BÀI GIẢNG 5:
NỀN KINH TẾ THỰC

ĐỖ THIÊN ANH TUẤN

TRƯỜNG CHÍNH SÁCH CÔNG VÀ QUẢN LÝ

ĐẠI HỌC FULBRIGHT VIỆT NAM

A large income is the best recipe for happiness I ever heard of.

—Jane Austen

GDP BY INDUSTRIAL ORIGIN AT CURRENT MARKET PRICES (VND BILLION)

	2017	2018	2017	2018
	5.005.975	5.542.332	100%	100%
Agriculture, forestry, and fishing	768.161	813.724	15%	15%
Mining and quarrying	373.931	408.228	7%	7%
Manufacturing	767.495	886.580	15%	16%
Electricity, gas, steam, and air-conditioning supply	217.443	250.806	4%	5%
Water supply; sewerage, waste management, and remediation activities	25.946	28.193	1%	1%
Construction	287.137	323.466	6%	6%
Wholesale and retail trade; repair of motor vehicles and motorcycles	536.259	602.584	11%	11%
Accommodation and food service activities	191.743	209.390	4%	4%
Transportation and storage	133.073	149.478	3%	3%
Information and communication	34.293	37.793	1%	1%
Financial and insurance activities	273.809	295.444	5%	5%
Real estate activities[b]	239.868	253.870	5%	5%
Professional, scientific, and technical activities[b]	64.258	69.341	1%	1%
Administrative and support service activities[b]	18.729	20.411	0%	0%
Public administration and defense; compulsory social security	137.635	150.004	3%	3%
Education	177.619	203.193	4%	4%
Human health and social work activities	132.507	151.542	3%	3%
Arts, entertainment, and recreation	29.990	32.418	1%	1%
Other service activities	87.620	94.301	2%	2%
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	8.082	9.124	0%	0%
Gross value added at basic prices	4.505.601	4.989.887	90%	90%
Plus: Taxes less subsidies on production and imports	500.374	552.444	10%	10%

WHAT DETERMINES THE TOTAL PRODUCTION OF GOODS AND SERVICES?

- **Factors of production** are the inputs used to produce goods and services. The two most important factors of production are capital and labor.

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

- Many production functions have a property called **constant returns to scale**. A production function has constant returns to scale if an increase of an equal percentage in all factors of production causes an increase in output of the same percentage.

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

- Because we assume that the supplies of capital and labor and the technology are fixed, output is also fixed.

