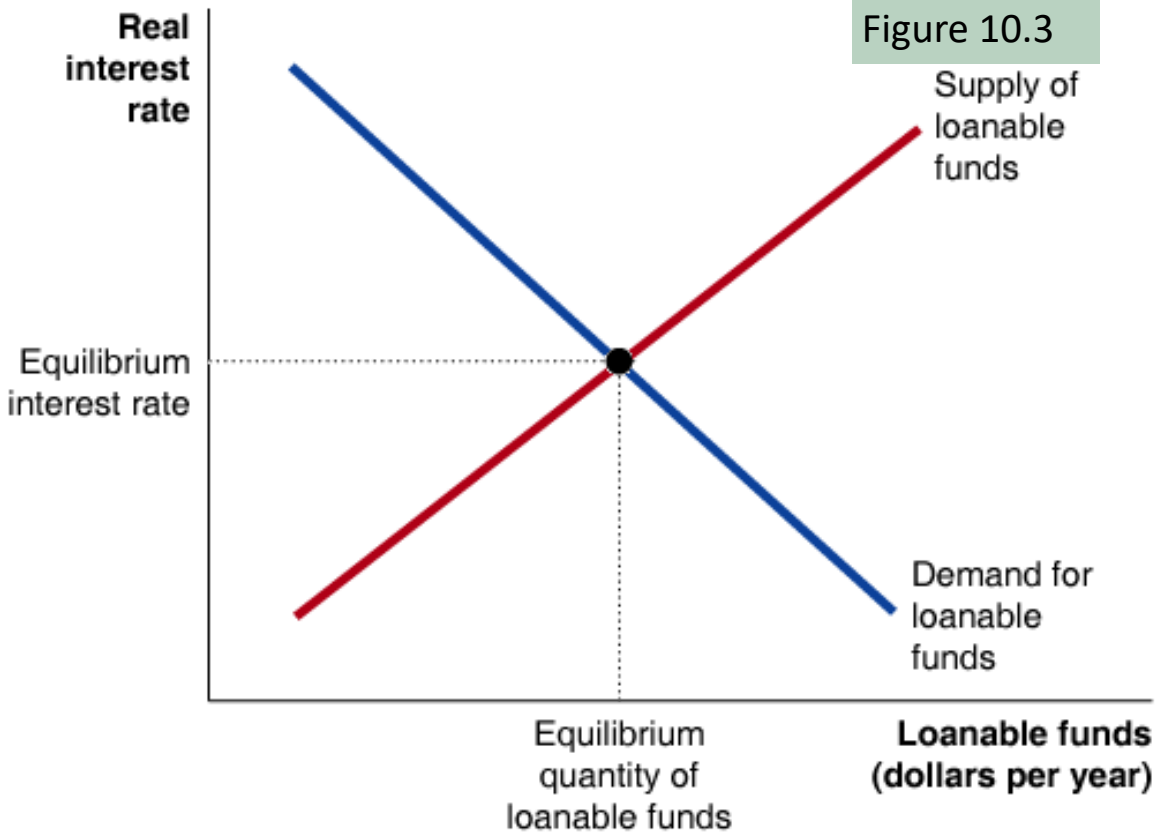
Firms borrow from households.

Households supply loanable funds to firms.

Households also supply loanable funds to the government.

Governments, through their saving or dissaving, affect the quantity of funds that "pass through" to firms.

Figure 10.3



The equilibrium real interest rate and quantity of loanable funds is determined by this supply and demand.

Don’t Miss this!!! The Y axis: **Real** Interest Rates

- Ernie has $1,000, wants to buy a Moped.
- Bert asks Ernie to lend him the $1,000.
- ‘I’ll repay the $1,000 plus $50 in interest. (5%)
- Ernie decides he can get a helmet, if he waits.
- So Ernie lends Bert $1,000 for one year.

