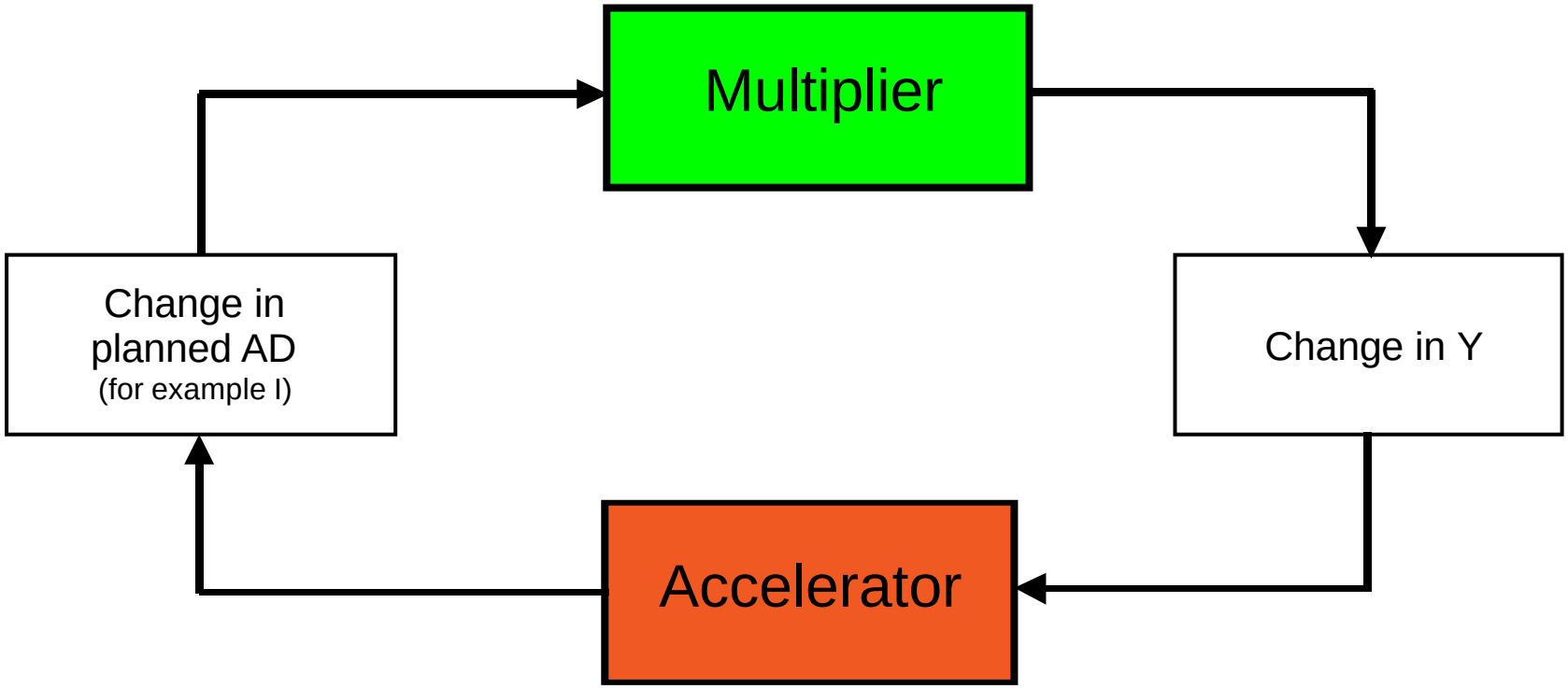
Multiplier and Accelerator

1 How do the multiplier and the accelerator interact?



AD	Aggregate demand	Y	National income / Output
I	Investment		

2 How does the *multiplier* work?

21 A numerical example

Round	Change in Y	Change in C (MPC = 0.7)	Change in S (MPS = 0.3)
1 (ΔI=1000)	1000	700	300
2	700	490	210
3	490	343	147
4	343	240	103
5	240	168	72
all future rounds	560	392	168
sum	**3'333**	**2'333**	**1'000**

I = Investment

Y =Output/National income

C = Consumption
MPC = Marginal propensity to consume

S = Saving
MPS = Marginal propensity to save

Multiplier (K):

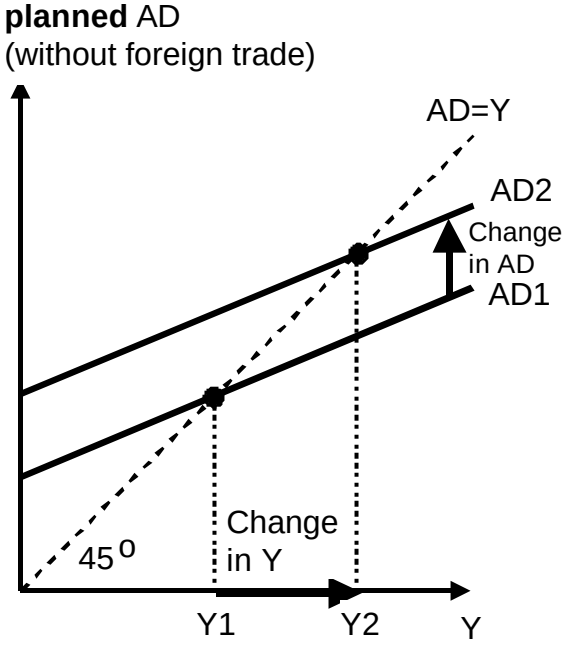
$K = \frac{1}{1\text{-MPC}}$ **or** $K = \frac{1}{MPS}$

Multiplier with taxes and foreign sector = $\frac{1}{MPS+MPT+MPM}$

MPT = Marginal propensity to tax
MPM = Marginal propensity to import

22 The multiplier, graphically

$$\text{Multiplier} = \frac{\text{Change in Y}}{\text{Change in AD}}$$



3 How does the *accelerator* work? A numerical example

Year	**Y (= Output)**	Stock of capital ①	Net investment ②	Depreciation ③	**Gross investment ④**
(0)	(100)	(200)			
1	**100**	200	0	10	**10**
2	**120**	240	40	10	**50**
3	**140**	280	40	12	**52**
4	**160**	320	40	14	**54**
5	**160**	320	0	16	**16**

① Capital - output ratio = 2 : 1
② Net investment = 2 * change in output (in comparison to the previous year)
③ Depreciation = 0.05 * Stock of capital (of the previous year)
④ Gross investment = Net investment + depreciation

Remarks

- It can be seen that a (relatively) small increase in Y (from 100 to 120) causes a big increase in gross investment (from 10 to 50). If, however, Y stagnates (160/160), gross investment is falling a lot (from 54 to 16). Thus, the accelerator is reinforcing the effects of the multiplier, upwards as well as downwards.

- This reinforcing effect is due to the fact that there is a stock of capital which can be used to produce Y in the future. If you take only into account net investment, this type of investment may be proportionate to the change in Y. In our case: Net investment = 2 * change in Y. The same can be observed if you look at the effect of changes in Y on stocks of goods.