

Department of Economics
Saint Louis University
Professor: Rapach
Summer 2009
ECON 312
Intermediate Macroeconomics

Chapter Outline for “Chapter 3—National Income: Where It Comes From and Where It Goes,” N. Gregory Mankiw, *Macroeconomics*, Sixth edition (New York: Worth Publishers, 2007)

See Figure 3-1

3-1 What Determines the Total Production of Goods and Services?

The Factors of Production

$$K = \bar{K}$$

$$L = \bar{L}$$

The Production Function

$$Y = F(K, L)$$

Constant returns to scale

$$zY = F(zK, zL)$$

The Supply of Goods and Services

$$Y = F(\bar{K}, \bar{L}) = \bar{Y}$$

3-2 How Is National Income Distributed to the Factors of Production?

Factor Prices

Factor Prices

See Figure 3-2

The Decisions Facing the Competitive Firm

Competitive firm

$$Y = F(K, L)$$

Profit = Revenue – Labor Costs – Capital Costs

$$\text{Profit} = PY - WL - RK$$

$$\text{Profit} = PF(K, L) - WL - RK$$

The Firm's Demand for Factors

The Marginal Product of Labor

$$MPL = F(K, L + 1) - F(K, L)$$

Diminishing marginal product

See Figure 3-3

From the Marginal Product of Labor to Labor Demand

$$\Delta\text{Profit} = \Delta\text{Revenue} - \Delta\text{Cost}$$

$$\Delta\text{Profit} = (P \times MPL) - W$$

$$P \times MPL = W$$

$$MPL = W / P$$

See Figure 3-4

The Marginal Product of Capital and Capital Demand

$$MPK = F(K + 1, L) - F(K, L)$$

$$\Delta\text{Profit} = \Delta\text{Revenue} - \Delta\text{Cost}$$

$$\Delta\text{Profit} = (P \times MPK) - R$$

$$MPK = R / P$$

The firm demands each factor of production until that factor's marginal product falls to equal its real factor price.

The Division of National Income

$$\text{Economic Profit} = Y - (MPL \times L) - (MPK \times K)$$

$$Y = (MPL \times L) + (MPK \times K) + \text{Economic Profit}$$

$$F(K, L) = (MPK \times K) + (MPL \times L)$$

$$\text{Accounting Profit} = \text{Economic Profit} + (MPK \times K)$$

CASE STUDY: The Black Death and Factor Prices

The Cobb-Douglas Production Function

$$\text{Capital Income} = MPK \times K = \alpha Y$$

$$\text{Labor Income} = MPL \times L = (1 - \alpha)Y$$

$$F(K, L) = AK^\alpha L^{1-\alpha}$$

$$MPL = (1 - \alpha)AK^\alpha L^{-\alpha}$$

$$MPK = \alpha AK^{\alpha-1} L^{1-\alpha}$$

$$MPL = (1 - \alpha)Y / L$$

$$MPK = \alpha Y / K$$

See Figure 3-5

CASE STUDY: Labor Productivity as the key Determinant of Real Wages

See [Table 3-1](#)

3-3 What Determines the Demand for Goods and Services?

$$Y = C + I + G$$

Consumption

$$\text{Disposable Income} = Y - T$$

$$\text{Consumption function: } C = C(Y - T)$$

Marginal propensity to consume (MPC)

See Figure 3-6

Investment

Nominal interest rate

Real interest rate

$$I = I(r)$$

See Figure 3-7

FYI: The Many Different Interest Rates

Government Purchases

$$G = \bar{G}$$

$$T = \bar{T}$$

3-4 What Brings the Supply and Demand for Goods and Services Into Equilibrium

Equilibrium in the Market for Goods and Services: The Supply and Demand for the Economy's Output

$$Y = C + I + G$$

$$C = C(Y - T)$$

$$I = I(r)$$

$$G = \bar{G}$$

$$T = \bar{T}$$

$$Y = F(\bar{K}, \bar{L}) = \bar{Y}$$

$$Y = C(Y - T) + I(r) + G$$

$$\bar{Y} = C(\bar{Y} - \bar{T}) + I(r) + \bar{G}$$

At the equilibrium interest rate, the demand for goods and services equals the supply.

Equilibrium in the Financial Markets: The Supply and Demand of Loanable Funds

$$Y - C - G = I$$

$$S = (Y - T - C) + (T - G) = I$$

$$Y - C(Y - T) - G = I(r)$$

$$\bar{Y} - C(\bar{Y} - \bar{T}) - \bar{G} = I(r)$$

$$\bar{S} = I(r).$$

See Figure 3-8

Changes in Saving: The Effects of Fiscal Policy

An Increase in Government Purchases

Crowding out

See Figure 3-9

CASE STUDY: Wars and Interest Rates in the United Kingdom, 1730-1920

See [Figure 3-10](#)

A Decrease in Taxes

Changes in Investment Demand

See Figure 3-11

See Figure 3-12

3-5 Conclusion

Questions for Review: 1, 5, 7, 8

Problems and Applications: 1, 7, 8, 9 (in-class), 10, 12 (in-class)