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Level I - Macroeconomics

Readings	Page
Aggregate Output, Prices, and Economic Growth	2
Understanding Business Cycles	17
Monetary and Fiscal Policy	32
International Trade and Capital Flows	45
Currency Exchange Rates	61
Reviews	77

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Aggregate Output, Prices and Economic Growth

- a. calculate and explain gross domestic product (GDP) using expenditure and income approaches;
- b. compare the sum-of-value-added and value-of-final-output methods of calculating GDP;
- c. compare nominal and real GDP and calculate and interpret the GDP deflator;
- d. compare GDP, national income, personal income, and personal disposable income;
- e. explain the fundamental relationship among saving, investment, the fiscal balance, and the trade balance;
- f. explain how the aggregate demand curve is generated;
- g. explain the aggregate supply curve in the short run and long run;
- h. explain causes of movements along and shifts in aggregate demand and supply curves;
- i. describe how fluctuations in aggregate demand and aggregate supply cause short-run changes in the economy and the business cycle;
- j. distinguish among the following types of macroeconomic equilibria: long-run full employment, short-run recessionary gap, short-run inflationary gap, and short-run stagflation;
- k. explain how a short-run macroeconomic equilibrium may occur at a level above or below full employment;
- l. analyze the effect of combined changes in aggregate supply and demand on the economy;
- m. describe sources, measurement, and sustainability of economic growth;
- n. describe the production function approach to analyzing the sources of economic growth;
- o. define and contrast input growth and growth of total factor productivity as components of economic growth.

Aggregate Output, Prices, and Economic Growth

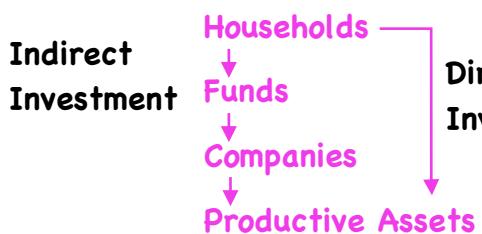
Aggregate output (AO)
 - value of all g/s produced
 in a specified time period

=

Aggregate Income (AI)

- value of all payments
 earned by the suppliers of the
 factors of production

Page 1
 LOS a
 - calculate
 - explain



wages, rent, interest, profit

- since households are the ultimate
 owners of productive assets, plus
 the source of all labour, it is
 standard to attribute all income
 to the household sector

→ **Aggregate Expenditure (AE)** → total amount spent on g/s produced in
 the domestic economy during a period

$$AO = AI = AE = Y$$

→ **GDP** – gross domestic product → measures:

a) the market value of all final g/s produced within
 an economy in a given period of time (**output definition**)

- all g/s must be produced during the measurement period
 - excluded → previous period production, transfer pmts.
 from gov't. to households, capital gains

- only g/s whose value can be determined by being sold
 in a market
 - only market value of final g/s are included

or/ b) the aggregate income earned by all households, all companies, and
 the government within the economy in a given period of time
 (**income definition**)

∴ Income approach → $GDP = \text{total amt. of income earned (over a period)}$
 Expenditure approach → $GDP = \text{total amount spent (over a period)}$

Page 2
 LOS a
 - calculate
 - explain

→ value of GDP based on expenditure → 2 measurement methods

Page 3
LOS b
- compare

- 1/ value of final output
- 2/ sum of value added

(Exhibit #2)
(example #1)

Note: g/s whose market price cannot be determined:

- use imputed price

e.g. owner-occupied housing → purchase/sale of houses not included
→ estimate of 'rent' is included instead
government services → included at cost with no value-added

→ non-market transactions, barter and black market/illegal activities are excluded

→ Nominal vs. Real GDP/

Page 4
LOS c
- compare
- calculate
- interpret

- real GDP → removes the effect of changes in the general price level
- per capita real GDP → real GDP/population → measures the standard of living in an economy

• nominal GDP → value of g/s produced at current prices

e.g./

	output	Price	nominal GDP	
YR 1	300,000	18,750	5.625B	7% growth in nominal GDP
YR 2	300,000	20,062.50	6.01875B	

$P_t \times Q_t$

- real GDP → $P_B \times Q_t = 18,750 \times 300,000 = 5.625B \rightarrow 0\% \text{ growth in real GDP}$

↓
base year

- if YR 2 output = 309,000, real $GDP_{YR2} = 18,750 \times 309,000 = 5.79375 B$
3% growth in GDP_r

→ GDP deflator (or implicit price deflator for GDP)

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100 \quad (\Rightarrow \text{GDP}_r = \frac{100 \times \text{GDP}_n}{\text{GDP deflator}})$$

- using YR2 data at 309,000 units, €20,062.50/unit

$$= \frac{(309,000 \times 20,062.50)}{(309,000 \times 18,750)} \times 100 = \frac{20,062.50}{18,750} \times 100 = 107$$

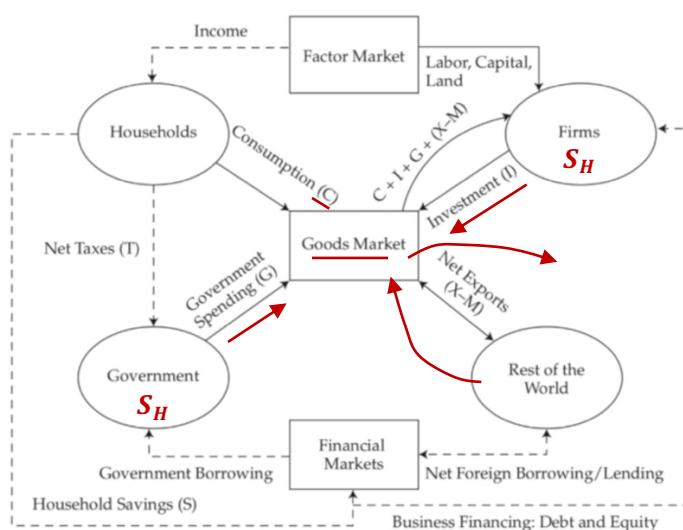
Page 5
LOS c
- compare
- calculate
- interpret

→ also: nominal GDP = $[(1 + \text{GDP}_r)(1 + \text{inflation})] - 1$ e.g. output ↑ 3%

(example #2)

$$\begin{aligned} \text{prices} &\uparrow 7\% \\ \text{GDP}_n &= [(1.03)(1.07)] - 1 \\ &= 10.2\% \end{aligned}$$

→ Components of GDP /



$$\text{GDP} = C + I + G + (x - m)$$

C = consumer spending

$$\begin{aligned} \text{G} &= \text{government spending} \\ &= G^c + G^i \end{aligned}$$

I = private domestic investment

(capital goods + Inventory)

x = exports

m = imports

$$\text{GDP} = (C + G^c) + (I + G^i) + (x - m)$$

Page 6
LOS d
- compare

- household sector = $C + S$
- Investment (I) most volatile component of GDP
- Government (G), net Taxes (T) = gross taxes - transfer payments
if $G > T \rightarrow$ fiscal deficit included in C
- External Sector $\rightarrow (x - m) < 0 \rightarrow$ trade deficit
 $> 0 \rightarrow$ trade surplus

Page 7
LOS d
- compare

$$\begin{aligned} \cdot \text{GDP} &= C + I + G + (x - m) \\ &= C + (\text{bus. Inv.} + \Delta \text{Inventories}) + (G^C + G^I) + (x-m) + \text{statistical discrepancy} \end{aligned}$$

data are more timely and reliable

$$\begin{aligned} \cdot \text{National Income} &= Y = \text{net domestic Income} + \text{CFC} + \text{statistical discrepancy} \\ \text{e.g./ NI} &= \text{all income} + \left(\begin{array}{l} \text{what needs to be reinvested to maintain the capital stock} \\ \downarrow \\ \text{wages} \\ \text{return on capital} \\ \text{sales tax} \end{array} \right) \\ &\quad \downarrow \\ &\quad \text{consumption of fixed capital (i.e. depreciation)} \end{aligned}$$

$$\begin{aligned} \rightarrow \text{personal income} &= \text{all income received by households} \\ &= \text{wages} + \text{net mixed income} + \text{net property income} \quad \text{whether earned or not} \\ \rightarrow \text{disposable income} &= \text{personal income} - \underbrace{\text{net personal taxes}}_{\text{taxes paid transfers received}} \end{aligned}$$

$$\rightarrow \text{personal savings} = \text{disposable income} - C + \underbrace{\Delta \text{pension entitlements}}_{\text{some payroll taxes are for gov't. sponsored personal pensions}}$$

Page 8
LOS d
- compare

• IS → Investment and Savings

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

$$(Y - T) = C + I + (G - T) + (X - M)$$

$$(Y_d - C) = I + (G - T) + (X - M)$$

$$\therefore S = I + (G - T) + (X - M)$$

$$\downarrow \\ S_B + S_H$$

must hold for $AE = AI$

Recall: $AO = AE = AI$

if $AE > AI$, then $AE > AO$

must borrow

must import

net taxes

→ subtract T from both sides

→ $(Y - T) = \text{disposable income } (Y_d)$

→ subtract C from both sides

→ $(Y_d - C) = S$

Page 9

LOS e

- explain

- in words, domestic savings is used to finance:

- Investment
- fiscal deficit
- trade surpluses

→ $G - T > 0 = \text{fiscal deficit}$

→ $X - M > 0 = \text{trade surplus}$
(example #4)

$AE = C \rightarrow$ an increasing function of Y_d

→ a decreasing function of r (real interest rate)

$MPS = 1 - MPC \Rightarrow$ larger MPC is (i.e. C/Y), greater the impact

+ I → a decreasing function of r (cost of financing)

→ an increasing function of AE (stronger demand = ↑ investment spending)

+ G → $G - T = \overline{G} - t(Y) \rightarrow$ taxes are an increasing function of AE

↳ gov't. expenditure treated as exogenous

∴ fiscal balance will increase as AE decreases and decrease as AE increases

.. surplus

.. deficit

+ $(X - M)$ → decreasing function of domestic income

→ increasing function of foreign income

→ negatively related to the fx-rate

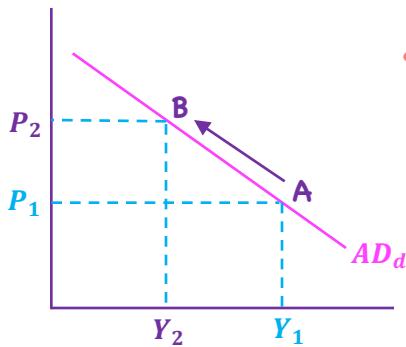
Page 10

LOS f

- explain

Aggregate Demand - quantity of g/s that households, businesses, government, and international customers want to buy at any given level of prices

Page 11
LOS f
- explain



- Downward slope of AD curve results from 3 effects:

1/ Wealth effect: a rise in the general price level (P_1 to P_2) decreases the quantity of g/s that can be purchased with a fixed quantity of nominal wealth

i.e. consumers are less wealthy and ∴ demand fewer g/s

- Downward slope of AD curve results from 3 effects:

Page 12
LOS f
- explain

2/ Interest Rate Effect: as P changes, demand for money changes

- as $P \uparrow$, demand for money increases
- since the money supply is fixed, the price of money ↑
- price of money = the interest rate
- as $P \downarrow$, less demand to hold money, more investment, bond prices ↑, interest rates ↓
- as $P \uparrow$, more demand to hold money, less investment, bond prices ↓, interest rates ↑
- as $r \uparrow$, businesses invest less since borrowing costs ↑, consumers finance fewer big-ticket items (durable goods)
- in total, as $P \uparrow$, demand for money ↑, $r \uparrow$, which leads to $AD \downarrow$

- Downward slope of AD curve results from 3 effects:
3/ the real exchange rate

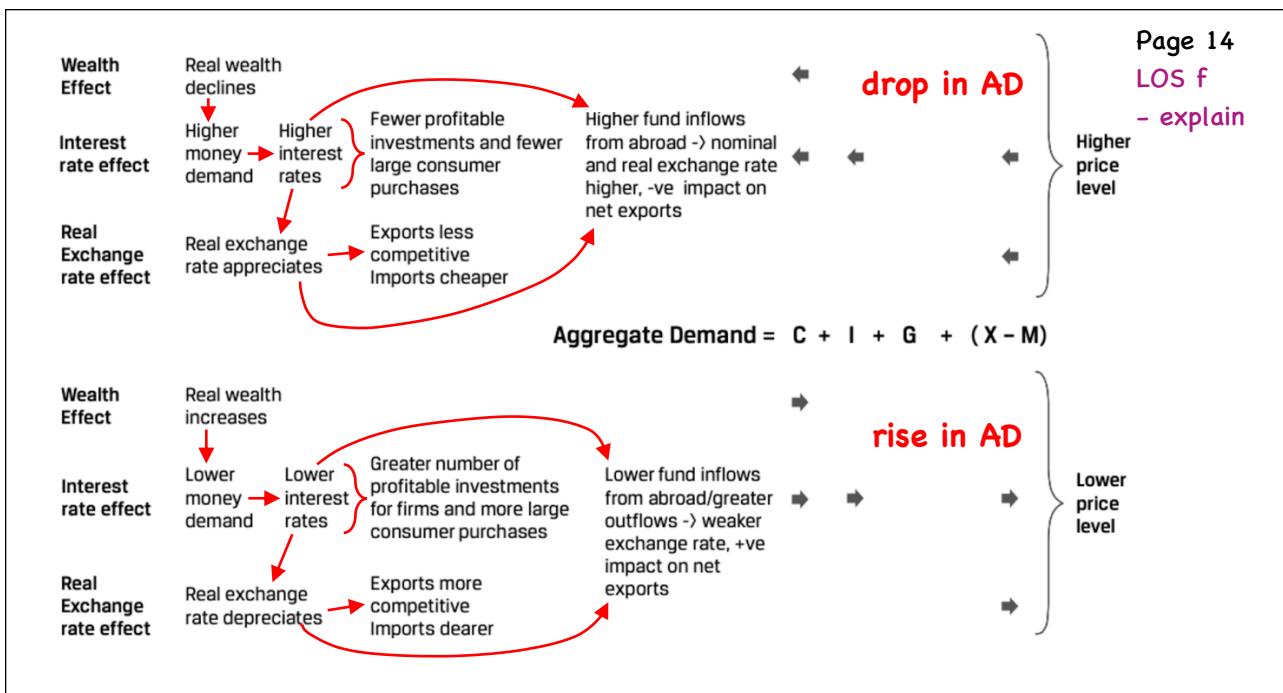
Page 13
LOS f
- explain

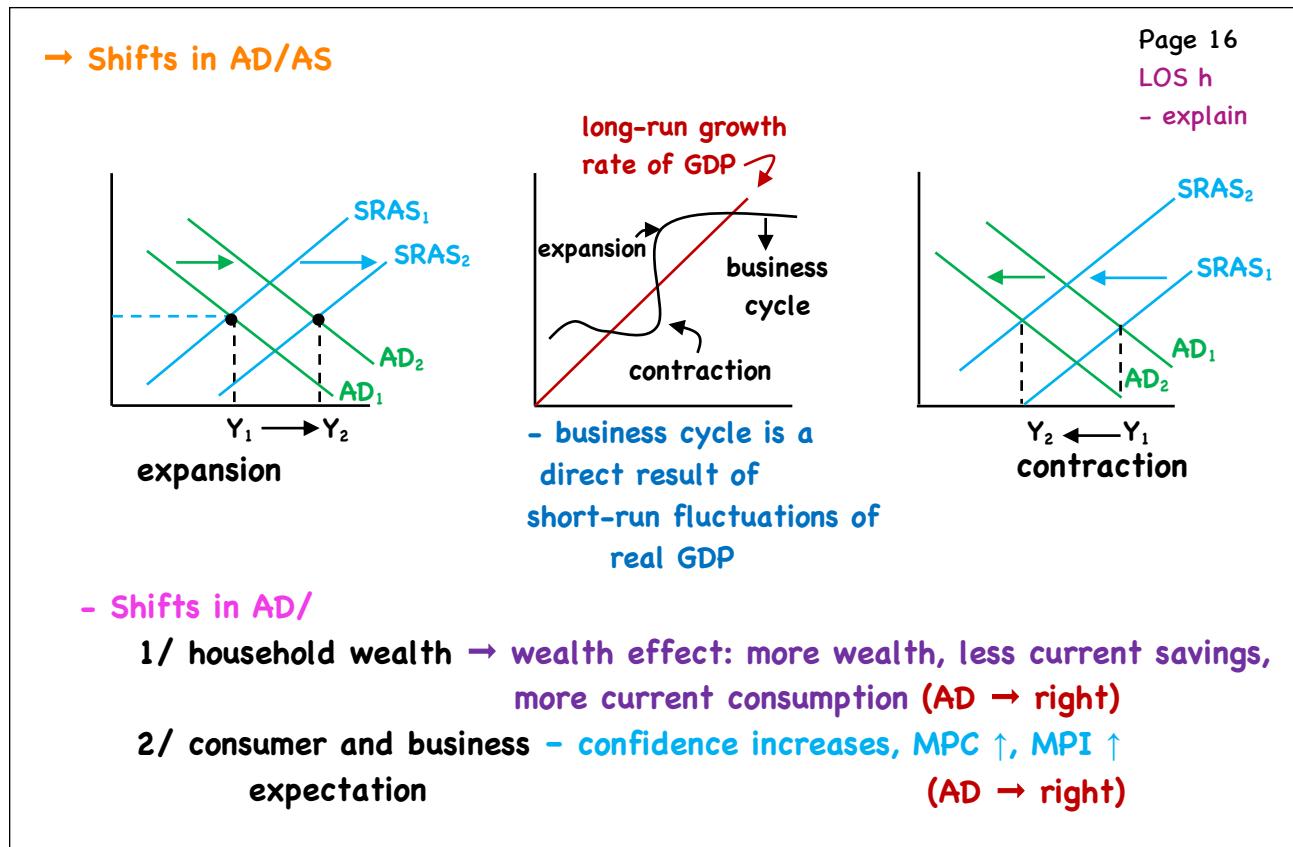
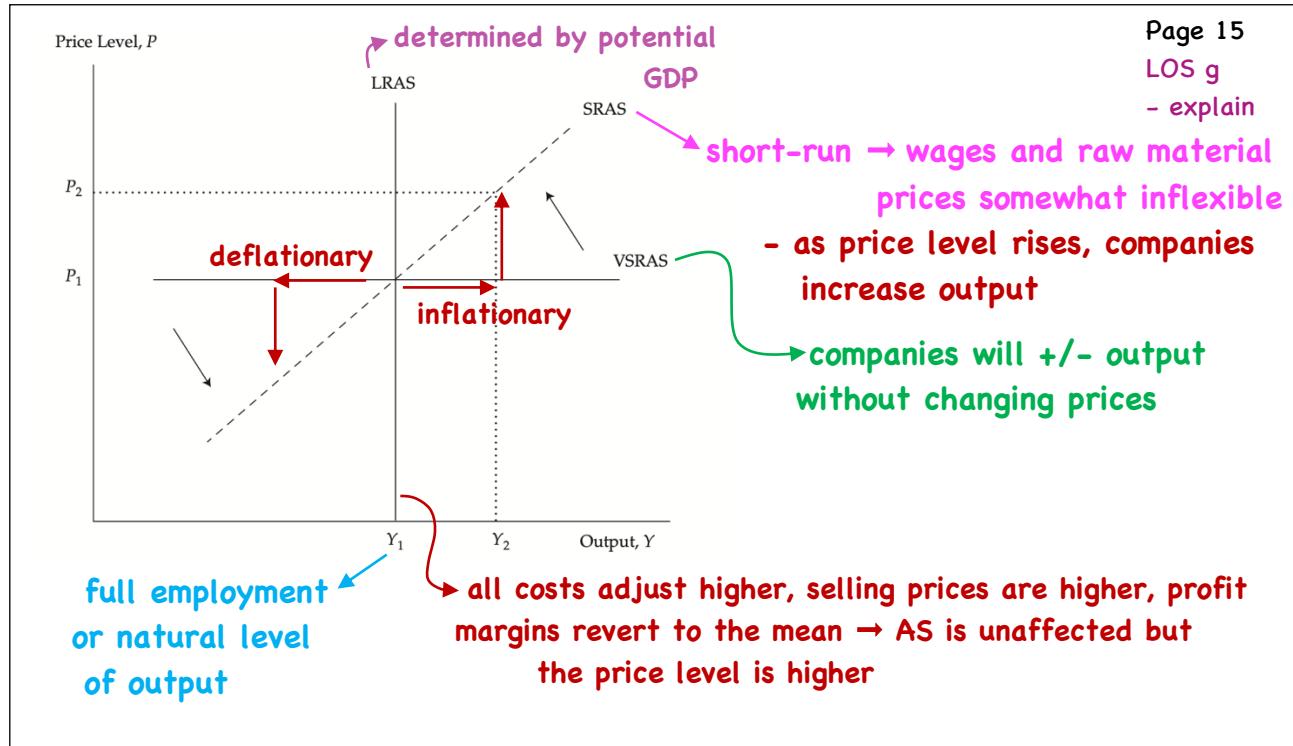
- as $P \uparrow$, real exchange rate \uparrow - makes domestic g/s more expensive in other countries
 - reduces exports
 - also makes foreign goods less expensive \rightarrow raising imports

$$\therefore (x - m) \downarrow$$

- Recall: as $P \uparrow$, $r \uparrow$, capital inflows raise demand for the local currency and thus the real exchange rate increases

- reverse for $P \downarrow$





- Shifts in AD/

3/ Capacity utilization > 82% to 85%, I ↑ (AD → right)

4/ Fiscal policy → G ↑ or T ↓, C ↑ (AD → right)

5/ Monetary policy → increase money supply by:

a) buying securities from banks

b) lowering the required reserve ratio

c) reducing target interest rate

as M ↑, AD → right

6/ Exchange rate - affect the price of X and M

↓ fx-rate → ↑X, ↓ M AD → right

7/ Global growth → higher X, AD → right

(example #8)

Page 17

LOS h

- explain

• Shifts in SRAS/ - factors that change cost of

production or expected profit margins will cause SRAS to shift

plus: factors that shift LRAS will also shift SRAS in the same way

1/ changes in nominal wages ↑ W raises production costs → SRAS → left

↑ W may be offset by ↑ productivity no impact on LRAS

$\% \Delta \text{ unit labour} = \% \Delta W - \% \Delta \text{productivity}$ (example #9)

2/ changes in input prices ↑ RM prices raise cost of production SRAS → left

3/ change in expectations about future prices → expectations of being

able to increase prices in future SRAS → right

- but temporary and small (difficult to predict impact)

4/ changes in business taxes and subsidies

↑ T and ↓ S raise production costs/unit SRAS → left

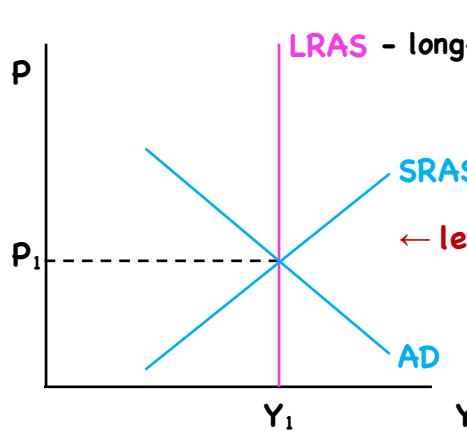
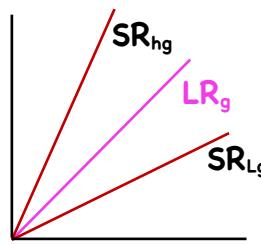
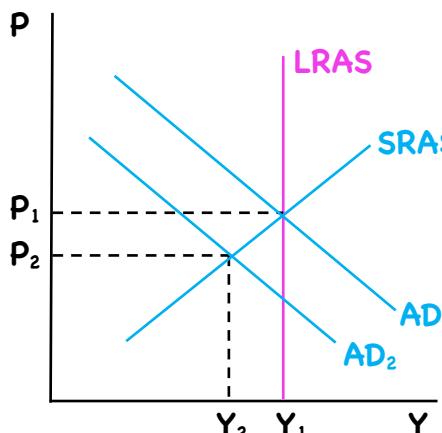
5/ changes in fx-rate - higher fx-rate, ↓ M_p → if those are RM, lowers

production costs SRAS → right

Page 18

LOS h

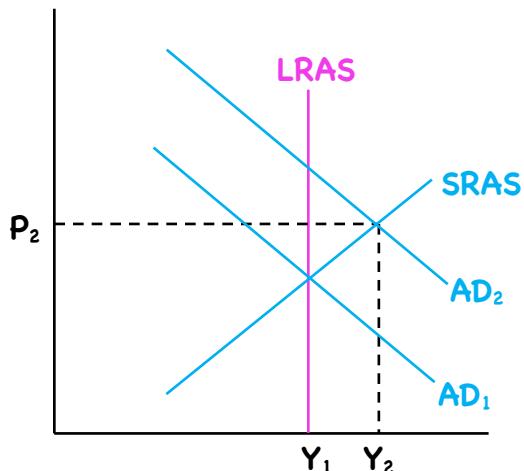
- explain

• Shifts in LRAS/
1/ Supply of Labour
• population
• participation rate
• net immigration
↑ workforce, ↑ potential GDP
LRAS → right
2/ supply of natural resources
- increased availability
LRAS → right
3/ supply of physical capital
- increased capital stock, increase in productive capacity
LRAS → right
4/ supply of human capital
- higher quality of labour, ↑ potential GDP
• training • education
LRAS → right
• skills
5/ Labour productivity and technology
- more efficient workforce, higher output per hour worked, lower production costs/unit
- typically obtained through technological advances
LRAS → right
(example #10, #11)
Page 19
LOS h
- explain

LRAS - long-run full employment equilibrium
- AD intersects SRAS on the LRAS curve
- economy is at potential GDP
← level
**growth
rate**

Page 20
LOS i
- explain

Recessionary gap/
AD → left = lower Y, lower P
- companies cut production, cut workforce (movement along SRAS)
- recessionary gap = ($Y_1 - Y_2$)
- equilibrium GDP < potential GDP
LOS j
- distinguish

- Recessionary gap → Investment Implications

- corporate profits decline
- commodity prices decline
- interest rates decline
- demand for credit declines

- } - reduce investments in cyclical companies, commodities, or commodity-oriented companies, and speculative equity companies
 - increase investments in defensive stocks, IG/gov't long-term bonds



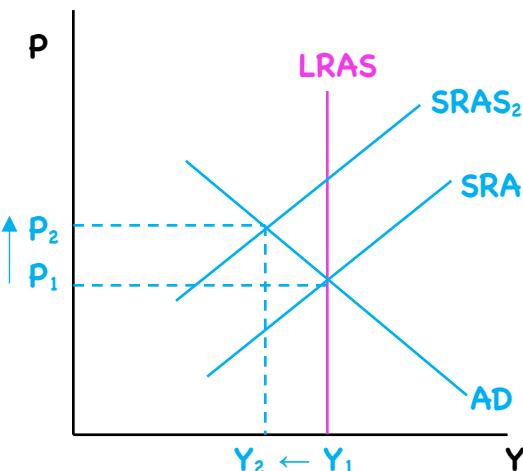
Inflationary gap – economic expansion, real GDP and employment increase

