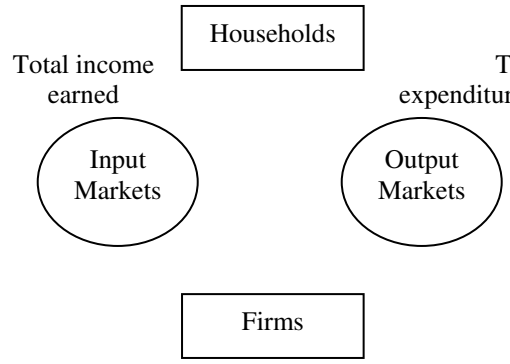
Lecture #16 – Monday, February 2, 2004

MACROECONOMICS



- Output : GDP.
- Employment: employment/unemployment.
- Prices: inflation.

NATURAL INCOME ACCOUNTING

- Profits = Total Sales Revenue – Cost of Goods Sold.
  - Cost of Goods Sold: wages/salaries, rent, indirect taxes, purchases from other firms, interest, depreciation.
- Profits + Cost of Goods Sold = Total Sales Revenue (Income Earned = Expenditure).

Cost of Good Sold + Profits		Total Sales Revenue	
Purchase of goods and services *	100	To households	500
Wages, salaries, benefits	600	To businesses: capital	200
Rents	100	To businesses: non-capital *	100
Interest paid	100	To government	300
Indirect Taxes - Subsidies	50		
Depreciation	50		
Profits			
Corporate profits: retained			
Corporate profits: dividends			
Corporate profits: taxes			
Total	**1100**	**Total**	**1100**

- "Purchase of goods and services" and "Capital sales to businesses" must be netted out.

Cost of Good Sold + Profits		Total Sales Revenue	
Wages, salaries, benefits	600	Personal Consumption Expenditure (C)	500
Rents	100	Government spending on goods and services	300
Interest	100	Gross Business Investment	200
Corporate profits	100		
Domestic Income (at factor cost)	**900**	Export - Imports (X - M)	
Indirect Taxes - Subsidies	50		
Net Domestic Product (NDP)	**950**		
Depreciation	50		

Gross Domestic Product (GDP)	**1000**	**Gross Domestic Expenditure (GDE) (at market prices)**	**1000**

Lecture #17 – Monday, February 9, 2004

INTERMEDIATE SALES AND VALUED ADDED

Example

	Sales	Purchase From Other Firms	Value Added
Wheat	10		10
Flour	25	10	15
Bread	50	25	25
	85	35	50

- Proper contribution = 50.
- Bread is the final product (brought by consumers).

REAL VS. NOMINAL

- Real: Figures adjusted for average price increases and inflation.
- Nominal: Figures not adjusted for average price increases and inflation.

PRICE INDEX

- Helps determine whether increases in GDP is prices or production.

Examples

- "GDP deflator", CPI (consumer price index).

Challenges

- Changing prices.
- Weighting – what is more important?
- What is included? What is not included?
- New/changing products.

GDP VS. GNP

Gross Domestic Product

- Measures economic activities.
- Ignores who owns the factors of production.

Gross National Product

- Concentrates on who owns the assets – tracing where profits goes.

OUTPUT/GDP GAP

- Potential GDP vs. Actual GDP.
- Employment vs. Unemployment.

LABOUR FORCE

- $LF = E + U$.
- $U_{\text{rate}} = \dfrac{U}{LF}$.

Issues

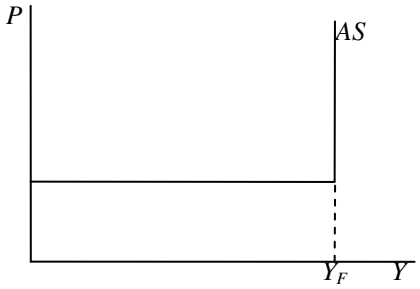
- Full employment = no unemployment? No. There is always frictional unemployment (between jobs).
- Definition of unemployment differ country to country:
  - US: not active = not in labour force
  - Canada: no jot = unemployment

KEYNESIAN MODEL

- $GDP = C + I + G + X - M$.

