ISTANBUL BILGI UNIVERSITY

Lecture Notes for EC201

Macroeconomics

Delivered by

Asaf Savaş Akat

based on

N.G.Mankiw: *Macroeconomics (5th ed)*

Istanbul, 2007

http://akat.bilgi.edu.tr

PART ONE: INTRODUCTION

Ch.1: Macroeconomics as Science
Ch.2. The Data of Macroeconomics

Macroeconomics

- *Microeconomics* is the study of how individual households and firms make decisions and how they interact with one another in markets
- *Macroeconomics* is the study of the economy as a whole or economic changes that affect many households, firms, and markets at once
- Major macroeconomic variables are
  - Inflation
  - Economic growth and unemployment
  - Interest rate
  - Exchange rate
  - Financial crisis

Difficulties of macroeconomics

- Macroeconomics is both abstract and concrete
- *Abstract*: because there are many models and theories which explain the behaviour of complex economies
- *Concrete*: because we deal with a real economy such as the US economy or the Turkish economy
- Mankiw's book is written for US students and therefore deals mainly with the US economy
- Our course puts the emphasis on the problems and issues relevant for the Turkish economy
- Lecture notes include *Turkish macroeconomic data* and issues

Key variables and magnitudes

- *Growth of GNP*: direction and size of the change in production and economic activity
- *Unemployment*: number of jobless and its proportion to the labour force
- *Balance of Payments*: relations with the outside world
- *Inflation*: change in price level
- *Interest rate*: the price of money
- *Exchange rate*: the price of foreign exchange
- *Public finance*: taxes, government spending and the budget balance
- *Public debt*: its level and the direction of change

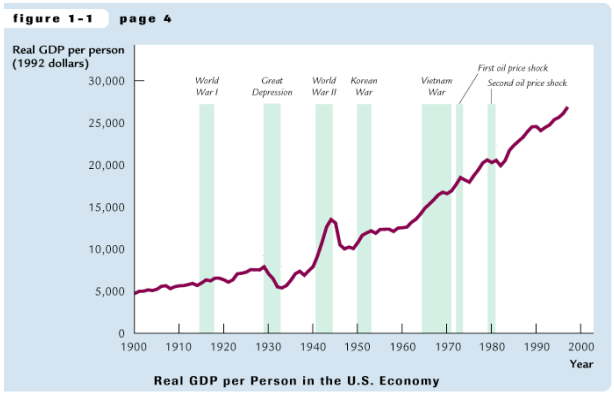
Some definitions

- *Boom*: expansion in economic activity resulting in above average growth rate of GNP
- *Recession*: a serious slowdown in economic activity leading below average or even negative growth rate of the GNP
- Technically: recession is negative GNP growth for two successive quarters
- *Depression*: severe and long contraction in GNP that lasts several years
- *Deflation*: an absolute fall in price indexes
- *Financial crisis*: major turmoil in markets leading to volatility in all macroeconomic variables

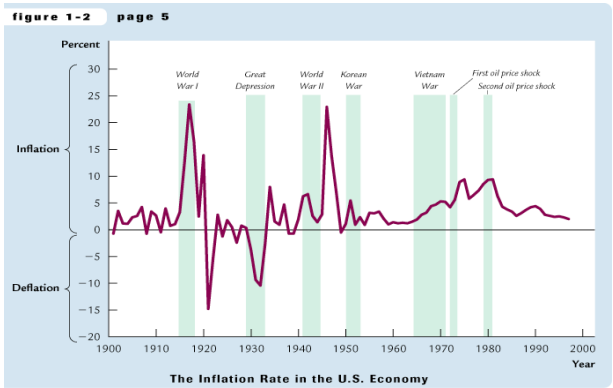
Economic policy

- The actions of the government play a very important role in macroeconomic analysis
- Government involvement in the economy is through macroeconomic policies that it implements
- *Fiscal policy*: taxing and spending decisions, summarized by the budget
- *Monetary policy*: interest rate and money supply decisions by the Central Bank
- *Exchange rate policy*: often a part of monetary policy
- Trade policy, policies towards the financial sector, public borrowing policies, etc. may also have important macroeconomic consequences