- higher output at higher prices
- companies increase production, may have to compete on wages to attract employees
- inflationary gap = $(Y_2 - Y_1)$
- equilibrium GDP > potential GDP

- Inflationary gap → Investment Implications

- corporate profits rise
- commodity prices increase
- interest rates rise
- inflationary pressure builds

- } - increase investments in cyclical companies, commodities, or commodity-oriented companies, and speculative fixed-income securities
 - reduce investments in defensive stocks, IG/gov't long-term bonds



Stagflation → SRAS shifts to the left

- lower output at higher prices
- higher unemployment, higher inflation
- reduce exposure to both equities and fixed income
- increase exposure to commodities

Page 21

LOS j, k

- distinguish
- explain

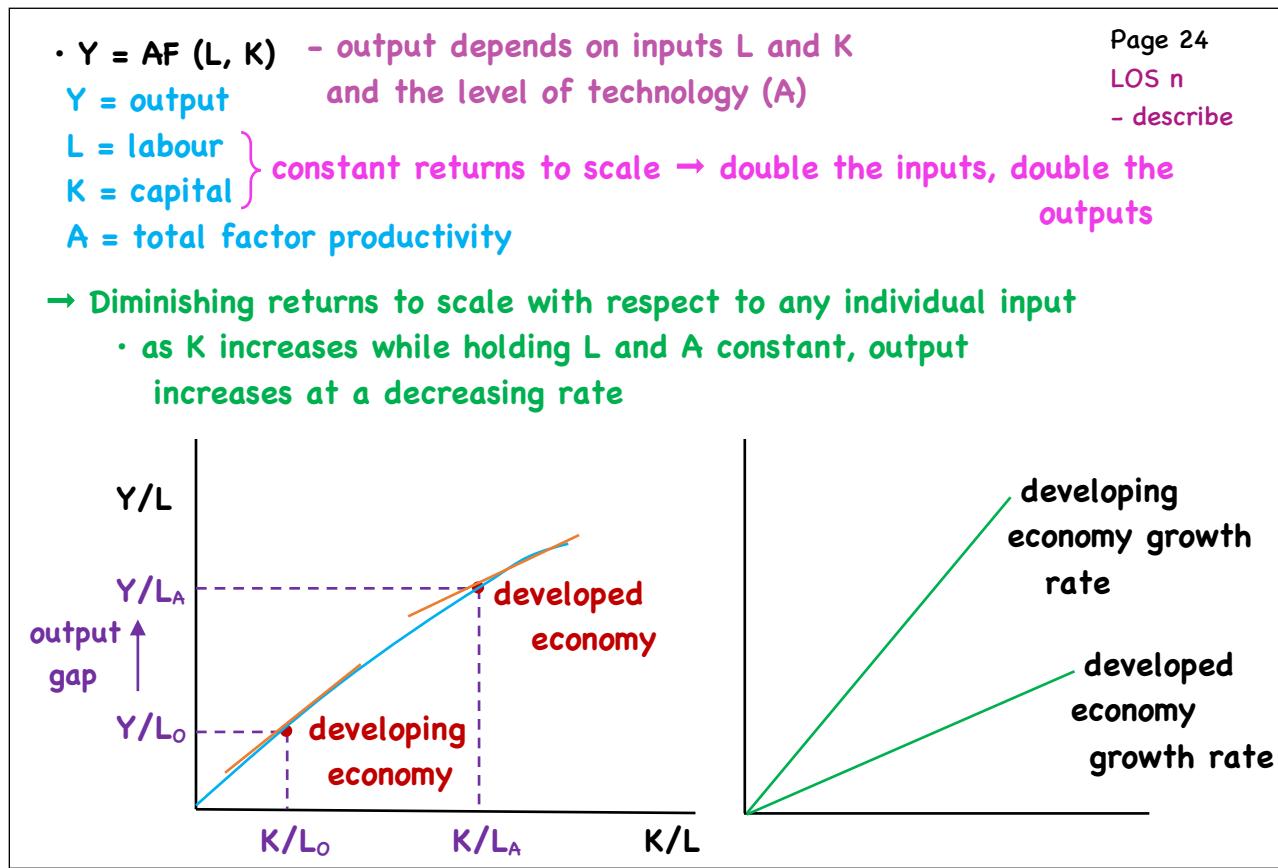
Page 22

LOS j, k

- distinguish
- explain

Change in AS	Change in AD	Effect on Real GDP	Effect on Aggregate Price Level	Page 23 LOS L - analyze
Increase	Increase	Increase	Indeterminate	
Decrease	Decrease	Decrease	Indeterminate	
Increase	Decrease	Indeterminate	Decrease	(example #13)
Decrease	Increase	Indeterminate	Increase	

- economic growth is calculated as %Δ in real GDP
 ↓
has a limit → sustainable growth
 rate of increase in the economy's productive capacity or potential GDP
 LRAS - the factors that shift LRAS right also increase potential GDP



→ Growth in potential GDP = growth in technology
 + W_L (growth in Labour)
 + W_c (growth in capital)

Page 25
 LOS n
 - describe

$$\left. \begin{array}{l} W_L = \frac{\text{Wages}}{\text{GDP}} \\ W_c = I - W_L \end{array} \right\} \text{relative shares of capital and labour in national income} \quad \frac{\text{corporate profits, net interest income, net rental income, depreciation}}{\text{GDP}}$$

e.g. U.S. → $W_L = .7$ ∵ ↑ in L will have a larger effect
 → $W_c = .3$ on GDP than an increase in K

→ Growth in per capita GDP = growth in technology + W_c (growth in K/L)

- Sources of Economic Growth/
 - 1/ Labour Supply (quantity variable)
 - daycare
 - child benefits
 - immigration
 - labour force = participation rate × population
 - potential size (quantity) = labour force × Avg. hours worked per worker
 - ↑ business cycle sensitive
 - 2/ Human Capital (quality variable)
 - education, training, experience
 - 3/ Physical Capital Stock - increases from year to year as long as net investment is positive
 - (gross Inv. - Dep.)
 - 4/ Technology - most important factor
 - allow economies to overcome the limits imposed by diminishing marginal returns
- TFP growth = growth in potential GDP - [W_L (growth in labour) + W_c (growth in Capital)]

Page 26
 LOS o
 - distinguish

→ Sources of Economic Growth/

5/ Natural Resources $\begin{cases} \text{renewable (forest)} \\ \text{non-renewable (oil)} \end{cases}$ imports can overcome
these deficits

Page 27

LOS o

- distinguish

→ Measures of sustainable growth/

- recall the growth accounting equation:

$$\text{Growth in potential GDP} = \frac{\text{growth in technology}}{\downarrow \text{unobservable}} + \frac{W_L (\text{growth in Labour})}{\downarrow \text{unobservable}} + \frac{W_C (\text{growth in capital})}{\text{data may not be available}}$$

$$\therefore \text{focus on labour productivity} = \frac{\text{Real GDP}}{\text{Aggregate Hours}} \rightarrow \text{both observable}$$

depends on

- K/L • A

$\therefore \text{growth in potential GDP} = \text{LT growth rate of labour force} + \text{LT labour productivity growth rate}$

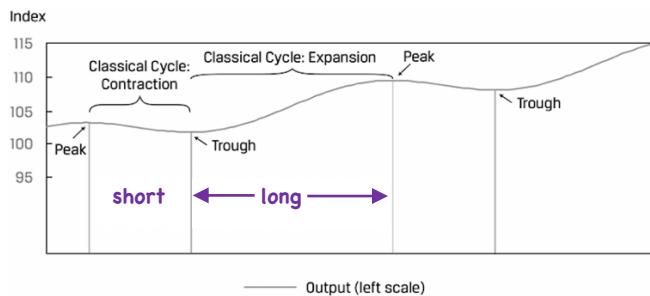
Understanding Business Cycles

- a. describe the business cycle and its phases;
- b. describe credit cycles;
- c. describe how resource use, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle;
- d. describe theories of the business cycle;
- e. interpret a set of economic indicators and describe their uses and limitations;
- f. describe types of unemployment and compare measures of unemployment;
- g. explain inflation, hyperinflation, disinflation, and deflation;
- h. explain the construction of indexes used to measure inflation;
- i. compare inflation measures, including their uses and limitations;
- j. contrast cost-push and demand-pull inflation.

Understanding Business Cycles

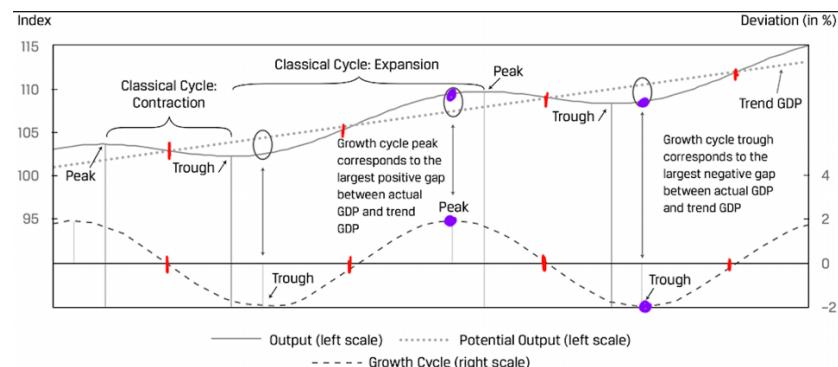
LOS a (7p)	Overview of the Business Cycle - describe
LOS b (2p)	Credit Cycles - describe
LOS c (11.5p)	Business Cycle Fluctuations - describe
LOS d (6p)	Theories of the Business Cycle - describe
LOS e (9p)	Economic Indicators - describe, interpret
LOS f (4.5p)	Unemployment - describe
LOS g, h, i (7.5p)	Inflation - explain
LOS j (6p)	Explaining Inflation - contrast

- **Types of cycles**
- 1/ Classical cycle**
- not very useful



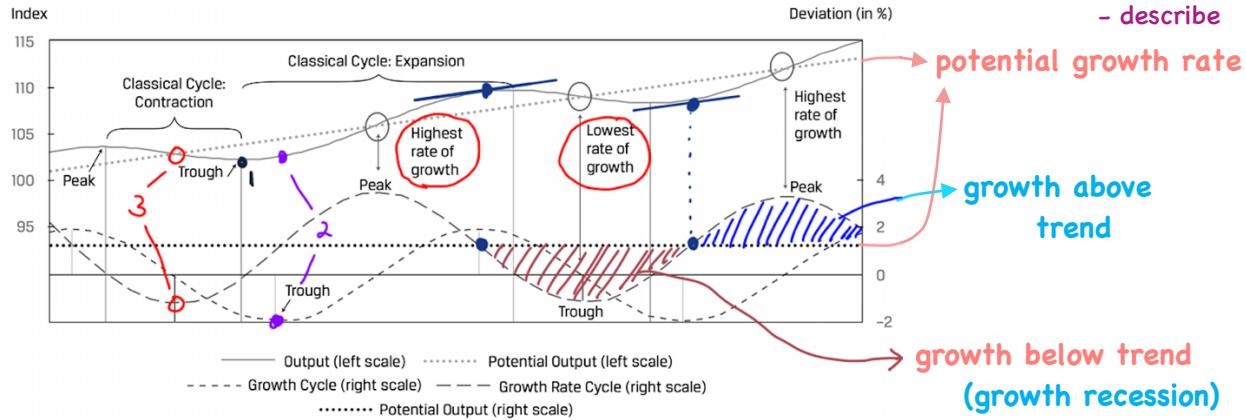
Page 1
LOS a
- describe

- 2/ Growth cycle**
- fluctuations in output around a long-term trend
vs. classical view
- peaks are earlier, troughs are later



• Types of cycles 3/ Growth rate cycle

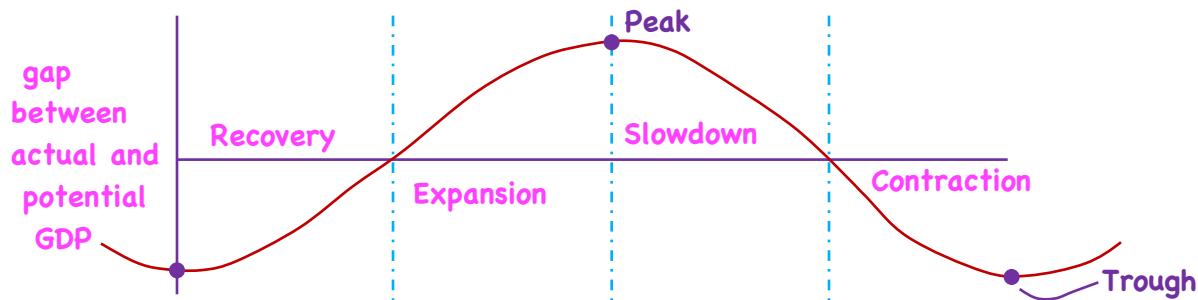
Page 2
LOS a
- describe



- economists and practitioners generally use
cycle #2 → growth rate

Page 3
LOS a
- describe

Phase	Recovery	Expansion	Slowdown	Contraction
Description	Economy going through a trough. Negative output gap starts to narrow.	Economy enjoying an upswing. Positive output gap opens.	Economy going through a peak. Positive output gap starts to narrow.	Economy weakens and may go into a recession. Negative output gap opens.
Activity levels – consumers and businesses	Activity levels are below potential but start to increase.	Activity measures show above-average growth rates.	Activity measures are above average but decelerating. Moving to below-average rates of growth.	Activity measures are below potential. Growth is lower than normal.
Employment	Layoffs slow. Businesses rely on overtime before moving to hiring. Unemployment remains higher than average.	Businesses move from using overtime and temporary employees to hiring. Unemployment rate stabilizes and starts falling.	Business continue hiring but at a slower pace. Unemployment rate continues to fall but at decreasing rates.	Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs. Unemployment rate starts to rise.
Inflation	Inflation remains moderate.	Inflation picks up modestly.	Inflation further accelerates.	Inflation decelerates but with a lag.



<ul style="list-style-type: none"> • strong economy → high credit availability on favourable terms <ul style="list-style-type: none"> - often leads to asset price and real estate bubbles - amplifies business cycles (financial leverage) - more extensive expansions, deeper recessions • weak economy → tight credit market, higher rates <p>- Credit cycles tend to be longer, deeper, and sharper than business cycles</p> <ul style="list-style-type: none"> • growth or contraction in credit (i.e. stage of credit cycle): <ul style="list-style-type: none"> • determine direction in housing and construction markets • affect the extent of expansions and contractions <ul style="list-style-type: none"> - credit cycle contraction + business cycle contraction = more severe recession • foreshadow policy actions <p>- strong peaks in credit cycles are closely associated with systemic banking crises</p>	Page 4 LOS b - describe
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Phase	Recovery	Expansion	Slowdown	Contraction	Page 5 LOS c - describe
Employment average hours worked →	Layoffs slow. Businesses rely on overtime before moving to hiring. Unemployment remains higher than average. bullish	Businesses move from using overtime and temporary employees to hiring. Unemployment rate stabilizes and starts falling.	Businesses continue hiring but at a slower pace. Unemployment rate continues to fall but at slowly decreasing rates. bearish	Businesses first cut hours, eliminate overtime, and freeze hiring, followed by outright layoffs. Unemployment rate starts to rise.	
	(Levels of employment lag the cycle) big theme				
Sales and production	Sales decline slows. Sales subsequently recover. Production upturn follows but lags behind sales growth. Over time, production approaches normal levels as excess inventories from the downturn are cleared.	Sales increase. Production rises fast to keep up with sales growth and to replenish inventories of finished products. This increases the demand for intermediate products. “Inventory rebuilding or restocking stage.”	Sales slow faster than production; inventories increase. Economic slowdown leads to production cutbacks and order cancellations.	Businesses produce at rates below the sales volumes necessary to dispose of unwanted inventories.	
Inventory–sales ratio bullish →	Begins to fall as sales recovery outpaces production.	Ratio stable.	Ratio increases. Signals weakening economy.	Ratio begins to fall back to normal.	

Phase	Recovery	Expansion	Slowdown	Contraction	Page 6 LOS c - describe
capacity utilization rates	Excess capacity during trough, low utilization, little need for capacity expansion. Interest rates tend to be low—supporting investment.	Companies enjoy favorable conditions. Capacity utilization increases from low levels. Over time, productive capacity may begin to limit ability to respond to demand. Growth in earnings and cash flow gives businesses the financial ability to increase investment spending.	Business conditions at peak, with healthy cash flow. Interest rates tend to be higher—aimed at reducing overheating and encouraging investment slowdown.	Companies experience fall in demand, profits, and cash flows.	
keeps demand for employment low	Low but increasing as companies start to enjoy better conditions. Capex focus on efficiency rather than capacity. Upturn most pronounced in orders for light producer equipment. Typically, the orders initially reinstated are for equipment with a high rate of obsolescence, such as software, systems, and technological hardware.	Customer orders and capacity utilization increase. Companies start to focus on capacity expansion. The composition of the economy's capacity may not be optimal for the current structure of demand, necessitating spending on new types of equipment. Orders precede actual shipments, so orders for capital equipment are a widely watched indicator of the future direction of capital spending.	New orders intended to increase capacity may be an early indicator of the late stage of the expansion phase. Companies continue to place new orders as they operate at or near capacity.	New orders halted, and some existing orders canceled (no need to expand). Initial cutbacks may be sharp and exacerbate the economy's downturn. As the general cyclical bust matures, cutbacks in spending on heavy equipment further intensify the contraction. Maintenance scaled back. preserve cash flow	<ul style="list-style-type: none"> • Economic conditions • Expectations • Capacity utilization

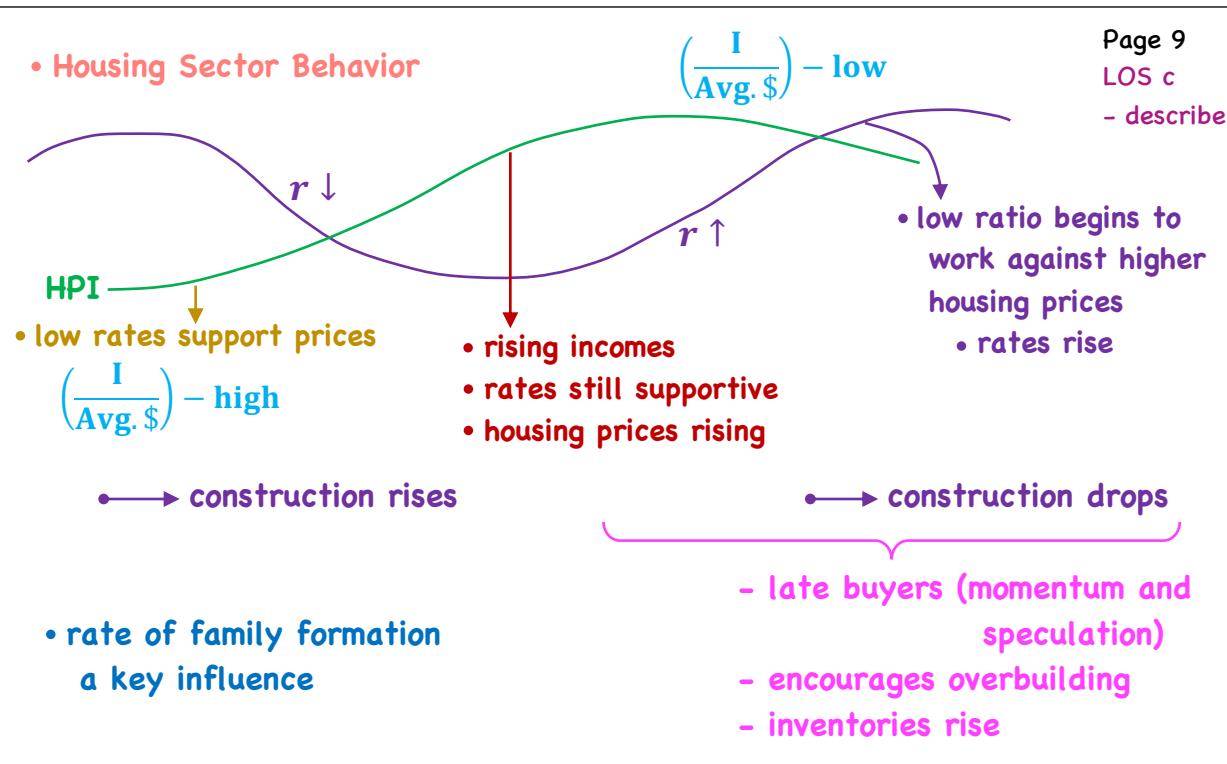
Phase of the Cycle	Recovery	Expansion	Slowdown	Contraction	Page 7 LOS c - describe
Incomes, employment, and confidence	Unemployment remains above average. Layoffs slow. Businesses rely on overtime before moving to hiring. bullish (Consumer confidence starts improving.)	Hiring restarts. Unemployment rate stabilizes and starts falling. Consumers experience rising incomes, healthy employment prospects, and greater confidence.	Businesses continue hiring but at a slower pace. Unemployment rate continues to fall. Incomes are still growing. Consumers remain confident.	Businesses first cut hours of overtime prior to freezing hiring and starting layoffs. Employment levels decline, and consumer confidence weakens.	Consumer Spending - less cyclical than investment spending
Spending on consumer durables (autos, motorcycles, appliances, furniture)	Spending limited as households postpone spending.	(Spending increases.) result → outperforms → (highly cyclical)	Spending above average.	Purchases postponed; spending decreasing.	
Consumer non-durables (i.e., medicines, food, household products)		Spending shows little change through the cycle.			
Services (+) (entertainment, outdoor eating, communications, personal services) (-)	Spending below average. - mixed cyclical	Spending increases.	Spending above average.	Spending declines.	
• economic data → Consumer confidence, ISM Services, Retail Sales					

- Household Incomes → Y_d - disposable income positively related to spending on durable goods
 - permanent income: excludes temporary income and unsustainable losses and gains → correlates well with non-discretionary spending

- Household Savings → ↑ S may indicate future caution
 - stock of S may indicate future consumption potential without a need for ↑ Incomes

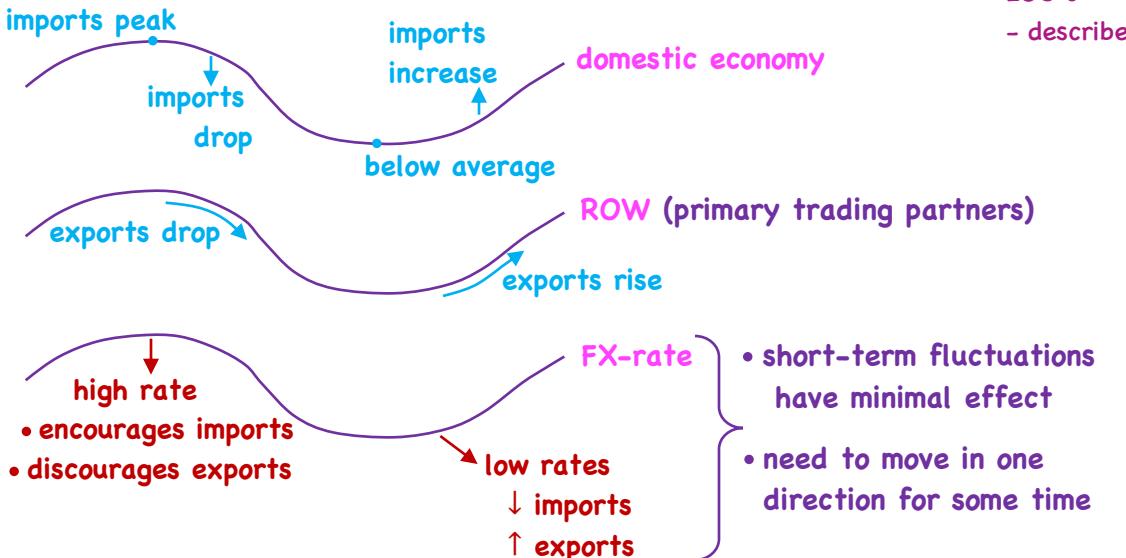
- Housing Sector Behavior
 - New/Existing Home Sales (Demand)
 - Building Permits (Supply - construction activity)
 - HPI - Housing Price Index (median home prices)

Page 8
LOS c
- describe



Page 9
LOS c
- describe

- External Trade Sector Behavior



- Trade Balance data.