Assumptions

- Only C and $I - G$, X, $M = 0$.
- No inflation – nominal = real.
- More output until Y_F (full employment GDP).



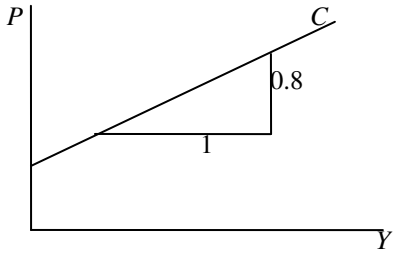
HOUSEHOLDS AND CONSUMPTION

- $C = C$(income, assets/wealth, interest rate). We'll use $C = C(Y)$.
- $\dfrac{\Delta C}{\Delta Y} > 0$ because higher income, more stuff. This rate is called the marginal propensity to consume (MPC).

  Also, $\dfrac{\Delta C}{\Delta Y} = MPC < 1$.
- $S = Y - C$ – savings is what is not spent.
- $MPC + MPS = 1$.

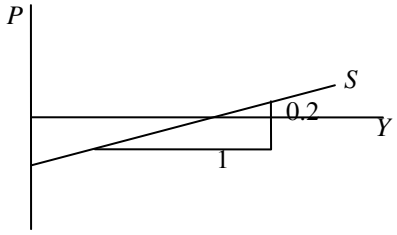
Consumption Function

- $C = 10 + 0.8Y$.
- $\frac{\Delta C}{\Delta Y} = MPC = 0.8$.



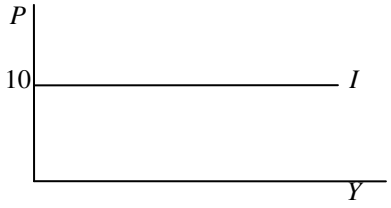
Savings Function

- $S = Y - C = Y - 10 - 0.8Y = -10 + 0.2Y$.
- $\frac{\Delta S}{\Delta Y} = MPS = 0.2$.



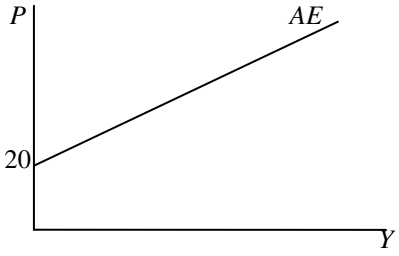
Investment Function

- $I = 10$.



Total Demand For Output (AE)

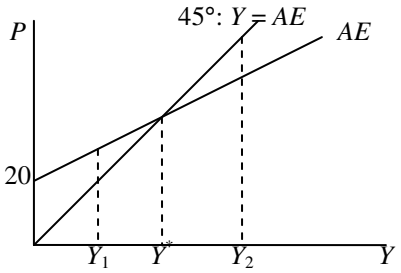
- $AE = C + I = 10 + 10 + 0.8Y = 20 + 0.8Y$.



Equilibrium

- Supply = Demand.
- $Y = AE = 20 + 0.8Y \Rightarrow Y^* = 100$.

- Y_1: Below equilibrium – $D > S$, inventory decreases, shifts economy outward.
- Y_2: Above equilibrium – $S > D$, inventory increases, shifts economy inward.



