

# Unemployment and fiscal policy

## ECONOMICS

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Lecture 14

# CONTEXT

*Investment* is *more volatile than GDP* (Unit 13)

*Consumption* is *less volatile than GDP* (Unit 13)

Households *smooth their consumption* by borrowing and saving

If *proportion of credit constrained households increase*, then the *consumption would become more volatile*

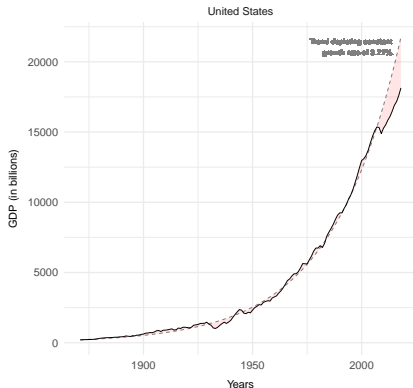
Sometimes *aggregate decisions* of households and firms can *destabilise* the economy. This gives *government* a role.

How can the *government stabilise* the economy?

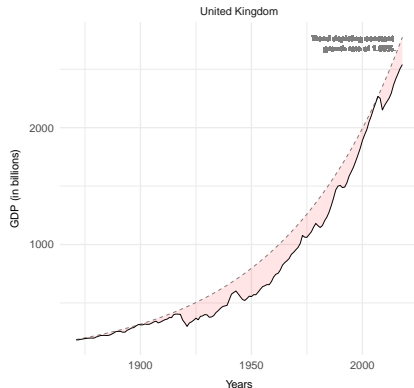
Why might *government* policies be *ineffective*?

How can we model the *link* between *output* and *unemployment*?

# US & UK GDP, 1871-2018



The graph uses available data from Maddison Project Database data for United States covering the period 1871 to 2018. From 1871 to 2007 United States recorded an average GDP growth rate of 3.23%. The trend depicted by the dotted line is constructed using the average GDP growth rate.

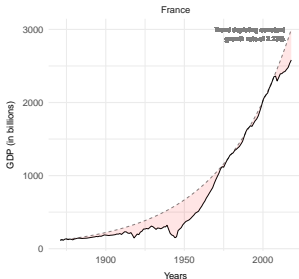


The graph uses available data from Maddison Project Database data for United Kingdom covering the period 1871 to 2018. From 1871 to 2007 United Kingdom recorded an average GDP growth rate of 1.83%. The trend depicted by the dotted line is constructed using the average GDP growth rate.

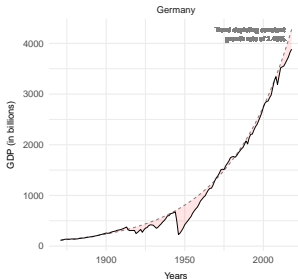
In this lecture, we are interested in analysing how economy's total GDP varies over time whether government can play a role in ensuring that the economy returns to its long term time trend.

United States has experience an average GDP growth rate of 3.21% over the 1871-2018 period. United Kingdom has experience an average GDP growth rate of 1.85% over the 1871-2018 period.

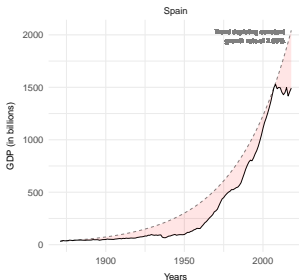
Please note that while United States GDP has reverted to the long term trend fairly quickly, United Kingdom's GDP tends to take a very long time to revert to the long term trend.



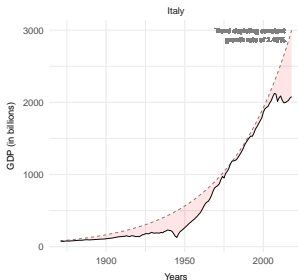
The graph uses available data from Maddison Project Database data for France covering the period 1971 to 2018. From 1971 to 2017 France recorded an average GDP growth rate of 2.23%. The trend depicted by the dotted line is constructed using the average GDP growth rate.



The graph uses available data from Maddison Project Database data for Germany covering the period 1971 to 2018. From 1971 to 2017 Germany recorded an average GDP growth rate of 2.48%. The trend depicted by the dotted line is constructed using the average GDP growth rate.