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

THE DECISIONS FACING A COMPETITIVE FIRM

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

- Profit = Revenue – Labor costs – Capital costs

  $= PY – WL – RK$

- Profit = $PF(K, L) – WL – RK$

Source: 123rf.com

THE MARGINAL PRODUCT OF LABOR

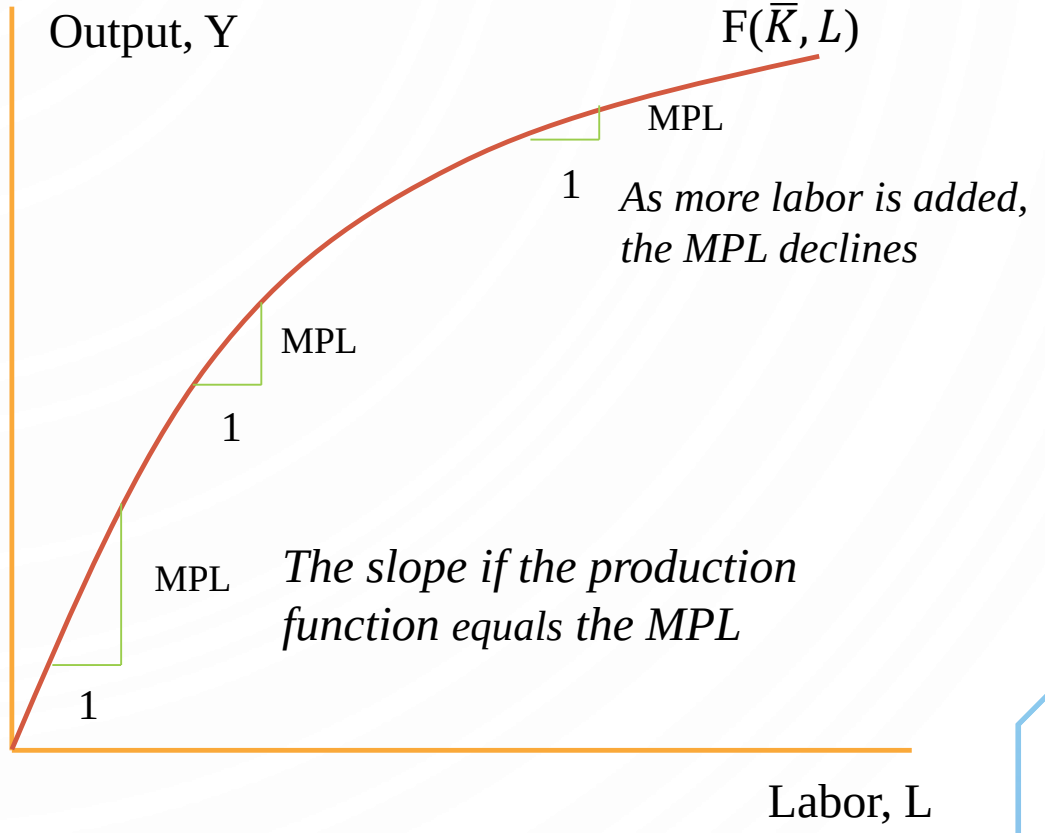
- The **marginal product of labor *(MPL)*** is the extra amount of output the firm gets from one extra unit of labor, holding the amount of capital fixed.

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

- Most production functions have the property of **diminishing marginal product**: holding the amount of capital fixed, the marginal product of labor decreases as the amount of labor increases.

FROM THE MARGINAL PRODUCT OF LABOR TO LABOR DEMAND

- **The Production Function** This curve shows how output depends on labor input, holding the amount of capital constant.
- The marginal product of labor *MPL* is the change in output when the labor input is increased by 1 unit.
- As the amount of labor increases, the production function becomes flatter, indicating **diminishing marginal product.**



HOW IS *MPL* DETERMINED?