Lecture #18 – Monday, February 23, 2004

THE MULTIPLIER

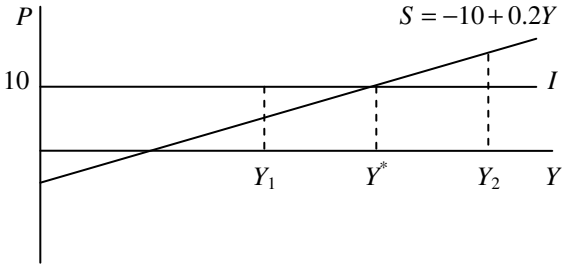
- If $I = 11$, then:
  - $\begin{cases} C = 10 + 0.8Y \\ I = 11 \end{cases} \Rightarrow AE = 21 + 0.8Y$. Since $Y = AE$ at equilibrium, $Y = 21 + 0.8Y \Rightarrow Y^{**} = 105$.
- So, $\Delta I = 1$, $\Delta Y = 5$.
- The multiplier $K_I = \dfrac{\Delta Y}{\Delta I} = 5$. In general, $K = \dfrac{1}{1 - (\text{slope of } AE)} = \dfrac{1}{1 - MPC}$.

SAVINGS-INVESTMENT/WITHDRAWAL-INJECTION VIEW OF EQUILIBRIUM

- $C = 10 + 0.8Y$.
- $Y = C + S \Rightarrow S = Y - C = -10 + 0.2Y$

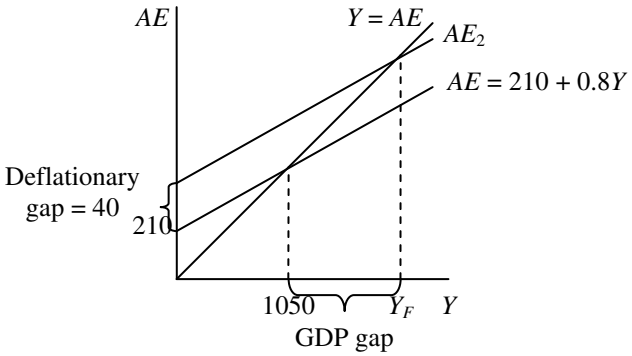
- $Y = AE = C + I$ for equilibrium.
- $Y - C = I$ for equilibrium.
- So, $S = I$ for equilibrium.

- Y_1: $I > S$ – injection > withdrawal, GDP rises.
- Y_2: $S > I$ – withdrawal > injection, GDP falls.



ADDING THE GOVERNMENT

- $AE = C + I + G$.
- $C = C(Y_d)$, Y_d is the disposable income. $Y_d = Y - T$.
- $C = 102 + 0.8Y_d$, $I = 100$, $G = 200$, $Y_d Y - T$, $T = 240$ (lump-sum taxes).
- So, at equilibrium, $AE = Y \Rightarrow C + I + G = Y \Rightarrow 102 + 0.8(Y - 240) + 100 + 200 = Y \Rightarrow Y^* = 1050$.



- The economy can come to rest far from Y_F.
- Shift AE up (to eliminate the deflationary gap and GDP gap):
  - Increase G.
  - Decrease T.
  - Increase I.

- GDP gap $= Y_F - Y^* = 1250 - 1050 = 200$. What is the ΔG required? Need to know $K_G = \dfrac{1}{1 - \text{slope of } AE} = 5$. So, the ΔG required is $\dfrac{200}{5} = 40$.

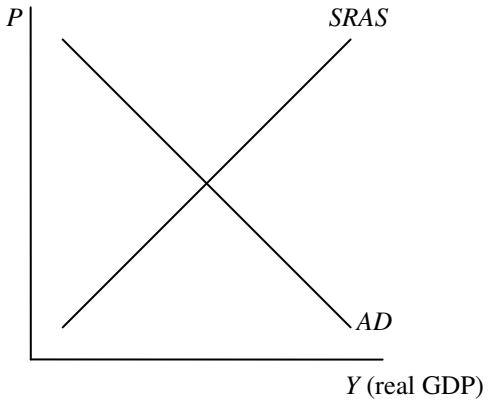
- By how much taxes does the government have to change to eliminate the GDP gap? $K_T = -MPC \dfrac{1}{1 - \text{slope of } AE} = -\dfrac{0.8}{0.2} = -4$. So, the ΔT required is $\dfrac{200}{-5} = -50$.