The graph uses available data from Maddison Project Database data for Spain covering the period 1971 to 2018. From 1971 to 2017 Spain recorded an average GDP growth rate of 2.86%. The trend depicted by the dotted line is constructed using the average GDP growth rate.



The graph uses available data from Maddison Project Database data for Italy covering the period 1971 to 2018. From 1971 to 2017 Italy recorded an average GDP growth rate of 2.46%. The trend depicted by the dotted line is constructed using the average GDP growth rate.

The general pattern is that countries face different kind of shocks all the time. Some of these shocks are big and other shocks are small and transitory. The question that motivates macroeconomic is whether government can follow any policy that will help the economy get back to its long-term growth trend. After the Great Depression, Keynes was the first to argue that varying size of the government can play a big role in ensuring that the economy can return back to its long-term trend after a big shock. Hayek and Friedman argued against using the Keynesian proposition. The argument continues to this day. At the risk generalising, the Left spectrum in politics tends to follow Keynes and the right spectrum in politics tends to follow Hayek and Friedman.

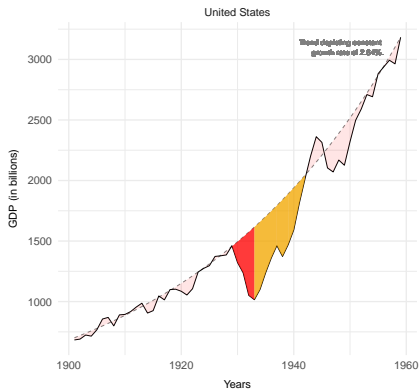
Of course, there are exceptions. The period from 1980s to 2007 (the eve of the Great Recession) is known as the Great Moderation. In this period, there were no big shocks and the economy's across the world has stabilised, leading policymakers to be complacent and politicians to rush to take credit. Gordon Brown famously proclaimed in 1999 that "we will never return to the days of Tory boom - bust" ([Link](#)). In the absence of the big shocks, there was a convergence of the view from the left and right, best epitomised by the politics of Bill Clinton and Tony Blair. Even though they were both from the Center-Left parties, they both governed from the center limiting the role of state in the society. While people often see them as ideological stances, one can also see it as politicians shaped by the events they faced.

# US & UK GDP, 1901-1959

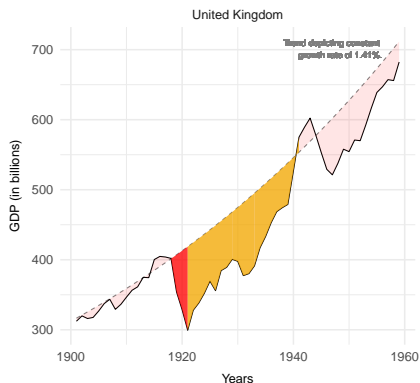
*World War I, 1914-18*

*The Great Depression, 1929-39*

*World War II, 1939-45*



The graph uses available data from Maddison Project Database data for United States covering the period 1901 to 1959. From 1901 to 1959 United States recorded an average GDP growth rate of 2.64%. The trend depicted by the dotted line is constructed using the average GDP growth rate.



The graph uses available data from Maddison Project Database data for United Kingdom covering the period 1901 to 1959. From 1901 to 1959 United Kingdom recorded an average GDP growth rate of 1.41%. The trend depicted by the dotted line is constructed using the average GDP growth rate.

United Kingdom suffered a economic shocks at the end of World War I (1919-21) and Great Depression (1929-31), which set it back in significant way. As we will see in the next slide, while US suffered a servere shock during the Great Depression, it was able to bounce back within a decade. The ideas of Keynes played a huge role in putting United States back on track.

While the shocks of early 20th Century had no long term impact on United States, it had a long-lasting impact on United Kingdom. In the previous graphs we say that Germany was the fastest to recover from the shocks of the early 20th Century, France, Spain and Italy were slower to recover.