Page 10
LOS c
- describe

Neoclassical/

- advocates no fiscal or monetary intervention
- business cycles are natural and efficient occurrences (e.g. creative destruction)
 - monetary and fiscal policy work with a delay
 - lag in implementation, lag in impact
 - may make the next cycle more volatile
 - intervention distorts pricing signals (information) that may cause malinvestment and inefficiencies (capital allocation)

Page 11
LOS d
- describe

Austrian School/

- also advocates no fiscal or monetary intervention
- low rates and excessive credit create booms that create busts
 \therefore avoid the boom
- overinvestment is the problem caused by intervention in rates and money supply
 - markets are flexible and prices will adjust

Monetarism/

- limited fiscal role, passive only (i.e. consistent policy over time)
- monetary policy should only concern itself with maintaining a steady growth rate of the money supply (long-term growth rate of GDP)
 - too slow → severe downturn
 - too fast → excessive inflation
- intervention to affect AD may actually cause the business cycle

Page 12

LOS d

- describe

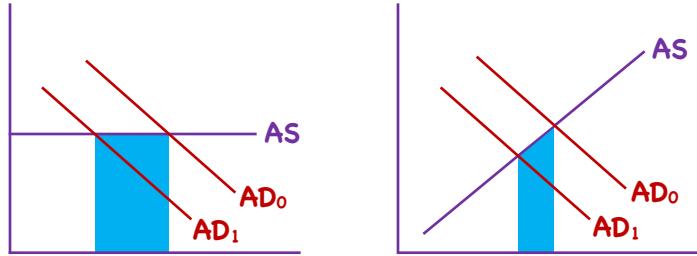
Keynesianism/

- very active role for fiscal policy in managing AD
- believe prices/wages are sticky in the SR, resulting in a flat supply curve
 - ∴ shifts in AD have large consequences on overall output

Page 13

LOS d

- describe

Keynesianism/


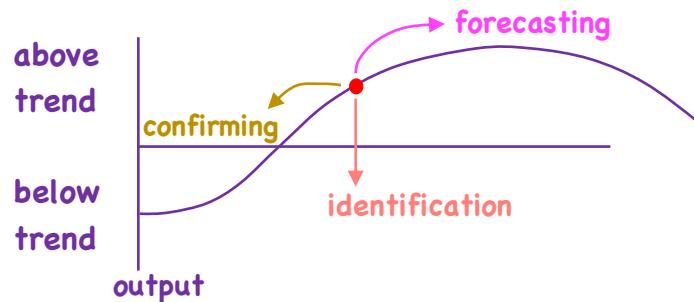
- low rates may not work if consumer confidence is low
 - plenty of capacity to lend, low demand
- negative output gap → fiscal deficits (\uparrow spending, \downarrow taxes)
- positive output gap → fiscal surpluses (\downarrow spending, \uparrow taxes)

Critics/

- deficits add to debt
- intervention adds to the boom
- fiscal policy works with a lag

- **Economic indicators:** variables that provide information on the state of the economy
- **leading** → have turning points that precede those of the overall economy
- **coincident** → have turning points that are usually close to those of the overall economy
- **lagging** → have turning points that take place later than those of the overall economy

Page 14
 LOS e
 - interpret
 - describe



Composite indicators: a group of indicators all leading, lagging, or coincident

Page 15
 LOS e
 - interpret
 - describe

e.g. **Composite Board Leading Economic Index (LEI)**
 - 10 components

Leading

- Stock market
- House prices
- Retail Sales
- 30yr-2yr, 10yr-2yr
- Building Permits
- Avg. weekly hours
- PMI - new orders

Coincident

- Industrial Production
- Real personal incomes
- Payrolls

Lagging

- Avg. duration of unemployment
- Inventory/Sales
- Avg. prime lending rate
- GDP
- consumer debt/Income
- commercial loans outstanding

Diffusion Index: attempts to capture the proportion of a composite index moving in the same direction

e.g. indicator + .05%	+1
- .05% to + .05%	+ .5
more than - .05%	0

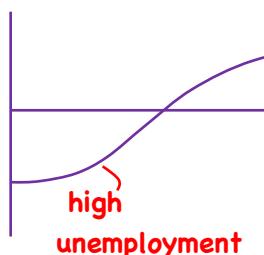
$$\frac{\sum I_i}{n} \times 100 , \text{ above } 50 \text{ represents growth.}$$

Surveys: Consumer Confidence
PMI

Big Data Economic Indicators → use many economic series (50+) using PCA to extract primary trend variables (uncorrelated)

Nowcasting - decompose an economic variable into components
- use component data to forecast the aggregate

e.g. GDPnow: $GDP = C + I + G + (X - M)$
quarterly data here is available faster
(weekly, monthly, throughout the quarter)



Page 17
LOS f
- describe
- compare

low unemployment
'tight labour market'
- potential for price-wage inflationary
(few available workers spiral
+ escalators tied to CPI)

Terminology:

Employed: those with a job

Labour force: those with a job + those looking for a job
(employed) (unemployed)

Unemployed: those without a job but looking

- long-term unemployed → 3-4 months but still looking
- frictionally unemployed → natural movement from job-to-job

Unemployment Rate: $\frac{\text{Unemployed}}{\text{Labour force}}$

Terminology:

Activity Ratio (Participation Rate): $\frac{\text{Labour force}}{\text{Population}}$

of working age
(16 to 64)

Underemployed: has a job below qualifications
or has PT but wants FT

Discouraged worker: person who has stopped looking for work
- not counted as unemployed

Voluntarily unemployed: person who could get a job but refuses
the work

Unemployment Rate:

- surveys (US BLS)

- claims for UI

- all working age regardless of willingness

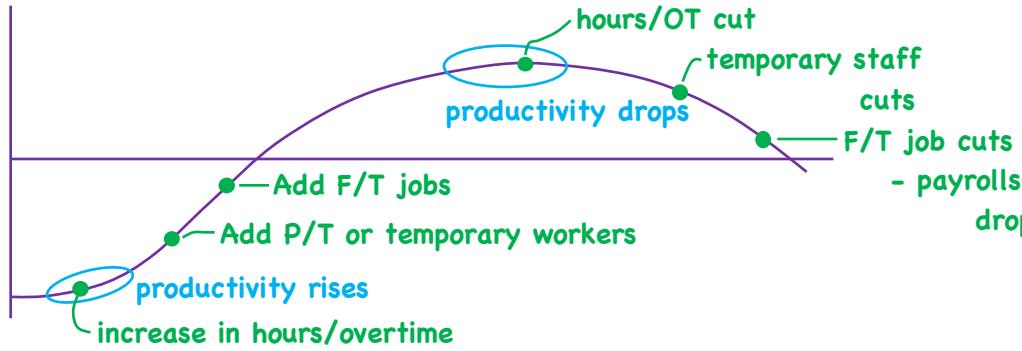
- lagging indicator - labour force responds to the economic environment
 - changes in participation rate produce paradoxical results
 - business response does not lead

Page 18

LOS f

- describe
- compare

• **Productivity = Output/Hours worked (leading to coincident)**



Page 19

LOS f

- describe
- compare

• **Economic Data: Payrolls (PT/FT)**

Hours worked

Temporary Workers

Inflation: a sustained rise in the overall level of prices

- the same amount of money purchases fewer goods
(erodes purchasing power and real incomes)
- pro-cyclical with a lag (a year or more)

$$\text{Inflation Rate} = \frac{\text{Price Index}_1 - \text{Price Index}_0}{\text{Price Index}_0} \quad \text{- lagging indicator}$$

Inflation Expectations - leading indicator, especially for the direction of monetary policy

Terminology:

Deflation: a sustained decrease in the aggregate price level
(value of money increases)

Hyperinflation: an extremely fast increase in the aggregate price level
- typically as a result of a rapid increase in the money supply

Disinflation: a decline in the rate of increase

e.g. YR1 - 3% YR2 - 2.5% YR3 - 2% YR4 - 1.5%

Page 20
LOS g
- explain

Measuring Inflation:

Price Index → the average prices of a representative basket of goods/services

Page 21
LOS h
- explain

Laspeyres Index - composition of the representative basket held constant as of a base year (updated every 5 years)

e.g. $YR_0 = WQ_0 \times P_0$

$YR_1 = WQ_0 \times P_1 \rightarrow \text{Index} = \left(\frac{WQ_0 \times P_1}{WQ_0 \times P_0} \right) \times 100$

$YR_2 = WQ_0 \times P_2$

Inflation Rate = $\left(\frac{\text{Index}_1}{\text{Index}_0} \right) - 1$

Issues/

- substitution → if the basket is not adjusted, results in an upward bias
- quality → if not adjusted for, results in an upward bias
- new products → not included until update - results in an upward bias

} can use
hedonic pricing

- chained Price Index – solves substitution bias

- Fisher Index

$$\sqrt{I_P \times I_L}$$

Paasche Index Laspeyres Index
 $\frac{WQ_1 \times P_1}{WQ_1 \times P_0}$ $\frac{WQ_0 \times P_1}{WQ_0 \times P_0}$
 current basket constant basket

- different names, weights, methodologies

CPI-U

HICP

PCE

reflecting
domestic conditions
and preferences or
constraints

household survey

- urban vs. rural

LOS i
- compare

CPI-U

PCE

Page 22
LOS h
- explain

Exhibit 20 Consumption Basket and Prices over Two Months

Page 22b

Time

Goods

January 2019

Quantity

Price

February 2019

Quantity

Price

Rice

50 kg

¥3/kg

70 kg

¥4/kg

Gasoline

70 liters

¥4.4/liter

60 liters

¥4.5/liter

$$I_L = \left(\frac{515}{458} \right) \times 100 = 112.44$$

$$I_P = \left(\frac{550}{474} \right) - 1 = 116.03$$

$$\text{Fisher} = \sqrt{112.44 \times 116.03} = 114.22$$

$$2019 \quad 50 \times 3 = 150$$

$$70 \times 4.4 = \underline{\underline{308}} \\ 458$$

$$2019 \quad 70 \times 3 = 210$$

$$60 \times 4.4 = \underline{\underline{264}} \\ 474$$

$$2020 \quad 50 \times 4 = 200$$

$$70 \times 4.5 = \underline{\underline{315}} \\ 515$$

$$2020 \quad 70 \times 4 = 280$$

$$60 \times 4.5 = \underline{\underline{275}} \\ 550$$

Producer Price Index - measures price changes paid by domestic producers
 - may lead to changes in CPI

Page 23
 LOS i
 - compare

(fuels, farm products, machinery and equipment by raw materials, intermediate goods and finished goods)

- bonds, contracts, leases, pensions, labour contracts → may be indexed to some price index
- different central banks follow different measures
 ECB - HICP India - WPI US-PCE (Fisher Index)
- Nominal GDP adjusted to real GDP by a price index - called a price deflator
- headline vs. core → strips out volatile components (energy and food)

Cost-Push Inflation: rising costs (usually wages) compel business to raise prices
 largest input cost.

Page 24
 LOS j
 - contrast

NAIRU
 non-accelerating inflation rate of unemployment
 (natural rate of unemployment)

very little excess wage inflation pressure

rising excess wage inflation pressure

Indicators: hourly wages, weekly earnings

- must consider productivity: $\text{Unit Labour Cost} = \frac{\text{Total w/hr}}{\text{Output/hr}}$

typically rise in tight labour markets

Demand-Pull Inflation: Capacity utilization
Actual output vs. potential } closer to capacity,
greater pressure on prices

Page 25
LOS j
- contrast

Commodity Prices - input costs

Monetarists/

too much money (increases in the money supply in excess of trend growth)

- Assessing inflationary potential/

$$\text{Velocity} = \frac{\text{Nominal GDP}}{\text{money supply}}$$

if velocity ↓ due to $M \uparrow$, may be inflationary

if velocity ↑ due to $nGDP \uparrow$, may be disinflationary or deflationary

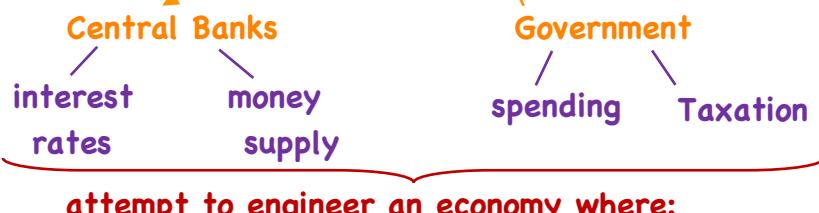
Inflation expectations → may become self-fulfilling

Monetary and Fiscal Policy

- a. compare monetary and fiscal policy;
- b. describe functions and definitions of money;
- c. explain the money creation process;
- d. describe theories of the demand for and supply of money;
- e. describe the Fisher effect;
- f. describe roles and objective of central banks;
- g. contrast the costs of expected and unexpected inflation;
- h. describe tools used to implement monetary policy;
- i. describe the monetary transmission mechanism;
- j. describe qualities of effective central banks;
- k. explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates;
- l. contrast the use of inflation, interest rate, and exchange rate targeting by central banks;
- m. determine whether a monetary policy is expansionary or contractionary;
- n. describe limitations of monetary policy;
- o. describe roles and objectives of fiscal policy;
- p. describe tools of fiscal policy, including their advantage and disadvantages;
- q. describe the arguments about whether the size of a national debt relative to GDP matters;
- r. explain the implementation of fiscal policy and difficulties of implementation;
- s. determine whether a fiscal policy is expansionary or contractionary;
- t. explain the interaction of monetary and fiscal policy.

Monetary & Fiscal Policy

Page 1



- 1) growth is stable and positive
- 2) inflation is stable and low (pos.)

Money

functions

- medium of exchange
- store of value
- unit of account

qualities must:

- be readily acceptable
- have a known value
- be easily divisible
- have a high value:weight ratio
- be difficult to counterfeit

definitions

What constitutes money?

narrow def'n

- coins/notes in circulation
- demand deposits
- chequing account balances
- traveller's cheques of non-bank issuers

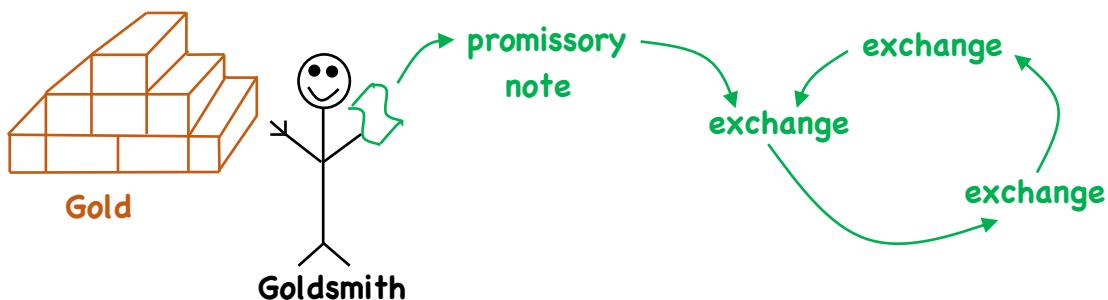
(M1)

broad def'n

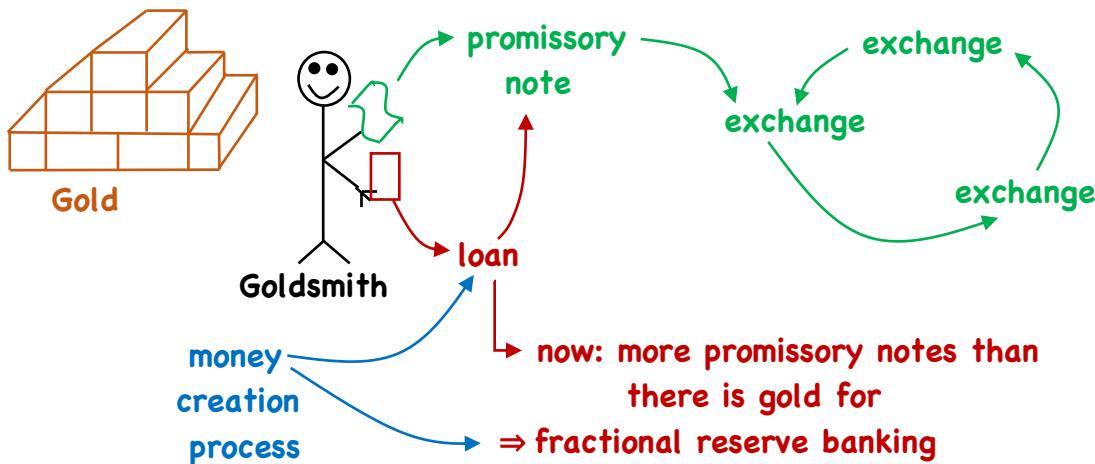
- narrow +
- savings/money market accts.
- time deposits < 100k
- retail money - market/mutual fund accts.

Page 2

Money Creation



Page 3


Example: Reserve Requirement = 10%

Bank 1		Bank 2		Bank 3	
res.	10	100 dep.		res.	9
loan	90		loan 81	90 dep.	etc...

purchases → **seller**

purchases → **seller**

$$\Sigma \text{ of money created} = \frac{\text{new deposit}}{\text{res. req.}}$$

i.e. $\frac{100}{.1} = \$1000$

$$\text{money multiplier} = \frac{1}{\text{res. req.}}$$

$\frac{1}{.1} = 10$

Set by central bank ⇒ ∴ Monetary Policy tool

Page 4

Quantity Theory of Money

$$M \times V = P \times Y$$

quantity of money } price level } real output
 velocity of money

- in words: the amount of money used to buy stuff = the monetary value of output
- since we assume V is constant: then spending ($P \times Y$) is proportional to M (money supply)

Money neutrality ⇒ if M ↑, only P ↑ (Monetarist Theory)

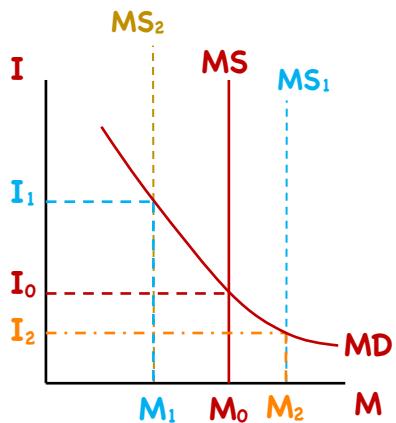
Demand for Money

- transactions
- pro-cyclical
- trans. bal. $\xrightarrow{\text{GDP}}$ fairly stable

- precautionary
- rainy day fund

- speculative
- inversely related to asset yields (counter-cyclical)
- positively related to perceived risk

Supply & Demand



- @ $I_1 - \text{excess MS } (M_0 - M_1)$
 - ∴ less speculative demand
 - demand for yield drives prices up and $I \downarrow$
- @ $I_2 - \text{excess MD } (M_2 - M_1)$
 - ∴ more speculative demand
 - less demand for yielding assets drives $I \uparrow$

The Fisher Effect

⇒ in words first: the real rate of interest is stable over time

∴ changes in nominal rates are the result of changes in expected inflation

$$R_{\text{nom}} = R_{\text{real}} + \pi^e$$

But: who knows?

uncertainty = risk

∴ R_{nom}

- ↳ a required real return
- ↳ inflation expectation premium
- ↳ risk premium

Role of Central Banks

⇒ Monopoly supplier of the currency (capacity to print money)
 from gold standard to fiat money

Page 1

- non-convertible
- legal tender
- gov't. decree

∴ guardians of the
 value of the currency (inflation control)
 ⇒ in order to maintain confidence

⇒ Banker to the gov't. and other banks

- ↳ drawdowns ↳ lender of last resort
- ↳ redeposits (if interbank loans can't
 be secured)

⇒ Supervisor of the Banking System (perhaps)

⇒ Regulator/supervisor of the payments system

↳ generates revenue i.e. Fed ~ \$20B/yr.

Page 2

⇒ Manage foreign reserves & gold reserves

* ⇒ Operation of Monetary Policy

↳ quantity of money & credit

Objectives

Promote stable/sustainable growth by:

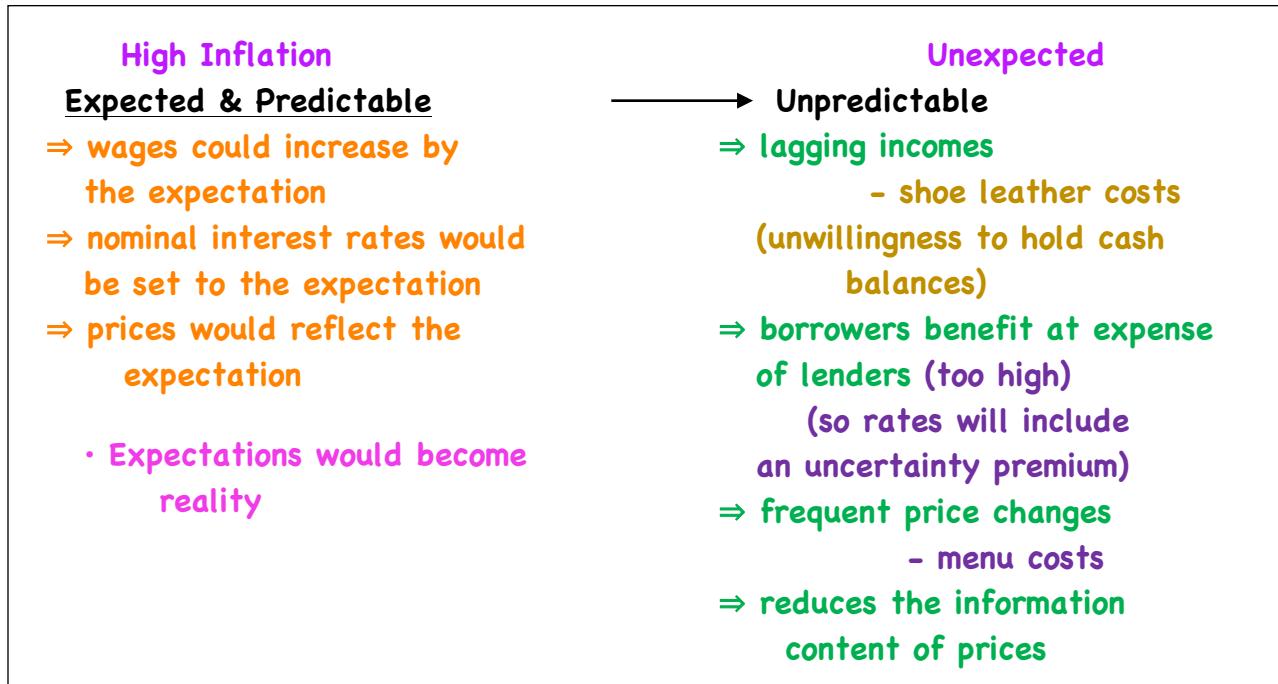
⇒ maintaining price stability - single

mandate
 (ECB)

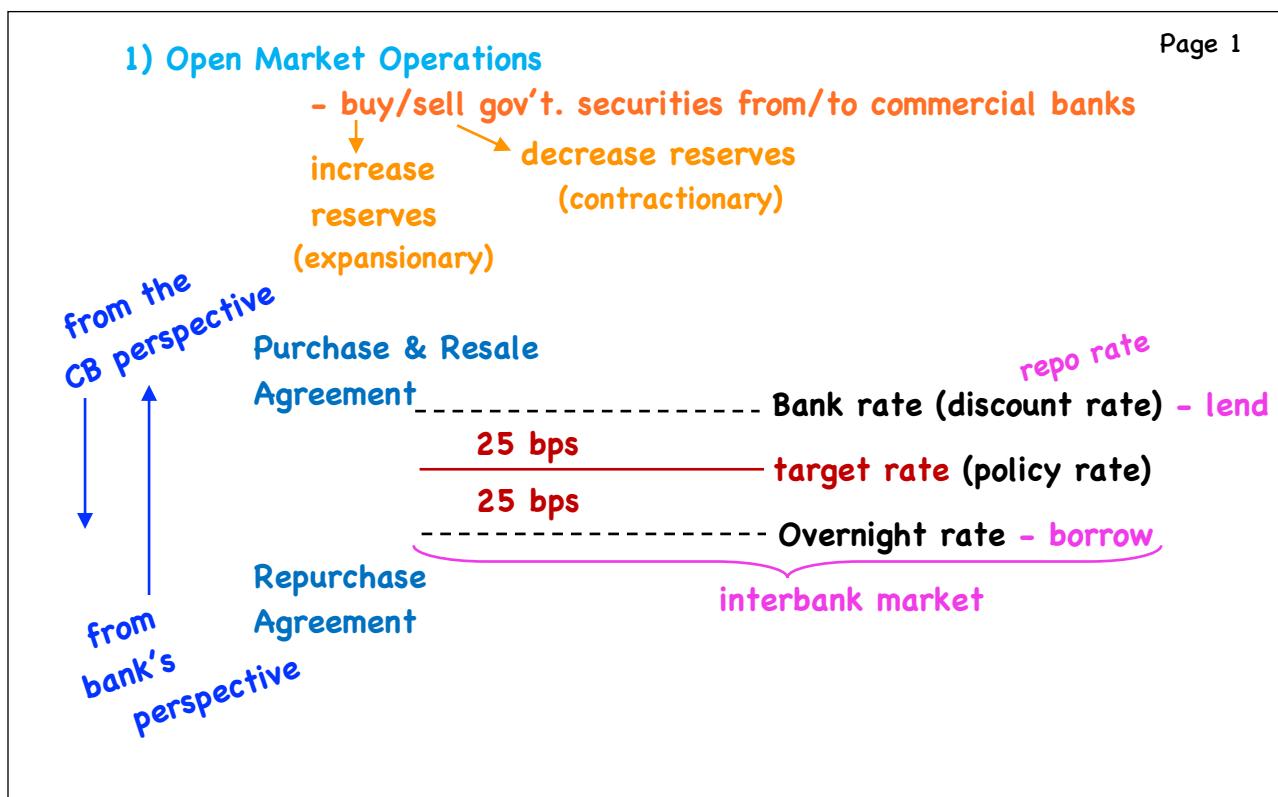
⇒ maximizing employment

dual mandate
 (Fed)

Costs of Inflation



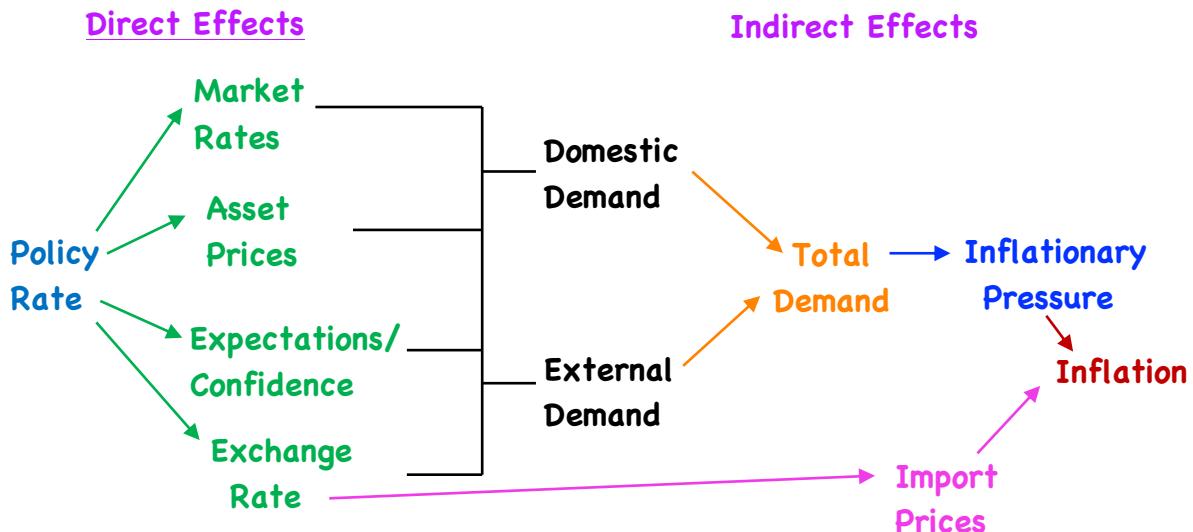
Policy Tools



- 2) Policy Rate \Rightarrow raising - contractionary
 \Rightarrow lowering - expansionary
- 3) Reserve Requirements - already discussed

Page 2

Transmission Mechanism



Policy

1) Inflation Targeting

Target: 1-3% usually

Horizon: 1-2 years

- most common except:

BO5 Fed

2) Exchange Rate Targeting

- setting a fixed level or bound of values for the exchange rate vs. a major currency \Rightarrow one with a good track record with inflation

- domestic interest rates & M2 must adapt to the FX rate instead!

Qualities of Effective Central Banks

① Independence: from gov't.