Government Budget

- Deficit (as a positive number): $G - T + TR$, TR is transfer payments.
- Balanced budget change in spending: $\Delta G = \Delta T$.

$$K_{BBM} = K_G + K_T = \frac{1}{1 - \text{slope of } AE} + \frac{-MPC}{1 - \text{slope of } AE} = 1.$$

VARIABLE PRICE MODEL: AD & AS (SHORT RUN)



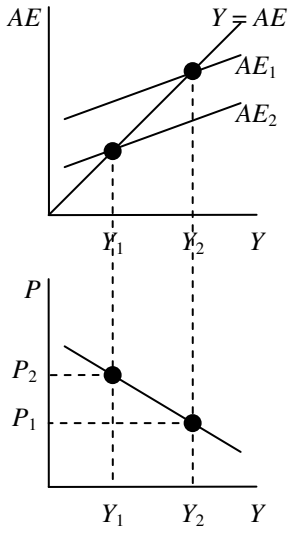
Why is AD negatively-sloped?

1) As real value of money decreases, P increases.
2) As real value of government decreases, P increases.
3) International substitution: as P increases, M increases and X decreases.
4) Interest rate effect: as P increases, r increases and Idecreases.

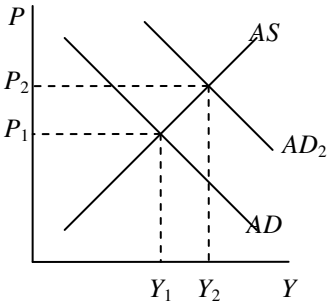
Why is AS positively-sloped?

1) Cost increases as you produces more, so P increases.

Relation to *AE*

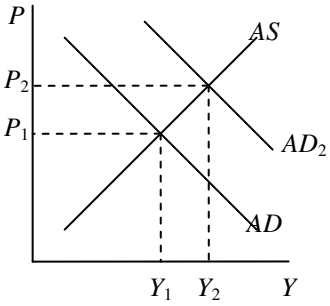


Shifts in *AD* and *AS*



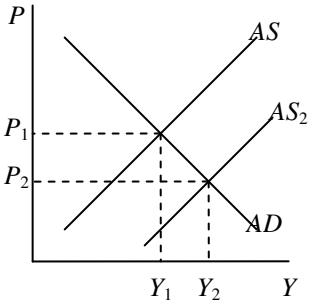
Consumer confidence increases:

- *C* shifts up.
- *AD* shifts up.



Government encourages business spending:

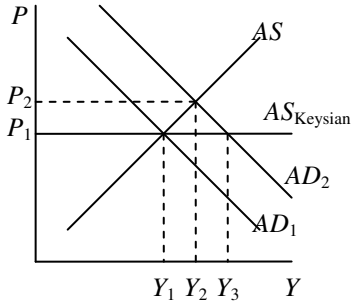
- *I* shifts up.
- *AD* shifts up.



More productive workers:

- *P* decreases.
- *AS* shifts down.

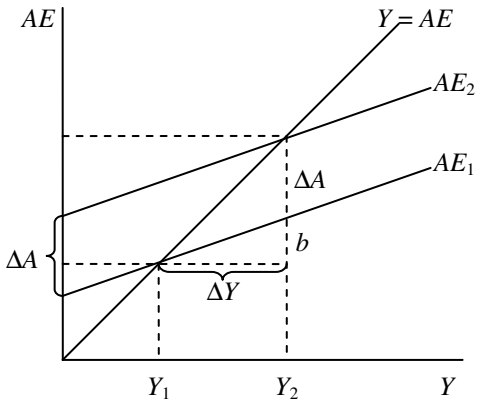
Is the simple k multiplier too large?



- Simple model: $Y_1 \rightarrow Y_3$ – too big!
- No perfectly elastic schedule: $Y_1 \rightarrow Y_2$.

Lecture #19 – Monday, March 1, 2004

The Multiplier In General



- $k = \dfrac{\Delta Y}{\Delta A}$.