- ΔProfit = ΔRevenue – ΔCost

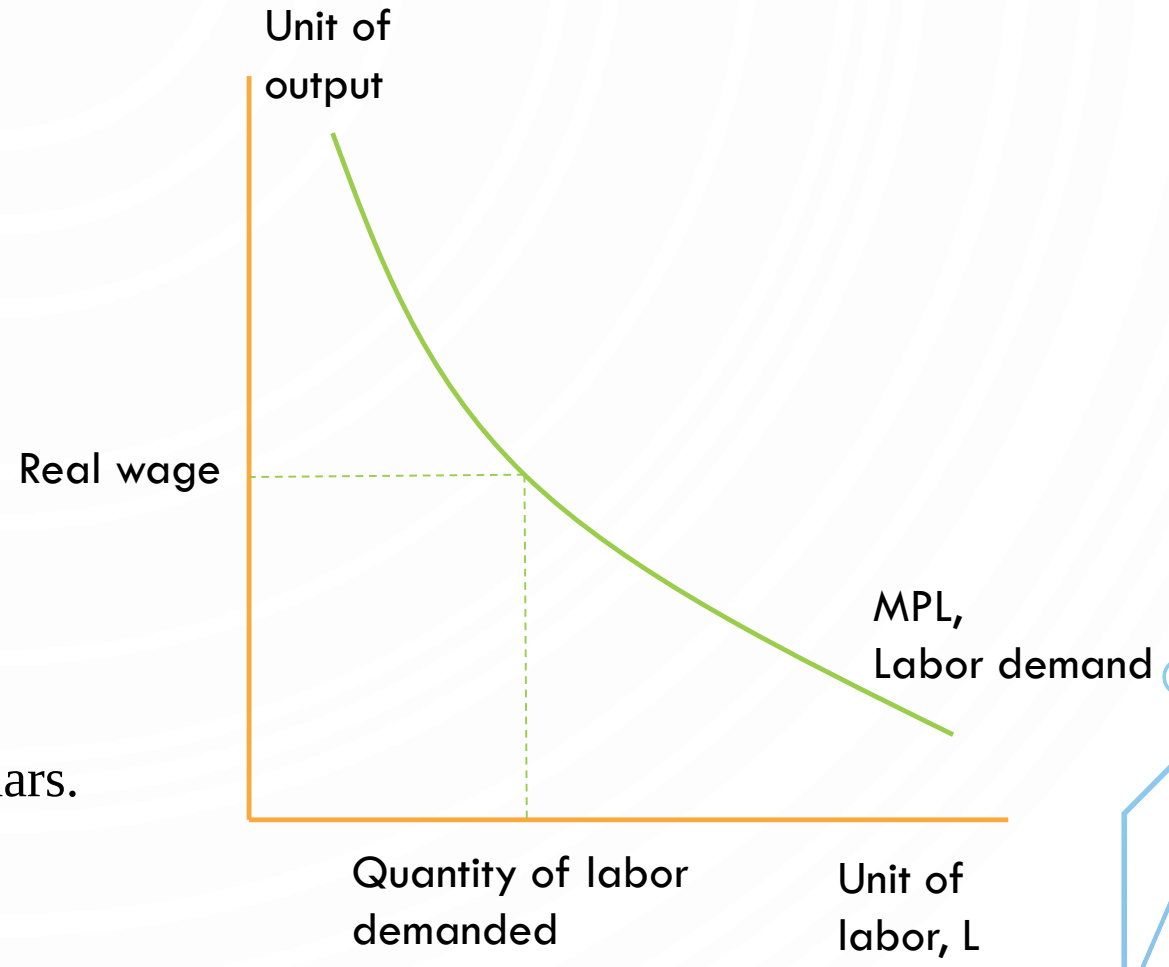
  = (P x MPL) – W

- The competitive firm's demand for labor is determined by:

  P x MPL = W

  $\Rightarrow$MPL = W/P

- *W*/*P* is the **real wage** —the payment to labor measured in units of output rather than in dollars.



THE MARGINAL PRODUCT OF CAPITAL

- The **marginal product of capital (*MPK*)** is the amount of extra output the firm gets from an extra unit of capital, holding the amount of labor constant.

$$MPK = F(K + 1, L) – F(K, L)$$

- ΔProfit = ΔRevenue – ΔCost

  $= (P \times MPK) – R$

- To maximize profit, the firm continues to rent more capital until the *MPK* falls to equal the real rental price:

$$MPK = R/P$$

ECONOMIC PROFIT

- Economic profit = $Y - (MPL \times L) - (MPK \times K)$

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

- If the production function has the property of **constant returns to scale**, as is often thought to be the case, then economic profit must be zero. That is, nothing is left after the factors of production are paid.

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

THE COBB–DOUGLAS PRODUCTION FUNCTION

- Capital Income = MPK x K = αY
- Labor Income = MPL x L = (1 - α)Y
- Where α is a constant between zero and one that measures capital's share of income.
- **Cobb–Douglas production function:**

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

- Where A is a parameter greater than zero that measures the productivity of the available technology.