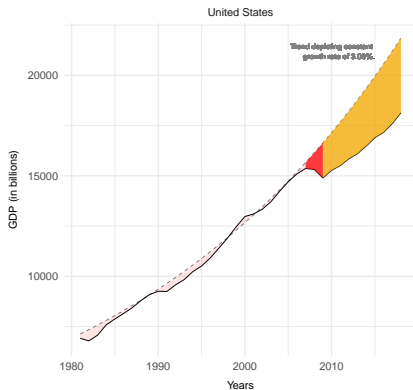
Macroeconomist are interested broadly on two distinct questions. The first question is one of counter-acting shocks to the economy and returning it back to the long-term trend. The policies that facilitate this are called *Macroeconomic Stabilisation policies*. The second question that they face is how to increase the growth rate over the long-term, i.e., over period of decades. This area of Macroeconomics is called *Long-term Economic Growth*. It answers questions like why United States has a higher GDP growth rate than United Kingdom and what can United Kingdom do to increase its GDP growth rate. Facing the Great Depression, Keynes was more interested in the question of *Macroeconomic stabilisation* that we will address in this lecture.



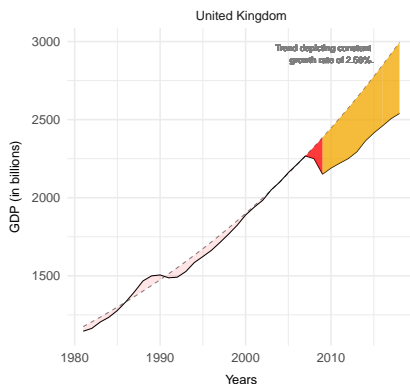
# US & UK GDP, 1981-2018

*The Great Moderation, 1980-2007*

*The Great Recession, 2008-09*



The graph uses available data from Maddison Project Database data for United States covering the period 1981 to 2018. From 1981 to 2007 United States recorded an average GDP growth rate of 3.00%. The trend depicted by the dotted line is constructed using the average GDP growth rate.



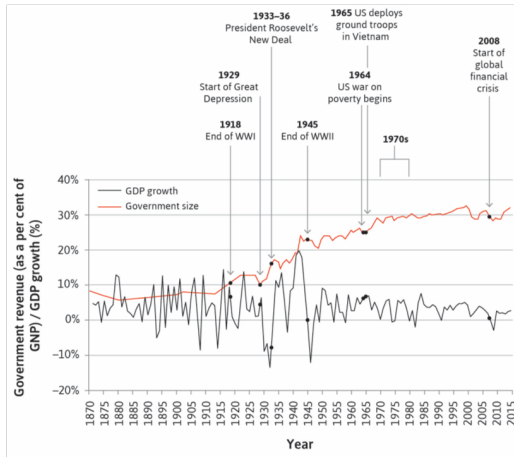
The graph uses available data from Maddison Project Database data for United Kingdom covering the period 1981 to 2018. From 1981 to 2007 United Kingdom recorded an average GDP growth rate of 2.50%. The trend depicted by the dotted line is constructed using the average GDP growth rate.

Both United States and United Kingdom have been extremely slow to recover back from the recent Great Recession (2008-2009). If we compare the United States experience of the Great Depression and Great Recession, it is clear that while it bounced back very fast from the former, it has been very slow to recover from the latter.

It is important to note that while the graphs on the left show the deviation of United States GDP from its average growth rate of 3.08% over the 1981=2007 period, the graph on the right shows the United Kingdom's deviation from its average growth rate of 2.56% in the same period.

# THIS LECTURE

Use a model of *aggregate demand* to explain how *government spending* can *stabilise* the economy



# CONSUMPTION FUNCTION

*Aggregate income*    *total income earned* by people in the economy (GDP)

*Aggregate consumption*    total consumption by the people of the economy

*Consumption function*     $C(Y) = C_0 + c_1 Y$

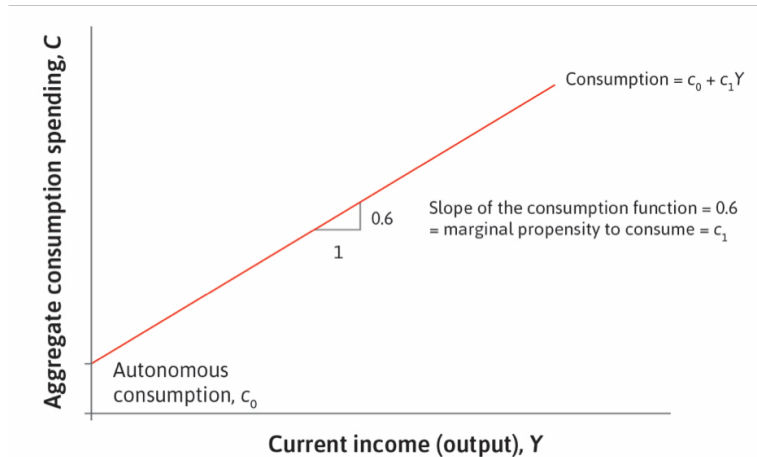
*aggregate consumption*  $C$  as a function of the *aggregate income*  $Y$

