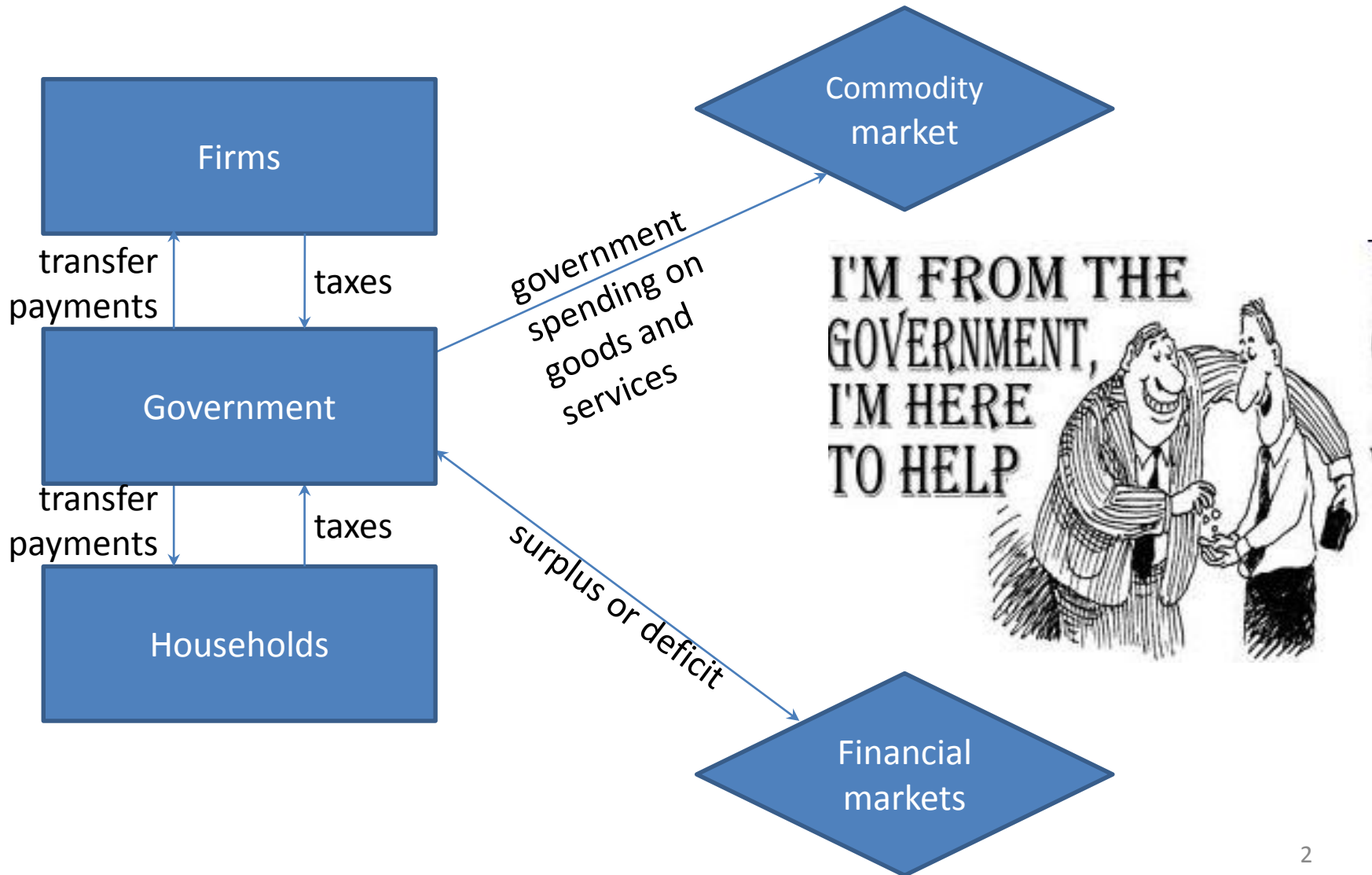


# Fiscal policy

Macroeconomics

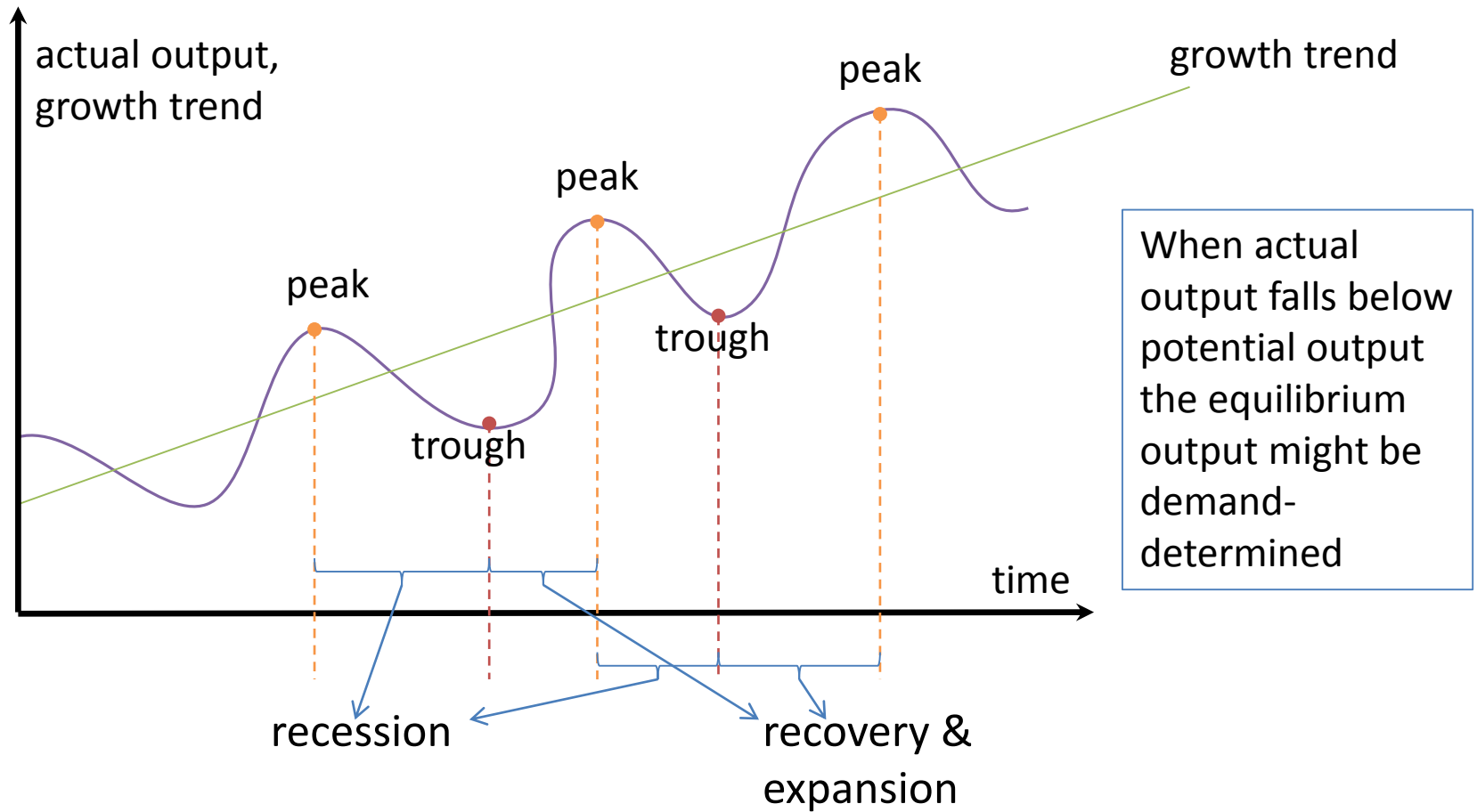
4th lecture

# Transactions by the government



# Fiscal policy

- In most European countries, the government directly buys about a fifth of national output, and spends about the same again on transfer payments. This spending is financed mainly by taxes.
- **Fiscal policy** is government policy on spending and taxes.
- **Stabilization policy** is government action to keep output close to potential output.



# Why is stabilization important? (business cycles)

# The effect of fiscal policy on AD

- Government spending ( $G$ ) on goods and services add directly to aggregate demand.
- The government also withdraws money from the circular flow through indirect taxes ( $T_e$ ) on expenditure and direct taxes ( $T_d$ ) on factor incomes, less benefits ( $B$ ) that augment factor incomes.
- Transfer payments affect aggregate demand only by affecting other components such as consumption or investment demand.