Inflation Can Destroy Purchasing Power

- One year later Ernie collects $1050
- He goes to buy the Moped.
- But its now priced at $1,100
- Ernie's lament:
- I got less than nothing for lending to Bert!
- The moral: when you lend money you want to be paid 'real' interest.

The Fisher equation

- $$i = r + \pi$$

Interest rate = real interest rate + inflation rate

Ex-Ante vs. Ex-Post Real Interest Rates

	10-year Yield	12-month Core CPI	Actual 10 year rate of inflation	Ex-ante Real 10-year Rate	Ex-post Real 10-year Rate
1970	6.4	4.6	7.9	1.8	-1.5
1980	12.8	9.6	4.8	3.2	8.0
2019	1.6	2.4	???	-0.8	???

Simple Credit Market Instruments:

A Simple Loan:

-
- Simple loan:
- (e.g., one-period bank loan)
- Principal: the borrower receives a specific amount.
- Interest: Borrower repays the principal amount plus an interest payment.
-

				(pays 10,000 + interest)		
Period			1			
			Year			
Receives $10,000						

Coupon Bond

	Coupon Bond (Government, Corporate, Bond Market)					
Maturity Date						
Face Value	0	1000	1000	…	1000	
Coupon Rate						
Borrower gets $10,000		1	2	19		20
Coupon Rate=	Yearly Coupon Payment		=	1,000	=	10%
	Face Value			10,000		

What do people expect inflation will be? TIPS Bonds give us a good sense of that.

- U.S. Treasury, and other treasuries around the world, offer inflation 'protected' bonds

- You can buy:

  10-year Treasury Inflation Protected Security

  (A TIPS bond)

  The bond will pay you its YIELD Plus
  the year-on-year CPI %change, over the life of the bond.

By subtracting the TIPS Yield from the regular bond yield, we derive break-even inflation rates

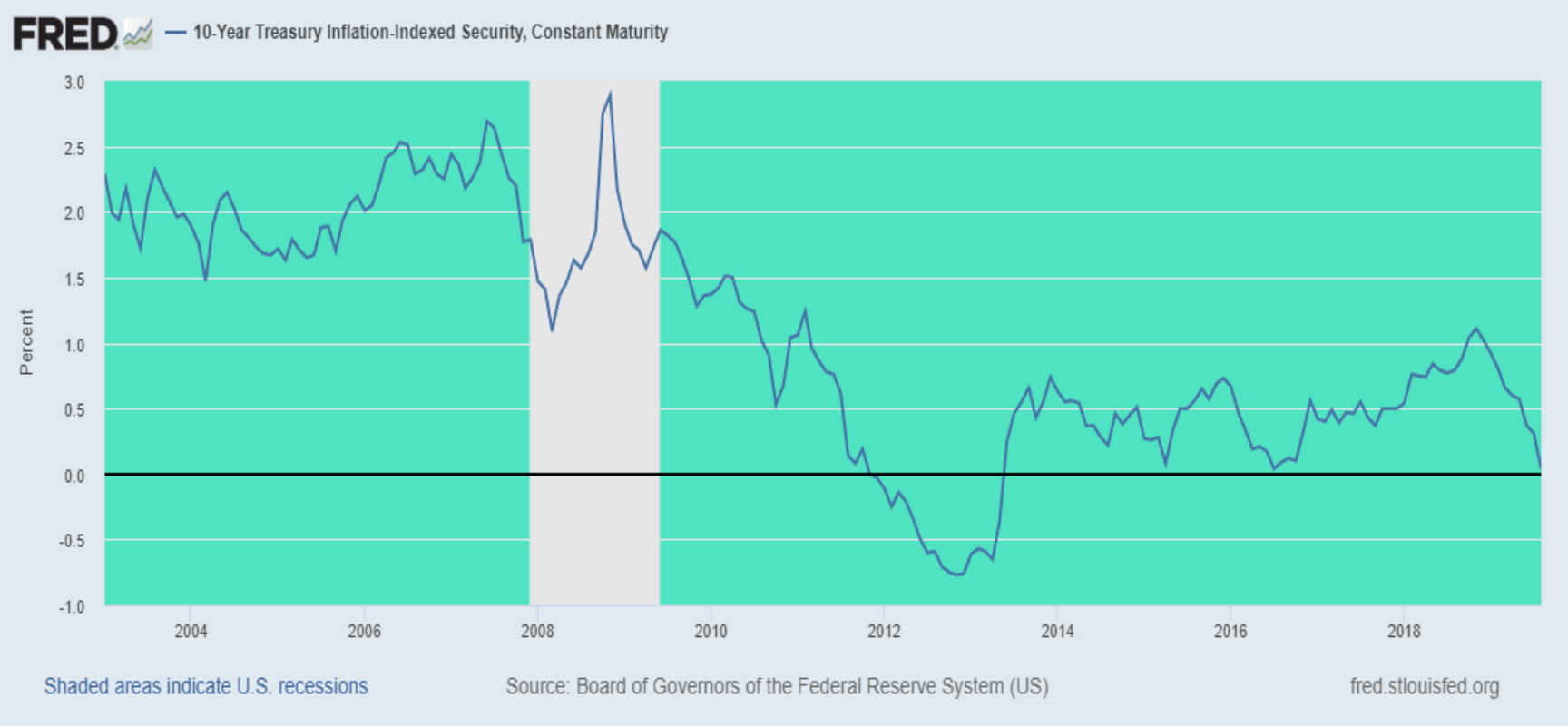
	Dec-1999	Dec-2006	Sept. 2018
10-year TIPS (yield)	4.3%	2.4%	0.1%
10-year T-note (yield)	6.4%	4.7%	1.6%
10-year breakeven Inflation rate	2.1%	2.3%	1.5%