THE MARGINAL PRODUCT OF LABOR AND MARGINAL PRODUCT OF CAPITAL

- The marginal product of labor

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

$$= (1 - \alpha)\text{Y/L}$$

- Marginal product of capital

$$\text{MPL} = \alpha\, AK^{\alpha-1} L^{1-\alpha}$$

$$= \alpha\ \text{Y/K}$$

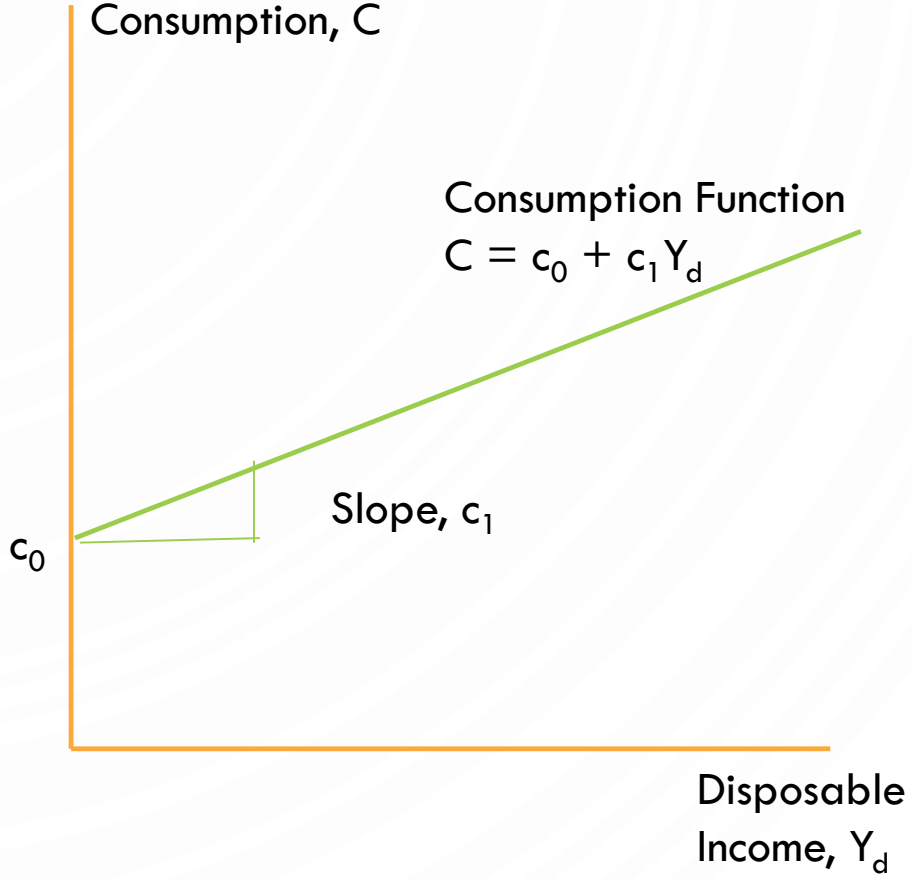
EXPENDITURE ON GDP AT CURRENT MARKET PRICES (VND BILLION)

	2017	2018	2017	2018
Expenditure on GDP at current market prices	5.005.975	5.542.332	100%	100%
Final consumption expenditure	3.731.554	4.103.655	75%	74%
Household final consumption	3.405.750	3.745.063	68%	68%
Government final consumption	325.804	358.591	7%	6%
Gross capital formation	1.330.694	1.470.550	27%	27%
Gross fixed capital formation	1.190.475	1.321.906	24%	24%
Changes in inventories	140.220	148.645	3%	3%
Exports of goods and services	5.085.742	5.865.550	102%	106%
Less: Imports of goods and services	4.945.460	5.679.497	99%	102%
Statistical discrepancy	-196.555	-217.926	-4%	-4%

Source: ADB Key Economic Indicators

DEMAND FOR GOODS

- $Z = C + I + G + X - M$
- **Consumption**
  - $C = C(Y_d) = c_0 + c_1 * Y_d$
  - Disposable Income: $Y_d = Y - T$
  - c_1 = MPC = Marginal Propensity to Consume
  - $MPC = 1 - MPS$



