

MEASURES OF MACROECONOMIC PERFORMANCE

Circular flow:

GDP: the market value of the final goods and services produced within a nation in a year = C + I (capital, buildings, inventory) + G + NX (Note: transfer payments don't count.)

= wages (labor) + rent (land) + interest (capital) + profits (entrepreneurs)

GDP deflator: Real GDP = Nominal GDP / Price Index * 100

%Δ Real GDP = %Δ Nominal GDP - %Δ Price Index

CPI: CPI current year = 100 * Spending current year / Spending base year

Inflation = 100 * (CPI new - CPI old) / CPI old

Real income = Nominal income / CPI * 100

Problems with CPI: consumers substitute, goods evolve, quality changes

Inflation is only bad if it's unexpected.

Banks adjust for inflation: nominal interest rate = real interest rate + expected inflation

Unemployment rate: unemployed / labor force (Discouraged workers don't count.)

- Frictional: someone new enters the labor market or switches jobs
- Seasonal: periodic and predictable job loss (agricultural jobs, ski lodges)
- Structural: fundamental changes in the economy
- Cyclical: business cycle (this form is felt throughout the economy, not just certain subgroups)

Frictional & structural unemployment are always present. Economists define full employment as no cyclical unemployment.

CONSUMPTION, INVESTMENT, AND THE MULTIPLIER

Disposable income (DI) = Gross Income - Net taxes (taxes - transfers)

With no net taxes, DI = C + S.

Consumption & savings schedules:

Table 13.1

DISPOSABLE INCOME (DI)	CONSUMPTION (C)	SAVINGS (S)
0	40	-40
100	120	-20
200	200	0
300	280	20
400	360	40
500	440	60

Consumption function:

The constant is autonomous consumption. The slope is marginal propensity to consume (MPC) = $\Delta C / \Delta DI$.

Savings function:

The constant is autonomous saving. The slope is marginal propensity to save (MPS) = $\Delta S / \Delta DI$.

Determinants of consumption & saving

- **Wealth:** when the value of wealth (stocks, etc.) increases, consumption rises & savings falls.
- **Expectations:** when people are uncertain about the future, consumption falls & savings rises. When people expect inflation, consumption rises & savings falls.
- **Household debt:** when people have lots of debt, consumption falls & savings rises.
- **Taxes & transfers:** when taxes decrease/transfers increase, both consumption & savings rise.

Investment

Investments happen when $r\% \geq i\%$ (r is expected rate of return; i is interest rate).

Interest demand curve

This can also be seen as a **demand for loanable funds curve** because when savers put money in banks/bonds, those funds are available to be borrowed for investment.

Supply of loanable funds: private saving + public saving (tax revenue - government spending)

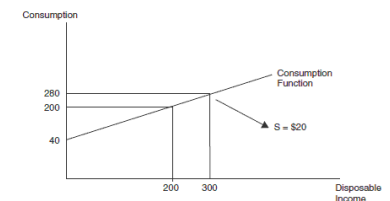
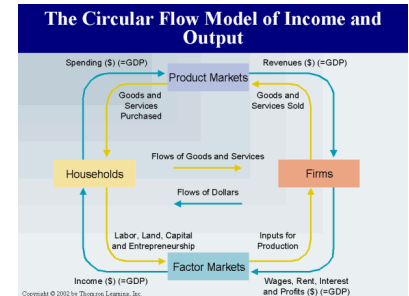


Figure 13.1

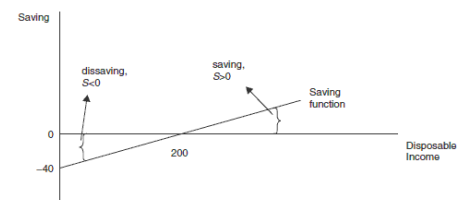
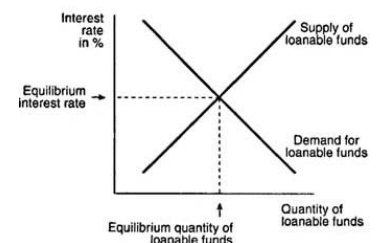


Figure 13.2



Multiplier effect: investment creates a ripple effect.