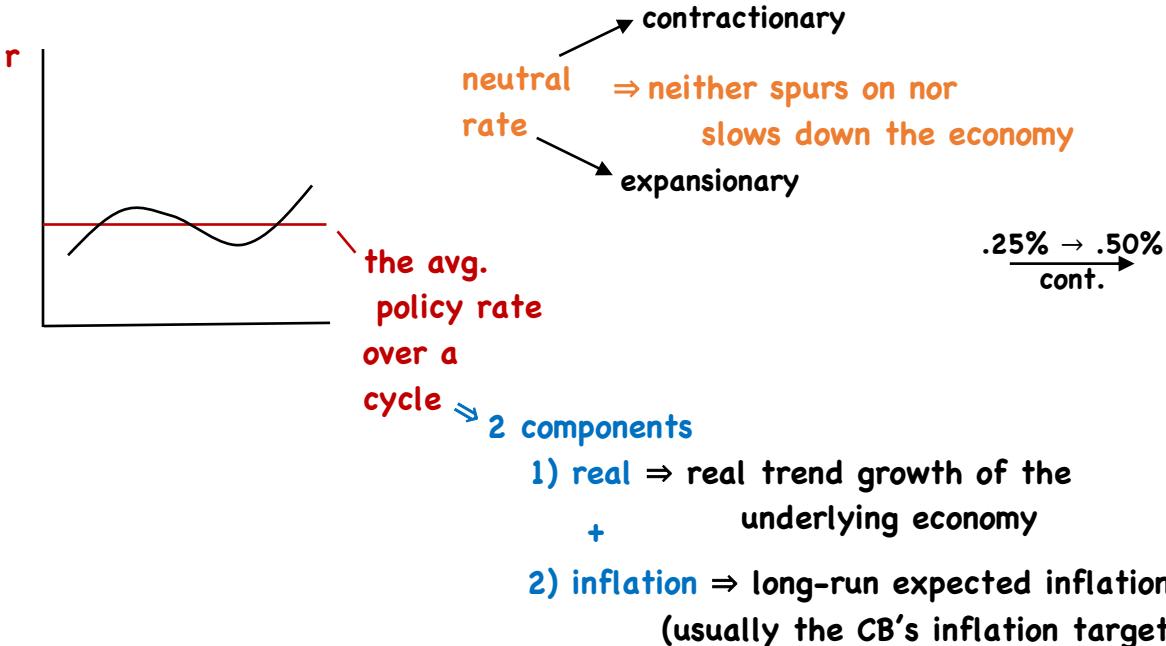
- operationally: to target rates without influence
 - target ind. free to define inflation

② Credibility: no competing incentives

③ Transparency

- the indicators watched
 - their forecast for inflation & growth

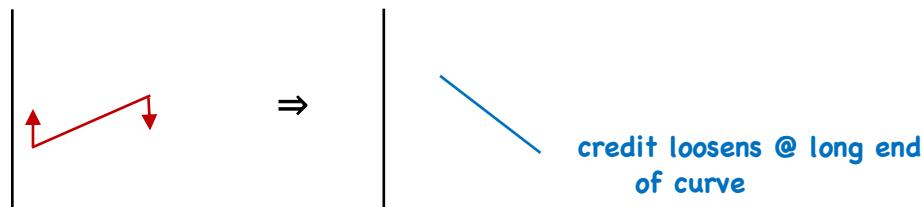
The Neutral Rate



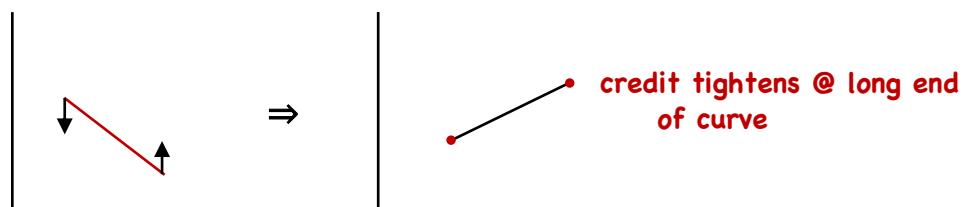
Limitations

1) Problems with transmission

Page 1



- rise in s.t. rates met with belief of looming recession



- drop in s.t. rates met with belief that inflation will not be controlled

2) Deflation

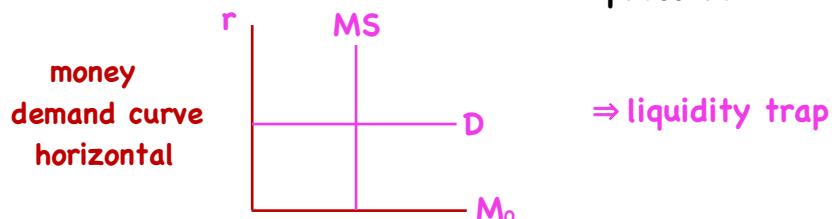
policy rate

 ↓
0%

- raises real value of debt
- may cause delays of consumption
(i.e. AD ↓)

Page 2

leads to more deflationary pressure



⇒ use of quantitative easing
to lower long rates



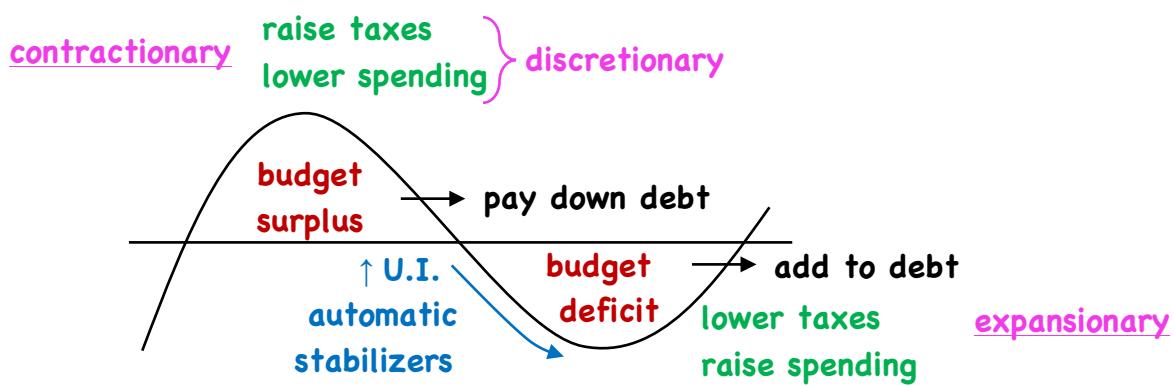
Fiscal Policy

Roles & Objectives

A. influence aggregate demand
(Keynesian)

- Expansionary ⇒ cut personal income taxes
⇒ cut sales taxes
⇒ cut corporate taxes
⇒ infrastructure spending
- Contractionary

opposite of



Fiscal Policy Tools

Exp.

Page 1

- A) Transfer Payments \Rightarrow automatic (i.e. UI, welfare, etc...)
- B) Government Spending \Rightarrow discretionary (i.e. health, education, defense)
- C) Capital Expenditure \Rightarrow infrastructure
 - enhances capital stock productivity
 - \Rightarrow innovation investments

Rev.

- A) Direct Taxes \Rightarrow on incomes
- B) Indirect Taxes \Rightarrow fuel, alcohol, tobacco, sales tax, etc...

Taxes should be:

1. Simple (easy to both calculate & pay)
2. Efficient (should not affect decisions)
3. Fair - horizontal equity - those in the same situations pay the same tax
 - vertical equity - richer pay more (progressive rates)
4. Revenue sufficient \Rightarrow should be enough

Adv:

Page 2

- \Rightarrow Indirect Taxes can be adjusted immediately
- \Rightarrow influence spending instantly
- \Rightarrow generate revenue efficiently
- \Rightarrow discourage undesirable behavior

may all have expectational effects

Dis:

- \Rightarrow Direct Taxes take time to change
- \Rightarrow Cap.Ex. takes even longer

Fiscal Multiplier

Recall:

\therefore household spending $c(1 - t)Y$

$$Y_d = Y - NT - (1 - t)Y$$

so if $G \uparrow$, $Y_d \uparrow$ $(1 - t)G$

$$MPS = 1 - MPC$$

and $C \uparrow$ $C(1 - t)G$

(c)

$(1 - t)c(1 - t)G$ etc...

$$\frac{1}{1 - C} \Rightarrow \text{multiplier}$$

$$\frac{1}{1 - C(1 - t)} \Rightarrow \text{fiscal multiplier}$$

			(.9)	(.1)	F
e.g.	Income	tax	Y_d	C	S
	100	20	80	72	8
			Fiscal multiplier	$\frac{1}{1 - .9(1 - .2)} = \frac{1}{1 - .72} = \frac{1}{.28} = 3.57$	

Balanced Budget Multiplier

$$Y = C + I$$

$$1000 = 900 + 100$$

$C = .9$
 $S = .1$

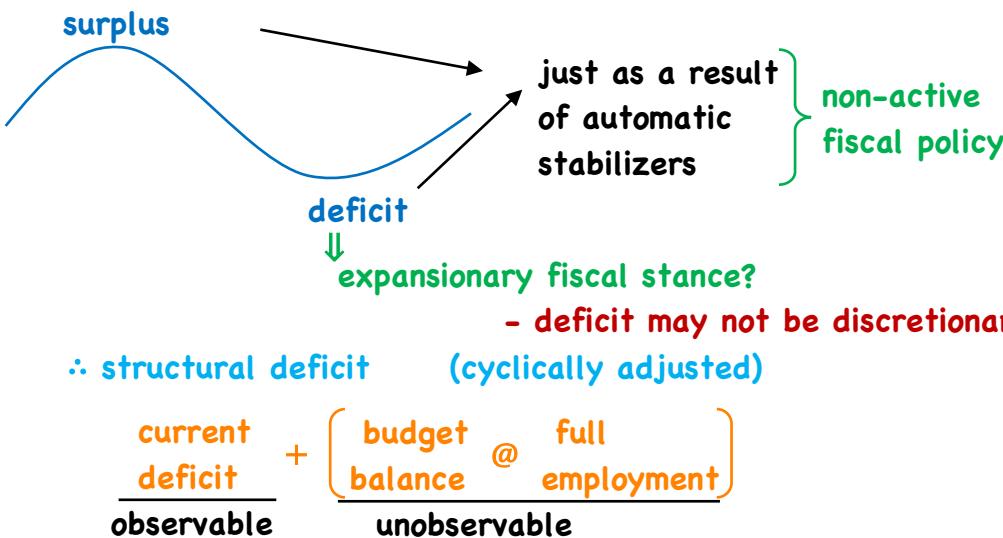
savings = investment

Introduce a gov't. sector with $t = 20\%$
and spending = \$200

if MPC < 1, Y increase

$$\begin{aligned}
 \text{net change} &= [200 - 200(.9)] \quad \frac{1}{1 - c(1 - t)} \\
 &= 20 \times 3.57 \\
 &\approx 71.40
 \end{aligned}$$

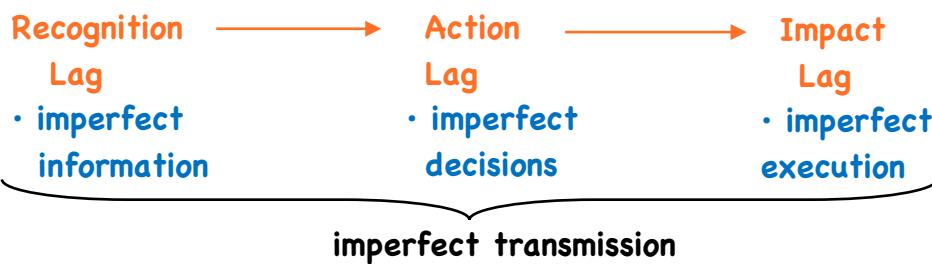
Implementation



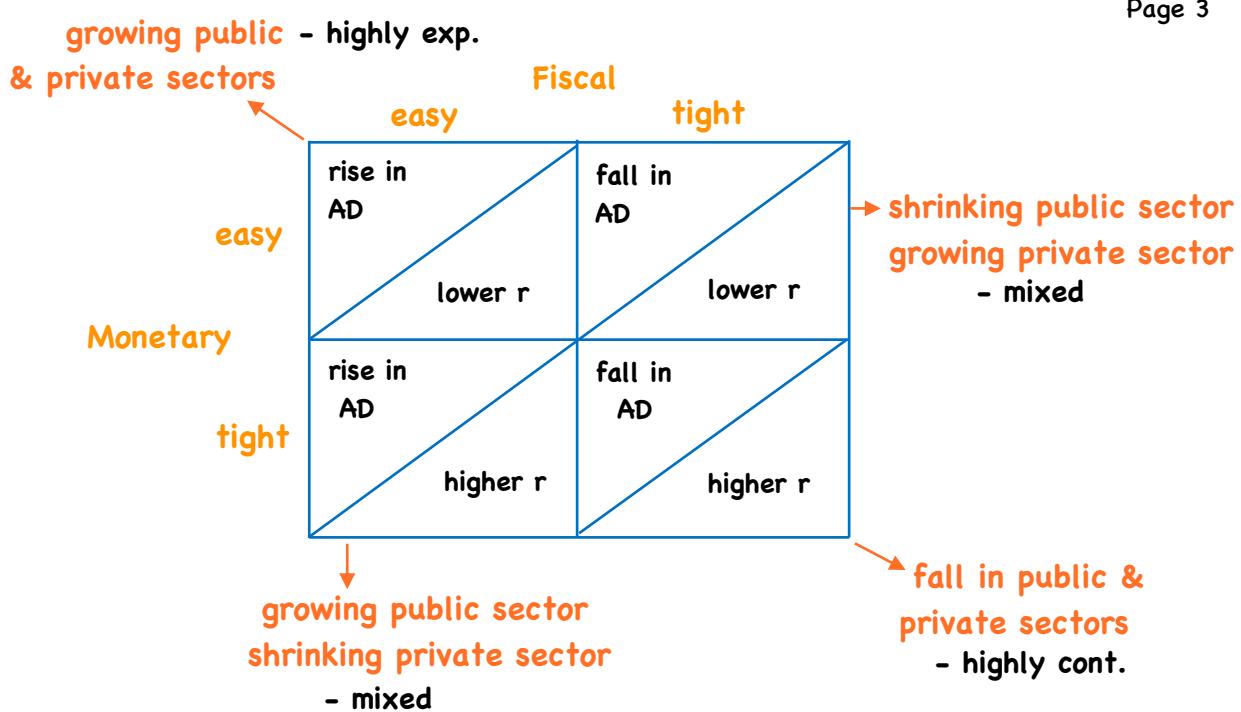
i.e. Assume automatic stabilizers reduce taxes and increase transfer payments by \$1B

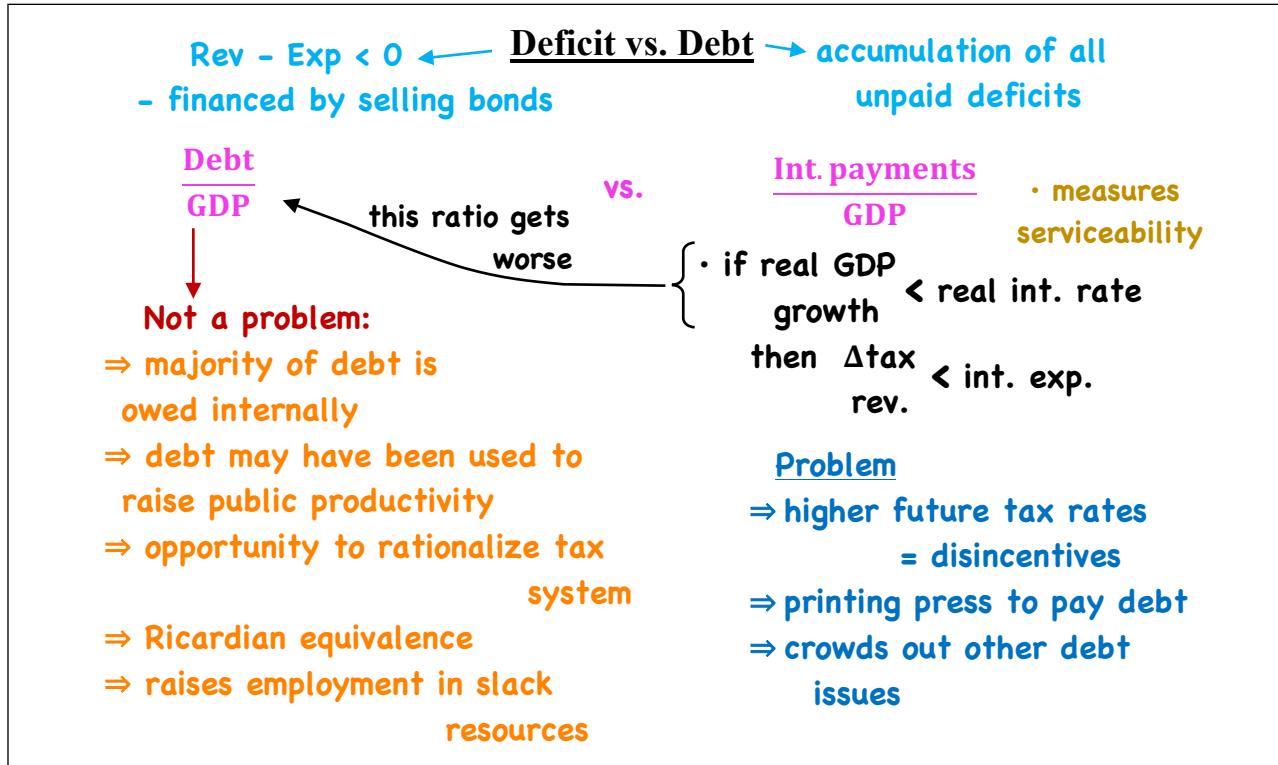
current deficit = (\$1.2B)

$$\therefore \text{structural deficit} = (\$1.2B) + \$1B = (\$200M)$$



- ⇒ will ↑G lead to inflation?
- ⇒ if deficit/GDP is large, extra deficits may not be possible
- ⇒ full employment is not static
 - ⇒ i.e. 5% unemp. may be 7% today
- ⇒ gov't. borrowing may crowd out more productive private borrowing

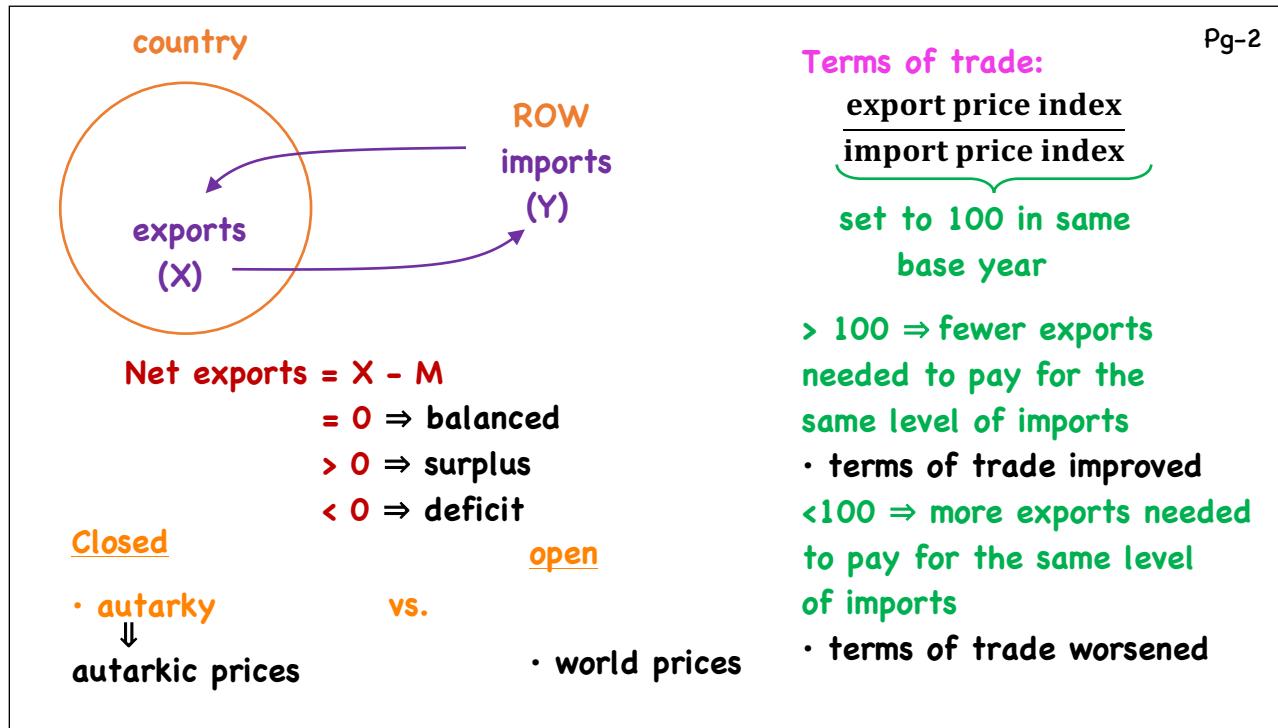
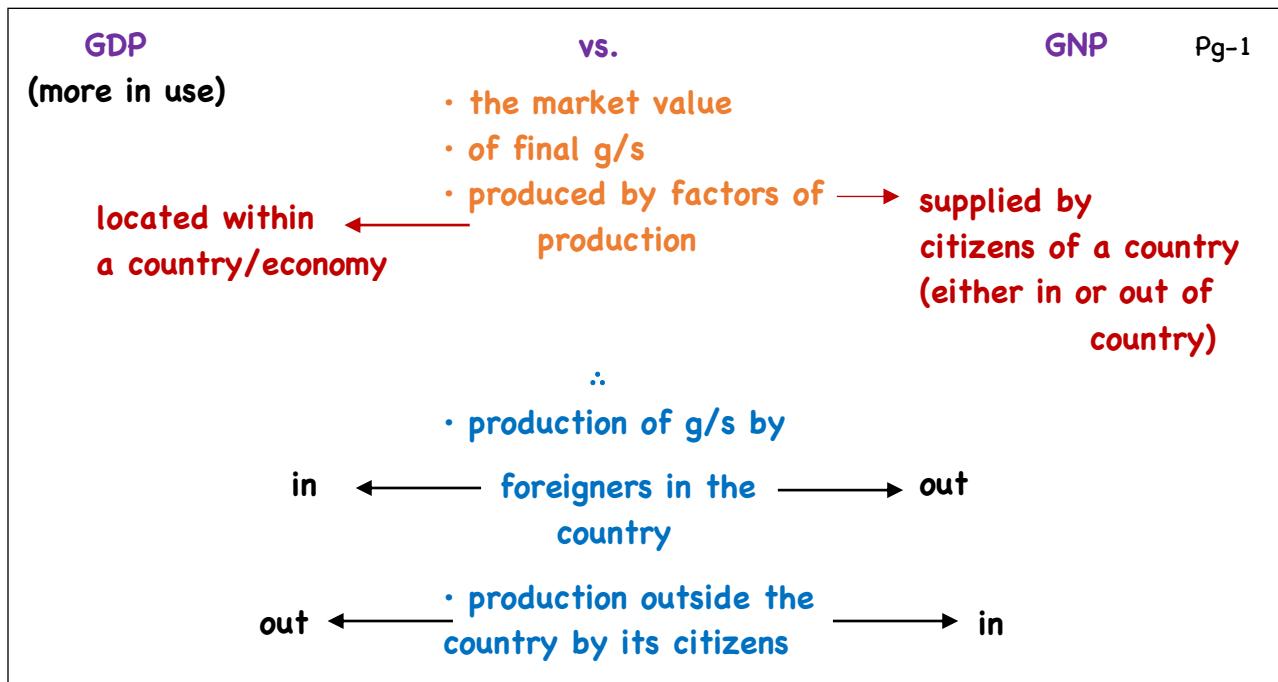




International Trade and Capital Flows

- a. compare gross domestic product and gross national product;
- b. describe benefits and costs of international trade;
- c. contrast comparative advantage and absolute advantage;
- d. compare the Ricardian and Heckscher-Ohlin models of trade and the source(s) of comparative advantage in each model;
- e. compare types of trade and capital restrictions and their economic implications;
- f. explain motivations for and advantages of trading blocs, common markets, and economic unions;
- g. describe common objectives of capital restrictions imposed by governments;
- h. describe the balance of payments accounts including their components;
- i. explain how decisions by consumers, firms, and governments affect the balance of payments;
- j. describe functions and objectives of the international organizations that facilitate trade, including the World Bank, the International Monetary Fund, and the World Trade Organization.

International Trade

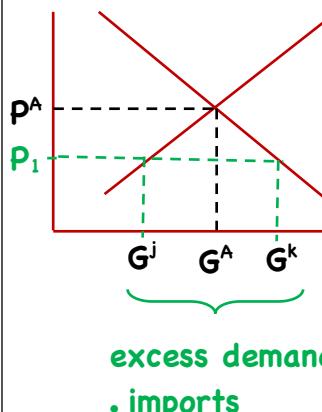


Free trade \Rightarrow no gov't restrictions on trade

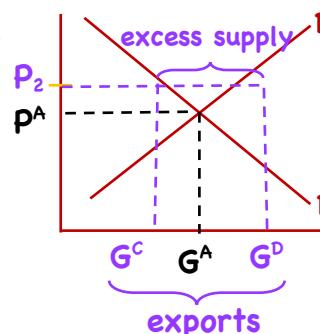
vs. \Rightarrow global AD & AS determine E_q & E_p of X/M

Trade Protection \Rightarrow tariffs, quotas, etc...

Pg-3



- Dom. S • trade @ P_1
- Dom. D
- trade-off
- lower P
- lower dom. production
- lower dom. employment



- Dom. S • trade @ P_2
- Dom. D
- trade-off
- higher P
- higher dom. prod. & empl.

- if the trade affected sector is labour intensive:
exports - positive imports - negative

Benefits:

Pg-4

- countries gain from exchange & specialization
 - exports occur @ higher prices
 - imports occur @ lower prices
- industries experience greater economies of scale
- households/firms have greater product variety
- competition is increased
- resources allocated more efficiently

reduces monopoly power of domestic firms

- trade \rightarrow + GDP
- efficient allocation
 - higher productivity
 - knowledge spillovers
 - pace of innovation
 - comp. necessity incentives

- Costs:**
- potential for greater income inequality
 - loss of jobs in developed countries

= structural unemployment (most difficult to fix)

Gains from Trade

Absolute Advantage \Rightarrow make it cheaper than other trading partners

Pg-1

Comparative Advantage \Rightarrow opportunity cost of making output is lower than opportunity cost of trading partners

	Mach.	Cloth
U.K.	4	8
India	2	16

U.K.	2-cloth	$\frac{1}{2}$ mach.
India	8-cloth	$\frac{1}{8}$ mach.

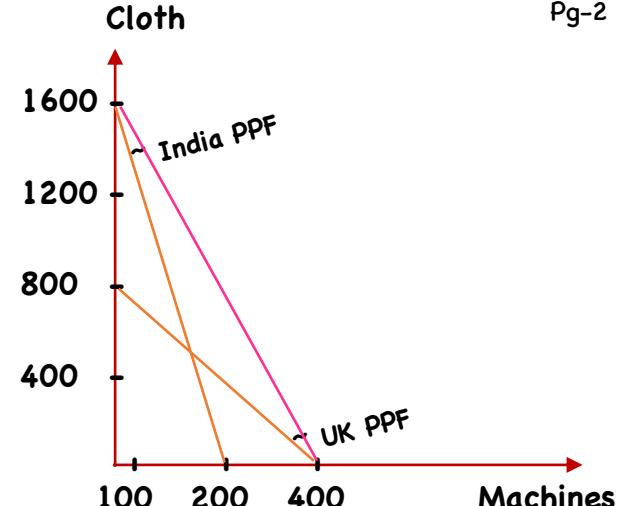
- if U.K could sell 1 mach. $>$ 2 cloth & India could buy 1 mach. $<$ 8 cloth win - win

	Mach.	Cloth
U.K.	4	8
India	2	6

U.K.	2-cloth	$\frac{1}{2}$ mach.
India	3-cloth	$\frac{1}{3}$ mach.