$C_0$  (*intercept*)    *Autonomous consumption*: the fixed amount one will spend, independent of income

$c_1$  (*slope*)    *Consumption dependent on income*: Slope of consumption function. It is also called the *marginal propensity to consume* (MPC)

# CONSUMPTION FUNCTION

Consumption function with *marginal propensity of consumption* of 0.6.



# CONSUMPTION FUNCTION

*Expectations* about future income are reflected in *autonomous consumption*

*Marginal propensity to consume* varies across people:

*poor households*      MPC is large

*current income matters a lot* for current consumption because they are often *credit constrained*

*wealthy households*      MPC is small

*current income matters little* for current consumption

# AGGREGATE DEMAND

Important to distinguish between what *income* ( $Y$ ) and *aggregate demand* ( $AD$ ) measure.

*Income*    *income earned* by the people in the economy  
the income in turn determines how much  
people consume

*Aggregate Demand*    *total goods demanded* in the economy  
includes    consumption,    investment,  
government expenditure and net exports

$AD > Y$     *Excess demand*: people demanding more than  
economy's output (income)

$AD < Y$     *Deficient demand*: people demanding less than  
economy's output (income)

# AGGREGATE DEMAND

$$AD = C(Y) + I + G + (X - M)$$

$AD$       Aggregate Demand

$C(Y)$       Consumption function of Income

$I$           investment

$G$           government expenditure

$X - M$       net exports

*Assume for now*       $G = 0$

$X - M = 0$



# GOODS MARKET: AGGREGATE DEMAND

*Aggregate demand:* Goods & services being demanded by the people in the economy

$$\begin{aligned}AD &= C(Y) + I \\ &= C_0 + c_1 Y + I\end{aligned}$$

*Slope of AD* Consumption is a function of income and investment is independent of income

Slope of AD flatter than  $45^\circ$  because the *marginal propensity of consume*  $c_1 < 1$

# GOODS MARKET: AGGREGATE SUPPLY

*Aggregate supply*: available supply of goods & services produced by firms in the economy

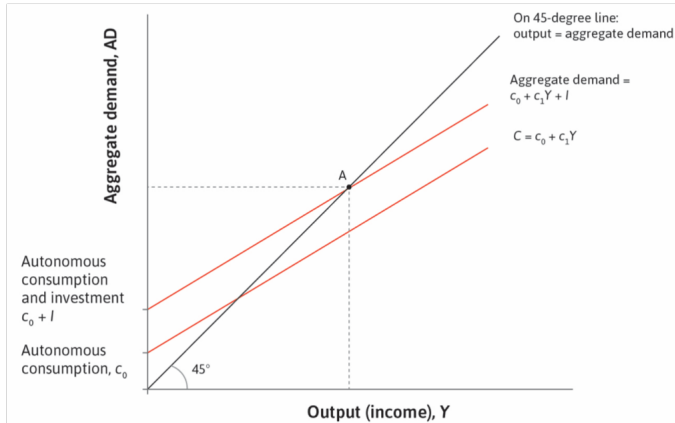
$$Y = Y$$

*Slope of Y*     $Y$  is represented by a  $45^\circ$  line.

# GOODS MARKET EQUILIBRIUM

*Equilibrium* there is no excess demand or supply

aggregate demand (red line) *equals* aggregate supply (black)



# GOODS MARKET EQUILIBRIUM

*Goods market equilibrium:* aggregate demand *equals* aggregate supply

$$\begin{aligned}AD &= C(Y) + I \\ &= Y\end{aligned}$$

$AD > Y$     *Excess demand:* people demanding more than economy's output (income)

$AD < Y$     *Deficient demand:* people consuming less than economy's output (income)

To *understand the mechanics* of the model, we *assume that prices are fixed*, i.e., prices of goods don't change in response of either excess demand and excess supply.