*** *Spending multiplier* = $1/MPS = 1/(1-MPC) = \Delta GDP/\Delta Spending$ ***

The multipliers for private investment, government spending, and net exports work this way.

*** *Tax multiplier* = MPC/MPS ***

*** *Balanced budget multiplier* = 1 ***

AGGREGATE DEMAND & SUPPLY, INFLATION, UNEMPLOYMENT, FISCAL POLICY

Aggregate demand: relationship between all spending on domestic output & average price level of that output
= demand for GDP (C + I + G + NX) at different price level

Why is AD down sloping?

-*Foreign Sector Substitution Effect:* when domestic price increases, consumers look to imports.

-*Interest Rate Effect:* when the price level increases, loans cost more, so consumers wait.

-*Wealth Effect:* as average price level rises, purchasing power falls.

***Aggregate demand is not the summation of microeconomic demand curves. It is a model of how domestic production changes when the average price level changes. ***

Shifts in AD—changing a component of GDP shifts the AD (C, I, G, NX)

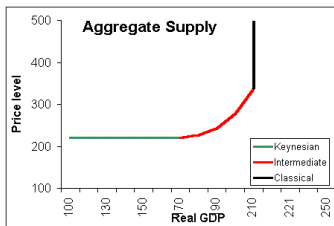
C: give consumers more money, make them more confident or lower taxes & increase transfer payments (increases DI)

I: make investors more confident, or make borrowing cheap

G: increase government spending (direct),

NX: depends on foreign incomes, consumer tastes, and exchange rates.

Aggregate supply: relationship between level of domestic output produced & average price level of all domestic output



Short-run: price levels are changing, but input prices have not yet adjusted

- Keynes: unemployed resources, puts little pressure on input costs
- Intermediate: resources become more difficult to find, so input costs rise
- Classical: input prices have adjusted (same as long-run)

Long-run: input producers have increased their prices (because higher prices lead to higher costs-of-living) = PPF

Shifts in AS

-Short-run shifts

- *Input prices:* if input prices fall, SRAS increases without changing the level of full employment.
- *Tax policy:* if supply-side taxes are lowered, SRAS increases.
- *Deregulation:* if regulations are lessened, SRAS increases.
- *Political/environmental disasters:* if a disaster occurs, SRAS decreases without changing the level of full employment.

-Long-run shifts

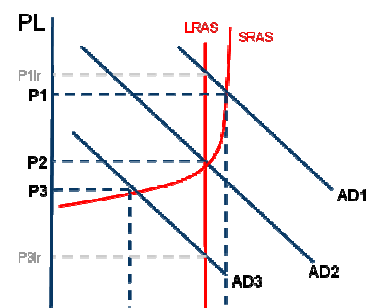
- *Availability of resources:* more widely available resources can increase the level of full employment.
- *Technology and productivity:* better technology increases productivity.
- *Policy incentives:* policies like unemployment insurance provide incentives for a nation's labor force to work.

Equilibrium: quantity of output demanded = quantity of real output supplied

When the economy is in equilibrium, but not at the level of GDP that corresponds to full employment (LRAS), the economy is experiencing a gap.

- *Recessionary gap:* economy is operating below full employment.
- *Inflationary gap:* economy is operating above full employment.

In the Keynesian range, an increase in demand increases GDP & employment and doesn't increase price level much.



Beyond that, an increase in demand increases GDP & employment, but also inflation (*demand-pull inflation*).

Spending multiplier effect: in the Keynesian range, the effect of an increase in AD is greater than beyond that.