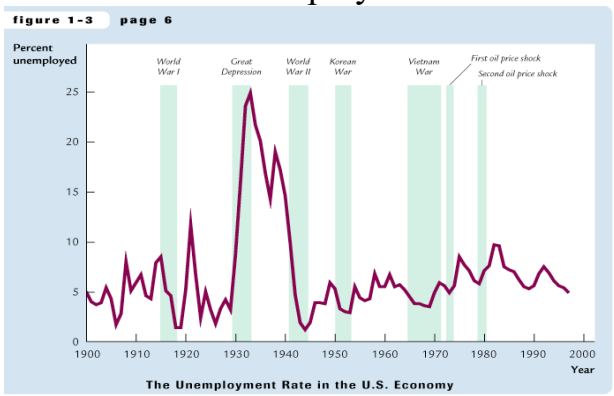
US: real GDP



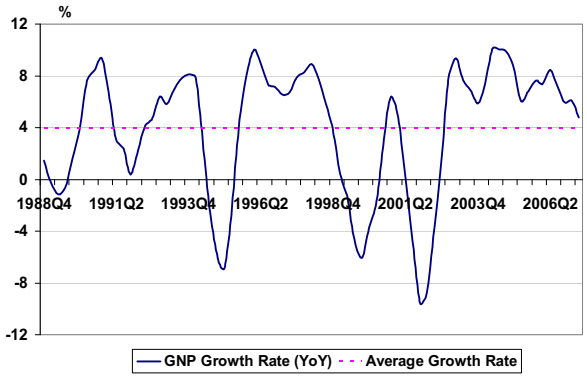
US: inflation



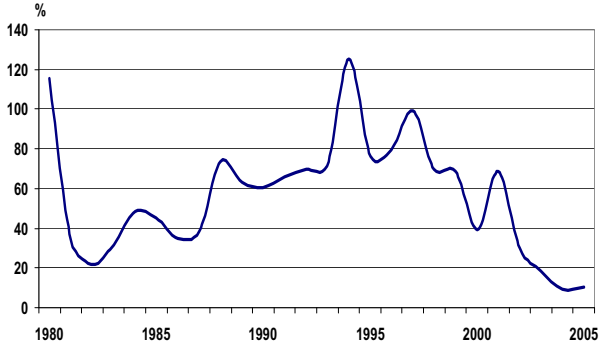
US: unemployment



Turkey: GDP growth 1988-2007



Turkey: CPI inflation 1980-2005

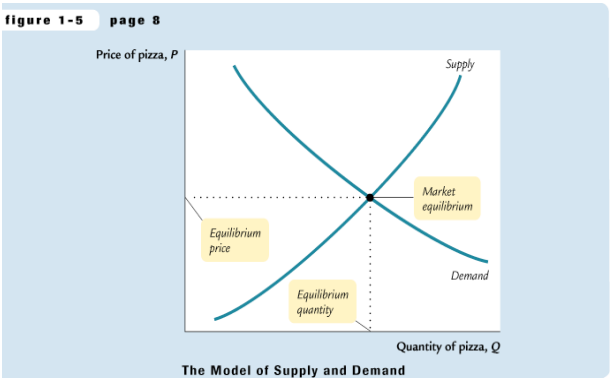


Theory as model building

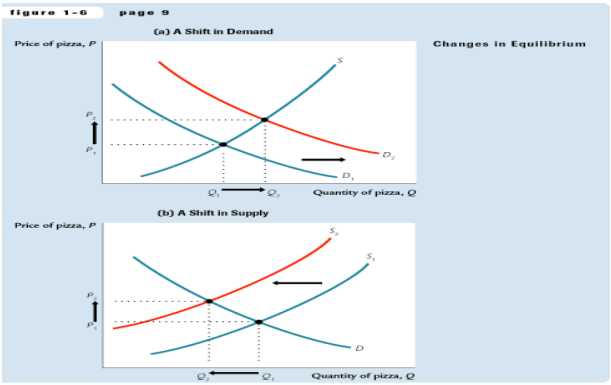
- *Models* help us simplify complex events taking place in real economies
- *Exogeneous* variables are taken as given
- *Endogeneous* variables are explained by the model
- The basic tool of economic analysis is the supply and demand model
- Where the factors that influence demand and supply decisions are simplified into price P, income Y and cost of production C

$$Q^d = D(P, Y)$$
$$Q^s = S(P, C)$$
$$Q^d = Q^s$$

Supply, demand and equilibrium



Changes in equilibrium



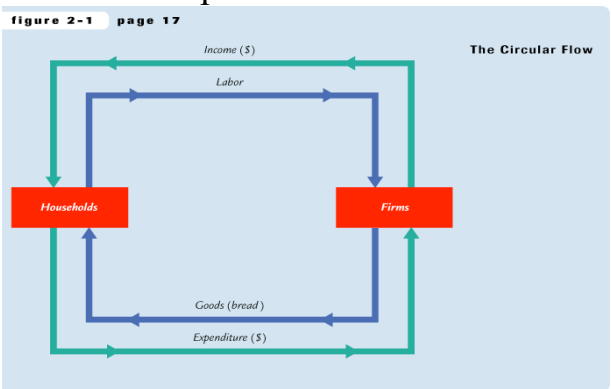
Prices: flexible or sticky

- How does supply and demand work?
- We can ask another question: What *clears* the markets?
- In theory, prices move to adjust supply and demand quantities
- This is called *flexible prices*
- In real life, sometimes prices don't change
- Quantity supplied has to adjust itself to quantity demanded at the constant price
- This is called *sticky prices*
- Flexible prices require perfectly competitive markets
- Otherwise sticky prices may the the rule
- This distinction is vital for macroeconomics