The 10-year breakeven inflation rate,

2010-2018 readings.

(Vertical axis spans 1.2% to 2.8%)

What do Lenders Demand, ex-ante, as a **Real Rate**,
To lend for **10-years**, to the U.S. Government?
Around **2%**, 2001-2005: Around **0%** today!



Expectations: the Centerpiece of Economic Decision-Making

- We assume people are rational consumers:
  - Two six packs, $10/six pack
  - One twelve pack, $22/twelve pack
  - People will buy two six packs
- In most cases, we assume rational investors:
  - A U.S. government bond, 8%/year for 10 years
  - A U.S. government bond, 3%/year for 10 years
  - People will buy the bond that pays them 8%

Markets: arbitrage eliminates any perfectly riskless wagers

Efficient Markets In Action					
	Statistics for 03/15/07				
Date Of Issuance	Years Remaining For Instrument	Coupon Rate	Date Of Maturity	Bond Price Secondary Market	Yield-to-Maturity
2/15/2007	10	4 5/8	2/15/2017	100	4.57
5/15/1987	10	8 3/4	5/15/2017	132	4.64

What clearly happens to the price of the two-year note, in October of 2018?

A SNAPSHOT WITH NO CHANGE IN INTEREST RATES		
	Oct. 17	Oct. 18
2-year note, price	$100	$100
2-year note, annual coupon payment	$10	$10
1-year note, price		$100
1-year note, annual coupon payment		$10

A SNAPSHOT WITH A FALL FOR INTEREST RATES		
	Oct. 17	Oct. 18
2-year note, price	$100	???
2-year note, annual coupon payment	$10	$10
1-year note, price		$100
1-year note, annual coupon payment		$5

‘A Theory of Interest.
J. R. Hicks

- *The essential characteristic of a loan transaction is that its execution is divided in time.*
- *The money rates of interest paid for different loans at the same date differ from one another for two main reasons:*
- *(I) because of differences in the length of time for which loans are to run*
- *(2) because of differences in the risk of default by the borrower.*

What is Hicks Saying?