# MULTIPLIER PROCESS

*Drop in investment* → *fall in aggregate demand*

*excess supply* in the economy

inventories pile up till the *supply decreases*

→ lower output and income

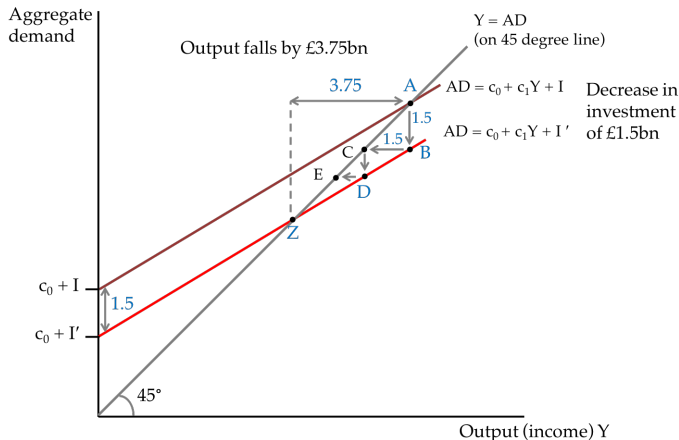
→ further *fall in aggregate demand* due to fall income earned by factors of production

*excess supply* in the economy drives down the output till the *supply equals demand*

→ new equilibrium (Z)

# MULTIPLIER PROCESS

*Drop in investment* leads to *excess supply*. As *supply decreases* it initiates the *multiplier process* and leads to *drop in output* (Z)



# THE MULTIPLIER EFFECT

*Output change* due to *change* in *aggregate demand*, which is due to change in *investment* or  $C_0$

can be *greater* or *lesser* than the initial change

*multiplier process* is due to the *circular flow of expenditure, income, and output*

$$\text{multiplier} = \frac{\text{increase in GDP}}{\text{increase in spending}}$$

*Multiplier* represents the relative magnitude of this change.

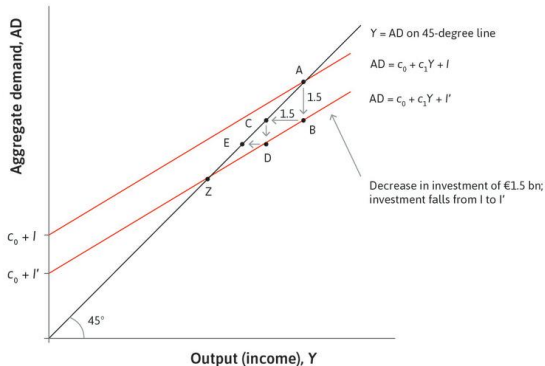
$\text{multiplier} = 1$     *increase in GDP* = *increase in spending*

$\text{multiplier} > 1$     *increase in GDP* > *increase in spending*

$\text{multiplier} < 1$     *increase in GDP* < *increase in spending*

# MPC & SLOPE OF AD

*Smaller the MPC* the *flatter the AD*  
 the *smaller the drop in output* due to *AD shock*  
*smaller the multiplier*





# WEALTH AND INCOME

*Stock* accumulated quantity existing at that point

*Flow* quantify flowing per unit of time, say a year

*Income* *flow* of earnings going to factor of productions in lieu of their services

*Consumption* output *flow* consumed

*Savings* output *flow* not-consumed

*Wealth* *stock* of assets accumulated from flow of savings

*wealth* can be drawn down in case of crisis serving as a *self-insurance* mechanism

# PRECAUTIONARY SAVINGS

*Target wealth* the level of wealth that a household aims to hold, based on its economic goals and expectations

wealth is just accumulated past savings

*Precautionary saving* an increase in saving to restore household wealth to its target level

this is because household wealth is a *self-insurance* mechanism can tide over households in case of crisis

Need for *precautionary savings* when an *unexpected crisis looms* in foreseeable future

# WEALTH EFFECTS

*Consumption*      $C = C_0(w) + c_1 Y$

assume household wealth  $w$  just impacts autonomous consumption  $C_0$

*Savings*      $S = Y - C = Y - C_0(w) - c_1 Y$

*Fall in expected earnings*     household would find it difficult to reach target wealth level

increases *precautionary savings*

by cutting autonomous consumption  $C_0$  to restore target wealth

*endogenous shock*     shifts down aggregate demand *AD*

*multiplier process*     reduces economy's output  $Y$

# GREAT DEPRESSION

*Initial shock* fall in investment

Decrease in aggregate demand (AD shifts)