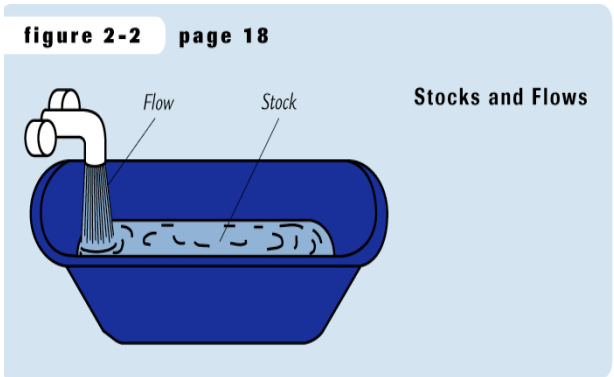
Circular flow of income and expenditure

- Macroeconomics studies the flows of income and expenditure in the economy
- EVERY SPENDING BECOMES INCOME TO SOMEONE
- EVERY INCOME IS SOMEONE'S SPENDING
- Macroeconomics basically involves an analytical effort to answer the following questions
  - What makes the circular flow work smoothly?
  - When and why does the circular flow break down?
  - What can be done at the policy level to restore it back to work smoothly once it breaks down?

Simplest circular flow



Stocks and flows



Measuring income: GDP and GNP

- *Gross Domestic Product* (GDP) covers all goods and services produced within the country
- *Gross National Product* (GNP) includes net factor income from abroad
- Total spending = total production = total income earned
- Measuring GDP and GNP is also called *National Income Accounting*
- *Türkiye İstatistik Kurumu TÜİK* (eski Devlet İstatistik Enstitüsü DİE) publishes in quarterly and annual format Turkish national income
- There are UN rules for standardisation

Rules for computing GDP

- Key concept: *Value added*
- It prevents the double accounting of inputs in the final product
- Used (second hand) goods are excluded
- *Inventory change* is a tricky subject
  - Increases are treated as demand from firms
  - Falls are treated as negative value added
- Intermediate goods enter only with the value added in their production not their full value
- *Imputed value*: owner occupied houses create value
- Informal (black or underground) economy is excluded from national income accounting

Nominal and real GDP

- GDP is always computed with *current prices*
- *Nominal GDP* is at current (actual) prices
- Comparing two periods, changes in the value of nominal GDP reflects:
  - Changes in the quantities of goods and services
  - Changes in the prices of goods and services
- *Real GDP* calculates only the change in quantities
- It is computed by using base year constant prices
- *GDP deflator* is the measure of inflation used to obtain real GDP from nominal GDP
- Turkish real GDP is calculated on the basis of constant 1987 prices

Components of expenditure

- Gross Domestic Product - Y
  - Consumption – C
  - Investment – I
  - Government purchases – G
  - Net exports – NX
- *National income identity* (expenditure)

$$Y = C + I + G + NX$$

- Alternative presentation

$$Y = C + I + G + X \text{ (spending)}$$

$$Y = C + S + T + M \text{ (allocation)}$$

- *Consumption*: all goods and services bought by households (excluding houses)
  - Food, tobacco and drinks
  - Non-durable goods
  - Durable goods
  - Trade and services
- *Investment*: goods bought for future use
  - Business fixed investment (public & private)
  - Residential fixed investment (housing)
  - Inventories
- *Government*: excludes transfer payments (interest, social security, etc)
- *Net exports*: includes services (tourism, transport, licence fees, banking and insurance, etc)

Other measures of income

- *Gross National Product* (GNP) : GDP + net factor income from abroad
- *Net Factor Income From Abroad*: factor payments to and from abroad (interest, dividends, expatriate pay, etc.)
- *Net National Income* (NNP): GNP – Depreciation
- US and developed countries prefer GDP
- In Turkey GNP is more meaningful due to the size of workers remittences
- In Turkey only production and spending data are published; US also publishes data on income earned by different categories (wages, profits, rent, interest)

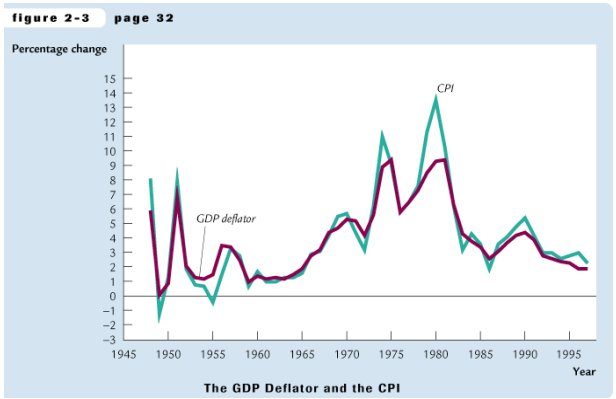
Seasonal cycles

- Economists are interested in studying the quarter-to-quarter change in national income variables
- But there exist substantial variations in output due to the *effects of seasons*
- For example in Turkey agriculture and tourism activities take place mainly in the summer months
- This is called the *seasonal cycle*
- Therefore it is necessary to adjust the national income series for these seasonal factors in order to make quarter-to-quarter comparaisons
- Many statistical methods may be used to obtain *seasonally adjusted* series