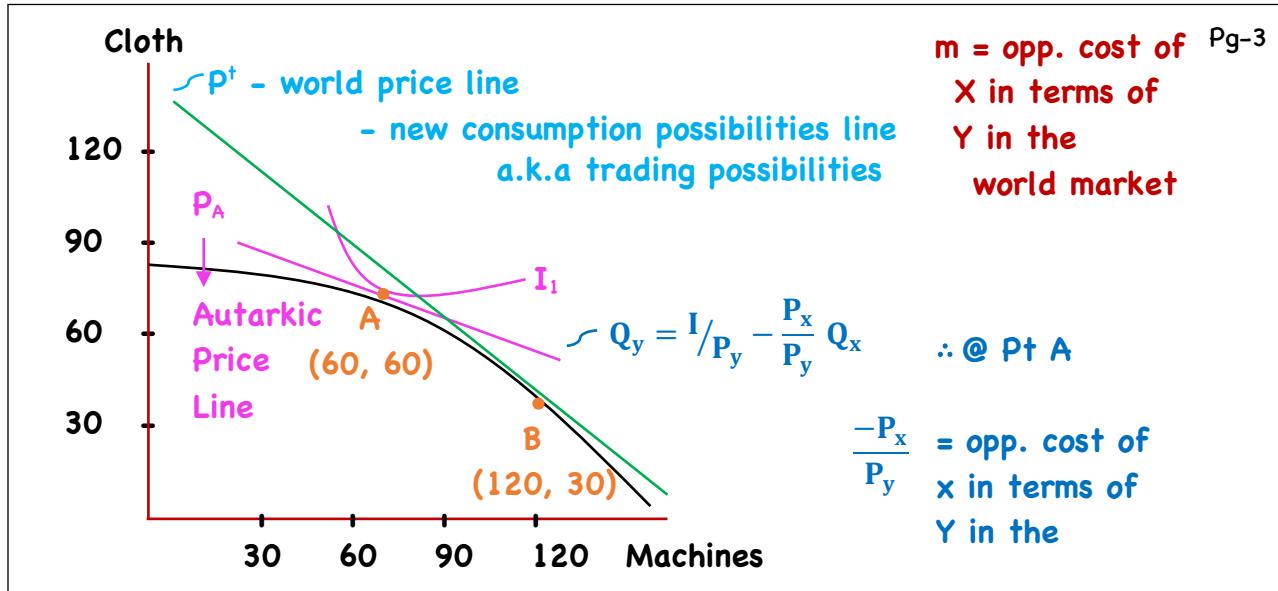
- U.K wins a bit
@3
- India wins a lot
@7
- U.K wins a low
@7
- India wins a bit

	P ^A	P ^G	C ^A	C
U.K.				
Machines	200	400	200	240
Cloth	400	0	400	640
India				
Machines	100	0	100	160
Cloth	800	1600	800	960
World				
Machines	300	400	300	400
Cloth	1200	1600	1200	1600



U.K. (200, 400) 1 mach. = 2 cloth

India (100, 800) 1 mach. = 8 cloth



Competitive Advantage

1. **Ricardian** \Rightarrow trade is based on technological differences
 \Rightarrow results in differences in labour productivity (comp. adv.)

Assumptions:

- Labour is the only variable factor input
- Technology varies across countries

of hours to make X/Y

$$a_{LX} \neq b_{LX} \quad \text{if } a_{LX} > b_{LX} \quad b \text{ make X}$$

$$a_{LY} \neq b_{LY} \quad \text{if } a_{LY} < b_{LY} \quad a \text{ make Y}$$

Pg-4

2. **Hecksher-Ohlin** \Rightarrow trade is based on endowment of factors of production
 \Rightarrow comp. adv. lies in goods produced with relatively abundant factor

$$\left(\frac{K}{L}\right)_A > \left(\frac{K}{L}\right)_B$$

cap. abundant country (X)
X - cap. int.
Y - Lab. int.

labour abundant country (Y)

Assumptions:

- Identical technologies within industries across countries
- Both L & K are variable factor inputs

Trade and Capital Flows

Restrictions

- Tariffs (tax on imports)
- Import quotas (restrict Q)
- Voluntary export restraints (VER)
- Export subsidies
- Embargoes (economic weapon)
- Domestic content requirements

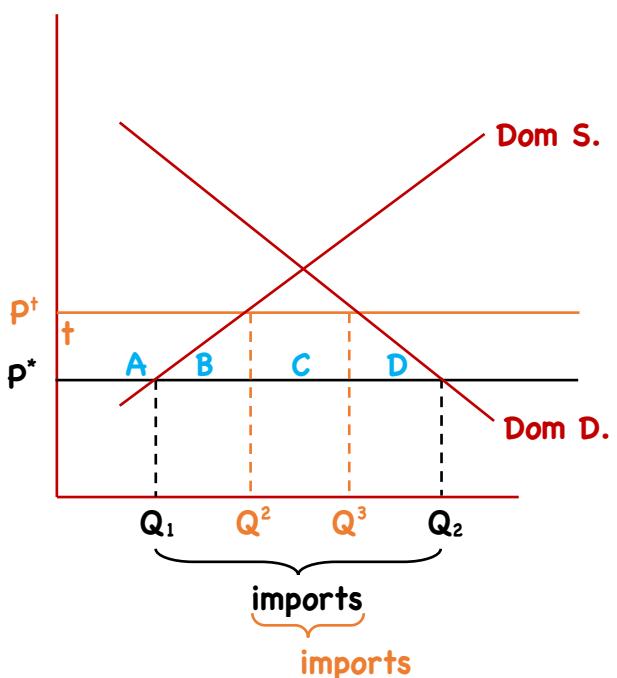
Pg-1

- protect domestic industries (established & new)
- protect domestic employment
- national security
- generate revenue
- close trade deficits

Capital Restrictions \Rightarrow restrict foreign ownership of domestic assets (limits openness of financial markets)

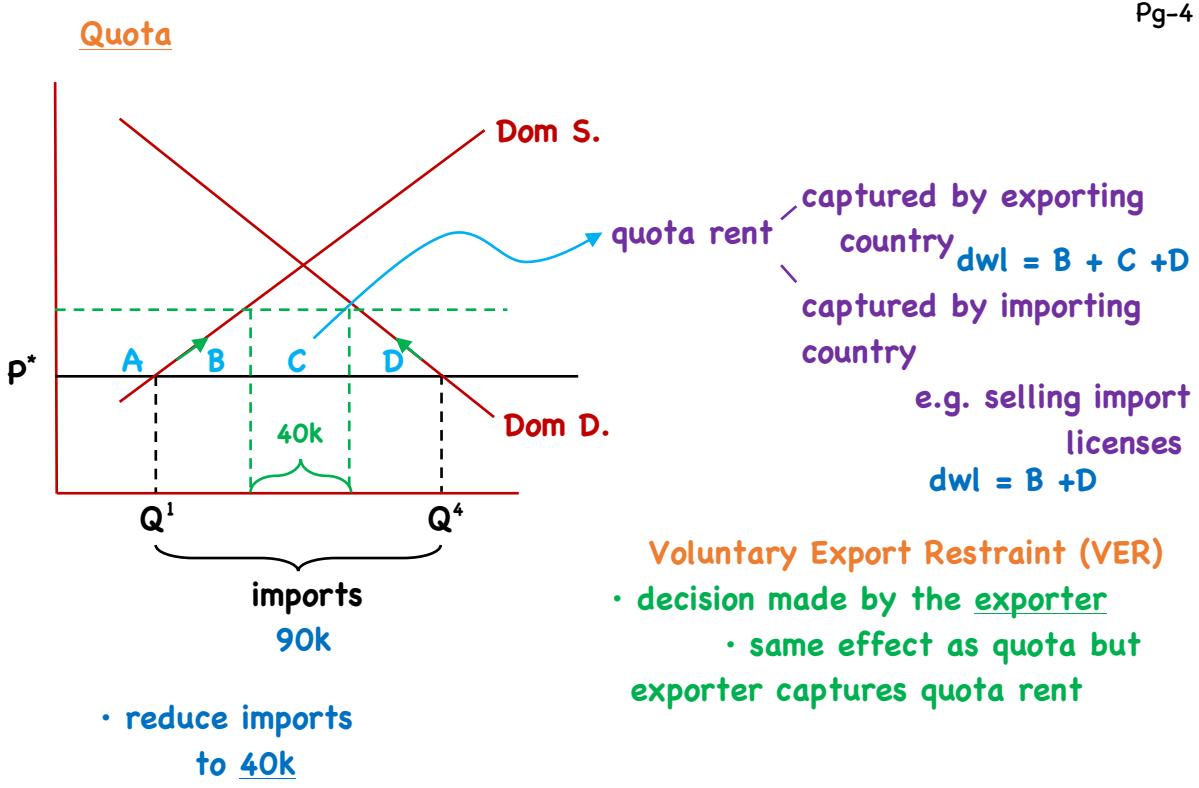
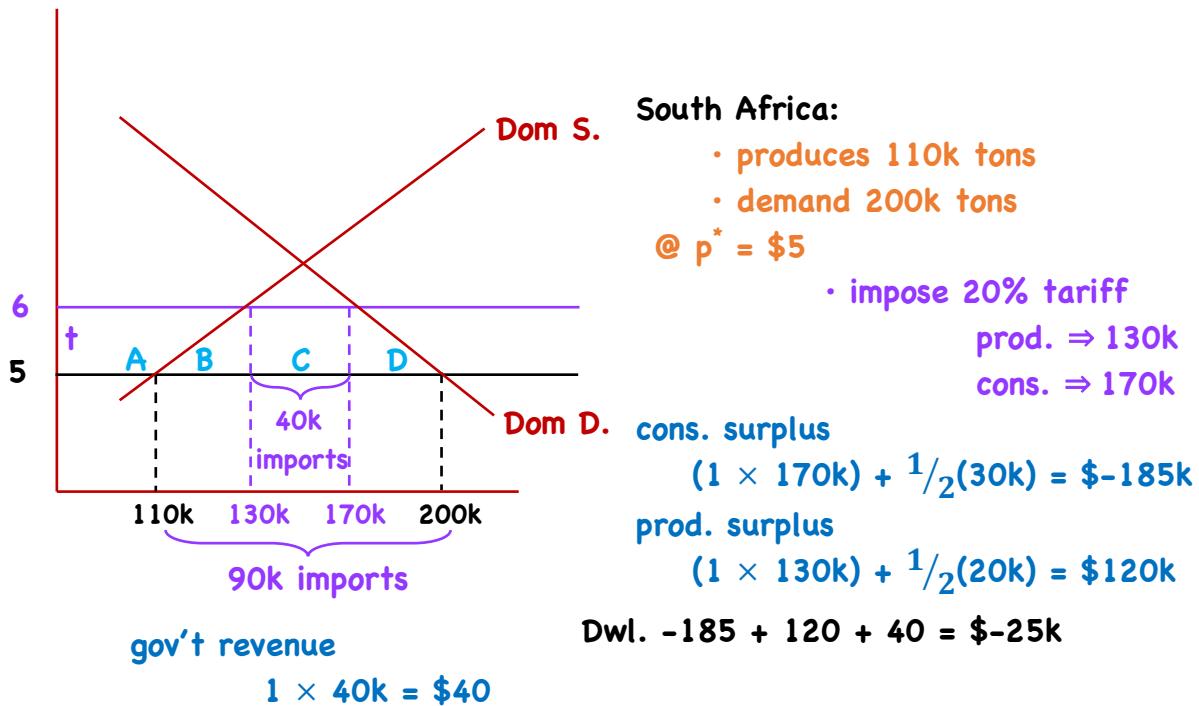
Tariffs - protect industries, generate revenues, reduce trade deficits

Pg-2



- consumer loses surplus value
 $A + B + C + D$
- producer gains surplus value
 A
- gov't revenue
 C
- d.w.l
 $- (B + D)$

Tariffs - protect industries, generate revenues, reduce trade deficits Pg-3



Export Subsidy • encourages exports

- direct payment from gov't → producer

Pg-5

Producer → shifts sales to export market

- get p^* + subsidy

⇒ no incentive to sell domestically for less than $(p^* + \text{subsidy})$

small country effect

prod. → $p^* + \text{subsidy}$
cons. → $p^* + \text{subsidy}$

large country effect

- efforts depress world price
- prod. ⇒ $(\text{lower } p^* + \text{subsidy})$
- cons. ⇒ $(p^* + \text{subsidy})$
- ∴ some part of subsidy is transferred to ROW

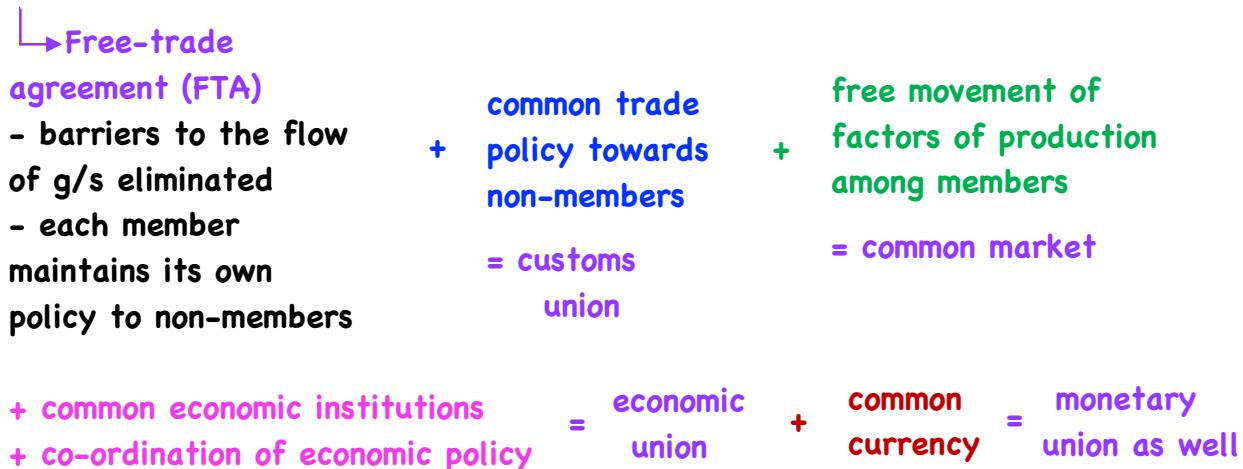
	Tariff	Import Quota	Export Subsidy	VER	Pg-5
Impact on:	Imp. Country	Imp. Country	Exp. Country	Imp. Country	
Prod. sur.	+	+	+	+	
Cons. sur.	-	-	-	-	
Gov't rev.	+	mixed	-	Ø	
dwl	- (small) may + (large)	- (small) may + (large)	-	-	
Price	+	+	+	+	
D. Cons.	-	-	-	-	
D. Prod.	+	+	+	+	
Trade	imports -	imports -	export +	imports -	

Regional Trading Agreements

Regional Trading Bloc

Pg-1

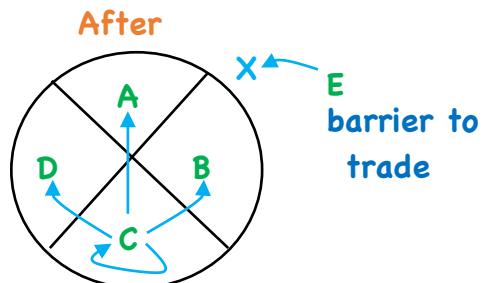
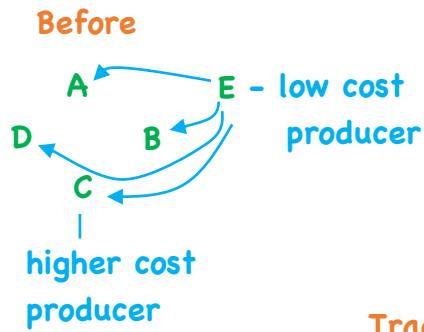
⇒ a group of countries that have signed an agreement to reduce and progressively eliminate barriers to trade and movement of factors of production among members



- regional integration • quicker, easier than WTO process

Pg-2

↳ results in preferential treatment for members vs. non-members

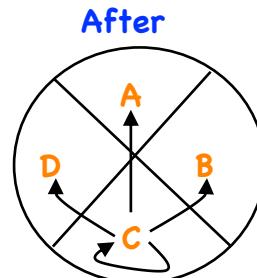
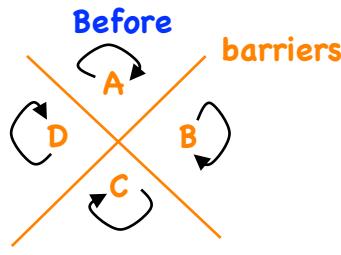


Trade diversion ⇒ lower cost imports from non-members are replaced with higher cost imports from member countries

- regional integration • quicker, easier than WTO process

↳ results in preferential treatment for members
vs. non-members

Pg-3



Trade creation: the replacement of higher cost domestic production for lower cost imports from member countries

- All the benefits from LO2

Pg-4

- + reduced potential for conflict
(higher levels of integration)
- + greater member bargaining power with ROW
- + spillover growth (convergence in living standards)



- Costs • adjustment costs

⇒ some production & jobs leave

temporary (i.e. one-time)

- but longer duration than otherwise

Contagion ⇒ problems in one country may spread to other members

Challenges to Implementation

Pg-5

1) Cultural/historical differences

⇒ integration @ economic level will require some social/political integration
(esp. common market)

2) higher levels of integration may result in loss of independent economic control

- difficult to control
 - relative prices
 - level of imports

less challenging

more challenging

FTA

custom union

common market

economic union

monetary union

Capital Restrictions

Pg-1

⇒ Free flow: adv.

- long term
- relatively fixed
- 'Direct'

- investment can occur @ a rate higher than domestic savings
- achieve higher economic growth rate
- FDI may bring new technology, skills, processes
- induce domestic firms to become more efficient

disadv. - if investment is short-term in nature

i.e. indirect investing (stocks, bonds, etc...)
may inflate local currency (overvaluation)

- when hot money leaves ⇒ capital flight

'hot
money'

- value destruction
 - real estate
 - equity markets
- currency devaluation
 - inflation engine

why restrict?

Pg-2

- protect domestic industries
- preserve domestic ownership
- minimize the export of profit
- control currency value

- if economy has a fixed-rate currency (i.e. a peg)

inflows - push
up a currency

- will most likely need capital restrictions
- limits on inflows/outflows make it easier to hold the peg

outflows - push
down a currency

- interest rates can be used to steer the domestic economy and not the exchange rate

How?

Pg-3

- prohibition \Rightarrow outright elimination
- taxes (in & out) \rightarrow punitive
- price controls
 - \swarrow special taxes on investment returns
 - \swarrow transaction taxes
- quantity controls \Rightarrow small relaxations on prohibition

- with holdings
- loss of special allowances

i.e. Cap. gains. exem.
Div. Tax Credit

\Rightarrow Costly to administer/monitor

\Rightarrow May have long-term costs - isolation from global capital markets

Balance of Payments

- Pg-1
- Double Entry**
- | | | |
|--------------------------------------|-----------|--------------------------------------|
| Debits | | Credits |
| • increases in real assets | | • decreases in real assets |
| • increases in financial assets | | • decreases in financial assets |
| • decreases in financial liabilities | | • increases in financial liabilities |
| • exports | • imports | • financial transactions |
| | | • transfer payments |

Components

1. Current Account - measures the flow of g/s
2. Capital Account - measures the transfer of capital
3. Financial Account - records investment flows

BOP identity: $1 = 2 + 3$

$$A = L + OE$$

Current Account

Pg-2

1. Merchandise trade - all commodities and manufactured goods bought, sold, given away
2. Services e.g.- tourism, transportation, engineering, business services
 - fees on patents, copyrights (software, books, movies)
3. Income Receipts - dividends, interest
4. Unilateral transfers - one-way transfer of assets
 - foreign direct aid
 - income earned from abroad sent back home

Capital Account

- 1) Capital transfers \Rightarrow debt forgiveness, migrants transfers, gift/inheritance taxes, death duties, transfer of funds linked to the sale/purchase of fixed assets
- 2) Sale and purchase of non-produced, non-financial assets
 - rights to natural resources, sale/purchase of intangible assets

Financial Account
1) financial assets abroad

official reserve assets
 government assets
 private assets

gold
 forex
 securities

Pg-3

2) foreign owned financial assets within the country

official assets

bonds, stocks,
 MBS

other foreign assets

- direct inv.
 - foreign liabilities

Examples

sell \$50M of goods

(\$1M in transp. costs)

terms: 90 days

(Acts. Rec.)
 (Inv.)

Financial Account \$50M

Current Account \$50M

goods \$49M
 services \$1M

Examples

Pg-4

2) import \$45M, terms of 90-days

Current Account \$45M

(Inv.)

Financial Account \$45M

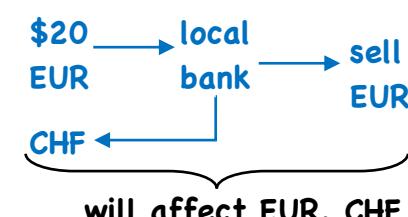
(Acts. Pay.)

3) Buy \$100M in bonds from foreign country (same currency)

Financial Account \$100M

 (Invest)⁺

Financial Account \$100M

 (cash)⁻
4) Switzerland


German
 Bank
 deposits rather
 than sells
 (foreign reserves)

Recall: $Y = C + I + G + (X - M)$

equals the current account balance

- measures the size and direction of international borrowing (lending)

$$| \text{current account} | = | \text{capital + financial account} |$$

• hence the term 'balance' of payments

$$\text{So, } Y = C + I + G + (X - M)$$

$$(X - M) = Y - C - I - G$$

or

$$CA = Y - (C + I + G)$$

if $CA < 0$, then must borrow from abroad

if $CA > 0$, must be lending abroad

Pg-5

Recall:

$$Y_d = Y - (T + R)$$

and $Y_d = C + S_p$

or

$$C = Y_d - S_p = Y - (T + R) - S_p$$

$$CA = Y - (C + I + G)$$

$$CA + I = S_p + S_g$$

dom I

If $CA < 0$, dom I

Can be $> S_p + S_g$

$$CA = Y - [(Y - (T + R) - S_p) + I + G] \quad \text{Pg-6}$$

$$= Y - (Y + R + T - S_p + I + G)$$

$$= Y - Y - R + T + S_p - I - G$$

$$= S_p + T - R - I - G$$

$$= S_p - I + (T - G - R)$$

gov't surplus
 S_g

$$CA = S_p - I + S_g$$

$$\text{or } S_p = I + CA - S_g$$

dom I

$$\text{or } CA = S_p + S_g - I$$

$$CA < 0$$

If S_p too low
I is too high
 $S_g < 0$

Trade Organizations

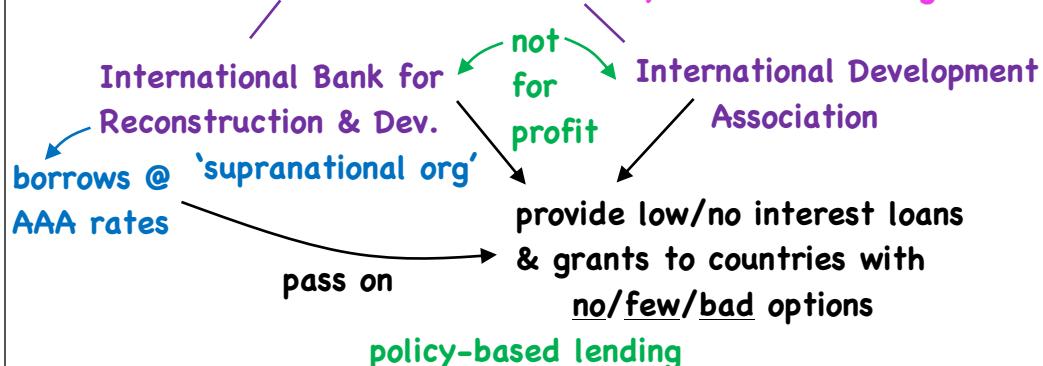
International Monetary Fund (IMF)

Pg-1

- oversees the fixed exchange rate agreements between countries
- help gov'ts manage their exchange rates
- provide short-term capital to aid balance of payments (prevent the spread of crises)

World Bank

- help developing countries fight poverty and enhance environmentally sound economic growth



World Trade Organization (WTO)

Pg-2

- regulates cross-border trade relationships globally (reviews/monitors trade policies)
- implements, administers & operates individual agreements
- settles disputes

Currency Exchange Rates

- a. define an exchange rate and distinguish between nominal and real exchange rates and spot and forward exchange rates;
- b. describe functions of and participants in the foreign exchange market;
- c. calculate and interpret the percentage change in a currency relative to another currency;
- d. calculate and interpret currency cross-rates;
- e. calculate an outright forward quotation from forward quotations expressed on a points basis or in percentage terms;
- f. explain the arbitrage relationship between spot rates, forward rates, and interest rates;
- g. calculate and interpret a forward discount or premium;
- h. calculate and interpret the forward rate consistent with the spot rate and the interest rate in each currency;
- i. describe exchange rate regimes;
- j. explain the effects of exchange rates on countries' international trade and capital flows.

