Nominal GDP

Year	**Quantity**	**Price**	**Nom. GDP**
1999	5	2	10
2000	5	4	20
2001	7	5	35

Real GDP in 1999 Prices

Year	**Quantity**	**Price**	**Real GDP**
1999	5	**2**	10
2000	5	**2**	10
2001	7	**2**	14

Another price index: The GDP deflator.

GDP deflator =Nominal GDP$\times$ 100 /Real GDP

e.g., suppose only prices rise. In 2000, nominal GDP is 20, real GDP is 10. Then the GDP deflator is 200.

Year	Price	Nom. Wage	Real Wage
1999	5	10	2
2000	5	20	4 ($\Uparrow$)
2001	20	20	1 ($\Downarrow$)
2002	1	20	20 ($\Uparrow$)

Important Relationship.

$$Y = C + I + G + X - M$$

Ignore $X - M$

$$Y = C + I + G$$

What do people do with income, Y?

$$Y = C + S + T$$

Therefore,

$$C + I + G = C + S + T$$

$$\Rightarrow I + G = S + T$$

$$\Rightarrow I = S + (T - G)$$

Long-Run Growth: How does Y_t evolve over time?

Large differences in output over time and across countries

$\frac{70}{g}$ rule

Classical Dichotomy.

No Output Gap

Potential Output:

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha} \qquad 0 < \alpha < 1$$

A_t is *total factor productivity*

What is A?

Innovation

Human Capital

Climate/Geography Competition/Openness to Trade

Conflict

Social Infrastructure

Culture

Political Institutions

Neoclassical Growth Model

Model: used to give predictions about policy changes etc.

L people: all work

All people the same

All units of capital the same

No government

Closed Economy (so Current Account is zero)

People save a constant fraction s of income.

So they consume a fraction $1 - s$ of income.

$$\Delta K_t = I_t - \delta K_t$$

$$\Delta K_t = S_t - \delta K_t$$

$$\Delta K_t = sY_t - \delta K_t$$

Key Idea: if $sY_t > \delta K_t$, capital grows (and vice versa.)

$$Y_t = A_t K_t^{\alpha} L^{1-\alpha}$$

$$\Delta K_t = sY_t - \delta K_t$$

Graphical Analysis

$$Y_t = \underbrace{A_t L^{1-\alpha}}_{constant} K_t^{\alpha}, \qquad 0 < \alpha < 1$$

$$Y_t = \beta K_t^{\alpha}, \qquad 0 < \alpha < 1$$

Depreciation when $\delta = .1$

K	δK
0	0
10	1
20	2
30	3