Measuring inflation: price indexes

- *Consumer Price Index* – CPI (TÜFE) covers all goods and services of a typical consumer basket
- CPI includes in Turkey rent for housing
- *Producer Price Index* – PPI (Producer Price Index – ÜFE – in Turkey) covers basic inputs and raw materials (all goods – mainly inputs, no services)
- PPI includes in Turkey agricultural products
- For example, prices of shirts, ties, etc. are in the CPI
- Prices of cotton, yarn, etc are in the PPI
- *TÜİK* calculates price indexes on the basis of a basket established in 2003 through a consumer survey

US: CPI and GDP deflator



Measurement issues

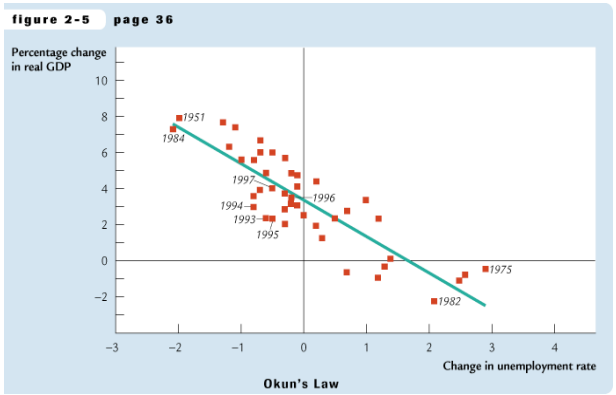
- GDP deflator measures prices of all *domestically produced* goods and services
- CPI measures only consumption goods and services but it includes the prices of imports
- GDP deflator assigns changing weights when new categories are added
- CPI uses fixed weights established in the base year
- CPI may *overstate inflation* due to
  - new products
  - quality improvements
  - substitution effect,
  - changing tastes

Measuring unemployment

- *Adult population*: total population in the working age group (ages 16 or 18 to 65)
- *Participation rate*: ratio of labour force to the active population
- *Labour force*: those working + those unemployed
- *Unemployment rate*: number of unemployed divided by labour force
- *Okun's law*: higher growth rates lead to lower unemployment rates

  % change in GDP = 3 % - 2 x change in unemp.rate
- In the US unemployment remains constant for GDP growth rate of 3 %, increases at lower and falls at higher growth rates

US: GDP growth and unemployment



PART TWO

CLASSICAL THEORY

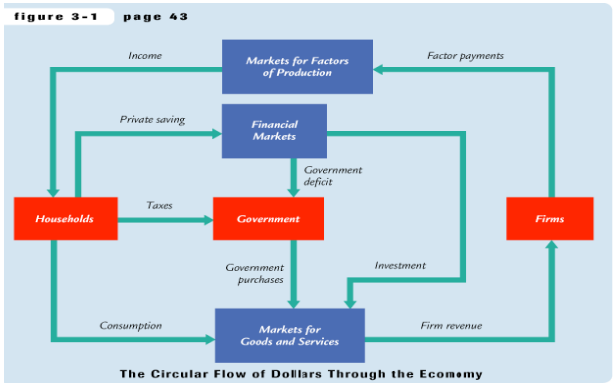
THE ECONOMY IN THE LONG RUN

- Ch.3 – National Income: Where it comes from and where it goes (Week 1)
- Ch. 4 – Money and Inflation (Week 2)
- Ch. 5 – The Open Economy (Week 3)
- Ch. 6 – Unemployment (Week 9)

Ch.3 : National Income
Where it comes from and where it goes

- In Part Two, we introduce the "*classical*" models of macroeconomic theory
- "Classical" models assume prices are *flexible*
- Chapter 3 builds the most basic classical model
- Which tries to answer the following questions:
  - What determines a nation's total income?
  - Who gets how much of it?
  - Who buys the output of the economy?
  - What keeps the equilibrium between the supply and demand of the goods and services produced?