- The interest rate a lender charges depends on:
- DURATION

  HOW LONG THE LOAN LASTS

- DEFAULT

  HOW MUCH RISK OF BANKRUPTCY EXISTS

A Menu of Government and Company Borrowing Costs:

	9/30/13	9/30/18
German 2-year:	0.00%	-0.55%
U.S. 2-year:	0.30%	1.50%
German 10-year:	1.75%	-0.60%
U.S. 10-year:	2.65%	1.60%
Brazil 10-year:	9.90%	7.05%
High Quality Firm:	4.60%	3.10%
Risky Firm:	5.40%	3.90%
Junk Firm:	6.10%	5.40%

A Barebones Description of the World of Finance

- Banks

  Borrow from depositors, lend to homebuyers and businesses

Bond Market

Bond buyers provide loans

for businesses and governments

Stocks

When companies issue new equity, they receive funds from the buyers of issued shares

Key Differences

- Banks: We will evaluate in about 8 lectures

- Bonds: DURATION AND DEFAULT DRIVE BORROWING COSTS
- Stocks: share buyers are not promised a guaranteed interest payment.

    they own a piece of the gain if good times

    They can lose everything if things go awry

(REPEAT SLIDE)
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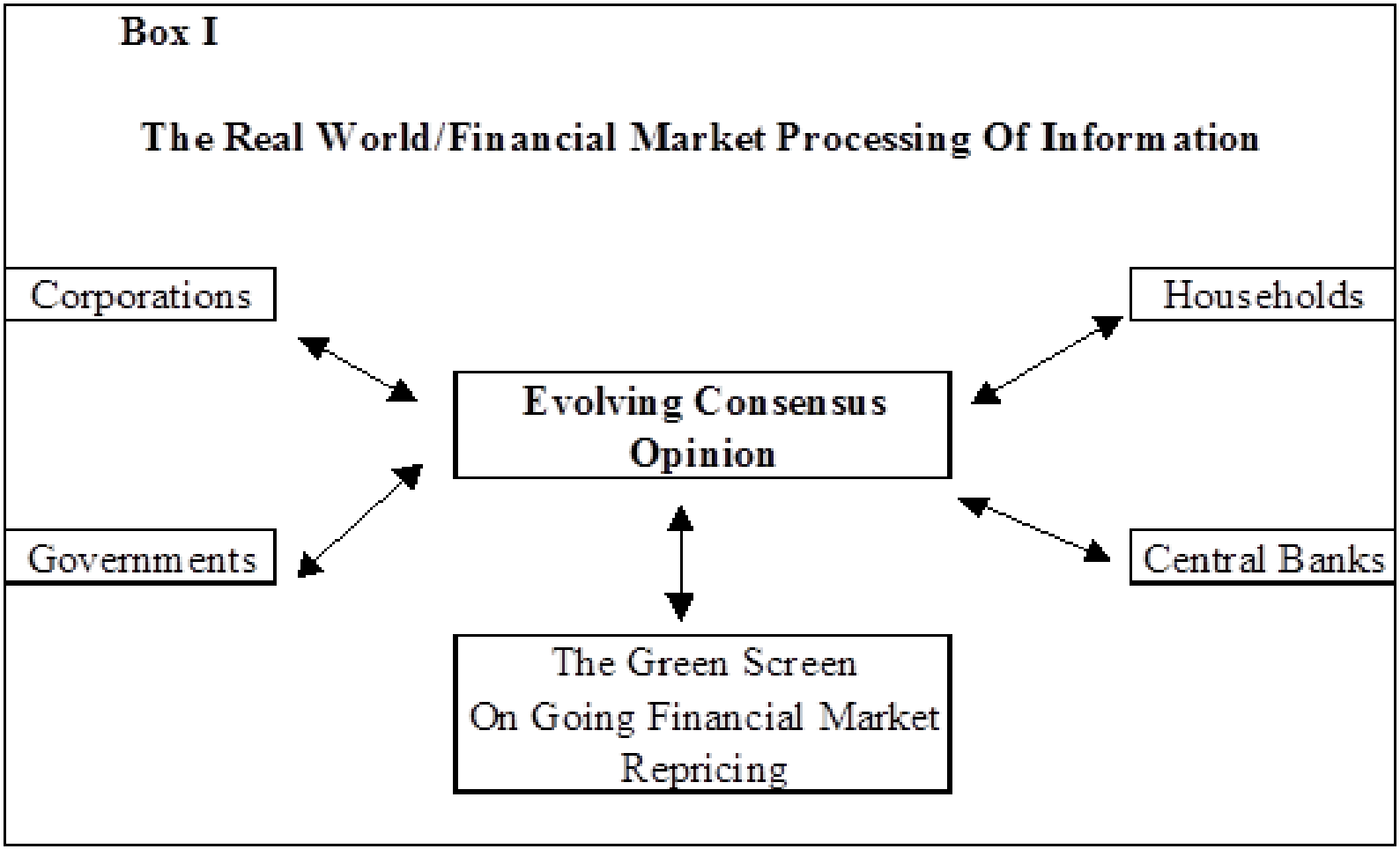
BUT: Rational Expectations Swim Against Pervasive Uncertainty