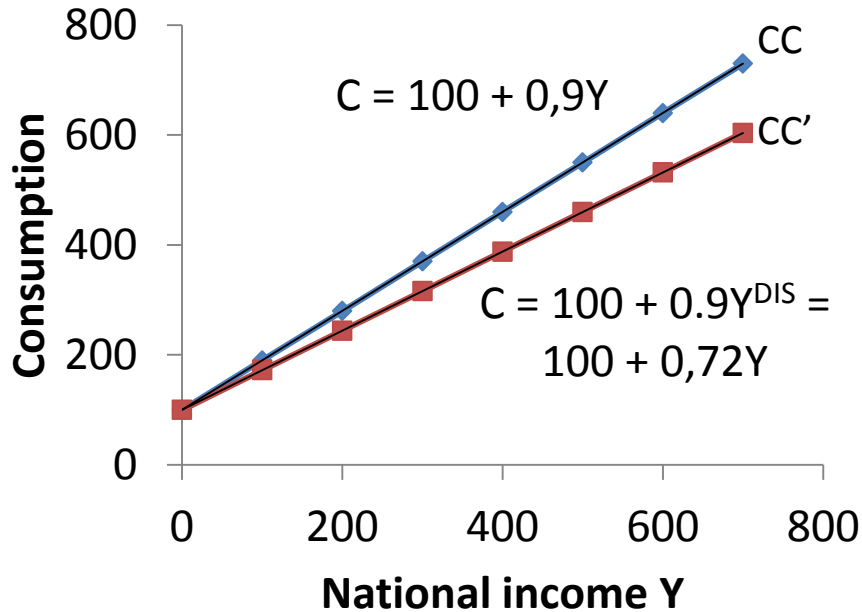
# Aggregate demand with a government sector

- Assuming all taxes are direct taxes:

$$AD = C + I + G$$

- We assume that  $G$  is autonomous (independent of income).
- Net taxes (NT) are taxes minus transfers:  $T - B$ .
- Disposable income is:  $Y^{\text{DIS}} = Y - NT = Y + B - T$ .
- For simplicity, we assume that net taxes are proportional to national income. If  $t$  is the net tax rate, the total revenue from net taxes is  $NT = tY$ .
- Then, disposable income is  $(1 - t)Y$ .

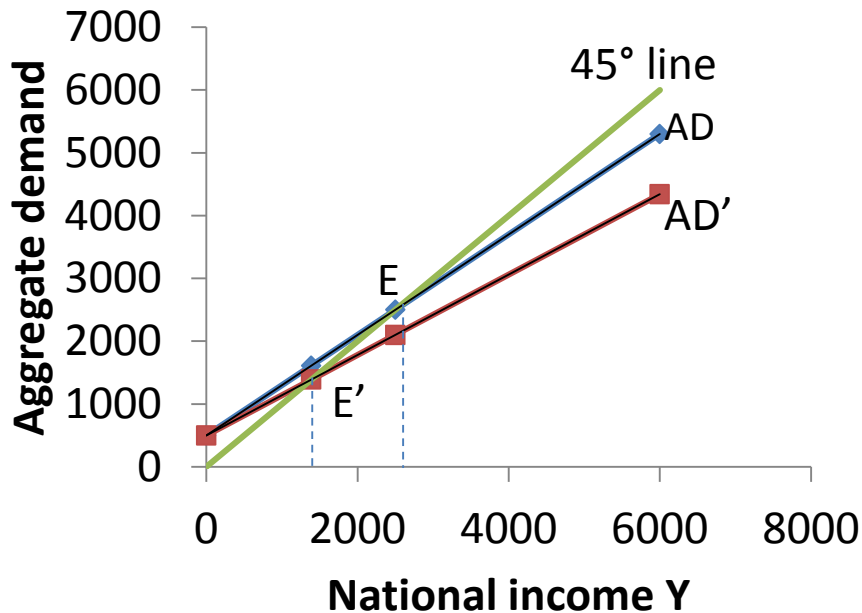
# Net taxes and consumption



Relating consumption to national income, the effect of net taxes is to rotate the consumption function downwards from CC to CC'

In the absence of taxation, national income  $Y$  and disposable income are the same. The consumption function  $CC'$  shows how much households wish to consume at each level of national income. With a proportional net tax rate of 0.2 (or 20%), households still consume 90% of each extra unit of disposable income. Since disposable income is now only  $0.8Y$ , households consume only  $0.9 \times 0.8 = 0.72$  of each extra unit of national income.