Circular flow for closed economy



Production of goods and services

- *Factors of production*: classical models take labour and capital as given (fixed) and fully utilised (markets clear)

$$K = \overline{K} \qquad L = \overline{L}$$

- *Production function*:

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

- *Constant returns to scale*

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

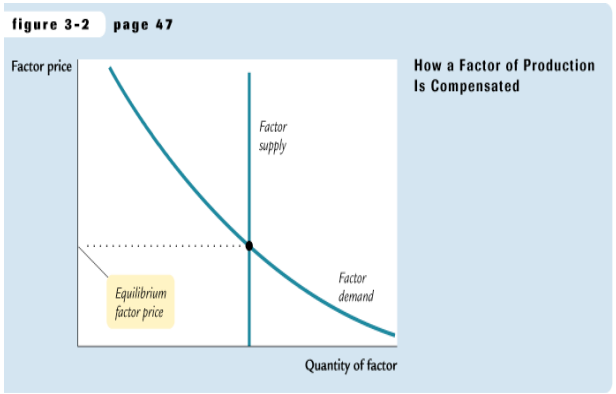
- Supply of goods and services is given by the production function:

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

Distribution of national income

- The classical (flexible price) model gives us the *neoclassical theory of distribution*
- *Factor prices* are determined by the supply and demand for factors of production
- Supply and demand (and *flexible factor prices*) therefore determine the distribution of income
- Factor demand comes from the competitive firms that maximise profits
- Factor supply is fixed both for capital and labour
- Flexible prices permit factor prices move up and down to adjust supply and demand for factors of production

Market equilibrium and factor prices



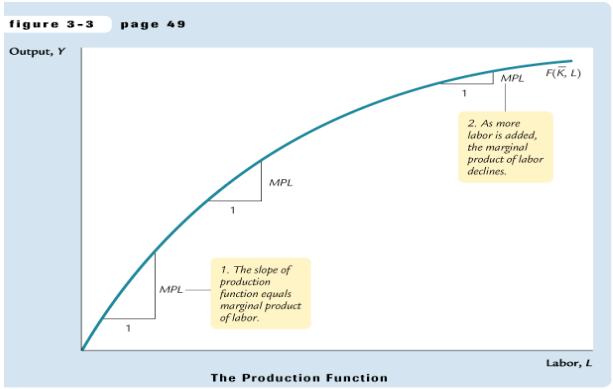
Marginal product of labour -MPL

- Firms in competitive markets will demand labour if MPL is above wages to earn profit

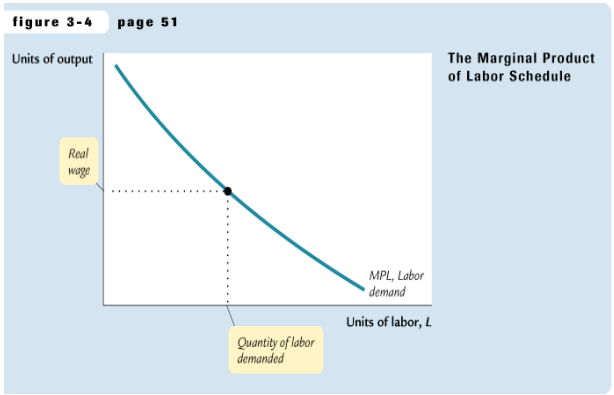
$$MPL = F(K, L+1) - F(K, L)$$

- *Diminishing marginal product*: as additional workers are employed with a given capital stock, their productivity declines
- In neoclassical theory, the MPL curve for the whole economy is also the demand curve for labour
- The intersection of the economy-wide MPL curve with the fixed supply of labour L determines *real wages*

Production function



Diminishing marginal product



Demand for goods and services

- We start with a very *simple model* in order to understand how the circular flow works
- Assumptions:
  - a *closed economy*: no exports or imports
  - *no money*, therefore no inflation
- National income identity becomes

$$Y = C + I + G$$

and

$$Y = C + S + T$$

- This is not realistic but it allows us to get a first feeling about the behaviour of economy-wide demand

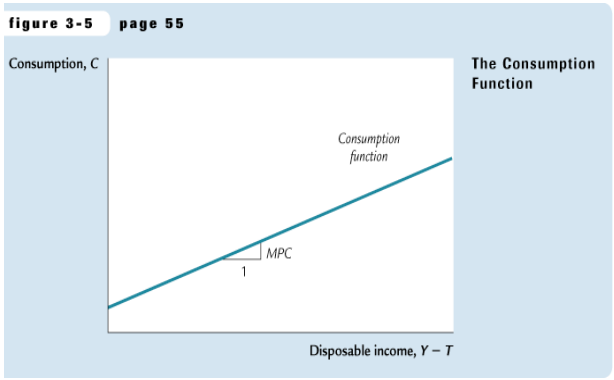
Consumption

- Households receive **Y** as income
- *Disposable income* is obtained by substracting taxes paid to government (Y – T)
- Households consume part of their disposable income
- *The consumption function* summarises this relation

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

- *Marginal propensity to consume* (MPC) is the share of additional consumption spending in additional income
- MPC is assumed to be positive but below 1
- *Average propensity to consume* (APC) is consumption C divided by income Y