- Rational investors pick the higher paying bond
- But for many investment decisions, it is not obvious which will deliver the better payoff
- 'Nobody Knows, but Everybody Has to Guess'

Neo's World: Stare at a Bloomberg And See Opinion about the Future Evolve



Duration and Default: Consider Rates, One Year Ago:

- U.S. Federal Government Borrowing:

For 3 months:	2.25% annualized
For 2 years:	2.80% per year
For 10 years:	3.10% per year

Borrowing Rates
As a Window on future rates

- You can lend to the federal government, by buying 2-year notes
- Do that every 2 years for 5 years, and you have lent to the federal government for 10 years.
- Alternatively, buy a 10-year note, and lend for 10 years, in one step.
- But if EXPECTATIONS are that two year rates will be rising, you want a higher rate, to lend for 10 years.

Default risks and bond spreads

- We can look at promised interest payments on bonds of the same duration:
- U.S. gov't 7-yr note: 3.0%/year
- Tesla Company 7-yr note: 7.62%/year
- If you lend to Tesla for 7 years, you get more than TWICE the interest, relative to US t-note

Interest rate differences: Investors' Collective opinion about the FUTURE

Duration:

Spreads between short-term notes and long term bonds:

they tell us whether investors think short-term rates are going up or down

Default:

Spreads between government bonds and company bonds:

