

# RAMSEY-CASS- KOOPMANS MODEL II

PART 2/2: GOVERNMENT SPENDING  
AND OTHER SHOCKS TO THE RCK  
MODEL.



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# ADDING GOVERNMENT TO THE RCK MODEL: INCLUDING LUMP SUM TAXES

- Recall that our budget constraint without government in per effective labour terms is written as:

$$\int_{t=0}^{\infty} e^{-R(t)} e^{(g+n)t} c(t) dt \leq k(0) + \int_{t=0}^{\infty} e^{-R(t)} e^{(g+n)t} w(t) dt$$

- the government finances its spending via a lump sum tax in per effective wages so we can simply put government spending in as

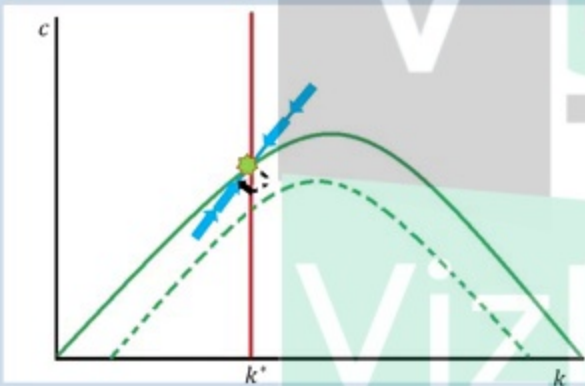
$$\int_{t=0}^{\infty} e^{-R(t)} e^{(g+n)t} c(t) dt \leq k(0) + \int_{t=0}^{\infty} e^{-R(t)} e^{(g+n)t} [w(t) - G(t)] dt$$

- It should be noted, since the government is employing lump sum taxes, our consumer's the euler equation does not change.
- the inclusion of government spending enters our capital accumulation equation, making the shifts in our graph more obvious this is:

$$\dot{k} = f'(k(t)) - c(t) - G(t) - (n + g)k(t)$$

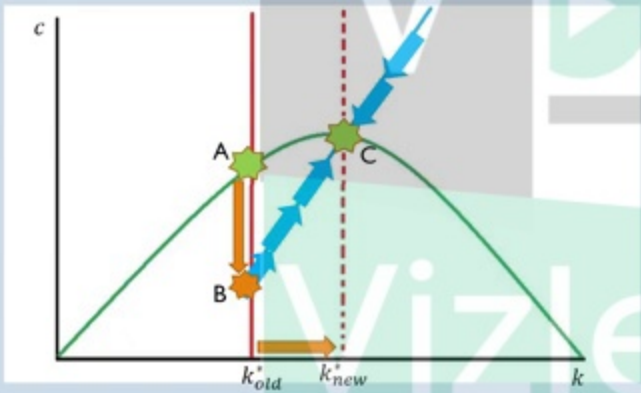
it is clear that  $G(t)$  is the source of the shift in our diagram.

# EFFECT OF A TEMPORARY INCREASE IN GOVERNMENT SPENDING



- If consumers expect an temporary increase in government spending, the way they consume is rather interesting.
- Say in the initial period  $t_0$  the government announces it will be imposing a lump sum tax in the next period  $t_1$  and will not impose the tax in period  $t_2$ .
- The way consumers act is that they cut back on consumption and invest more in capital to save for period  $t_1$  but don't reach a new saddle path, instead after waiting through the taxed period they return to the original saddle path directed to the initial BGP.
- This produces a clockwise circle of consumption around the original BGP until reaching the saddle path where it returns

# EFFECT OF A FALL IN DISCOUNT RATE $\rho$



- This sort of shock is more theoretical, since we are dealing with changes in our representative consumer's subjective discount rate. (one could say this such a result is due to an aggregate "self discovery" of new preferences).
- If we see a fall in the discount rate we will see a right shift of our  $\dot{c}$  line.
- The way our representative consumer approaches our new BGP is by immediate reduction of consumption (point A to B) and in turn increases consumption and capital until point C.
- Though not listed we can say that if there is a increase in  $\rho$  we would observe a leftward shift.



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