# A higher net tax rate

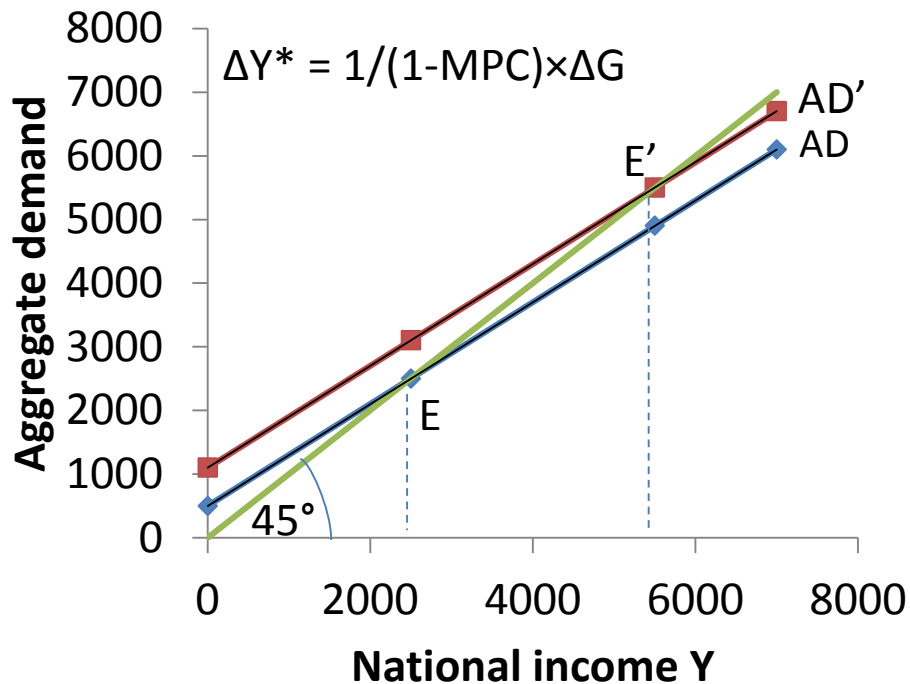


An increase in the income tax rate (or a reduction in the rate of unemployment benefit) will increase the net tax rate  $t$ . The consumption function rotates from  $CC$  to  $CC'$  (see previous slide). With constant investment demand, the aggregate demand schedule rotates from  $AD$  to  $AD'$  in the figure to the left. The equilibrium level of output falls and the equilibrium point moves from  $E$  to  $E'$ .

If  $MPC$  is the marginal propensity to consume out of disposable income, and there is a proportional net tax rate  $t$ , then  $MPC'$  the marginal propensity to consume out of national income is given by  $MPC' = MPC \times (1 - t)$ .



# Government spending and equilibrium output



Now suppose net tax rate is zero. National income and disposable income coincide. The figure to the left shows that higher government spending has an effect similar to that of higher autonomous investment demand.

$$C = A + 0.9Y$$

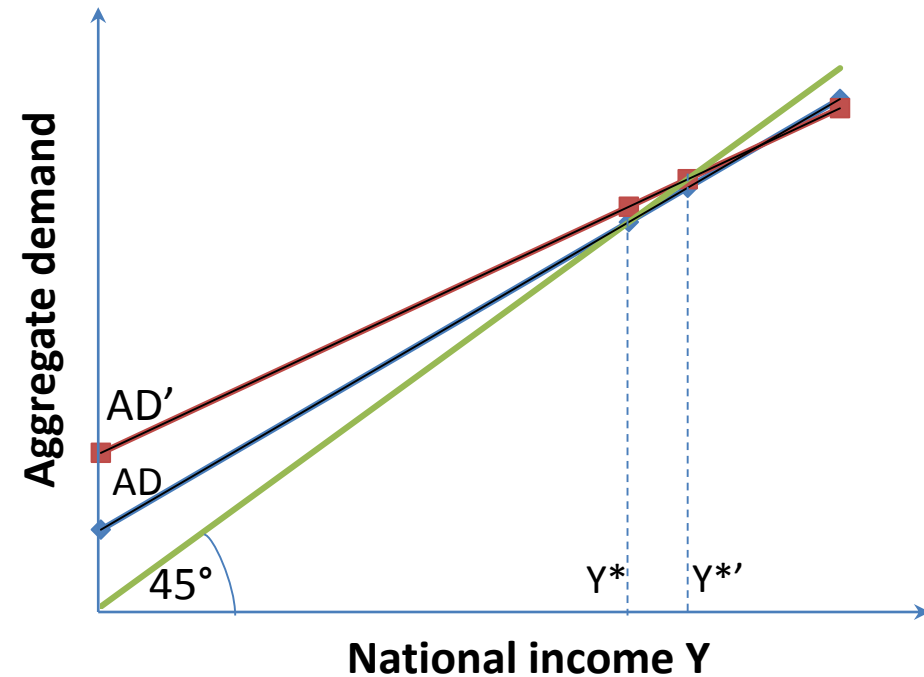
$$AD = C + I$$

$$AD' = C + I + G$$

Beginning from equilibrium at E, AD shifts up to AD'.

The new equilibrium is E' and equilibrium output rises by  $1/(1-MPC)$  times the rise in G.