they tell us how much risk of bankruptcy investors see in the world

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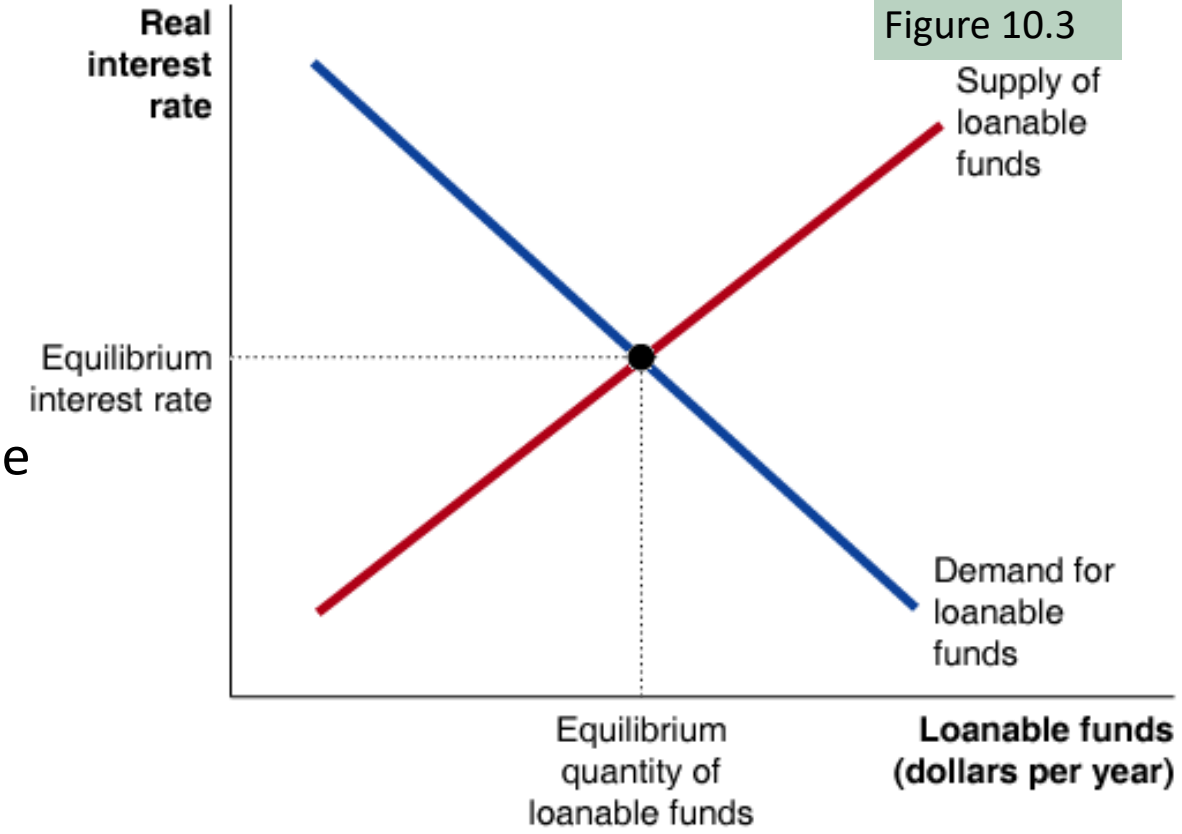