*multiplier process* decrease in output

*Okun's law* increase in unemployment

future looked uncertain for the households  
due to increased probability of unemployment  
in future

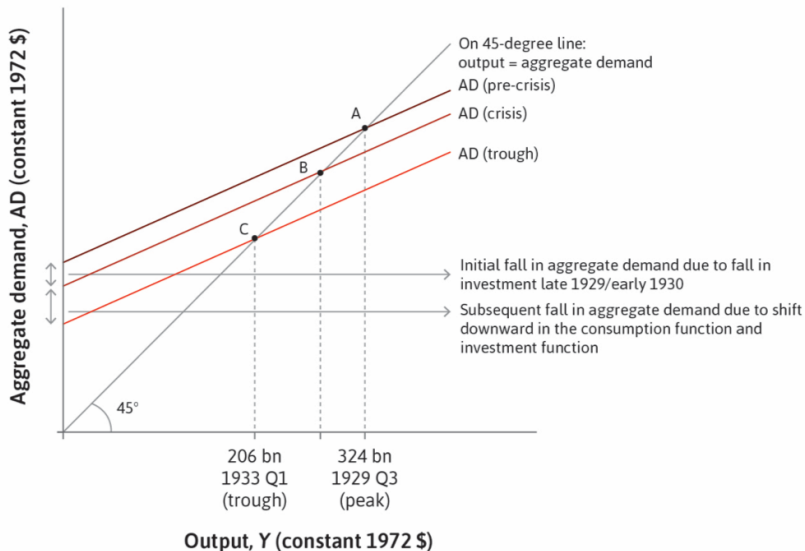
household increased precautionary savings

*endogenous shock* further drop in aggregate demand (AD shift)

*multiplier process* decrease in output

*Okun's law* further increase in unemployment

# GREAT DEPRESSION



# THE GREAT DEPRESSION

- A goods market equilibrium (1929)
- B fall in investment  
downward shift of AD
- C uncertainty due to stock market crash, pessimism,  
banking crisis and collapse of credit  
fall in autonomous consumption  
further downward shift of AD

# AD'S SLOPE & CONSUMPTION SMOOTHING

*AD's slope* *credit constraints* and *consumption smoothing* is reflected in size of the multiplier and the slope of the AD curve

Greater the ability to *smooth consumption*

the less sensitive consumption is to current income because it determined by *wealth* (income over the lifetime)

the lower the marginal propensity to consume

the flatter the AD curve

the smaller the multiplier

# AD'S INTERCEPT & CONSUMPTION SMOOTHING

*AD's intercept*   *consumption decisions* can shift the AD curve

e.g. a fall in house prices will be bad news for a household with a mortgage.

They may choose to save more (precautionary saving) and

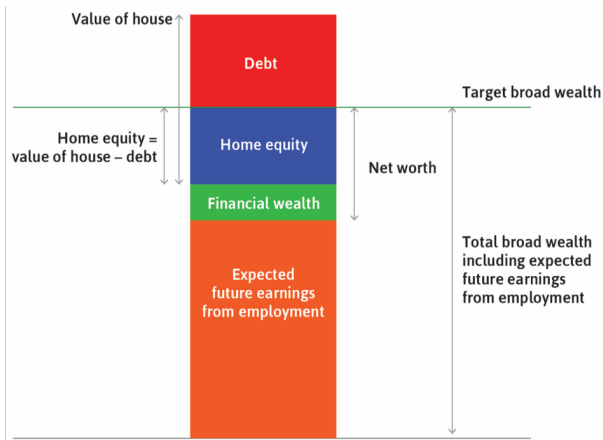
their autonomous consumption would fall.



# TARGET WEALTH

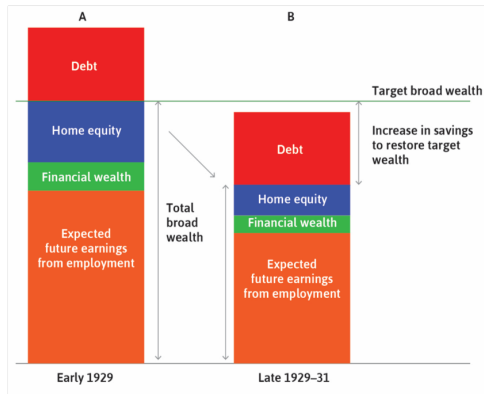
*Broad wealth* is broad assets *minus* debt