Consumption function

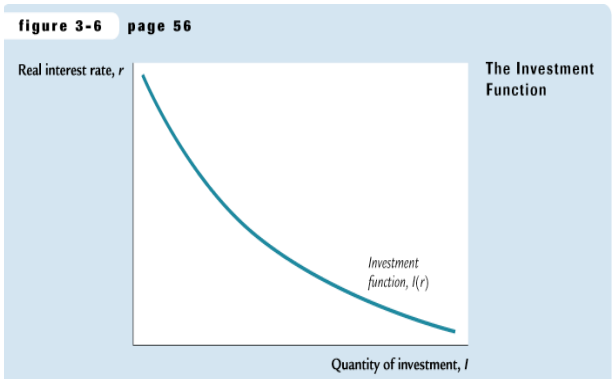


Investment

- Additions to the capital stock of the economy are called *gross capital formation* or investment
- New houses are also considered investment
- Investment decisions are undertaken by firms and households
- Investment decisions depend on many factors, such as market conditions, technology, etc.
- For classical analysis the real and nominal *interest rate* is the most important factor for investment decisions
- *The investment function* therefore becomes

$$I = I(r)$$

Investment function



Many interest rates

- In the media not one but many interest rates are reported
- These depend on many factors
- *Term*: some loans are for a short period of time; others are for very long periods of time
- *Credit risk*: the probability that the borrower will not pay back the loan must be taken into consideration
- *Tax treatment*: the interest income on different kinds of deposits and loans are taxed differently
- All actual interest rates are nominal
- We assume *a single interest rate and* usually express it as the real interest rate

Government purchases

- *Government spending* includes salaries of civil servants, electricity, gas, stationary, travel, etc.
- But it *excludes* transfer payments such as pensions, subsidies, interest, etc.
- Governments decide on the level of spending as they see fit in the budget

$$G = \overline{G}$$

- *Taxes* are net of subsidies and pensions:
- The budget also fixes taxes: $T = \overline{T}$
- *Budget balance* is the difference:

$$T - G \gtreqless 0$$

- *Fiscal policy* determines the budget balance

Goods and services market

- We can now write the equations for goods and services market
- Demand for goods and services

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

- Supply for goods and services: $Y = F(\overline{K}, \overline{L}) = \overline{Y}$
- Giving us:

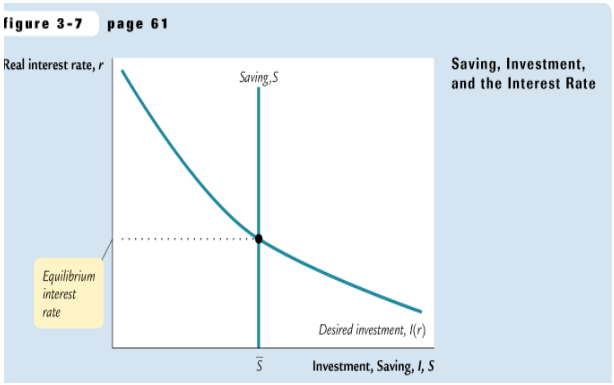
$$\overline{Y} = C(\overline{Y} - \overline{T}) + I(r) + \overline{G}$$

- The interest rate will change, bringing equilibrium into the goods and services market

Financial markets: loanable funds

- Now we look at the financial markets also called *loanable funds market* for saving and investment
- Saving: $S = Y - C - G$
- Private saving: $S_{pr} = Y - T - C$
- Public saving: $S_{pb} = T - G$
- Total: $S = Y - T - C + T - G$
- Also: $S = I(r)$
- Therefore: $\overline{Y} - C(\overline{Y} - \overline{T}) - \overline{G} = I(r)$
- Again the interest rate will change to bring equilibrium to the financial markets
- This is the classical loanable funds theory of the interest rate

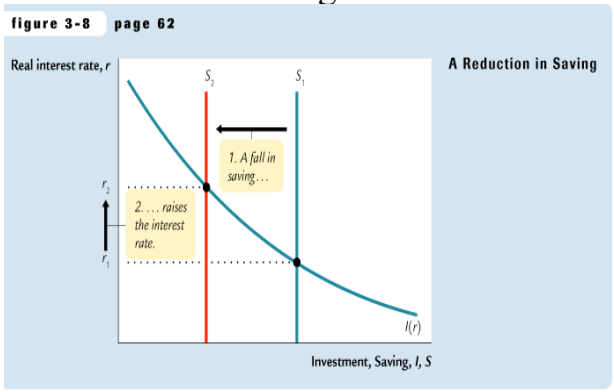
Loanable funds market



Fiscal policy and r

- *Fiscal policy* is changes in the budget balance
  - Either an increase\fall in G
  - Or an fall\increase in T
- Increase in G (decrease in T) causes lower S and the interest rate goes up
- Decrease in G (increase in T) causes higher S and the interest rate goes down
- Fiscal policy *shifts* the S curve and thus has an immediate effect on the interest rate
- In this simple classical model, the economy *adjusts* to changes in fiscal policy by interest rate movements