The equilibrium real interest rate and quantity of loanable funds is determined by this supply and demand.

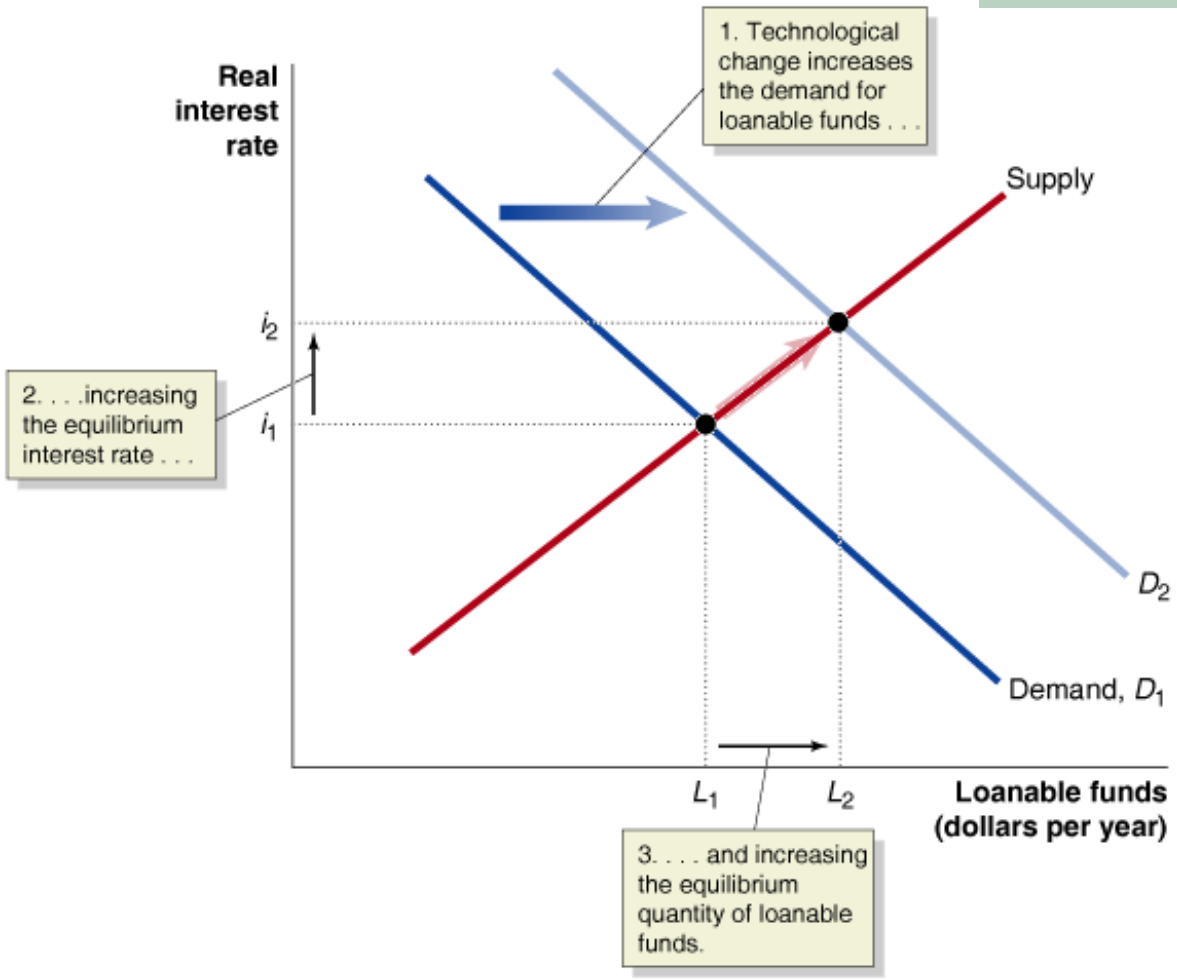
An increase in the demand for loanable funds