Supply-side boom: the best of all situations, price level falls, GDP increases, unemployment falls

Cost-pull inflation or stagflation: the worst of all situations: inflation rises, GDP decreases, unemployment increases

Supply shock: an economy-wide phenomenon that affects the costs of firms (e.g. high productivity or OPEC embargo); these are what cause shifts in AS



Phillips curve: the inverse relationship between inflation and the unemployment rate

□ Short-run: downward sloping

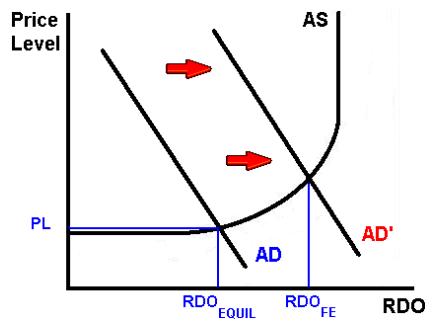
When supply shocks happen, the short-run Phillips curve shifts.

Long-run: like LRAS, it's a vertical line; the economy ALWAYS goes to this (natural rate of unemployment)

Expectations: if people think inflation will happen, they'll actually cause it.

FISCAL POLICY

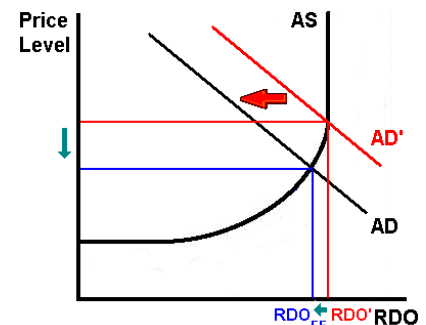
Demand-side



□ Expansionary: fixes recessionary gap
Contractionary: fixes inflationary gap □

Does the fall in price level actually happen? Keynesians say no because prices are sticky, so contractionary policy actually only slows inflation.

Deficit = in one year, a gov't spends more than it collects; debt = accumulation



How to finance the budget deficit for expansionary policy:

Borrowing (consequence: crowding out (lowers supply of loanable funds, decreasing investment), decreasing effectiveness)

Creating money (consequence: inflation, decreasing effectiveness)

How to use a budget surplus for contractionary policy:

Pay off debt (consequence: crowding in (increases supply of loanable funds, increasing investment), decreasing effectiveness)

Removing idle funds from the economy (most effective)

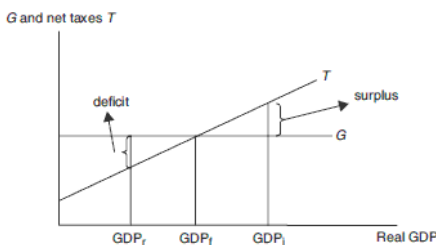


Figure 15.3

Another problem: **net export effect**—in a recession, the dollar appreciates, so NX decreases, decreasing effectiveness of an expansionary policy (similar for contractionary policy)

Also, state & local governments, which are required to balance their budgets, may also decrease effectiveness of an expansionary policy by increasing taxes.

Automatic stabilizers: taxes & transfers create deficits in recessions & surpluses during growth

These lessen business cycle swings.

GROWTH POLICY/PRODUCTIVITY

PPF grows if quantity of resources increases, quality of resources increases, or quality of technology increases.

Those factors represent increased productivity (quantity of output/worker).

Determinants of productivity

- Stock of physical capital—tools
- Human capital—knowledge, training, health
- National resources
- Technology

** All of these determinants require investment, and investment comes from saving. Policies to increase productivity should make it easier to invest and/or easier to save. **

Supply-side: if the government must intervene, focus on AS by providing incentives (best of all situations)

- Remove taxes → more savings → more loanable funds → more investment
- Use an investment tax credit (reduces a firm's taxes if it invests in physical capital)

These increase LRAS. (It also increases AD.)