Proof:

- $\Delta Y = \Delta A + b$.
- slope of $AE = \dfrac{b}{\Delta Y} \Rightarrow b = \Delta Y(\text{slope of } AE)$.

$\Delta Y = \Delta A + \Delta Y(\text{slope of } AE)$

- $\Rightarrow \Delta Y(1 - \text{slope of } AE) = \Delta A$.

$\Rightarrow \dfrac{\Delta Y}{\Delta A} = \dfrac{1}{1 - (\text{slope of } AE)} = k$

MONEY

Functions

- Medium of exchange – something everyone accepts.
- Store of value – an asset, capacity to store purchasing power.
- Unit of account – all accounting are done in money term.

What Is Money?

- Legal tender – coins and bills (√ M1)
- Cheques (√ M1)
- Electronic transfers (debit card) (√ M1)
- Government bearer bonds (×)
- Credit cards (×)
- Equities/stocks (×)
- Gold (×)
- Fixed assets – land, property (×)

- Foreign currency (√ included in M3)

Definition of Money (M1)

- M1: currency in circulation (CIC) + demand deposits (DD).
- M2: M1 + personal savings deposits + non-personal notice deposits.
- M2+: M2 + deposits at trust companies, credit unions, etc.
- M3: M2+ + non-personal term deposits + foreign currency deposits.

MONEY AND BANKING

T-Accounts/Balance Sheets

Bank	
Assets	Liabilities
Cash: +10	DD: +10
Cash: +100	DD: +100
Cash: +100000	DD: +100000
Cash: -10	DD: -10
Cash: -100	DD: -100
Cash: -1000	DD: -1000
Cash: +50	DD: +500
Loan: +100	DD: +100

Reserve Ratio

- Not everyone demands their cash at the same time – no need for 100% reserves.
- Reserve Ratio = $\frac{\text{reserves}}{\text{DD}}$.
- Risk for banks: might run out of money if reserves too low.
- Multiplier: $\Delta DD = \frac{1}{rr}\Delta R$, rr = reserve ratio, ΔR = increase in reserves.

Lecture #20 – Monday, March 8, 2004

CONTROL OF MONEY SUPPLY

Open Market Operations

- There is a market in government bonds.

- Suppose the Central Bank buys $100 of government bonds:

Public		Chartered Banks		Bank of Canada	
A	L	A	L	A	L
Bonds: -100				Bonds: +100	
Cash: +100				~~Cash: +100~~	Cash: +100
Cash: -100		Reserves: +100	DD: +100	Cash: +100	DD: +100
DD: +100		Reserves: -100			

	DD: +100		

- Since $\Delta R = 100$, $\Delta DD = 100 \times \frac{1}{0.1} = 1000$.

Summary:

Public		Chartered Banks		Bank of Canada	
A	L	A	L	A	L
Bonds: -100 DD: +100		R (DD): +100	DD: +100	Bonds: +100	DD (B): +100
DD: +900	Loans: +900	Loans: +900	DD: +900	Cash: +100	DD: +100

- DD grows to $1000.

Swap of Government Deposits

- Governments have accounts in both chartered banks and the Central Bank.

Chartered Bank		Public	
A	L	A	L
R (DD at BC): +100	DD of G: +100		DD of G: -100 DD of Banks: +100
Loans: +900	DD: +900		

- Government puts $100 into chartered banks – money supply grows by $1000.

Lecture # 21 – Monday, March 15, 2004

GOVERNMENT EXPENDITURE AND THE MONEY SUPPLY

How does the government finance spending?

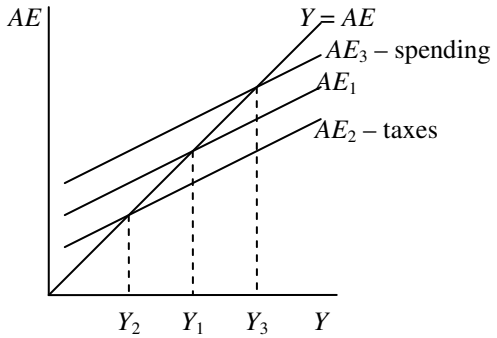
1) Tax-financed.
2) Bond-financed.
3) Money-financed.