*Wealth* can be hit by various types of *exogenous* and *endogenous shocks*



# PRECAUTIONARY SAVING

- ↓ *home equity* (declining house prices) &  
 ↓ *expected earnings* (risk of unemployment)  
*leads to* ↑ *precautionary savings*



# CONSUMPTION AND THE HOUSING MARKET

*Changes in house prices* affect consumption through two channels

*Home-equity channel*    *lower house value* reduces household wealth

*increases precautionary savings* and reduces consumption

*Credit-constraint channel*    *lower house value* makes it more difficult to borrow

*greater credit constraint* for the household

inability to *smooth consumption*

consumption more *sensitive* to current income

# INVESTMENT

*Aggregate investment function:* investment spending in the economy as function the following variables:

*Interest rate*    *Investment increases* as *interest rates* decrease

*Shift factors*    *Investment increases* as

*profit expectations* (net return on investment)  
*increases*

*business environment improves* or *risk of*  
*expropriation* by the government *decreases*

...*property rights* (Unit 5)

The entrepreneur compares the return an investment in the firm gives to the interest rate they would have to pay on the loan. Alternatively, they would earn an interest rate on the money they would invest in the firm. Let's say the investment in the firm gives the entrepreneur 2.5%. The prevailing interest rate in the economy, i.e., the rate at which the entrepreneur can borrow and save is 3%. The entrepreneur will prefer to save than to undertake the investment.

Now let's suppose the prevailing interest rate in the economy falls from 3% to 2%. Given the lower interest rate, it would be profitable for the entrepreneur to invest in the firm. This is an example of how a lower interest increases the investment in the economy.

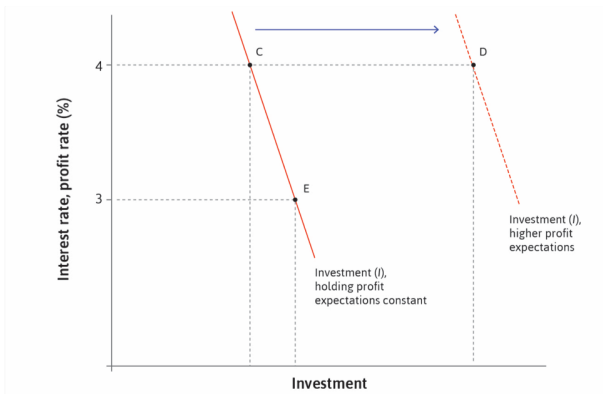
Every time the prevailing interest rate in the economy drops, some investment opportunities that were previously not profitable become profitable.

Firms make their investment decisions not just based on interest rate. The economic outlook, the decision other firms are making on investment is very important factors in their investment decision. These are the shift factors, i.e., shift the investment curve in the investment-interest rate graph (see next slide). Hence, we find that in practice, interest rate is not very sensitive to interest rate and the shift factors are more important.

# AGGREGATE INVESTMENT FUNCTION

In practice, *investment* is *not very sensitive to interest rate* and *shift factors are more important*.

... *Coordination problem in investment* (Unit 13)



# AD: GOVERNMENT AND NET EXPORTS

$$AD = C_0 + c_1(1 - t)Y + I + G + (X - M)$$

$G$  Government spending or *government purchasing power*

$T = tY$  *Taxes* collected by government

$(1 - t)Y$  Disposable income or *private purchasing power* in the economy

$$\begin{aligned} C &= C_0 + c_1(1 - t)Y \\ &= C_0 + c_1(Y - T) \end{aligned}$$

$$AD = C_0 + c_1(Y - T) + I + G + (X - M)$$

# AD: GOVERNMENT

$$AD = C_0 + c_1(Y - T) + I + G + (X - M)$$

$G - T$  Government's primary *budget deficit*

*financed* by selling bonds (government debt)

in effect the government finances its primary budget deficit by *borrowing* from bondholders (citizens)

$(G - T) \uparrow$  *Fiscal stimulus:* Increase in aggregate demand,  
*AD shifts up*