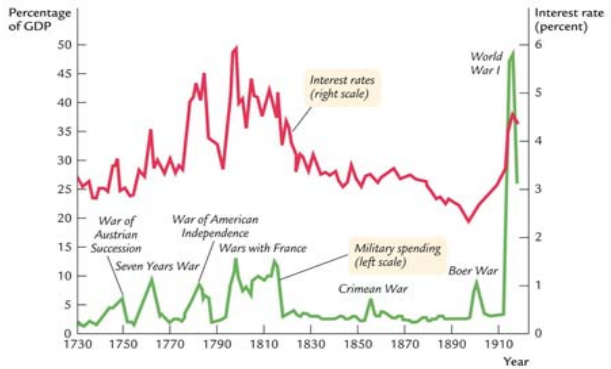
Rise in budget deficit



Wars and interest rates

- *Case Study* (p.62) "Wars and Interest Rates in the United Kingdom, 1730-1920"
- Military spending increases substantially during periods of wars
- Governments find it difficult to finance war spending by taxes alone
- Therefore incur large *public debts*
- In theory this should increase interest rates
- The experience of England is in line with the predictions of the theory
- Higher military spending and higher interest rates go together

Wars and interest rate in UK

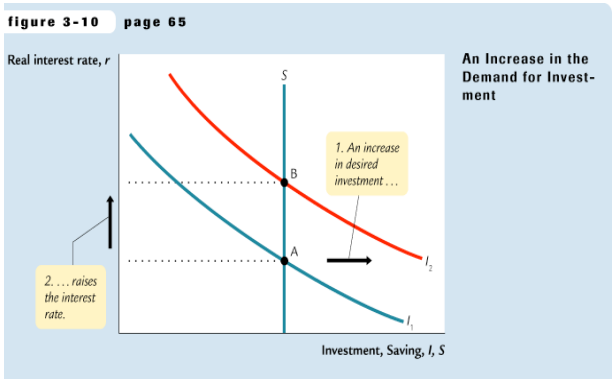


Investment demand and r

- Technological change, improved market conditions, incentives by the government may affect positively investment decisions by firms
- A financial crisis, pessimism about the future, political unrest, etc. may affect negatively investment decisions by firms
- These *shift* the investment curve up or down, leading to higher or lower interest rates
- Again, the economy *adjusts* to changes in investment environment through the interest rates
- Assuming a positive relation between saving and the interest rate does not change the results

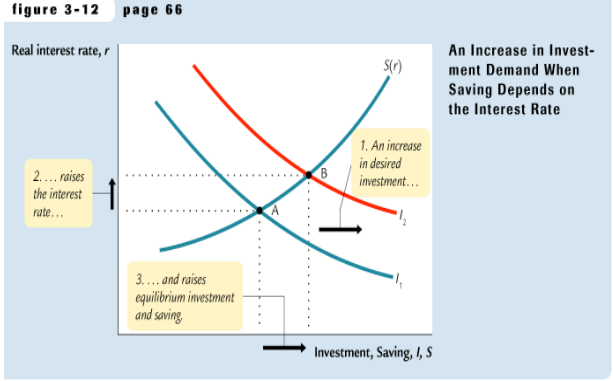
Increase in investment demand

figure 3-10 page 65



Saving depends on interest rate

figure 3-12 page 66



Identification problem

- In the model investment depends on the interest rate
- But in empirical research it is almost impossible to find the kind of relation predicted by the model
- Often investment spending and interest rates *move together*, not in opposing directions
- Because many other factors besides the interest rate influence investment decisions
- This is called an *identification problem*
- What we observe in data is usually the result of changes *both* in supply and demand conditions, not just in one of them as in the model

Final comments

- Simple closed economy model with government and financial markets but without money and inflation
- In the long run, we take capital, labour and therefore output as *fixed and fully employed*
- Smooth working of the circular flow is obtained by the *flexibility of the interest rate*
- There are difficulties in verifying this on data because of *identification problems*

MONEY AND INFLATION

Chapter 4

Money in a market economy

- Wherever and whenever trade appears and and prospers, societies invent *money*
- *Barter* is an inefficient method as a payment system to settle transactions
- A producer has to find someone who is willing to give what he wants in exchange for what he offers
- This is called "*double coincidence of wants*"
- A modern market economy requires an *efficient and reliable* payment system
- From early history onwards, human societies have invented mediums of exchange in order to facilitate exchange and trade

Inflation and the value of money

- *Inflation* is defined as " an increase in the overall level of prices"
- Prices of *all* goods and services increase over time even if relative prices remain unchanged
- Usually relative prices also change in time but not by the same amount or even in the same direction
- Inflation corresponds to a fall in the *purchasing power* of money
- Price level and the *value of money* are inversely related
- As the price level goes up, same amount of money buys less and less amount of goods