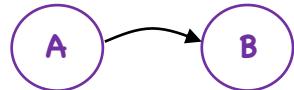
FX - Market

<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">USD</td> <td style="width: 33%;">AUD</td> <td style="width: 33%;">RUB</td> </tr> <tr> <td>EUR</td> <td>NZD</td> <td>SGD</td> </tr> <tr> <td>GBP</td> <td>NOK</td> <td>etc...</td> </tr> <tr> <td>JPY</td> <td>SEK</td> <td></td> </tr> <tr> <td>CAD</td> <td>CHF</td> <td></td> </tr> </table> <p style="margin-top: 10px;">individual currencies</p> <p>So... EUR. USD = $\frac{\text{USD}}{\text{EUR}}$</p> <p>if $\frac{\text{USD}}{\text{EUR}}$ et₁ = 1.0950 et₂ = 1.0900</p> <p>USD appreciated or EUR depreciated</p>	USD	AUD	RUB	EUR	NZD	SGD	GBP	NOK	etc...	JPY	SEK		CAD	CHF		<p style="margin-top: 10px;">exchange rates</p> <p>EUR. USD USD. CAD GBP. USD USD. JPY</p> <p style="margin-top: 10px;">in terms of A/B</p> <p>price $\frac{\text{USD}}{\text{EUR}} = 1.0950$ base (1) buys</p> <p>need $\frac{\text{CAD}}{\text{USD}} = 1.3925$ (1) to get</p>	<p style="text-align: right;">Pg-1</p>
USD	AUD	RUB															
EUR	NZD	SGD															
GBP	NOK	etc...															
JPY	SEK																
CAD	CHF																

<ul style="list-style-type: none"> • Nominal exchange rate <p>Now, let's assume</p> <ul style="list-style-type: none"> { 1) a world of homogenous g/s 2) no market frictions 3) no trade barriers (i.e. capital restrictions) <p>if an iPad cost £ 500 or \$750, we would expect</p> <p style="margin-left: 40px;">$\frac{\text{USD}}{\text{GBP}} = 1.5000$ [GBP. USD = 1.5000]</p> <p>called Purchasing Power Parity (theory) rarely satisfied (if ever)</p> <p>Reality Check: nominal exchange rates exhibit persistent deviations from PPP</p>	<p style="margin-top: 10px;">EUR. USD or $\frac{\text{USD}}{\text{EUR}}$</p> <p style="margin-top: 10px;">spot rates</p> <p style="margin-top: 10px;">direct → d - domestic f - foreign</p> <p style="margin-top: 10px;">indirect → $(S_{d/f})$</p>	<p style="text-align: right;">Pg-2</p>
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Real Exchange Rates

Pg-3



you live in
A - land... and want to buy
from B - land

① foreign price

$$\text{level in domestic} = S_{A/B} \times CPI_B \\ \text{currency}$$

and if CPI_A = price level in
A - land

$$\text{real exchange} \\ \text{rate} = S_{A/B} \times \frac{CPI_B}{CPI_A}$$

if $A/B \uparrow$ (B.A)
or if $CPI_B \uparrow$

- A - lander will suffer a loss of PP in terms of B - land g/s

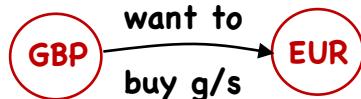
But: if $CPI_A \uparrow$ (and I & CPI move together)

- A - lander will gain PP in terms of B - land g/s

Real Exchange Rates

Pg-4

Example/



$$\text{real fx-rate} = S_{GBP/EUR} \times \frac{CPI_{EUR}}{CPI_{GBP}}$$

so, if $S_{GBP/EUR} \uparrow 10\%$, $CPI_{EUR} \uparrow 5\%$, $CPI_{GBP} \uparrow 2\%$

- what is the change in the real fx-rate?

$$\left[\left(1 + \% \Delta S_{GBP/EUR} \right) \times \frac{1 + \% \Delta CPI_{EUR}}{1 + \% \Delta CPI_{GBP}} \right] - 1 = \left(1.10 \times \frac{1.05}{1.02} \right) = 13.23$$

shortcut ~ $10\% + 5\% - 2\%$

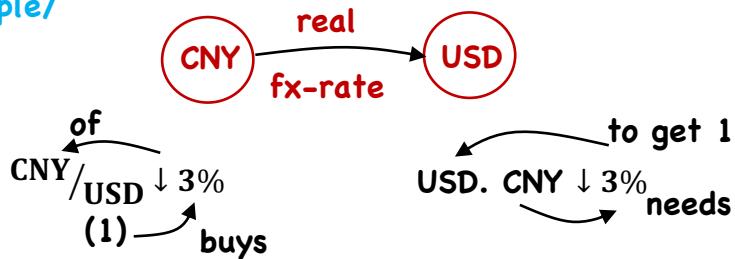
$$= 13\%$$

∴ real fx-rate is 13.23% higher

- means ⇒ need 13.23% more £ to buy same g/s in £

Real Exchange Rates
Example/

Pg-5



$$CPI_{USD} = 1.5\% \quad CPI_{CNY} = 4.5\%$$

$$\text{real fx rate } \left[1 + (-.03) \times \frac{1.015}{1.045} \right] - 1 = \left(.97 \times \frac{1.015}{1.045} \right) - 1 = -5.78\%$$

 (shortcut $-3\% + 1.5\% - 4.5\% = -6\%$)

means \Rightarrow need 6% less CNY to
buy same g/s in USD

 so, CNY
appreciated
against USD

e.g./ Setup: hold bonds in HKD, live in AUD

$$(S_{AUD/HKD}) = (S_d/f) \quad \text{Pg-5b}$$

1) if $S_{AUD/HKD} \uparrow$, HKD bonds \uparrow in AUD terms?

 yes, if $S_{AUD/HKD} \uparrow$, HKD buys more AUD

2) if $S_{AUD/HKD} \uparrow$, relative purchasing power in HKD \uparrow

 no, HKD buy more AUD, but they do not buy
more g/s denominated in HKD

**3) if $CPI_{AUD} \uparrow$, then $\text{real}_{AUD/HKD} \uparrow \Rightarrow$ implies that relative
purchasing power of AUD income is higher**

 ① no $S_{AUD/HKD} \times \frac{CPI_{HKD}}{CPI_{AUD}}$ (if $CPI \uparrow$, $\frac{CPI_{HKD}}{CPI_{AUD}} \downarrow$, $\text{real}_{AUD/HKD} \downarrow$)

 ② no if $\text{real}_{AUD/HKD} \uparrow$, purchasing power of AUD \downarrow

e.g./ Setup: hold bonds in HKD, live in AUD

$$\left(\frac{S_{AUD/HKD}}{S_d/f} \right) = \left(\frac{CPI_{HKD}}{CPI_{AUD}} \right)^{Pg-5c}$$

- 4) if $S_{AUD/HKD} \downarrow$, then $real_{AUD/HKD} \downarrow$ & increase the relative purchasing power of AUD income

yes: $\left(\frac{S_{AUD/HKD}}{S_d/f} \times \frac{CPI_{HKD}}{CPI_{AUD}} \right) = real_{AUD/HKD}$

- implies AUD is strengthening against HKD

- 5) $S_{AUD/HKD} \uparrow 5\%$, $CPI_{HKD} \uparrow 5\%$, $CPI_{AUD} \uparrow 2\%$

(HKD bonds in AUD \uparrow or \downarrow ?) $\uparrow 5\%$

- 6) change in relative purchasing power of AUD income

$$real_{AUD/HKD} = \left[\left((1 + .05) \times \frac{1.05}{1.02} \right) \right] - 1 = 8.089\%$$

FX - Market Products

spot rates \Rightarrow for immediate delivery (i.e. on the spot)

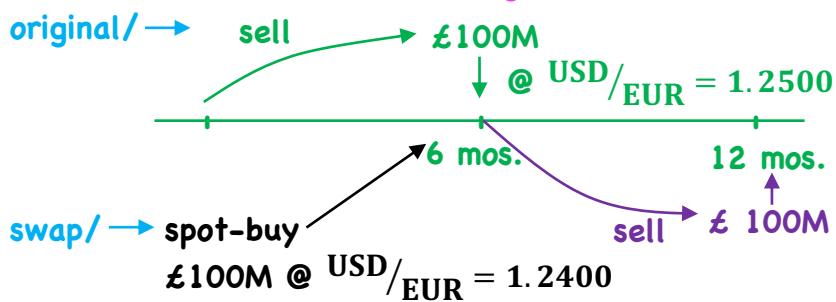
Pg-6

(24 hours/day - on business days) (T + 2 settlement)

forward exchange rates \Rightarrow delivery at a future date agreed upon today (OTC)

futures \Rightarrow exchange-traded forwards (standardized)

Fx-swap • rolling an existing, but expiring forward, to a future date
- requires simultaneous spot transaction + new forward agreement



FX - Market Participants

- facilitate trade in g/s
 - facilitate capital flows (FDI or indirect Inv.)
 - hedge forex risk
 - speculate
- ⇒ Participants
- Corporations ⇒ hedging, capital flows
 - Funds ⇒ insurance, mutual, pension, endowments, ETFs
(a.k.a. non-leveraged institutional or real money funds)
 - Leveraged Funds ⇒ hedge funds, prop. traders, leveraged ETFs, etc...
 - Retail ⇒ Individual Account
 - Government/Quasi-Gov't
 - Central Banks – manage foreign reserves, currency intervention
 - Sovereign Wealth Funds (SWFs)

Pg-7

FX- Rate Calculations



Pg-8

Quote Conventions

EUR	euro	USD/EUR	EUR. USD	Major Pairs
JPY	dollar-yen	JPY/CAD	USD. JPY	
GBP	sterling	USD/GBP	GBP. USD	
CAD	loonie	CAD/USD	USD. CAD	
AUD	aussie	USD/AUD	AUD. USD	
NZD	kiwi	USD/NZD	NZD. USD	
CHF	swissie	CHF/USD	USD. CHF	

Quote Conventions		A/B	B.A.	Pg-9
EURJPY	euro-yen	JPY/EUR	EUR. JPY	
EURGBP	euro-sterling	GBP/EUR	EUR. GBP	
EURCHF	euro-swiss	CHF/EUR	EUR. CHF	
GBPJPY	sterling-yen	JPY/GBP	GBP. JPY	
EURCAD	euro-cad	CAD/EUR	EUR. CAD	
CADJPY	cad-yen	JPY/CAD	CAD. JPY	

cross pairs

USD. CAD	
Sell	Buy
1.39 ⁰²	1.39 ⁰⁶
16.8M	19.2M

Bid Offer

Sell USD Buy USD

(Buy CAD) (Sell CAD)

1.3902⁵ some quotes

dollar cents pips

100 pips = 1 cent

Yen 110.63

t_0	$\text{USD/EUR} = 1.2500$	t_1	$\text{USD/EUR} = 1.3000$	Pg-10
	$\frac{1.30 - 1.25}{1.25} = 4\%$		\Rightarrow interpreted from the point of view of the base \therefore the EUR has appreciated relative to the USD by 4%	
Inverse/	$\text{EUR/USD} = \frac{1}{1.2500} = 0.8000$			
			$\text{EUR/USD} = \frac{1}{1.3000} = 0.7692$	Identical Statements

$\frac{.7692 - .8000}{.8000} = -3.85\%$ \therefore the USD has depreciated 3.85% relative to the EUR

USD. CAD = 1.3900	$CAD. USD = \frac{1}{1.3900} = 0.7194$	Pg-11																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">USD. CAD</th> </tr> <tr> <th>Sell 1.38⁹⁸</th> <th>Buy 1.39⁰²</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Bid</td> <td style="text-align: center;">Ask -offer ↓</td> </tr> <tr> <td style="text-align: center;">Buy USD</td> <td></td> </tr> <tr> <td style="text-align: center;">Sell CAD</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">Payoff: (gains/losses)</td> </tr> </tbody> </table>	USD. CAD		Sell 1.38 ⁹⁸	Buy 1.39 ⁰²	Bid	Ask -offer ↓	Buy USD		Sell CAD		Payoff: (gains/losses)		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">CAD. USD</th> </tr> <tr> <th>Buy .71⁹⁶</th> <th>Sell .71⁹²</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Ask offer</td> <td style="text-align: center;">Bid ↓</td> </tr> <tr> <td style="text-align: center;">Sell CAD</td> <td></td> </tr> <tr> <td style="text-align: center;">Buy USD</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">in USD</td> </tr> </tbody> </table>	CAD. USD		Buy .71 ⁹⁶	Sell .71 ⁹²	Ask offer	Bid ↓	Sell CAD		Buy USD		in USD	
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Buy USD																									
in USD																									

FX Cross - Rate Calculations

e.g. 1 / $CAD/USD = 1.3980$	$USD/EUR = 1.0950$	Pg-12
Find CAD/EUR		
$CAD/USD \times USD/EUR = CAD/EUR$		
$1.3980 \times 1.0950 = 1.5308$ (corrected from screen)		
e.g. 2 / $CAD/USD = 1.3980$	$JPY/USD = 121.10$	
Find JPY/CAD		e.g. 3 / Decompose CHF/EUR
- first $USD/CAD = \frac{1}{1.3980} = 0.7153$		$CHF/USD \times USD/EUR$
$JPY/USD \times USD/CAD = JPY/CAD$		
$121.10 \times 0.7153 = 86.62$		

Forward Calculations

- forward rates typically quoted as spot + points ↗ pips
(pos./neg.) Pg-13

spot + points = forward, premium (base)

spot - points = forward discount (base)

e.g. / $\text{USD/EUR} = 1.2875$ discount

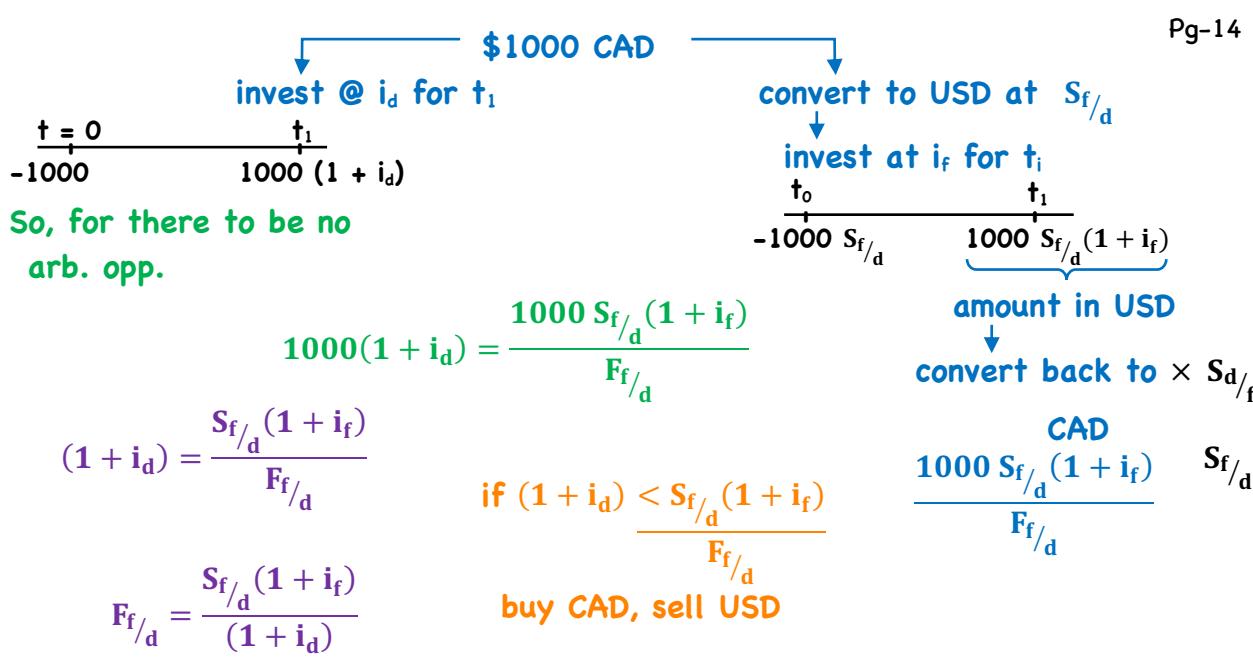
1-yr. forward rate = 1.28485

1-yr forward points = -26.5

e.g. /

spot	1.2875	
1 week	-.3	
1 mos.	-1.1	
3 mos.	-5.5	
6 mos.	-13.3	
12 mos.	<u>-26.5</u>	

also called swap points



$$F_{f/d} = \frac{S_{f/d}(1 + i_f)}{(1 + i_d)}$$

e.g. $S_{f/d} = 1.6535$ $i_d = 3.5\%$ $i_f = 5\%$ Pg-15

$$F_{f/d} = \frac{1.6535(1.05)}{1.035} = 1.6775$$

240 pips
(points)
i.e. 2.4¢

If $F_{f/d} = 1.6900$ - what would we do?

Simple Rule: Buy low, Sell high

$$(1 + i_d) = \frac{S_{f/d}(1 + i_f)}{F_{f/d}}$$

Borrow 1.6535 o (f), convert to 1 unit of (d), Sell $F_{f/d}$ @ 1.69

$$1.035 > \frac{1.6535(1.05)}{1.69} = 1.0273$$

$$F_{f/d} = \frac{S_{f/d}(1 + i_f)}{(1 + i_d)} \Rightarrow \frac{F_{f/d}}{S_{f/d}} = \frac{(1 + i_f)}{(1 + i_d)}$$

Pg-16

$\underbrace{F_{f/d}}_{F_{f/d} > S_{f/d}} > \underbrace{S_{f/d}}_{\text{if num} > \text{den}}$

$$\frac{F_{d/f}}{S_{d/f}} = \frac{(1 + i_d)}{(1 + i_f)}$$

$\left. \begin{array}{l} \text{den} > \text{num} \\ F_{d/f} < S_{d/f} \end{array} \right\}$

General Rule:

- if the base currency is the higher yielding currency
⇒ forwards will be at a discount
- if the base currency is the lower yielding currency
⇒ forwards will be at a premium

Exchange Rate Regimes

fixed-rate	floating-rate Pg-17
<ul style="list-style-type: none"> • reduces uncertainty 	<ul style="list-style-type: none"> • exchange-rate risk • uncertainty
fully convertible	capital restrictions
<ul style="list-style-type: none"> • unrestricted capital flows • efficient allocation of capital <p>weak to no monetary policy effectiveness</p>	<ul style="list-style-type: none"> • inefficient allocation of capital <p>effective monetary policy</p> <p>fully independent</p>

Historical Evolution:			Pg-18
Gold Standard	→	Bretton Woods	→ Flexible fx
<ul style="list-style-type: none"> • up to 1930s • money supply tied to trade balance surplus/deficit • drop in global trade during 1930s – countries abandoned the standard 		<ul style="list-style-type: none"> • fixed fx regime • inflation of 1970s - most countries leave fixed for floating fx regime 	<ul style="list-style-type: none"> • market determined • fx rates much more volatile than expected
→ Midway → limited flexibility			
EU (79-92)			

1) No separate legal tender

dollarization

monetary union (EU)

- countries use the currency of another nation
- imposes fiscal discipline since country cannot monetize debt
- renders domestic monetary policy unless

Pg-19

2) Currency Board System

- commitment to exchange domestic for foreign at a fixed rate
- limits printing press obviously
- 100% foreign currency reserves against the monetary base

3) Fixed parity • no legislative commitment

Pg-20

- can be abandoned

- does not require 100% fx reserves
- some central bank flexibility

→ USD or → trade-weighted basket of currencies

+/- 1% band

excess demand results in > 1%

inflationary → • must sell domestic & buy foreign to keep peg
deficient demand results in < 1%

deflationary → • must sell foreign reserves and buy domestic

4) Target zone - as above but +/- 2%

5) Active & Passive Crawling Pegs

Pg-21

static peg \Rightarrow fixed

passive \Rightarrow peg adjusted to inflation (passive crawl)

active peg \Rightarrow fx-rate pre-announced with changes in small steps

- rather than react to inflation, the announcement was meant to influence expectations (active crawl)

6) Fixed Parity with Crawling Bands

fixed rate with +/- 1%

then +/- 2%

then +/- 3% etc...

7) Managed Float - fx-rate based on policy targets

i.e. trade balance, price stability, etc...

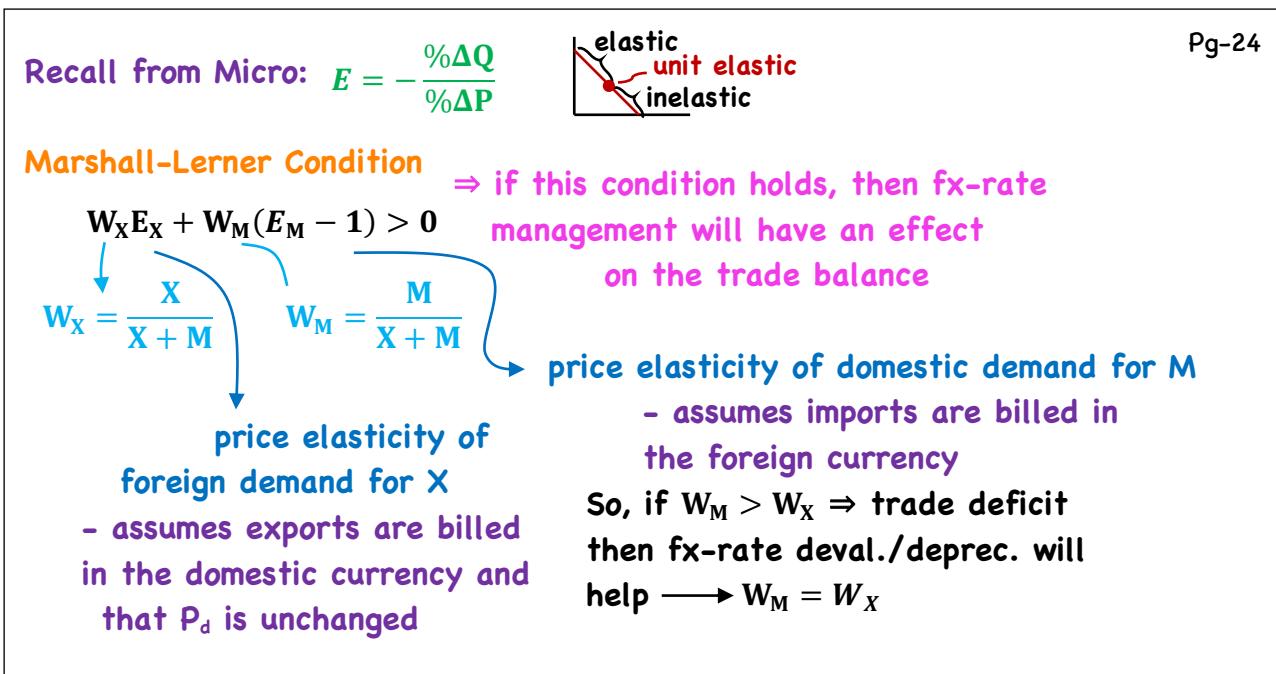
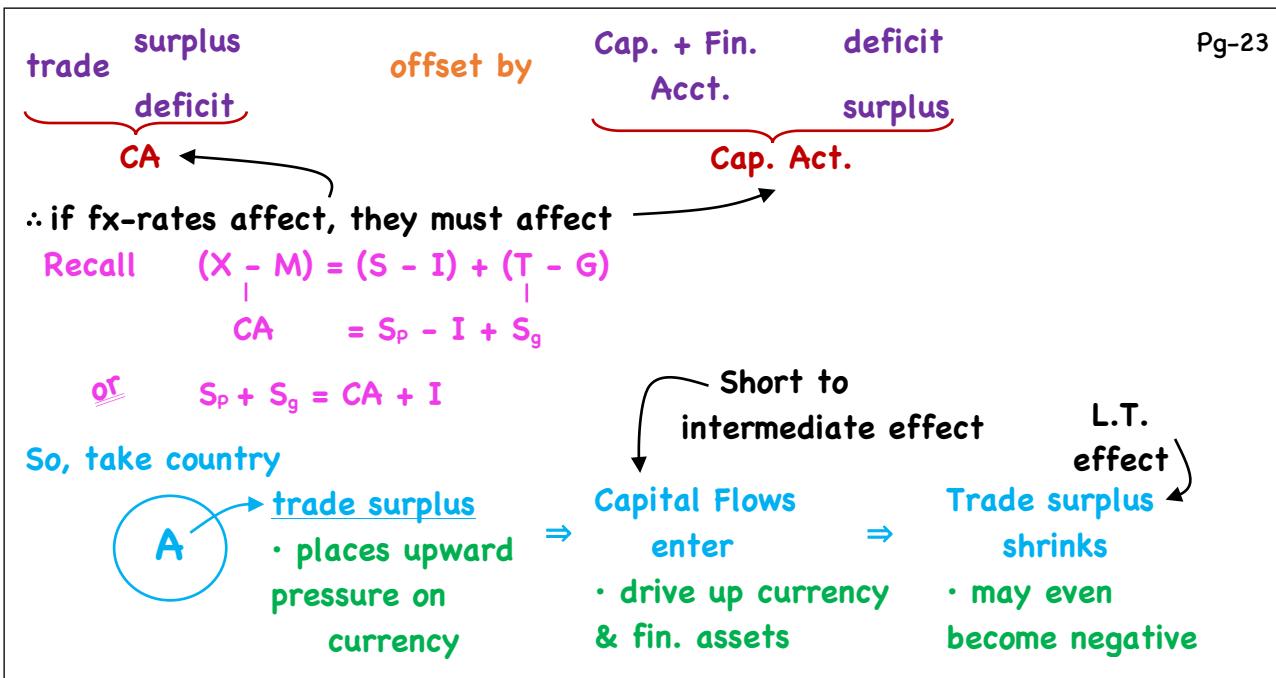
8) Independently Floating Rates

Pg-22

- market determined fx-rates
- central bank enjoys full independence
- most common (esp. among the majors)

- Central Banks will 'regime switch' as it suits their objectives

FX, International Trade, Capital Flows



$$\underbrace{W_X E_X}_{\text{larger as } E_X \text{ increases}} + \underbrace{W_M (E_M - 1)}_{\text{if } E_M < 1, \text{ this term negative}} > 0$$

larger as E_X increases if $E_M < 1$, this term negative

$$W_M > W_X$$

E_M becomes more critical for success

	X	M
E_d	.75	.65
dep. € 10%		
P_d	Ø	10%
P_f	-10%	Ø
$X = 400M$	$M = 600M$	

Pg-25

- the more elastic demand is for X and M, the more likely deval./deprec. will improve a trade balance

$$W_X > W_M$$

$$W_M = W_X$$

Initial condition met?

$$W_X E_X + W_M (E_M - 1) > 0$$

$$.4(.75) + .6(.65-1)$$

$$.30 + (-.21) = .09 > 0$$

$$\text{new } x \quad 430M$$

$$y \quad 621M$$

$$(191M)$$

$$(1 - E) \% \Delta P$$

$$(1 - .65) 10\%$$

$$3.5\%$$

$$\text{U.S. (200M)}$$

$$W_X E_X + W_M (E_M - 1) > 0$$

Pg-26

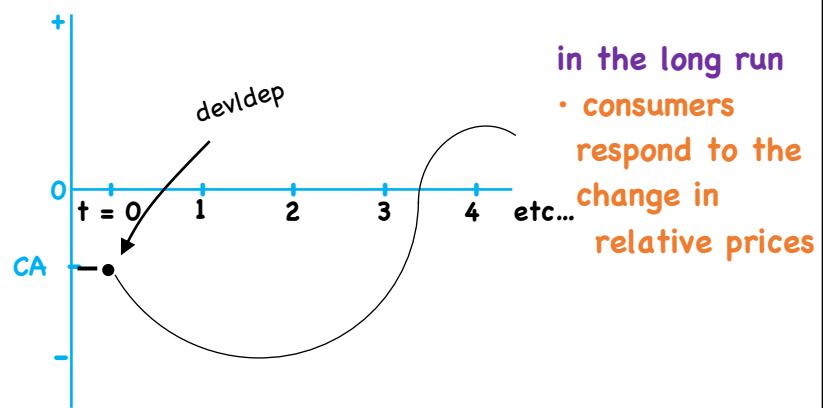
fx- rate changes will be more effective for trade adjustment if X & M

- have substitutes
- trade in competitive markets
- are luxury goods, rather than necessities
- are goods that represent a large portion of consumer expenditures

J-curve

- in the short run:
- fx-rate ↓, but $E_d < 1$
- consumers need time to change behavior

∴ deficit worsens



in the long run

- consumers respond to the change in relative prices

Absorption Approach

$$Y = \underbrace{C + I + G}_{A} + \underbrace{(X - M)}_{B}$$

$$\Rightarrow Y = A + B$$

or $B = Y - A$

Pg-27
 A = total absorption

B = trade balance

∴ to improve trade balance, increase incomes/output
 and/or reduce absorption

a lower fx-rate may cause
 a wealth effect

⇒ lower purchasing power of
 domestic currency denominated
 assets may boost MPS
 (weak argument)

a lower fx-rate will shift
 demand to domestic g/s
 (if there is excess capacity)