# Higher spending and taxes



Beginning from equilibrium E, government spending rises from zero to 200, shifting the AD schedule upwards, and the tax rises from zero to 0.2, making the new schedule AD' flatter. Equilibrium moves from E to E' where AD' intersects the 45° degree line. Equilibrium output increases from  $Y^*$  to  $Y^{*}$ .

$$G=200; t=0.2; C = A + 0.9Y^{\text{DIS}}$$

$$AD = C + I \quad Y^{\text{DIS}}=Y$$

$$AD' = C + I + G; Y^{\text{DIS}}=Y(1 - t)$$

# An example: higher spending and taxes

- Suppose that the economy began at an equilibrium output of 1000. ( $A+I=100$ ;  $MPC=0.9$ ).
- With a proportional tax rate of 20 per cent, initial tax revenue was 200, precisely the amount of government spending. ( $t=0.2$ ;  $T = 200 = G$ )
- The new 200 of government spending raises AD by 200 and the tax increase cuts disposable income by 200. ( $\Delta G = +200$ ;  $Y^{DIS}=Y-200$ )
- The MPC out of disposable income is 0.9, so lower disposable income reduces consumption demand by only  $0.9 \times 200 = 180$ . ( $\Delta C_1 = -0.9 \times 200 = 180$ )

# The balanced budget multiplier

- The initial effect of the tax and spending package raises AD by 200 but reduces it by 180. Aggregate demand rises by 20.
- Output rises, inducing further rises in consumption demand. When the new equilibrium is reached, output has risen a total of 71, from 1000 to 1071. ( $MPC' = 0.72$ ;  $A + I + G = 300$ ; hence:  $Y = [A+I+G]/[1-0.72] = 300/0.28 \approx 1071$ )
- The **balanced budget multiplier** says that a rise in government spending plus an equal rise in taxes leads to higher output.

# The multiplier revisited

MPC	t	MPC'	Multiplier*
0.9	0	0.9	10
0.9	0.2	0.72	≈3.57
0.7	0	0.7	≈3.33
0.7	0.2	0.56	≈2.27
0.7	0.4	0.42	≈1.72
Values of the multiplier * $1/(1-MPC')=1/(1-MPC \times [1-t])$			

- The multiplier relates changes in autonomous demand to changes in equilibrium national income and output.
- The multiplier with proportional taxes:  

$$\text{Multiplier} = 1/[1-MPC']$$
- Where  $MPC' = MPC \times (1 - t)$ .

Larger leakages from the circular flow (higher tax rates or MPS) reduce the multiplier. If both the tax rate and the marginal propensity to save are high, the multiplier might be much lower. See the table above.

# The government budget

- A budget is the spending and revenue plans of an individual, a company, or a government.
- The government budget describes what goods and services the government will buy during the coming year, what transfer payments it will make, and how it will pay for them.
- Most of its spending is financed by taxes.