Tax-Financed Spending

Suppose the government taxes $100 and spends $100:

Public		Chartered Banks		Central Bank	
DD: -100	NW: -100		DD (P): -100 DD (G): +100		
			DD (P): +100 DD (G): -100		

- Money supply increases because the Balanced Budget Multiplier $k_{BBM} > 0$. So there is always going to be an expansionary trend.



Bond-Financed Spending

Suppose the government issues $100 of bonds to the public and spends that $100:

Public		Chartered Banks		Central Bank	
DD: -100 Bonds: +100			DD (G): +100 DD (P): -100		
DD: +100	NW: 100		DD (G): -100 DD (P): +100		

- Does not change the money supply.

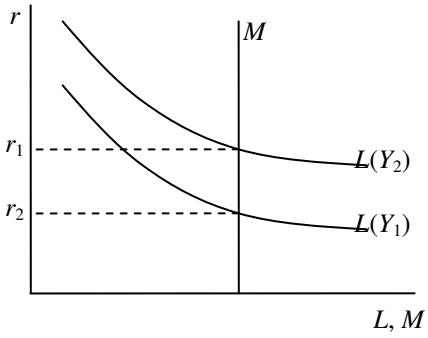
Money-Financed Spending

Suppose the government issues $100 of bonds to the central bank and spends that $100 (assume reserve ratio is 10%):

Public		Chartered Banks		Central Bank	
		R: +10 L: +90	DD (G): +100	Bonds: +100	DD (G): +100
DD: +100	NW: +100		DD (G): -100 DD (P): +100		
DD: +900	L: +900	L: +900	DD (P): +900		

- The money supply increases rapidly – may lead to inflation.
- Question: How much power/independence should to the Central Bank have for allowing this to happen?

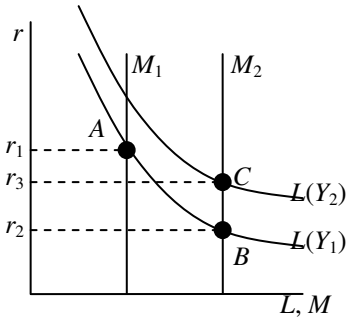
IMPACT OF MONEY



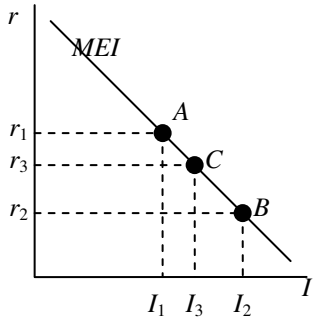
- L_t: Transaction Demand – $L_t(Y, r)$.
- L_p: Pre-cautionary Demand – $L_p(Y, r)$.
- L_s: Speculative Demand – next time.
- Note: $\frac{\Delta L_t}{\Delta Y} > 0$ and $\frac{\Delta L_t}{\Delta r} < 0$.

Suppose, through monetary policy, there is an increase in the money supply:

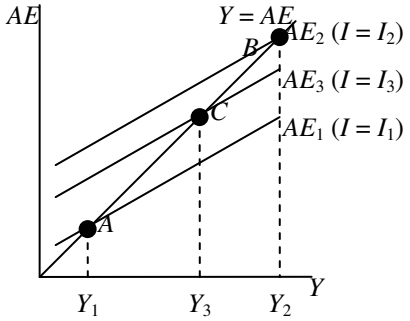
Money Market



Marginal Efficiency of Investment



Output Market



- There is a "Feedback Effect" because *Y* changes!

SIMPLE *K* MULTIPLIER

For the same reason as above, the simple *K* multiplier $K = \frac{1}{1 - \text{slope } AE}$ is too large – a change in *Y* will lead to change in *r*, which leads to change in *I*, which then leads back to change in *AE*.