- if $MPC < 1$, output rises faster than absorption

⇒ trade balance improves

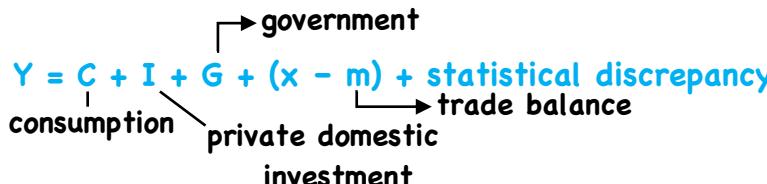
REVIEWS

Aggregate Output, Price & Economic Growth

Review - 1

- Aggregate Output = Aggregate Income = Aggregate Expenditure**
- MV/final g/s W/in an economy
 - ↓
produced during the measurement period
 - value of all payments earned by land, labour, capital
 - total spending on g/s produced domestically
 - all income is attributed to the household sector
 - transfer pmts. from G → C excluded
 - not included: used goods, illegal activity, barter, financial assets, intermediate g/s
 - owner-occupied housing ⇒ rent is assumed (i.e. imputed) to be paid in GDP
 - Real GDP/ controls for price changes nominal $GDP_t = P_t \times Q_t$
real $GDP_t = P_0 \times Q_t$
- $$GDP \text{ Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100 = \frac{P_t \times Q_t}{P_0 \times Q_t} \times 100$$
- $$\therefore \text{Real GDP} = \frac{(\text{Nominal GDP})}{\left(\frac{\text{GDP Deflator}}{100} \right)}$$

Review - 2

- $GDP = Y = C + I + G + (x - m) + \text{statistical discrepancy}$
- expenditure approach
 - income approach
- 

 consumption → private domestic investment → government → trade balance → statistical discrepancy
- $GDP = NI + CCA$ (National Income + Capital Cost Allowance)
- $$NI = \text{Wages} + \text{Profit} + \text{Interest} + \text{Private Profit} + \text{rent} + (\text{Indirect Tax} - \text{subsidies})$$
- $$\downarrow$$
- $$(\text{Div.} + \text{RE} + \text{Tax})$$
- $$|$$
- $$\text{sales tax, etc...}$$
- ⇒ Personal Income = PI = NI - Indirect Bus. Tax - Corp. Tax - RE + Transfer Pmts.
- ⇒ Personal Disposable Income = PDI = PI - personal tax
- ⇒ Savings = S = PDI - C - interest paid - transfer pmts. to foreigners
- ⇒ Business Saving = RE + CCA

Review - 3

$$Y = C + I + G + (X - M) \quad - \text{subtract } T$$

$$\underline{Y - T} = C + I + (G - T) + (X - M) \quad - \text{subtract } C$$

$$\underline{Y - C} = I + G + (X - M)$$

key $[S = I + (G - T) + (X - M)] \quad - \text{saving is used to finance}$

- investment
- gov't. details
- $(G - T)$
- claims against foreigners
- $(X - M)$

$\hookrightarrow S + \text{gov't surplus} = I + (X - M) \quad - \text{good trade surplus}$

$(T - G)$

$S + \text{trade deficit} = I + (G - T) \quad - \text{bad (unsustainable) gov't def.}$

$(M - X)$

$S + \text{gov't surplus} + \text{trade deficit} = I$

$AE = C$	$+ I$	$+ G$	$+ (X - M)$
- as $Y_d \uparrow, C \uparrow$	- as $r \uparrow, I \downarrow$	- treated as exogenous	• X treated as exogenous
- as $r \uparrow, C \downarrow$	- as $Y \uparrow, I \uparrow$	- as $Y \uparrow, t(Y) \uparrow$	• as $Y \uparrow, M \uparrow$
- as $T \uparrow, Y_d \downarrow, C \downarrow$			

$MPS = 1 - MPC$

$\therefore Y = C_A + \beta_1 Y - \beta_2 r =$



(IS) - curve represents all the points of equilibrium in the goods market for a given price level

Review - 4

AD → quantity of g/s demanded at a given price level

↓
downward sloping due to

Wealth Effect Interest rate effect Real Exchange rate effect	Real wealth declines Higher money demand Real exchange rate appreciates	Higher interest rates Fewer profitable investments and fewer large consumer purchases Exports less competitive Imports cheaper	Higher fund inflows from abroad → nominal and real exchange rate higher, -ve impact on net exports Aggregate Demand = $C + I + G + (X - M)$
--	---	--	--

AD decreases

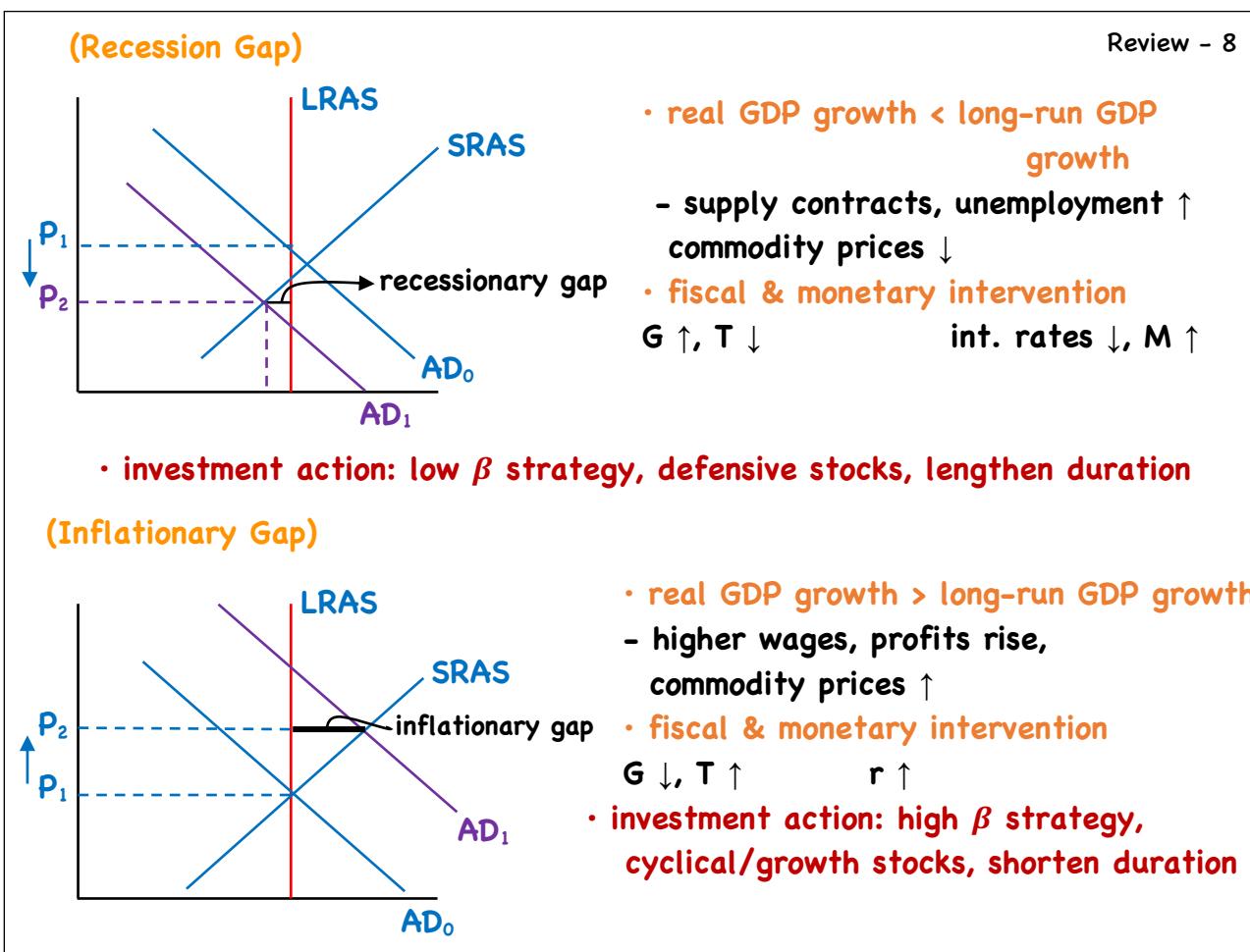
Higher price level

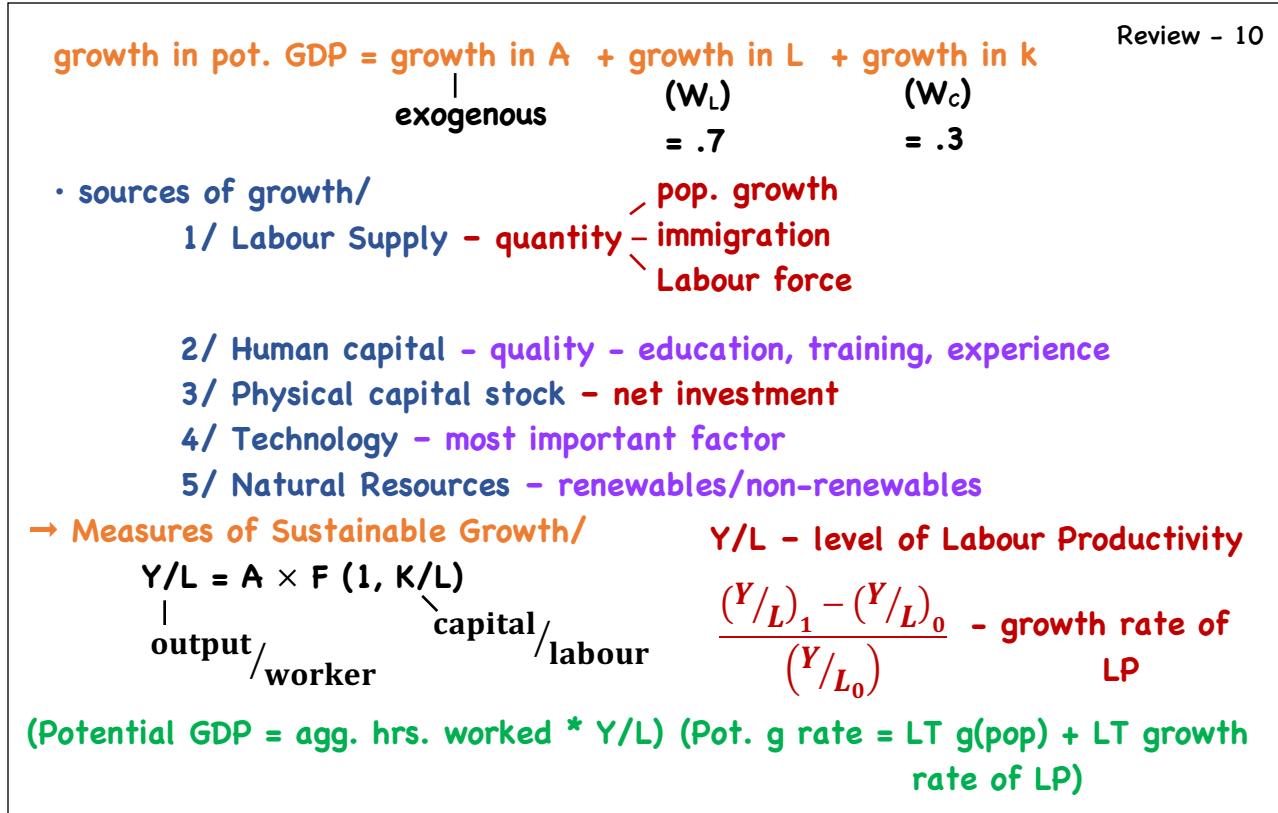
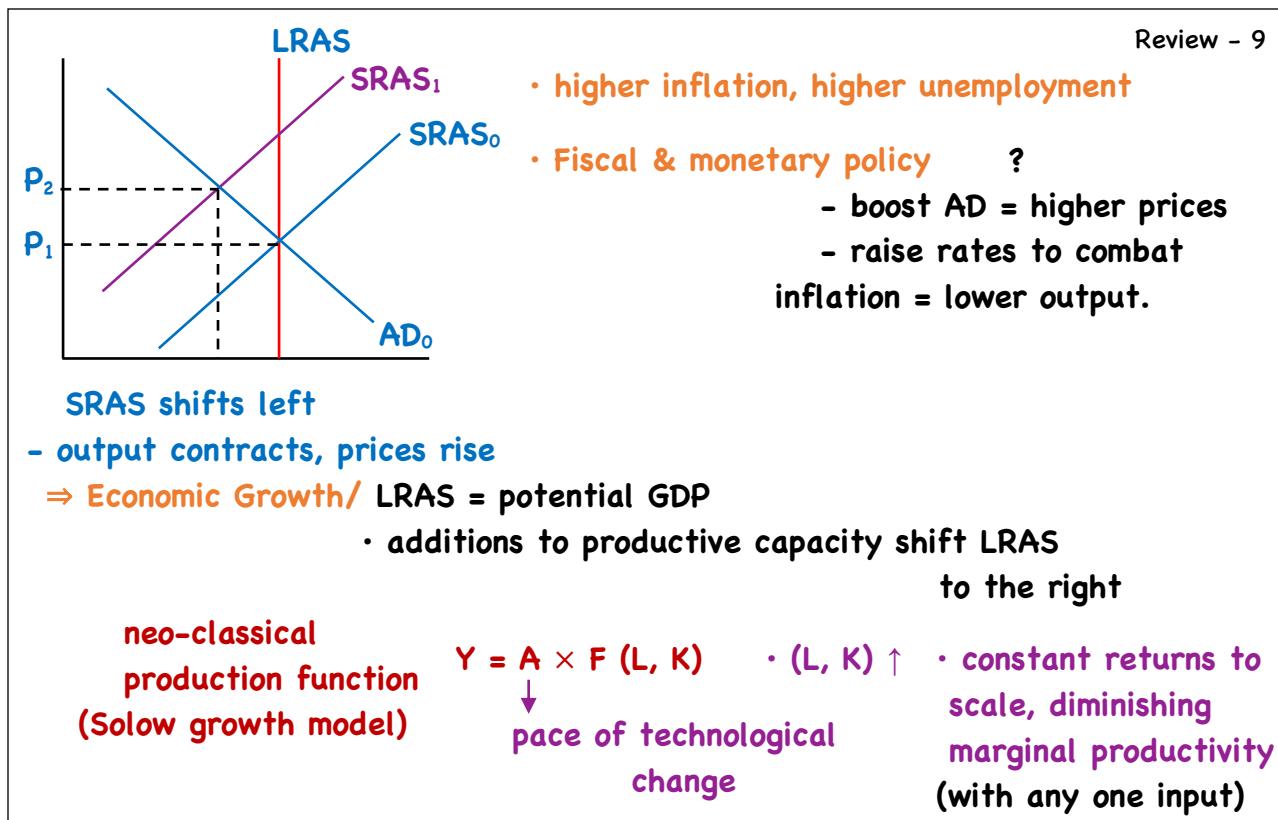
Wealth Effect Interest rate effect Real Exchange rate effect	Real wealth increases Lower money demand Real exchange rate depreciates	Lower interest rates Greater number of profitable investments for firms and more large consumer purchases Exports more competitive Imports dearer	Lower fund inflows from abroad/greater outflows → weaker exchange rate, +ve impact on net exports
--	---	---	---

AD increases

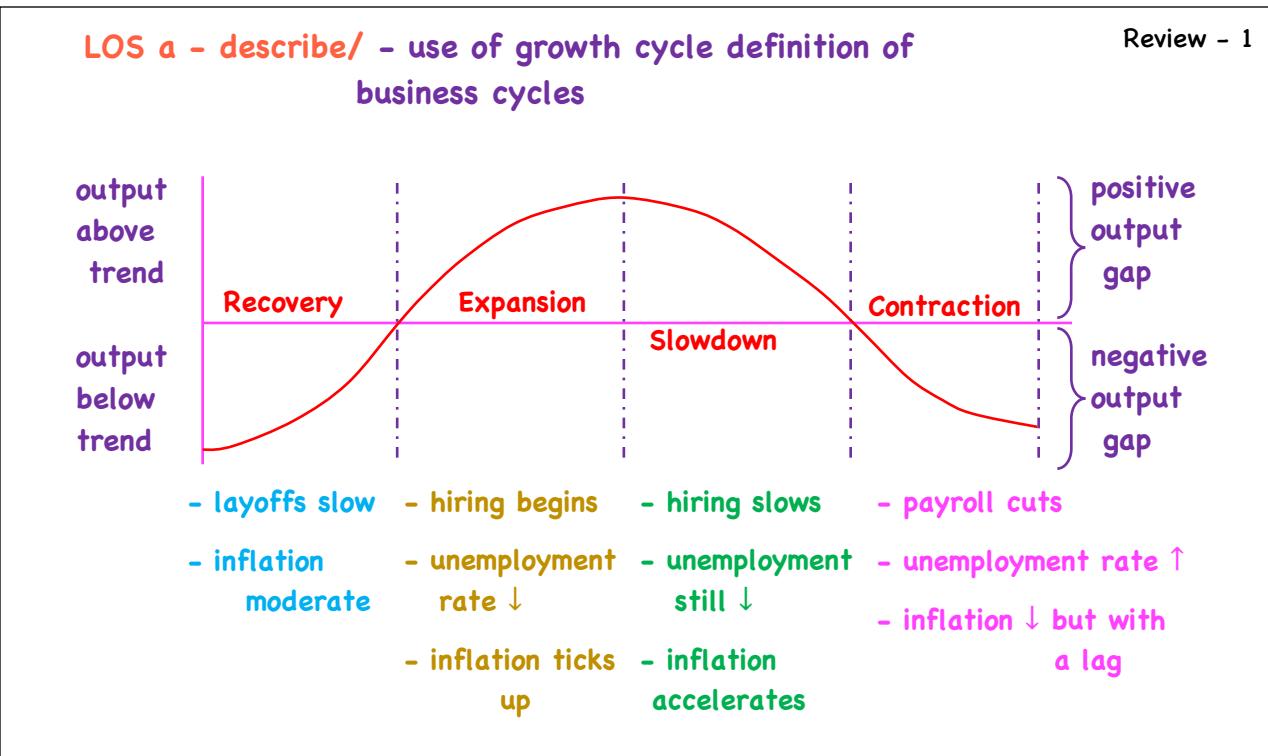
Lower price level

⇒ Shifts in AS/	left	← LRAS →	right	Review - 7
a) Supply of Labour	↓	population participation rate net immigration	↑	
b) Supply of Physical Capital	↓	net Investment	↑	
c) Supply of Human capital	↓	Quality of Labour (training/education/skills)	↑	
d) Labour Productivity & Technology	↓ ↓	(output/LH) Investments in technology	↑ ↑	





Understanding Business Cycles



LOS b - strong economy → high credit availability on favourable terms } can create asset price bubbles

Review - 2

- weak economy → tight credit
- credit cycle longer, deeper, and sharper than Bus. cycle

LOS c - describe

	Recovery	Expansion	Slowdown	Contraction
Sales/Production	- sales recover - production lags	- sales increase - production accelerates	- sales slow faster than production	- production cuts below level of rate of sales
Inventory/Sales	- begin to fall	Stable	increases	- falls back
Cap. Util.	• excess cap. • low util.	• cap. util. ↑ • order ↑	continued	- utilization ↓
Capital Spending	- low but increasing - efficiency focus	- capacity expansion		- new orders halted - maintenance delayed

LOS c - describe

Review - 3

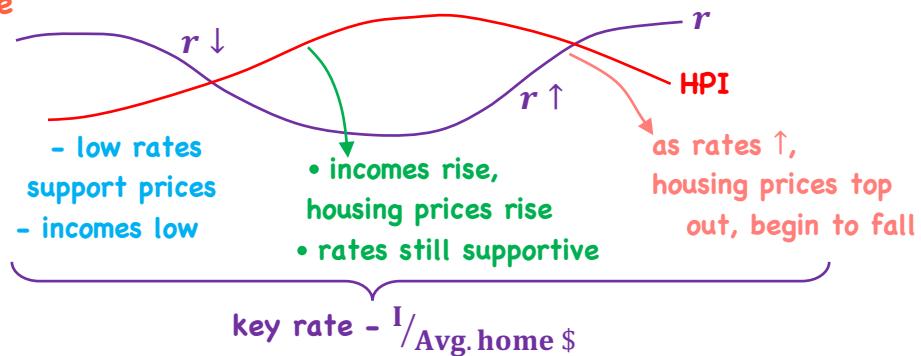
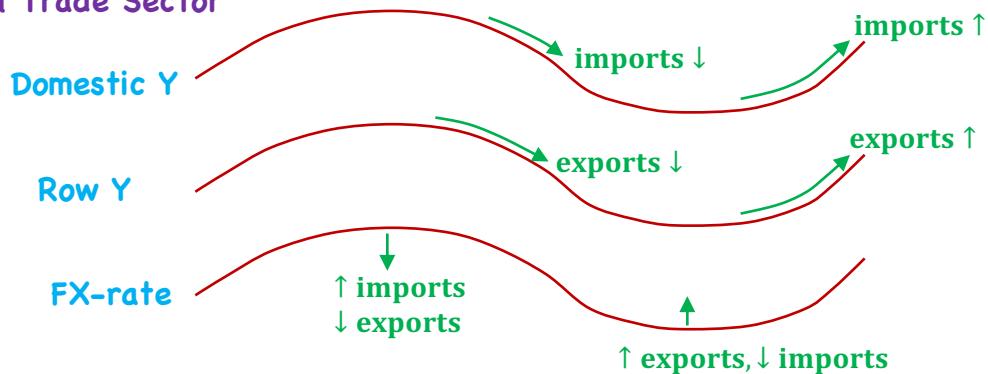
	Recovery	Expansion	Slowdown	Contraction
Incomes	Stable	rising	rising	falling (in aggregate)
consumer confidence	improving	increasing	stable	dropping
durable goods	- limited	increasing	above average	dropping
non-durable	-	Stable across the phases of the business cycle		
services	- below average	increasing	above average	dropping

- Household Income - Y_d - positively related to spending on durables
 - permanent income - correlates well with non-discretionary
- Household Savings - $\uparrow S$ may indicate future caution
 - stock of S may indicate future consumption potential

LOS c - describe

Review - 4

Housing Sector/
- interest rate sensitive
- new family formation a key driver


• External Trade Sector


LOS d - describe/

Review - 5

- Neo-classical – economy is self-correcting
 - no fiscal or monetary intervention (distorts pricing signals)
 - bus. cycles are natural
- Austrian – no fiscal or monetary intervention
 - low rates and overinvestment create the boom that creates the bust.
 - markets and prices will adjust
- Monetarism – limited fiscal role
 - monetary role limited to increasing *M* at a steady growth
 - too fast → inflationary gap rate
 - too slow → deflation
 - interventions will cause bus. cycles
- Keynesianism – economy is not self-correcting, low rates may not work
 - fiscal policy tools
 - deficit spending
 - lower taxes

LOS e - interpret/describe/

Review - 6

- economic indicators → have turning points that:

precede	are close to	take place after	those of the overall economy
(leading)	(coincident)	(lagging)	
• stock market	• Industrial prod.	• GDP	
• house prices	• Incomes	• Inflation	
• Retail Sales		• Unemployment rate	
• 10yr. - 2yr.		• consumer debt/Income	
• Building permits		• Inventory/Sales ratio	
		• Prime lending rate	
- Composite Indicator – a group of indicators
 - usually constructed as a diffusion Index
 - > 50 implies growth
- some indicators are survey-based – consumer confidence, PMI
- NowCasting (e.g. GDPnow) – decompose an economic variable into components
 - use component data to forecast the aggregate

LOS f - describe/compare/

Review - 7

Employed - those with a job

Labour force - employed + unemployed

Unemployed - those without a job but looking

Unemployment Rate - Unemployed/Labour force

Participation Rate - Labour force/Population (of working age)

Frictional Unemployment - natural movement from job-to-job

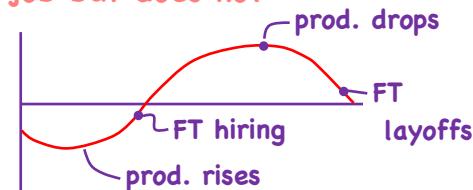
Underemployed - has a job below qualifications or PT but wants FT

Discouraged Worker - person who has stopped looking for work

Voluntarily unemployed - could get a job but does not

Unemployment Rate - lagging indicator

Productivity = $\frac{\text{Output}}{\text{Hours worked}}$
(leading to coincident)


LOS g - explain/

Review - 8

Inflation - a sustained rise in the overall level of prices

- lagging

$$\text{Inflation Rate} = \left(\frac{\text{PriceIndex}_1}{\text{PriceIndex}_0} \right) - 1$$

- pro-cyclical

Inflation expectations - leading (may be self-fulfilling)

Deflation - a sustained decrease in the aggregate price level

Disinflation - a decline in the rate of increase

Hyperinflation - an extremely fast increase in the aggregate price level

LOS h - explain/

Price Index - avg. prices of a representative basket of g/s

$$\text{Laspeyres Index} = \frac{WQ_0 \times P_1}{WQ_0 \times P_0}$$

- constant basket (updated every 5 yrs.)
issues/substitution effect

$$\text{Paasche Index} = \frac{WQ_1 \times P_1}{WQ_1 \times P_0}$$

quality bias
new product bias } CPI
overstated

LOS h - explain/

Review - 9

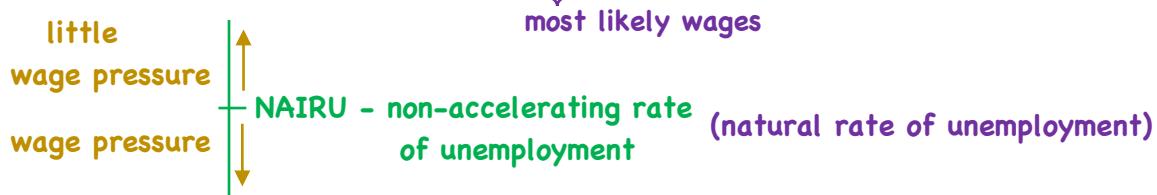
- Chained Price Index – solves substitution bias
- Fisher Index $\sqrt{I_P \times I_L}$

LOS i - compare/

- different names, weights, and methodologies
 - household survey (CPI)
 - business survey (PCE)
- many contracts are indexed to CPI/PCE (bonds, leases, pensions)
- nominal GDP is adjusted to real GDP by a price index (deflator)
- headline - food - energy = core inflation
- Producer Price Index (PPI) - measures price changes paid by domestic producers

LOS j - contrast/

Cost-Push Inflation – rising costs compel business to raise prices


LOS j - contrast/

Review - 10

Cost-Push Inflation

- must consider productivity

$$\text{Unit Labour Cost} = \frac{\text{Total w/hr}}{\text{Output/hr}}$$

↓
typically rise in
tight labour markets

Demand-Pull Inflation

- closer to capacity, greater pressure on prices
(capacity utilization, actual GDP vs. potential)

Monetarists - too much money

$$\text{velocity} = \frac{nGDP}{m}$$

if $V \downarrow$ due to $M \uparrow$ - may be
inflationary

if $V \uparrow$ due to $nGDP \uparrow$ - may be
disinflationary or
deflationary

Monetary & Fiscal Policy

Review - 1



- seek stable & positive growth, stable & low inflation

Money \Rightarrow medium of exchange, store of value, unit of account

- must be
 - readily acceptable
 - have a known value
 - be easily divisible
 - have a high value to weight ratio
 - be difficult to counterfeit