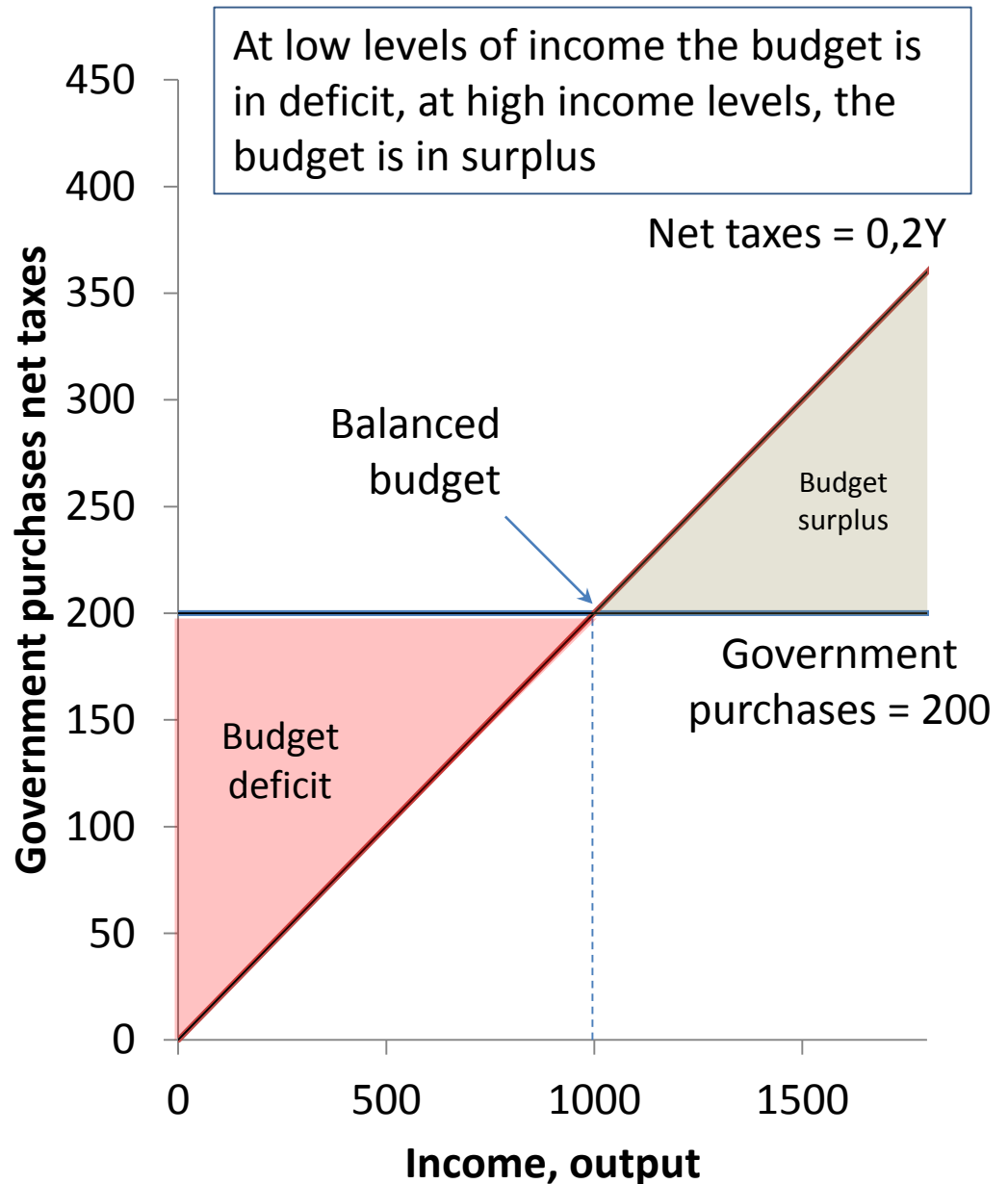
# The budget deficit

- When spending exceeds taxes, there is a budget deficit.
- When taxes exceed spending, there is a budget surplus.
- Continuing to use **G** for government spending on goods and services, and **NT** for net taxes or taxes minus transfer payments,

$$\text{Government budget deficit} = G - NT.$$

# The government budget

The budget deficit equals total government spending minus total tax revenue, or government purchases of goods and services minus net taxes. Government purchases are shown as constant, independent of income, while net taxes are proportional to income.





# Government spending, net taxes, planned saving and investment

- The economy is in equilibrium when all quantities demanded or desired are equal to actual quantities. Planned leakages equal planned injections:

$$S + NT = G + I$$

- This implies that in equilibrium desired saving minus desired investment equals the government's desired budget deficit:

$$S - I = G - NT$$

# The effects of government spending and tax rate on the budget deficit

- Higher government spending on goods and services increases equilibrium output. With a given tax rate  $t$ , tax revenue rises but the budget deficit increases (or the budget surplus falls).
- $G \uparrow \rightarrow Y \uparrow \rightarrow NT \uparrow, S \uparrow \rightarrow (S-I) \uparrow \rightarrow (G-NT) \uparrow$
- For a given government spending  $G$ , a higher tax rate reduces both equilibrium output and the budget deficit.
- $t \uparrow \rightarrow Y \downarrow \rightarrow S \downarrow \rightarrow (S-I) \downarrow \rightarrow (G-NT) \downarrow$

# Deficits and the fiscal stance

- The **fiscal stance** shows the effect of fiscal policy on demand and output.
- Fiscal policy might be **expansionary** (aiming to rise national income) or **contractionary**.
- In itself, the **budget deficit** may be a poor measure of the government's fiscal stance. The deficit can change for reasons unconnected with fiscal policy. E.g. a fall in investment demand might reduce output and income and thus raise the budget deficit.

# The structural budget

- Tightening fiscal policy during a recession (to eliminate a growing budget deficit) is likely to reduce output further.
- To use the budget deficit as an indicator of the fiscal stance we calculate the structural or cyclically adjusted budget.
- The **structural budget** shows what the budget would be if output were at potential output.

# Inflation-adjusted budget

- A second reason why the actual government deficit may be a poor measure of fiscal stance is the distinction between real ( $r$ ) and nominal ( $i$ ) interest rates.
- $r = i - \pi$  ( $\pi$ : inflation)
- Official measures of the deficit treat all nominal interest paid by the government on the national debt as government expenditure.
- The inflation-adjusted budget uses real not nominal interest rates to calculate government spending on debt interest.