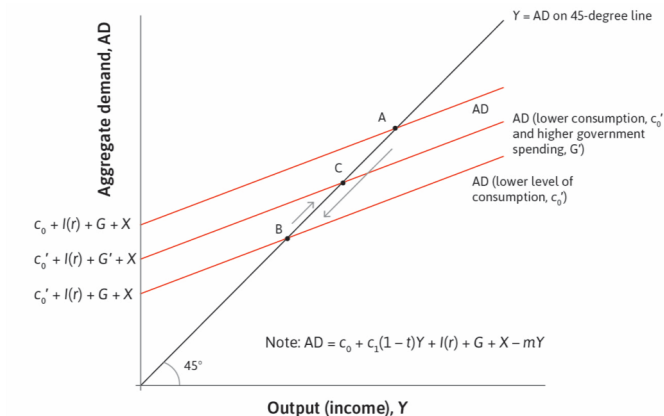
$(G - T) \downarrow$  *Fiscal contraction:* Decrease in aggregate demand,  
*AD shifts down*



# COUNTERACTING AGGREGATE DEMAND SHOCK

*Initial shock* government expects a fall in  $C_0$ , *AD shifts down*

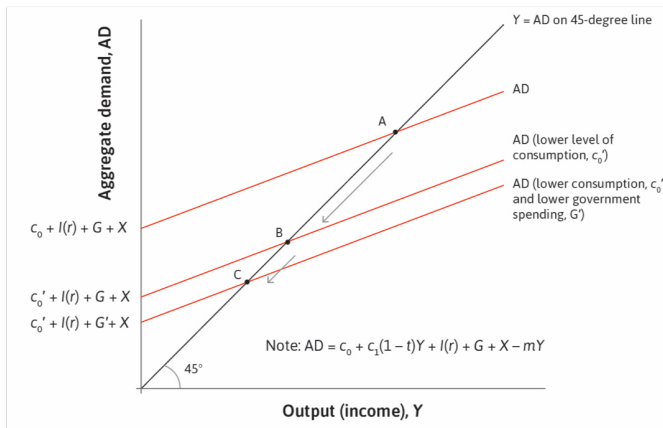
*Stabilisation* government  $(G - T) \uparrow$  in response, *AD shifts up*



# AUSTERITY

*Initial shock* government expects a fall in  $C_0$ , *AD shifts down*

*Austerity* government  $(G - T) \downarrow$  in response, *AD shifts down*



# MACROECONOMIC STABILISATION

*Stabilisation* Government can counter-act aggregate demand shocks through fiscal stimulus or contraction

fiscal stimulus financed by government borrowing

*E.g, FDR's New Deal*

*Information* government requires precise information about the shock beforehand to counteract it

*Austerity* Financial crisis leads to drop in autonomous consumption

Fiscal contraction wrong response to financial crisis

*E.g, UK and Greece since 2007-08*

# OTHER STABILISATION MECHANISMS

*Unemployment insurance* helps households *smooth consumption*

Corrects the *market failure* of private insurance because of *correlated risk*, *hidden actions*, *hidden attributes*

*Automatic stabilisers* automatically offset an expansion or contraction of the economy

*E.g., Unemployment benefit scheme*  
*proportional tax rate*

# FEEDBACK MECHANISMS

*Mechanisms*    *Private* and *government mechanisms* that *dampen* and *amplify* the shocks to the economy

	DAMPENING MECHANISMS OFFSET SHOCKS (STABILISING)	AMPLIFYING MECHANISMS REINFORCE SHOCKS (MAY BE DESTABILISING)
PRIVATE SECTOR DECISIONS	Consumption smoothing	<p>Credit constraints limit consumption smoothing</p> <p>Rising value of collateral (house prices) can increase wealth above the target level and raise consumption</p> <p>Rising capacity utilisation in a boom encourages investment spending, adding to the boom</p>
GOVERNMENT AND CENTRAL BANK DECISIONS	<p>Automatic stabilisers (e.g. unemployment benefit)</p> <p>Stabilisation policy (fiscal or monetary)</p>	<p>Policy mistakes, such as limiting the scope of automatic stabilisers in a recession or running deficits during low demand periods, while not running surpluses during booms</p>

# SUMMARY

## *Aggregate demand*

$$AD = C + I + G + (X - M)$$

*Shocks* to aggregate demand are *amplified* by the multiplier

Government can *stabilise* economic fluctuations

Automatic stabilisers

*Fiscal stimulus* can *offset* decline in aggregate demand from the private sector

*Austerity* policies *amplify* the negative demand shock