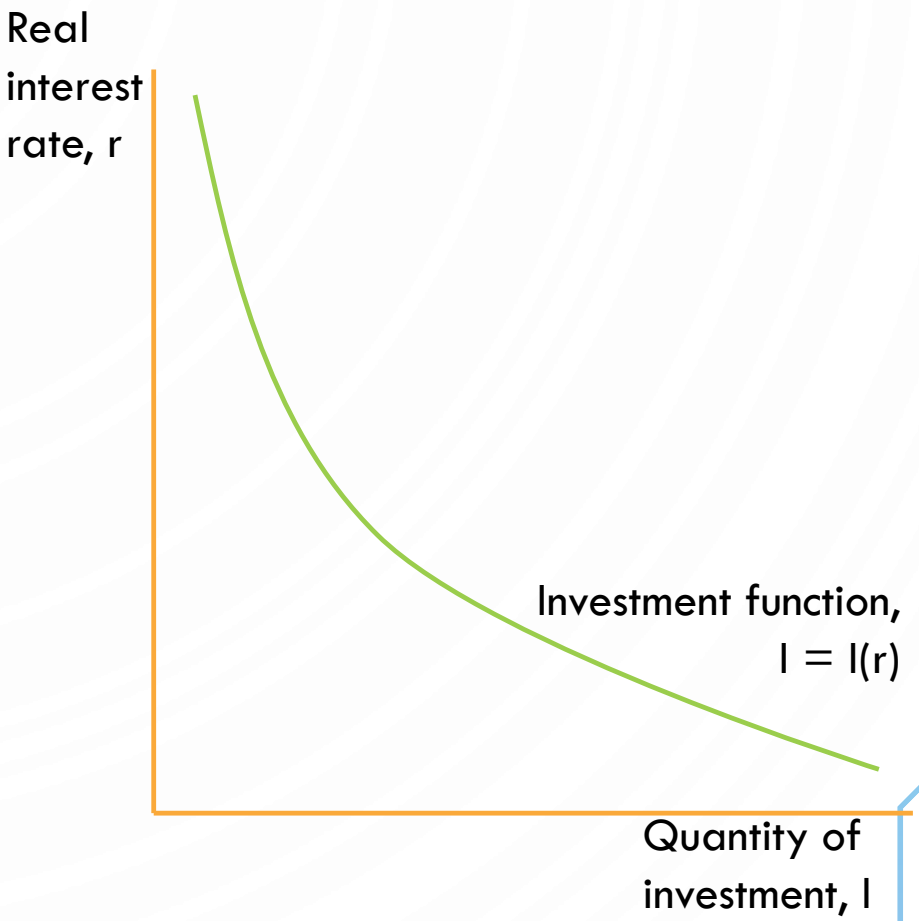
INVESTMENT

- Models have two types of variables. Some variables depend on other variables in the model and are therefore explained within the model. Variables like these are called **endogenous variables**.
- Other variables are not explained within the model but are instead taken as given. Variables like these are called **exogenous variables**.

$$I = I(r)$$

- We take investment as given to keep our model simple

$$I = \bar{I}$$



GOVERNMENT SPENDING

- Together with taxes T, G describes **fiscal policy**—the choice of taxes and spending by the government.
- Just as we just did for investment, we will take G and T as **exogenous**.

$$G = \overline{G}$$

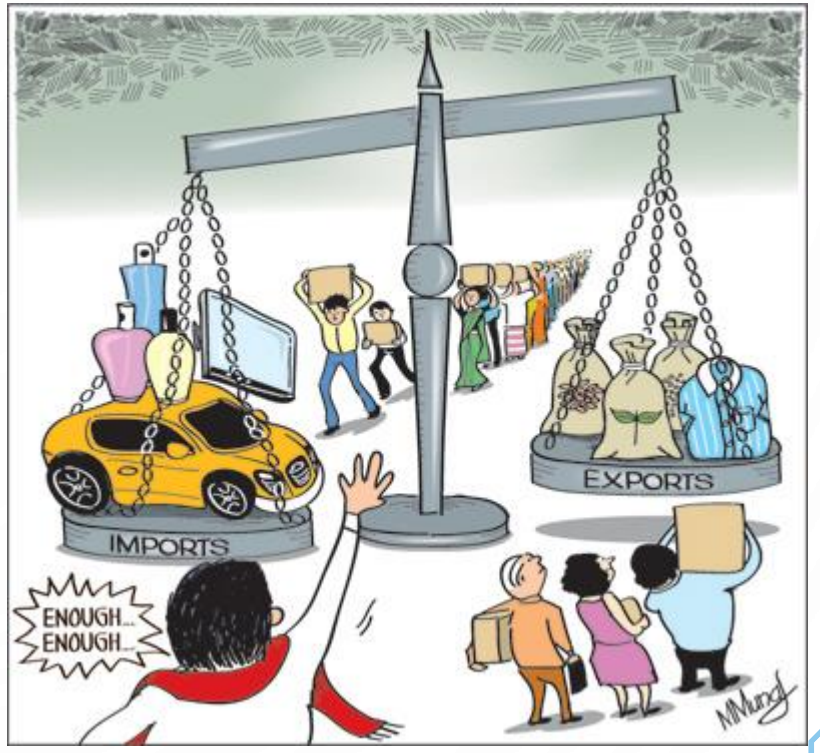
NET EXPORT

- Net export = exports – imports
- $NE = X - M$

$$\boldsymbol{NE = NE(\varepsilon)}$$

- Where ε is real exchange rate.
- To simplify:

$$NE = \overline{NE} = 0$$



EQUILIBRIUM IN THE GOODS MARKET

- The demand for goods is the sum of consumption, investment, government spending and net export:

$$Z = c_0 + c_1(Y - T) + \bar{I} + \bar{G}$$

- **Equilibrium in the goods market** requires that production Y be equal to the demand for goods Z:

$$Y = Z$$

$$Y = c_0 + c_1(Y - T) + \bar{I} + \bar{G}$$

- *In equilibrium, production, Y (the left side of the equation), is equal to demand (the right side).Demand in turn depends on income, Y, which is itself equal to production.*

AUTONOMOUS SPENDING VS. MULTIPLIER

- $Y = c_0 + c_1Y - c_1T + \bar{I} + \bar{G}$

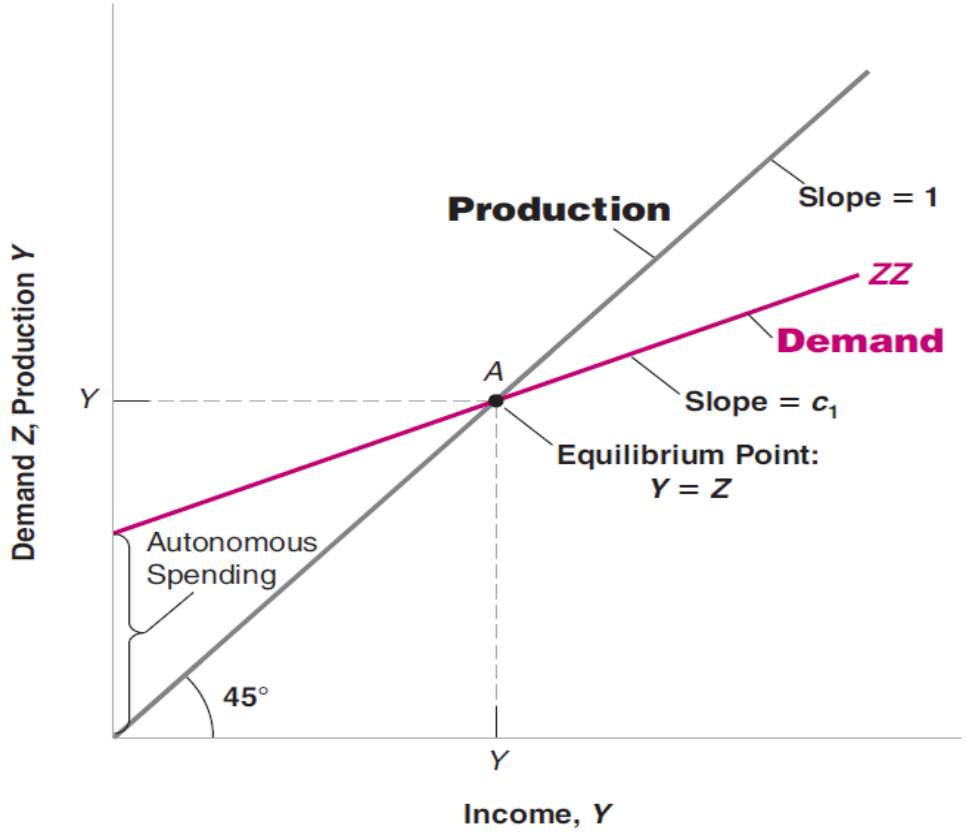
$\Rightarrow (1 - c_1)Y = c_0 + \bar{I} + \bar{G} - c_1T$