# Automatic stabilizers

- Suppose investment demand falls – the larger the multiplier, the larger is the fall in equilibrium output.
- A higher net tax rate ( $t$ ) reduces the multiplier  $[= 1/(1-MPC \times [1-t])]$ , and dampens the output effect of shocks to autonomous aggregate demand.
- **Automatic stabilizers** reduce the multiplier and thus output response to demand shocks.

# Discretionary fiscal policy

- Income tax, VAT, and unemployment benefit are important automatic stabilizers. At given tax rates and given benefit levels, a fall in income and output raises payments of benefits and reduces tax revenue.
- Although automatic fiscal stabilizers are always at work, governments also use discretionary fiscal policies to stabilize aggregate demand.
- Discretionary fiscal policy is decisions about tax rates and levels of government spending.
- In practice, not even active fiscal policy can **stabilize** output perfectly.

# The national debt and the deficit

- **Budget deficits** add to the **national debt**. If the debt is mainly owed to citizens of the country, interest payments are merely a transfer within the economy.
- However, the national debt may be a burden if the government is unable or unwilling to raise taxes to meet high interest payments on a large national debt.



# Should we hate budget deficits?

- Deficits are not necessarily bad.
- Particularly in a recession, a move to cut the deficit may lead output further away from potential output.
- But huge deficits can create a vicious circle of extra borrowing, extra interest payments, and yet more borrowing.

# Foreign trade

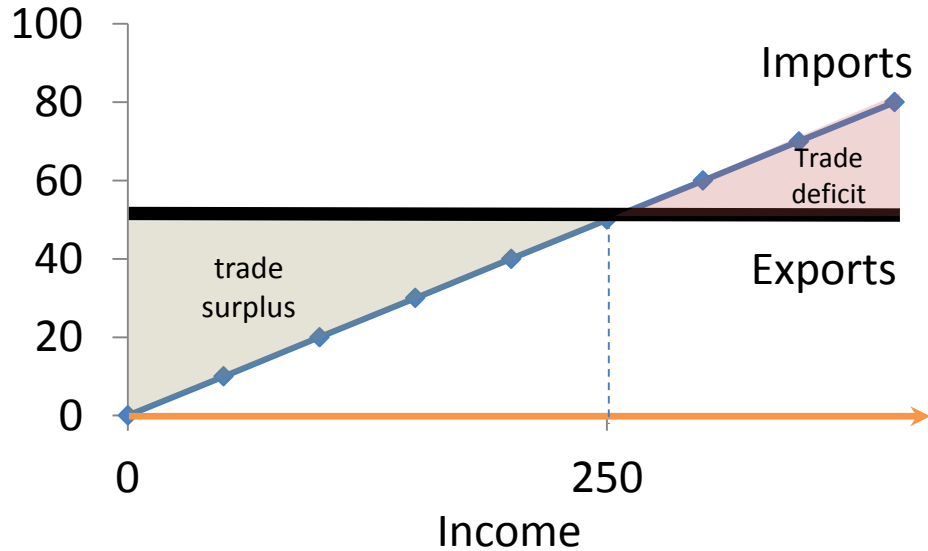
- In an open economy, **exports** are a source of demand for domestic goods but **imports** are a leakage since they are a demand for goods made abroad.
- The **trade balance** is the value of net exports.
- If these are positive, the economy has a trade surplus. If imports exceed exports, the economy has a trade deficit.