- Definition of Money/

- | | |
|---|---|
| <ul style="list-style-type: none"> - narrow (M1) - coins/notes in circulation - demand deposits - chequing account balances - travellers cheques | Broad (M2) <ul style="list-style-type: none"> - narrow + - savings/money market accts. - time deposits < \$100k - retail money-market/MF accounts |
|---|---|

- Fractional Reserve Banking/

Review - 2

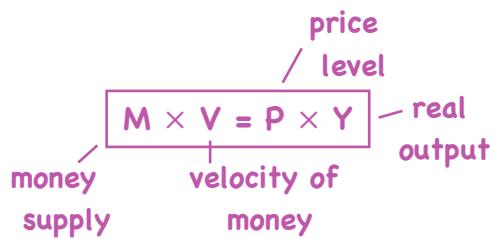
	Bank 1		Bank 2		Bank 3	
reserve	10	100 dep.	Res.	9	90 dep.	R.
Loans	90		Loan	81		Loan
						72.90
	purchaser	\rightarrow seller		purchaser	\rightarrow seller	

$$\Sigma \text{ of money created} = \frac{\text{new deposit}}{\text{res. req.}} - \frac{100}{.1} = \$1000$$

$$\text{money multiplier} = \frac{1}{\text{res. req.}} = \frac{1}{.1} = 10$$

- set by Central Bank
- policy tool

- Quantity Theory of Money/

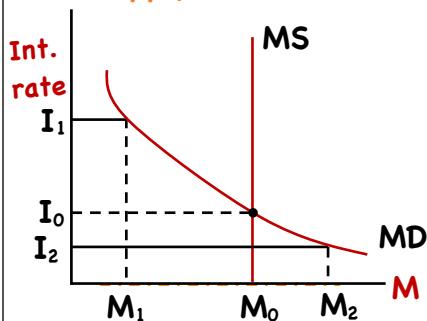


$P \times Y = \text{nominal GDP}$
 V - assume constant
Money neutrality \Rightarrow if $M \uparrow$, only
 $P \uparrow$ in the long-run; in the
short-run, $M \uparrow$ can affect output

- Demand for Money / • transactions - pro-cyclical
 • precautionary - pro-cyclical
 • speculative - counter-cyclical (inversely related to asset yields, positively related to perceived risk of other assets)

Review - 3

- Supply & Demand /



- I₁ - excess MS , high I, ∵ less speculative demand for cash, more demand for yielding assets, drives down rates
- I₂ - excess MD , low I ∵ opposite effect
 - real interest rate is stable over time

- The Fisher Effect

$$R_{\text{nom}} = R_{\text{real}} + \pi^e$$

R_{nom} ↗ a required real return
 ↗ inflation expectation
 ↗ risk premium (regarding inflation uncertainty)

• Role of Central Banks

Review - 4

- monopoly supplier of the currency - fiat currency
- banker to the gov't. & other banks
 - drawdowns • redeposits ↗ lender of last resort
- Supervisor of the banking system (not always, not alone)
- regulator/supervisor of the payment system
- manage foreign reserves/gold reserves
- operation of monetary policy

- Objectives / • maintain price stability → single mandate
 • maximize employment → dual mandate

Costs of Inflation /

Expected	vs.	Unexpected
<ul style="list-style-type: none"> - wages, interest rates and prices would reflect the expectation (expectations become reality) 		<ul style="list-style-type: none"> - lagging incomes, borrowers benefit, frequent price changes, information content of prices reduced

- Policy Tools/

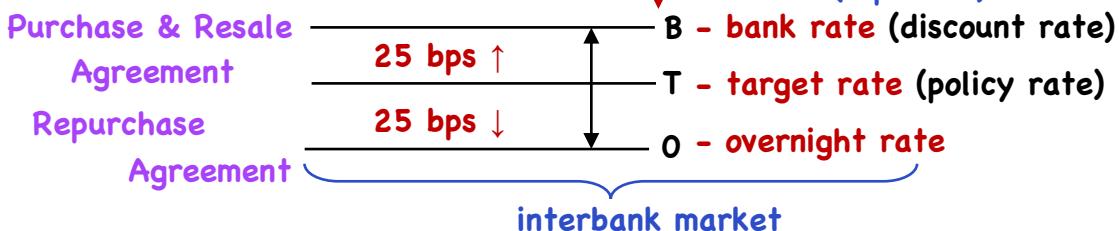
Review - 5

- 1) Open Market Operations - buy/sell gov't. securities from/to

buy = increase reserves

commercial banks

sell = opposite

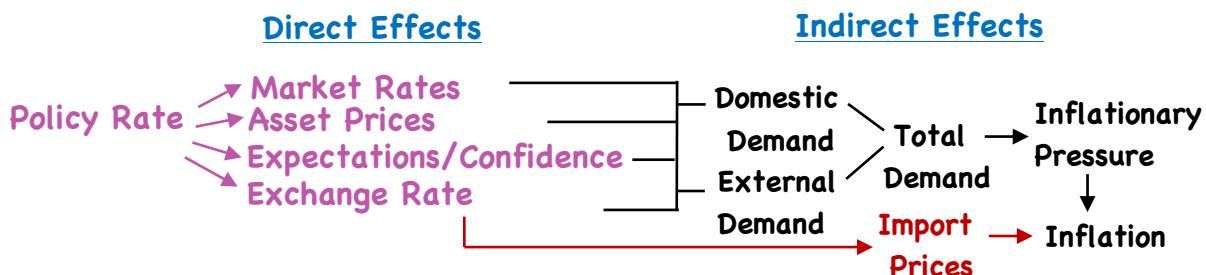


- 2) Policy Rate - raising = contractionary

- lowering = expansionary

- 3) Reserve Requirements

- Transmission Mechanism/



- Qualities of Effective Central Banks/

Review - 6

- 1) Independence *operational - target rates without influence*

target - free to determine inflation

- 2) Credibility - no competing incentives

- 3) Transparency

- Inflation Targeting → 1-3% over 1-2 yr. horizon

- Exchange Rate Targeting → set a fixed level or band of values

- Neutral Rate - neither spurs on nor slows down the economy

- 2 components *real rate (real trend growth)*

inflation expectation (long run expectation)

- lower than neutral rate = expansionary policy

- higher = contractionary policy

- Limitations of Monetary Policy/

- 1) transmission - rise in s.t. rates may be met with a belief of a

looming recession (credit loosens at long end of curve)

- drop in s.t. rates may be met with a belief that

inflation will not be controlled (credit tightens at long end of curve)

- Limitations of Monetary Policy/

Review - 7

2) Deflation - policy rate has a lower bound of 0%

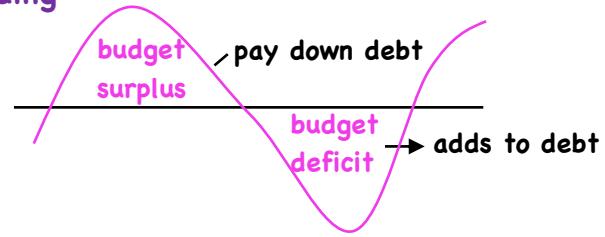
⇒ Fiscal Policy/
 ↘ taxation
 ↘ spending

- Influence Aggregate Demand

(Keynesian)

- expansionary
 ↗ cut taxes
 ↗ increase spending

- contractionary - opposite



- Fiscal Policy Tools/

- Transfer Payments - automatic
- Government Spending - discretionary
- Capital Expenditure - infrastructure

- Direct Taxes - on income
- Indirect Taxes - fuel, alcohol, tobacco
 - (taxes should be simple, fair (horizontal equity, vertical equity or progressive tax), efficient (should not affect decisions) and revenue sufficient)

Advantages/ • indirect taxes can be adjusted quickly

Review - 8

- influences spending immediately
- generate revenue
- discourage undesirable behavior

Disadvantages/ Direct taxes take time to change

CapEx takes even longer

Fiscal Multiplier/

$$MPS = 1 - MPC \quad \frac{1}{1 - MPC} \Rightarrow \text{multiplier}$$

 So if $G \uparrow$, $Y_d \uparrow$ by $(1 - t)G$ and $C \uparrow$ by $MPC(1 - t)G$

$$\therefore \text{fiscal multiplier} = \frac{1}{1 - MPC(1 - t)}$$

 e.g./ gov't. spending $\uparrow \$1B$, $t = 30\%$, $MPC = .90$ $\frac{1}{1 - .9(.7)} = 2.702$

∴ gov't. spending of \$1B adds \$2.702B to GDP.

Deficit vs. Debt/ - Σ of all deficits

Review - 9

Rev. - Exp. < 0

$\frac{\text{Debt}}{\text{GDP}}$

vs.

$\frac{\text{Int. payments}}{\text{GDP}}$

- measures serviceability

- high GDP/Debt not an issue if:

- majority of debt owned internally
- debt was used to raise public productivity
- raise employment in slack resources

but// • higher future tax rates

- crowds out other debt issues

- Due to automatic stabilizers, surpluses/deficits may not be discretionary

⇒ Structural deficit

$$\text{current deficit} + \left(\begin{array}{l} \text{budget balance} \\ @ \end{array} \right) \begin{array}{l} \text{full} \\ \text{employment} \end{array}$$

⇒ Implementation/

Review - 10

Recognition Lag → Action Lag → Impact Lag

- ↑ G may lead to inflation
- if deficit/GDP is large, extra G may not be possible

growing public &
private sectors

Fiscal

Monetary

		easy	tight
		- rise in AD - lower r	- fall in AD - lower r
Monetary	easy	- rise in AD - lower r	- fall in AD - higher r
	tight	- rise in AD - higher r	

shrinking public &
private sector

International Trade & Capital Flows

GDP - final MV of all final g/s produced

- within a country (including foreigners within the country,
excluding citizens outside the country)

Pg-1
- review

GNP - excludes foreigners within the country, includes citizens outside the country

Net exports $X - M$ $> 0 = \text{surplus}$ $< 0 = \text{deficit}$

Terms of trade: $\frac{\text{export price index}}{\text{import price index}}$ } set to 100 in same base yr.

Closed economy: Autarky

- autarkic prices

> 100 - fewer exports needed

to pay for imports

- terms of trade improved

Open economy - world prices

< 100 - opposite

Free Trade - no gov't. restrictions on trade

\Rightarrow global AD/AS determine E_p & E_q of X/M

Trade protection - tariffs, quotas, etc....

Pg-2
- review

- moving from closed to open economy, winners & losers

Losers

- lower m prices vs. Domestic prices
- lower domestic production
- lower employment

Winners

- higher X prices vs. domestic prices
- higher domestic production
- higher employment

excess demand filled

trade-off

- excess supply exported

by imports

- if the trade affected sector is labour intensive

exports - positive
imports - negative

Benefits of Trade/

- countries gain from exchange & specialization
- great economies of scale (business)
- greater product variety (consumer)
- more efficient allocated of resources
- increased competition - can increase the pace of innovation

Costs of Trade/

- potential for greater income inequality
- loss of jobs in developed countries \Rightarrow structural unemployment

Pg-3
- review

Absolute Advantage - make it cheaper than other trading partners

Comparative Advantage - opportunity cost of making output is lower than the opp. cost of trading partners

	X	Y
Country A	4	8
Country B	2	16

Country A	2Y	$\frac{1}{2}X$
Country B	8Y	$\frac{1}{8}X$

	X	Y
Country A	4	8
Country B	2	6

Country A	2Y	$\frac{1}{2}X$
Country B	3Y	$\frac{1}{3}X$

Absolute

Relative

Ricardian Model/ - trade is based on technological differences

\therefore results in differences in labour productivity

- labour is the only variable factor
- technology varies across countries

Hecksher-Olin/ - trade is based on a country's endowment of all the factors of production \Rightarrow comparative advantage lies in goods produced with relatively abundant factor

Pg-4
- review

- both labour and capital are variable
- technology is identical across countries

Restrictions on Trade/

- tariffs -tax on imports
- import quotas
- voluntary export restraints (VER)
- export subsidies
- embargoes
- domestic content requirements

- protect domestic industries
- protect domestic employment
- national security
- close trade deficits

Capital Restrictions - restrict foreign ownership of domestic assets

Tariffs - protect industries, generate revenues, reduce trade deficits Pg-5
 (raise domestic prices) - review

- consumer loses surplus value
- producer gains surplus value + government earns revenue
- will be deadweight loss
- small countries \Rightarrow loss of national welfare • large country - may be a gain

Quota - increases domestic production, domestic prices rise, imports drop

- consumer loses surplus value
- producer gains surplus value
- quota rent - if captured by exporting country - larger deadweight loss than with tariff
- if captured by importing country - same deadweight loss as tariff + gov't. revenue
- small country \Rightarrow loss of national welfare • large country - may be a gain

Voluntary Export Restraint/ decision made by the exporter gain

- same effect as quota, but exporter captures entire quota rent (generates no gov't. revenue)

Export subsidy/ direct payment from gov't. to producer

 Pg-6
 - review

- sell on world market for p^* , get $p^* \downarrow +$ subsidy \uparrow
- no motivation to sell domestically for less than $p^* +$ subsidy
- large country exporters \Rightarrow can depress world prices
 - producer gets lower $p^* +$ subsidy
 - \therefore some of the subsidy gets transferred to ROW
- all forms/ • increase domestic price, decrease domestic consumption, increase domestic production, create producer surplus, reduce consumer surplus

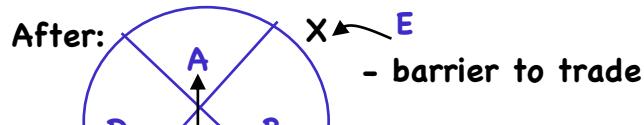
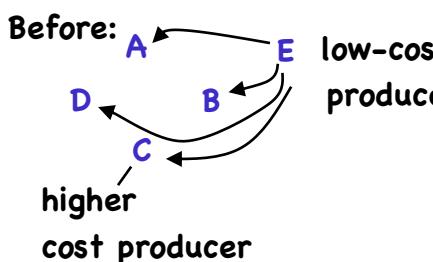
Regional Trading Bloc - group of countries, agree to reduce and eliminate barriers to trade

Regional Trading Bloc

Pg-7
- review

- Free Trade Agreement** + common trade policy towards non-members
- elimination of trade barriers
- each member maintains its own policy towards non-members = customs union
- + common economic intuitions = economic union
- + co-ordination of economic policy = common currency = monetary union

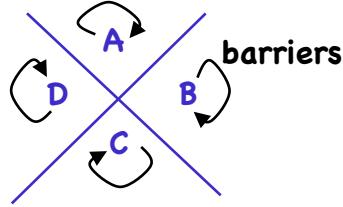
Regional Integration/ preferential treatment for members vs. non-members



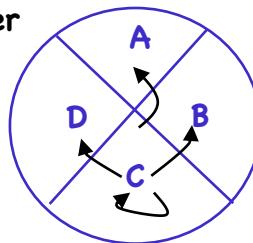
- trade diversion - lower cost imports from non-members are replaced by higher cost imports from members

Regional Integration/

Before/



After



- trade creation - replacement of higher cost domestic production with lower cost imports from members

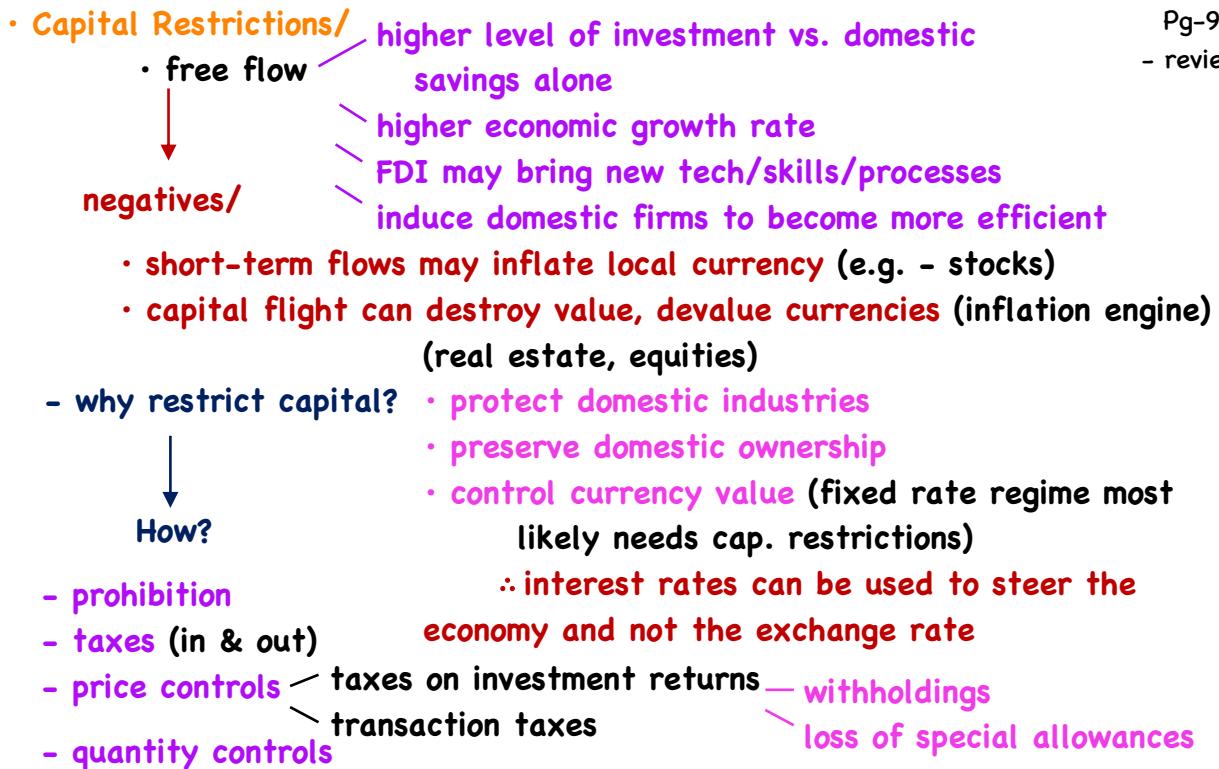
- benefits of integration: - all the benefits of trade

- + reduced potential for conflict
- + greater member bargaining power with ROW
- + convergence in living standards

- costs of integration:

- adjustment costs (will be losers)
- contagion - problems in one country may spread to another
- challenges to integration • cultural/historical differences
- some loss of independent economic control

Pg-8
- review


 Pg-9
 - review

Balance of Payments/

 Pg-10
 - review

Current Account	=	Capital Account	+	Financial Account
- flow of g/s		• transfer of capital		• investment flows
• merchandise trade		+ sale and purchase		• financial assets
• services		of non-produced, non-financial assets		abroad
• income receipts (div, int.)		(rights to nat. resources)		• foreign owned fin. assets within the country
• unilateral transfers (foreign direct aid)				
- if CA < 0, then must borrow from abroad				
CA > 0, must be lending abroad				

$$CA + I = S_p + S_g$$

- if CA < 0, dom. I can be > (S_p + S_g)
|
dom. S.

$$CA = S_p + S_g - I$$

- if CA < 0
 - S_p too low
 - S_g < 0
 - I too high

- International Monetary Fund
 - oversees the fixed exchange rate agreements
 - helps gov'ts manage their exchange rates
 - provide short term capital to aid balance of payments
 - World Bank - help developing countries fight poverty and enhance economic growth
 - International Bank for Reconstruction & Development
 - International Development Association
 - World Trade Organization
 - regulates cross border trade globally
 - settles disputes
(replaced GATT)
- Pg-11
- review
- International Bank for Reconstruction & Development

International Development Association
- slow & inefficient vs.
regional trading blocs

Currency Exchange Rates

⇒ Exchange Rate

$$\frac{\text{price}}{\text{base}} \text{ e.g. } \frac{\text{CAD}}{\text{USD}} = 1.2535$$

nominal

$S_{d/f}$ - direct

$S_{f/d}$ - indirect

• Purchasing Power Parity: assumes

- ① a world of homogenous g/s
- ② no market frictions
- ③ no trade barriers/capital restrictions

Pg-1
- review

⇒ Real Exchange Rate

$$S_{d/f} \times \frac{CPI_f}{CPI_d} \quad \text{or} \quad S_{f/d} \times \frac{CPI_d}{CPI_f}$$

rarely satisfied

- if $\% \Delta S_{d/f} \uparrow 10\%$

$CPI_f \uparrow 5\%$

$CPI_f \uparrow 2\%$

$$\left[1 + \% \Delta S_{d/f} \times \frac{1 + \% \Delta CPI_f}{1 + \% \Delta CPI_d} \right] - 1$$

$$\rightarrow \left[(1 + .10) \times \frac{1 + .05}{1 + .02} \right] - 1 = 13.23\%$$

- need 13.23%
more d. to buy
same goods in f.

- spot rates - for immediate delivery

Pg-2

- forward exchange rates - delivery at a future date, agreed on today - review

- Fx-swap - rolling a forward, forward - requires a simultaneous
spot transaction + new forward agreement

⇒ Participants in FX-markets

- Corporations, Financial Institutions, Retail Investors,
Governments, Central Banks

⇒ Major Pairs - very liquid currency pairs (include the USD)

e.g./ USD/EUR

⇒ Cross Pairs - less liquid currency pairs e.g./ GBP/EUR

- Calculations/

$$\text{USD/EUR} = 1.2500$$

$$\text{USD/EUR} = 1.3000$$

$$\frac{1.3000 - 1.2500}{1.2500} = 4\%$$

$$\text{EUR/USD} = \frac{1}{1.25} = .8000$$

$$\text{EUR/USD} = \frac{1}{1.30} = .76\%$$

EUR $\uparrow 4\%$

But

$$\frac{.7692 - .8000}{.8000} = -3.85\%$$

USD $\downarrow 3.85\%$

identical statements

- Cross Rate Calculations/

e.g. 1/ $CAD/USD = 1.3980$ $USD/EUR = 1.0950$

Pg-3
- review

$$CAD/EUR = CAD/USD \times USD/EUR = 1.3980 \times 1.0950 = 1.5308$$

e.g. 2/ $CAD/USD = 1.3980$ $JPY/USD = 121.10$

$$JPY/CAD = JPY/USD \times 1/(CAD/USD) = 121.10 \times \frac{1}{1.3980} = 121.10 \times .7153 = 86.62$$

⇒ Forward Rate Calculations/ spot + points = forward premium

e.g./ $USD/EUR = 1.2875$ spot - points = forward discount

spot — 1.2875

also called

1 week — -.3

swap points when only

1 month — -1.1

1 point quote is given

3 mos. — -5.5

6 mos. — -13.3 → 1.2875

12 mos. — -26.5

13.3

→ typically given in bid/offer form

1.28617

e.g. -13.0/-13.6

⇒ Arbitrage Pricing for forwards/

(price) (base)

$$F_{f/d} = \frac{S_{f/d}(1 + i_f)}{(1 + i_d)}$$

Pg-4
- review

- if $i_f > i_d \rightarrow$ forward premium

$$S_{f/j} \left[\frac{1 + i_f}{1 + i_j} \right]$$

d/f
f/j

- $i_f < i_d \rightarrow$ forward discount

⇒ Exchange Rate Regimes/

- fixed rates vs. floating rates

- reduces uncertainty - exchange-rate risk

- fully convertible vs. capital restrictions

- unrestricted capital flows - inefficient allocation of capital

- efficient allocation of capital

- types/

- No separate legal tender - countries use the currency of another nation

- Currency Board System - commit to exchange d for f at a fixed rate
 - 100% foreign currency reserves against the monetary base

types/

 Pg-5
 - review

- ③ fixed parity - just a peg, does not require 100% (+/- 1% bands) foreign curr. reserves
e.g./ → to USD or to trade-weighted basket of currencies
- ④ Target zone - as above but +/- 2% (e.g.)
- ⑤ Active & Passive Crawling Pegs
 - static peg - fixed
 - passive peg - peg adjusted to inflation
 - active peg - changes in fx-rate announced, typically in small steps - meant to influence inflation
- ⑥ Fixed Parity with Crawling Bands
 - fixed w/ +/- 1%, then +/- 2%, etc....
- ⑦ Managed Float - fx-rate based on policy targets

- types/

 Pg-6
 - review

- ⑧ Fully floating rate - market determined
 - most common

= FX, International Trade, Capital Flows

- trade surplus → capital flows enter → ↑ pressure on currency → trade surplus shrinks
- trade surplus is offset by a capital account deficit deficit surplus

- Marshall-Lerner condition/

$$\frac{W_X E_X}{X + M} + \frac{W_M (E_M - 1)}{M + X} > 0$$

↓ ↓
 price elasticity of foreign demand for X price elasticity of domestic demand for M

- assumes X are billed in domestic currency (P_d is constant)

if $W_M > W_X$ - trade deficit
 - then fx-rate devaluation will help → $W_M = W_X$
 (the more elastic X & M, the more likely intervention will improve trade balance)

- assumes more billed in the foreign currency

- Marshall-Lerner condition/

e.g. \underline{X} \underline{M}
 $E_X = .75$ $E_M = .65$
 $X = 400M$ $M = 600M$

Initial condition/

$$W_X E_X + W_M (E_M - 1) > 0$$

$$.4(.75) + .6(.65 - 1)$$

$$.30 - .21 = .09 > 0$$

∴ intervention will work

Pg-7
- review

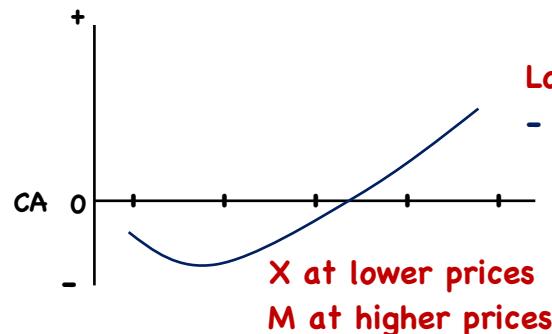
- Intervention will be more effective for trade adjustment if X & M:

- have substitutes
- trade in competitive markets
- are luxury goods rather than necessities
- are goods that represent a large portion of consumer expenditures

J-curve/

Short-run:

fx-rate ↓, $E_d < 1$
 - consumers need time to adjust
 ∴ deficit worsens



Long-run:

- consumers respond to changes in relative prices changes

- Absorption Approach/

$$Y = \underbrace{C + I + G}_{A} + \underbrace{(X - M)}_{B}$$

A = total absorption

Pg-8
- review

$$\therefore Y = A + B$$

$$\text{or } B = Y - A$$

Y - A > 0 = surplus

Y - A < 0 = deficit

B = trade balance

- to improve trade balance:

① increase incomes/output
 (make Y larger in $(Y - A)$)

- a lower fx-rate will switch demand to domestic g/s
 - trade balance improves

② reduce absorption

(make A smaller in $(Y - A)$)

- lower fx rate may cause a wealth effect
- ⇒ lower purchasing power of dom. curr. denominated assets may boost MPS