Why lower taxes increase AS & AD:

Productivity incentives: less taxes = greater incentive, people less dependent on government

Risk taking: less taxes = increased expected rate of return, more investment

MONEY

Types of financial assets:

1. Stocks (equity finance)
2. Bonds (debt finance)
3. Money: medium of exchange, unit of account, store of value

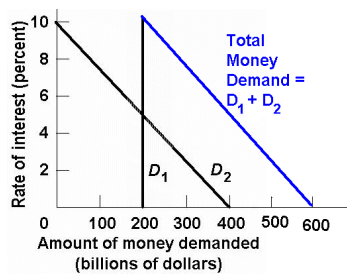
Time value of money: money available now is more valuable than money in the future (opportunity cost for interest)

$$FV = PV * (1+r) \quad PV = FV/(1+r)$$

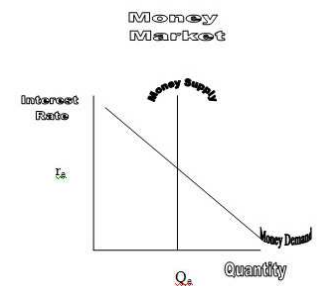
Money supply

- M1 = cash + coins + checking deposits + traveler's checks
- M2 = M1 + savings deposits + small (<\$100,000) time deposits + money market deposits + money market mutual funds
- M3 = M2 + large (>\$100,000) time deposits

Money supply is constant, so the curve is vertical. We focus on M1.



Demand for money = transaction demand + asset demand
 Transaction demand: as nominal GDP increases, consumers demand more money to buy stuff; we assume that interest rate doesn't affect transaction demand so it's constant
 Asset demand: money is low risk; there's a large asset demand when interest rates for bonds are low

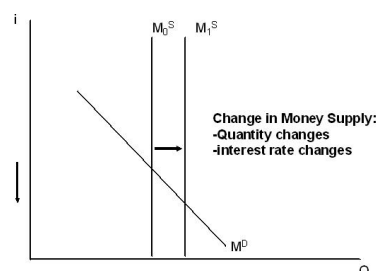


Money market

Theory of liquidity preference—equilibrium “price” of money is the interest rate where money supply intersects money demand (money demand can increase if more transactions are being made, but we'll focus on money supply)

How is this different from loanable funds?

1. Breadth of scope: loanable funds comes from saving; supply of money includes currency & checking deposits too
2. Different philosophies: classical = loanable funds; Keynesian = money market
3. Loanable funds = real interest rate; money market = nominal interest rate



Changes in money supply

With more money, people demand more assets like bonds to spend their money on. Bond prices increase due to higher demand, so interest rates drop (because they're relative to the bond price).

With less money, bondholders sell their bonds so they have money for transactions. An increase in bond supply decreases bond price & increases interest.

to hold a fraction of the total money supply in reserves
 Balance sheet □

Fractional reserve banking: a bank only has

(dollars in millions)	Increase	Change
Average assets		
Marketable investment securities	\$ 19,146	303%
Customer receivables	12,577	26
Receivables from brokers and dealers	9,566	96
Trading assets	8,833	9
Loans, notes and mortgages	4,084	44
Average liabilities		
Demand and time deposits	\$ 20,084	139%
Long-term borrowings	8,141	15
Trading liabilities	6,436	10

Asset: anything owned by the bank or owed to the bank (cash on reserve, loans made to citizens)

Liability: anything owed by the bank (checking deposits, loans to the bank)

Money multiplier (M) = $1/rr$ (maximum amount of money created by a deposit)

Monetary policy: takes longer to make an impact, but better

Expansionary: increase money supply □ lower interest rate □ higher demand for consumption & investment

Contractionary: decrease money supply □ higher interest rate □ lower demand for consumption & investment

Methods:

- Open market operations: buy/sell bonds
- Discount rate (rate at which banks borrow from the Fed): lower: increases excess reserves & expands money supply
- Reserve ratio: lowering rr increases excess reserves in banks & expands money supply

Policy mix

Deep recessionary gap: both expansionary (watch for inflation)

Mild recessionary gap: expansionary fiscal, contractionary monetary (watch for rising interest rates)

Inflationary gap: both contractionary (watch for unemployment)

Quantity theory of money: the critical link between monetary policy & real GDP is the relationship between changes in money supply, real interest, & level of private investment; monetarist theory postulates that increasing money supply has no effect on real GDP, only price level

Velocity of money (V)—times a year that money changes hands

$MV = PQ$, or $V = PQ/M$

Historically, V has been constant. Q is a function of technology & supply of resources. Thus, the only thing that changes is P .