$$NX = X - Z$$

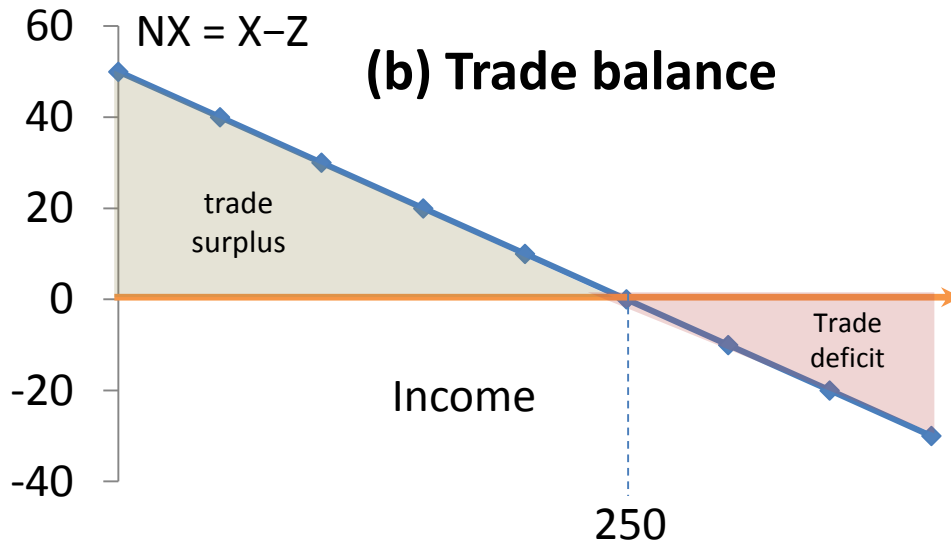
# Determinants of exports and imports

- Exports are determined mainly by conditions abroad and can be viewed as autonomous demand unrelated to domestic income.
- Imports are assumed to rise with domestic income.
- The **marginal propensity to import (MPZ)** tells us the fraction of each extra unit of national income that goes on extra demand for imports.

### (a) Exports and imports

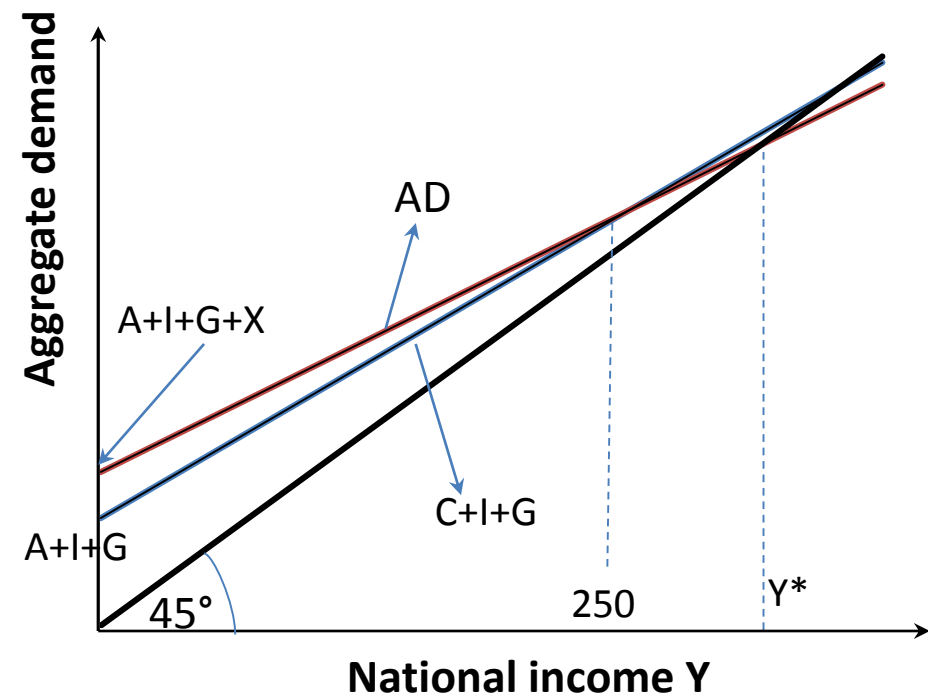


### (b) Trade balance



Part (a) shows the given level of exports at 50. Imports increase with the level of income. The diagram assumes a marginal propensity to import, shown by the slope of the import schedule of 0.2. The trade balance, the difference between the planned exports and planned imports, is zero at an income level of 250. Imports and exports both equal 50. At higher levels of income, imports exceed 50 and there is a trade deficit. The net export schedule  $X - Z$  in part (b) shows the difference between export and import demand.

# Equilibrium income in an open economy



Leakages reduce the multiplier to  
 $1/[1 - MPC' + MPZ]$

$$S + NT + Z = I + G + X$$

Net exports ( $X - Z$ ) must be added to  $(C + I + G)$  to get aggregate demand  $AD$ . The gap between  $(C + I + G)$  and  $AD$  is precisely the net export schedule  $(X - Z)$ . Equilibrium occurs at  $E$ , where the  $AD$  schedule crosses the  $45^\circ$  line. Here, net exports are zero at an income of 250. Thus at  $Y^*$  the  $AD$  schedule lies below  $(C + I + G)$ .

# How foreign trade affects equilibrium output and the trade balance

- Higher export demand raises domestic output and income.
- A higher marginal propensity to import reduces domestic output and income.
- The trade surplus, exports minus imports, is larger the lower is output.
- Higher export demand raises the trade surplus, a higher marginal propensity to import reduces it.

Summary