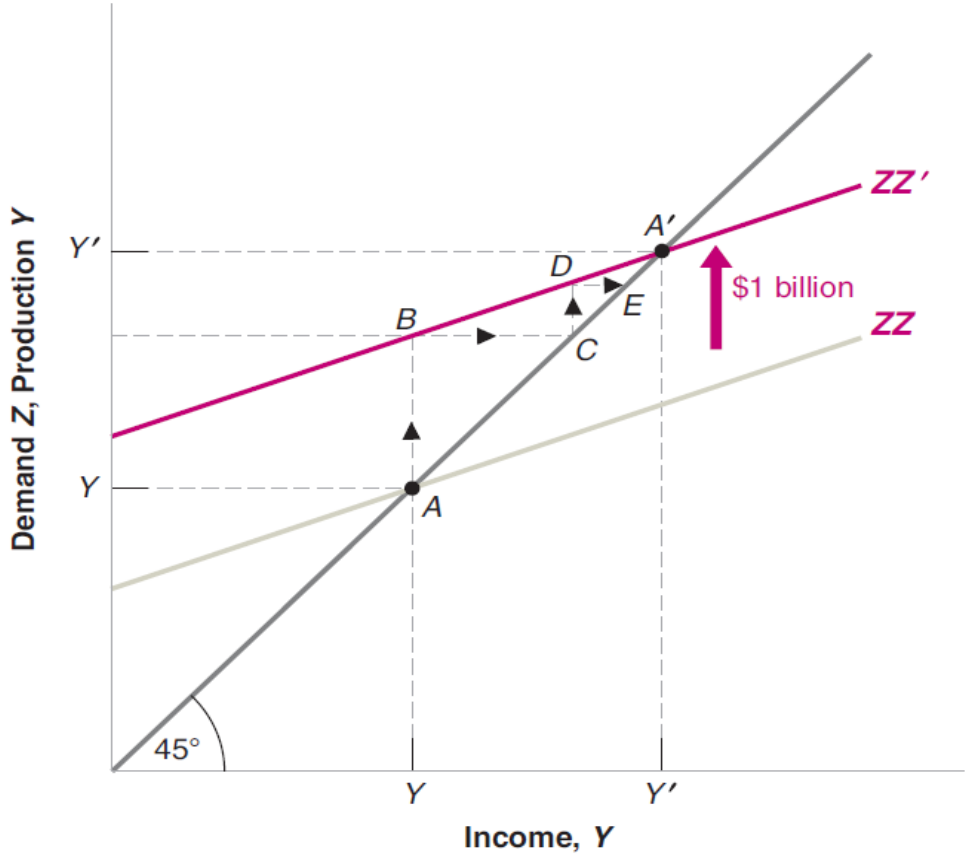
$\Rightarrow Y = \frac{1}{1-c_1}(c_0 + \bar{I} + \bar{G} - c_1T)$

- The term ($c_0 + \bar{I} + \bar{G} - c_1T$) is that part of the demand for goods that does not depend on output. For this reason, it is called **autonomous spending**.
- The term $\frac{1}{1-c_1}$ is called the **multiplier**

EQUILIBRIUM IN THE GOODS MARKET

Equilibrium output is determined by the condition that production is equal to demand.





Source: Blanchard 2017

AN ALTERNATIVE WAY OF THINKING ABOUT GOODS-MARKET EQUILIBRIUM

- Private Saving: $S_P = Y_d - C = Y - T - C$
- Government Saving: $S_g = T - G$
- Foreign Saving: $S_f = M - X$
- Total saving: $S = S_p + S_g + S_f$
- Investment = Saving:

$$I = S_p + (T - G) + (M - X)$$

To simplify: $M - X = 0$

$$\boldsymbol{I = S_p + (T - G)}$$

To summarize: There are two equivalent ways of stating the condition for equilibrium in the goods market:

Production = Demand

Investment = Saving

INVESTMENT EQUALS SAVING

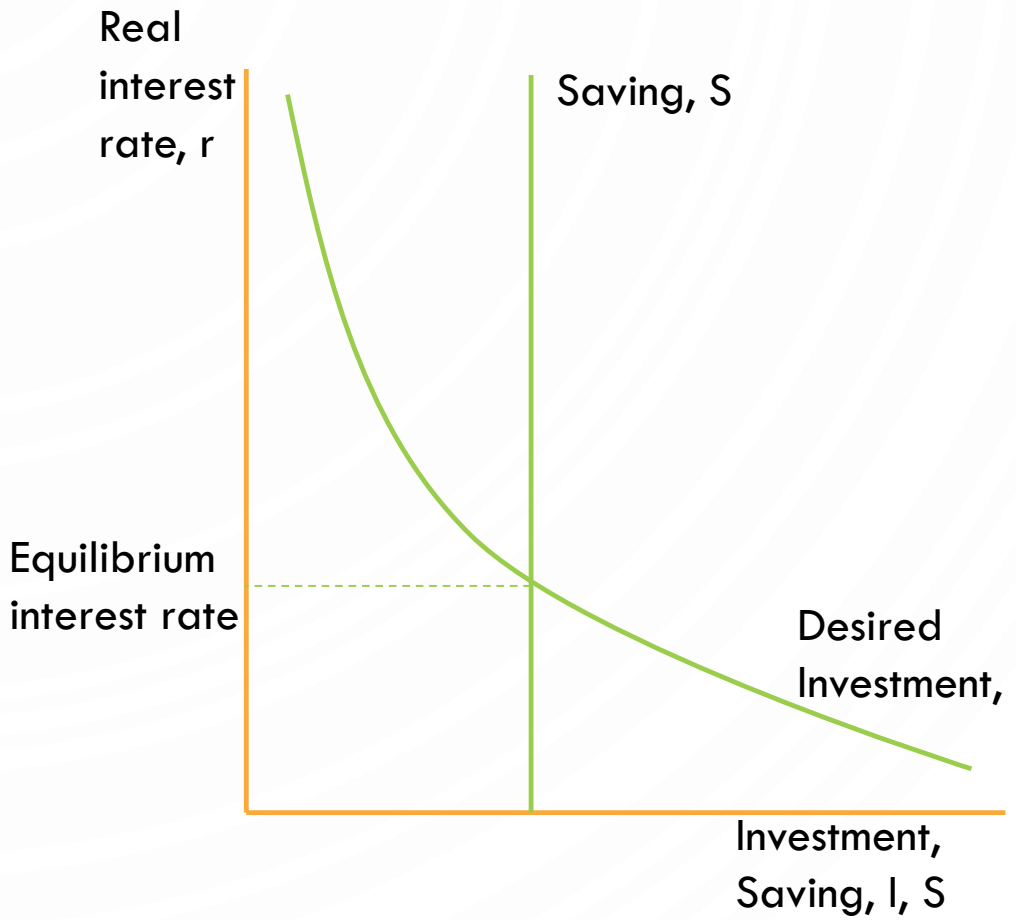
$$S = Y - T - C$$

$$= Y - T - c_0 - c_1(Y - T)$$

$$\Rightarrow S = -c_0 + (1 - c_1)(Y - T)$$

$$\Rightarrow I = -c_0 + (1 - c_1)(Y - T) + (T - G)$$

- Solving for output:
- $Y = \frac{1}{1-c_1}(c_0 + \bar{I} + \bar{G} - c_1 T)$



THE PARADOX OF SAVING

- As people save more at their initial level of income, they decrease their consumption. But this decreased consumption decreases demand, which decreases production.
- When income *Y* is lower, this decreases saving. Although people want to save more at a given level of income, their income decreases by an amount such that their saving is unchanged.
- This means that as people attempt to save more, the result is both a decline in output and unchanged saving. This surprising pair of results is known as the *paradox of saving* (or the ***paradox of thrift***).

APPENDIX

- The Cobb-Douglas Function

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

- Why this function has constant returns to scale?

$$F(zK,zL) = A(zK)^{\alpha}(zL)^{1-\alpha}$$

$$\Rightarrow F(zK,zL) = Az^{\alpha}K^{\alpha}z^{1-\alpha}L^{1-\alpha}$$

$$\Rightarrow F(zK,zL) = Az^{\alpha}z^{1-\alpha}K^{\alpha}L^{1-\alpha}$$

$$\Rightarrow F(zK,zL) = zAK^{\alpha}L^{1-\alpha} = zF(K,L) = zY$$