INTERNATIONAL TRADE

Consumption possibility frontier: when countries trade, their CPF extends beyond their individual PPF's

CURRENT ACCOUNT			
Merchandise Exported	290.1		
Merchandise Imported	-162.3		
Balance on Merchandise Trade		127.8	
Services Exported	25.3		
Services Imported	-82.6		
Balance on Services		-57.3	
Balance on Goods and Services			70.5
Unilateral Transfers		5.3	
Balance on CURRENT ACCOUNT			75.8
CAPITAL ACCOUNT			
Domestic Government Investment	-24.7		
Domestic Private Investment	-91.3		
Domestic Investment in Foreign Assets		-116.0	
Foreign Government Investment	8.1		
Foreign Private Investment	33.8		
Foreign Investment in Domestic Assets		41.9	
Balance on CAPITAL ACCOUNT			-74.1
Balance on CURRENT AND CAPITAL ACCOUNT			1.7
Statistical Discrepancy		-1.7	
OVERALL BALANCE			0.0

Balance of payments statement/balance of trade—a summary of payments from & to the United States

Current account—shows current import & export payments of G&S (e.g. USD, Euro)

Capital account—shows capital/asset flow

Official reserve account—the Fed holds quantities of foreign currency called official reserves.

- If the US has sent more dollars out than foreign currency has come in, there exists a balance of payments deficit. In this case the Fed credits the account so that it balances.

- If the US gets more dollars in than out, there exists a balance of payments surplus. In this case the Fed transfers surplus currency into

official reserves.

If Americans import more G&S, the current account will move in the deficit direction but the capital account will move in the surplus direction.

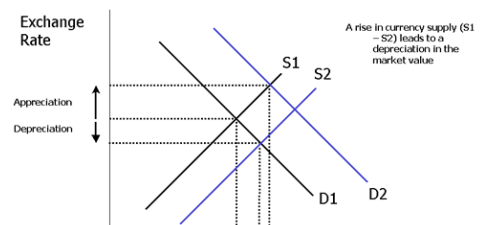
- US imports require a demand for foreign currency & a supply of USD.
- US exports require a demand for USD & a supply of foreign currency.

Currency markets: when countries trade G&S, they are implicitly trading currency. The rate of exchange is determined by the foreign exchange market. Some nations fix their exchange rate while others are allowed to “float” with the forces of supply & demand.

Appreciating & depreciating currency—if the US economy is strong, Americans increase demand for European G&S. They increase the supply of dollars in the market; the Euro appreciates while the dollar depreciates. (Demand for Euros & supply of dollars increase.)

Changes in exchange rates:

- Consumer tastes
- Relative incomes



- Relative inflation* (e.g. if European inflation is higher than US inflation, Europeans buy American.)
- Speculation* (because currencies are traded as assets)
- Monetary policy* (the US relative interest rate is higher, making the US a relatively more attractive place for financial investments like bonds but NOT capital investments)

Revenue tariff—an excise tax on goods not produced domestically (doesn't impede trade)

Protective tariff—an excise tax on goods produced in the domestic market

Quota—a maximum amount of goods that can be imported

Tariffs & quotas both...

...hurt consumers with artificially high prices & lower consumer surplus,

...protect inefficient domestic producers at the expense of efficient foreign firms, creating dead weight loss,

...and reallocate economic resources toward inefficient producers.

However, tariffs collect revenue while quotas do not.