Suppose that technological change occurs, so that investments become more profitable for firms.

This will increase the demand for loanable funds.

The real interest rate will rise, as will the quantity of funds loaned.

Figure 10.4



"Crowding out" in the market for loanable funds

Suppose the government runs a budget deficit.

To fund the deficit, it sells bonds to households, decreasing the supply of funds available to firms.

This raises the equilibrium real interest rate, and decreases the funds loaned to firms.

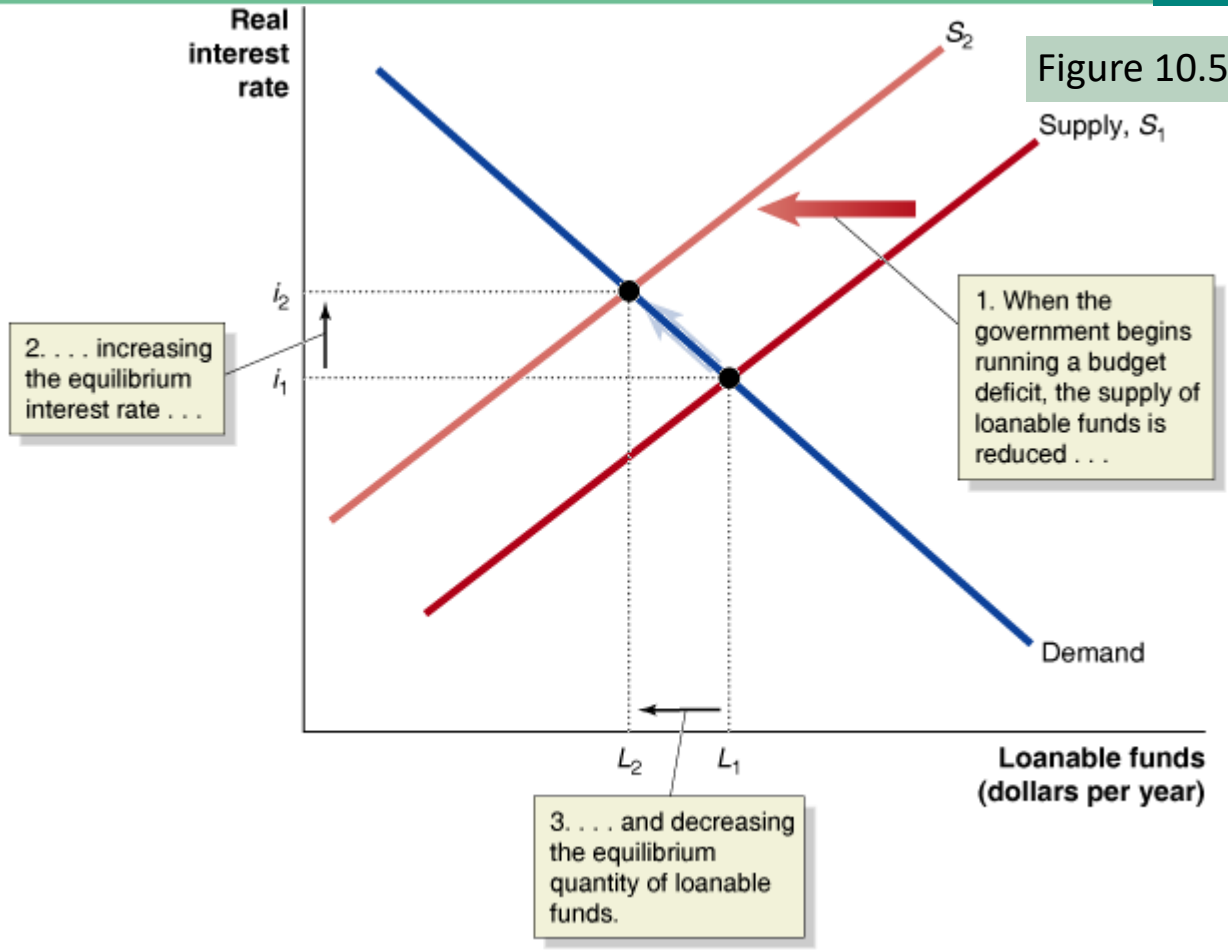


Figure 10.5

This is referred to as *crowding out*: the decline in investment spending that occurs as a result of increases in government purchases.

Circling Back to our Model: Saving = Investment

Hubbard text, rejects the idea that the surge in saving in 2009 played a big role in the recession:

- *'An increase in saving, by increasing the supply of loanable funds, should lower the real interest rate and increase the level of investment spending'*
- *'this increase in investment spending might offset some or all of the decline in consumption*.'

Keynes and the Paradox of Thrift

- Saving equals investment.
- But if everyone tries to save more

  DEMAND PLUNGES

  When demand plunges UNPLANNED INVENTORIES SOAR

  Our Aggregate Expenditure Model can be used to

  Show how big cuts in output/income, occur

  In reaction to soaring inventories

As Everyone Tries to Save more Saving Actually Goes Down!

- Big cuts in employment, in reaction to surging inventories,

Slashed jobs = sharp declines for income

A sharp fall for output and income and all values, including SAVING, FALL

That is Keynes's PARADOX OF THRIFT

Our more detailed look at the world of finance allows us to reject the simplistic loanable funds model!

- Hubbard points to ‘falling real interest rates’, as saving increases.
- But did THE RIGHT INTEREST RATES FALL?

- We will build a model that has 3 interest rates
- We will show how it is quite possible for government borrowing rates to fall and for company borrowing rates to rise.

COMPANY BORROWING COSTS WERE AT RECORD HIGHS IN 2009

	1997	2006	2009
10-Year Treasury	5.5	5	2.5
Junk Bond	8.0	7	17.5
Spread (10-Year-Junk)	2.5	2	15

Investment in 2009: A Collapse
Reflecting Plunging Risk-Free Interest Rates
And Soaring Interest Rates Demanded of Risky Companies