GOLDEN RULE OF ACCUMULATION

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Introduction

- According to Golden rule of accumulation, in a golden age per capita consumption is maximised when

  \[
  \text{SAVING RATE} = \text{PROFIT RATE}
  \]

- The steady state, value of $k$ which maximises consumption per worker is called Golden rule level of capital which is coined by Edmund Phelps and denoted by $k^*$. 
Golden age per capita consumption is shown on the y-axis and saving rate on the horizontal axis.
As we move along CS curve, per capita consumption increases at low levels of saving.
It is golden rule saving rate $s^*g$ that per capita consumption is maximised at $c^*g$ level of per capita consumption. This is the highest point H on the Cs curve.
Determining Golden Rule level of Capital

• Determine the steady-state consumption per worker.
• Since, \( Y = C + I \)
• Steady-State Output per worker = \( f(k^*) \)

\[ C^* = Y - I \]

\[ C^* = f(K^*) - \delta K^* \]

• An increase in steady state capital has 2 effects:
  - positive(↑K↑Q)
  - negative(more K, more Q to replace worn out K)
Golden rule steady state can be found by 2 ways:

- Looking at Steady-State Consumption
- Looking at MPK

- At the Golden Rule Level of Capital is characterised by $k^*$ where the slope of both the production function (i.e. MPK) and depreciation line (i.e. $\delta$). We have $\text{MPK} = \delta$

- Golden rule Capital stock is a condition used by policy makers for finding out capital stock for an economy which maximises level of consumption.

\[
C^* = f(k^*) - \delta k^* \\
\frac{dc^*}{dk^*} = f'(k^*) - \delta \\
f'(k^*) = \delta
\]
Conclusion:

- The golden rule relates to maximisation of per capita consumption, so it can be represented using output \(Q\), Saving \(s\), Investment \(I\) and Capital stock \(k\).
- Golden rule capital stock uses \(k^*\) as a variable to show steady-state capital stock per worker.
- Optimal Consumption and saving leads to Capital Formation.