Not every country has inflation

- Very low levels of inflation (say below 3 % p.a.) is the rule in most of the world economy today
- High and persistent inflation as in Turkey has become a *very exceptional* case
- US, Switzerland, UK, etc. have been using the *same currency* for several centuries
- Japan had several years of negative inflation (*deflation*) during the last decade
- Many countries, such as Germany and Switzerland had average annual inflation of around 3 % for the last half century
- Even in Turkey inflation is falling

Inflation in 20th century

- Widespread high inflation is a *20th century* phenomenon
- Some countries had short periods of very high inflation, called *hyperinflation*
- Other countries had longer periods of high inflation
- In most countries inflation increased in 1970s and early 1980s
- The world was back to low inflation in 1990s
- Today many countries are worried about possible deflation (negative inflation or falling price level)
- Turkey is *unique* with 3 decades of high inflation without ever experiencing hyperinflation

Comparative inflation: long run

	CPI in 1960	CPI in 2000	Average Inflation (%)	CPI inflation in 2001 (%)
Germany	100	342	3,1	1,7
Switzerland	100	382	3,4	0,7
Netherlands	100	498	4,1	3,8
Belgium	100	382	3,4	2,6
United States	100	581	4,5	1,1
Japan	100	550	4,4	-1,4
Canada	100	615	4,6	1,3
Thailand	100	757	5,2	0,3
France	100	813	5,4	2,0
United Kingdom	100	1.367	6,8	1,3
India	100	2.160	8,0	4,9
Egypt, Arab Rep.	100	3.734	9,5	2,5
South Korea(*)	100	1.965	9,2	-1,1
Greece	100	6.419	11,0	3,4
Mexico	100	491.460	23,7	4,8
Turkey	100	27.221.930	36,7	68,5
Argentina	100	144.071.709.066.919	101,4	4,0

(*) Series start at year 1966

Comparative inflation by decades

	Average Annual Inflation				
%	1960-2000	1960s	1970s	1980s	1990s
Germany	3,1	2,6	4,9	1,5	2,1
Switzerland	3,4	3,5	4,5	2,4	1,3
Netherlands	4,1	4,8	7,5	1,2	2,3
Belgium	3,4	3,5	4,5	2,4	1,3
United States	4,5	2,8	8,1	3,7	2,6
Japan	4,4	5,5	9,8	1,4	0,6
Canada	4,6	3,1	8,8	4,4	1,5
Thailand	5,2	1,8	10,2	3,0	4,8
France	5,4	3,8	10,2	4,4	1,5
United Kingdom	6,8	3,9	14,9	5,3	2,7
India	8,0	7,7	7,6	8,2	8,8
Egypt, Arab Rep.	9,5	4,2	10,1	18,3	7,9
South Korea(*)	9,2	-	16,5	4,1	4,8
Greece	11,0	2,3	15,5	17,9	8,0
Mexico	23,7	2,9	18,5	76,6	19,7
Turkey	36,7	4,4	29,2	48,5	80,8
Argentina	101,4	23,2	149,3	460,3	3,3

(*) Series start at year 1966

Understanding inflation

- Many questions need to be answered on inflation
  - Why the price level increases rapidly in some countries and some periods?
  - Why is there inflation in the first place?
  - What are the causes of inflation?
  - What determines the value of money in an economy?
  - What are the short term and long term effects of inflation on the performance of the economy?
  - Can a market economy live confortably with high inflation over the long run?
  - Should we fight against inflation?
  - How do we fight against inflation?

What is money

- In our daily use, the word "*money*" refers to three interrelated but nevertheless distinct concepts: currency, income and wealth
- In economics money has a very specific definition
- Money is the stock of assets that can be used readily to make transactions
- Keyword: *liquidity*
- *Currency*: coins and banknotes
- Currency, bank deposits, REPOs are typical asset that are considered as liquid assets
- Other assets, such as real estate, cars, etc. are considered not liquid (illiquid) assets

Functions of money

There are three functions of money
- *Medium of exchange* for transactions taking place in the economy
- *Unit of account* for accounting and intertemporal comparaisons in the economy
- *Store of value* to postpone purchasing power

- If the currency of a country fulfills all three functions we can call it *sound money* (sağlam para)
- TL fulfills partly the first function and only for small transactions
- For the two other two functions the USDollar or the Euro is preferred in Turkey
- TL is "*phoney money*" (dandik para)

Types of money

- *Commodity money*: for most of history money was linked to some commodity with an intrinsic value
- Gold and silver were the prefered commodities
- The international payment system was called the *gold standard*
- Each country defined its monetary unit in terms of a quantity of gold
- *Fiat money* has no intrinsic value
- It exists because of government decree or *fiat*
- The world today only has fiat money in the sense that currencies have no longer any link with gold or some other commodity with an intrinsic value

What makes a currency sound?

- *Many illusions* exist about sound money
- The soundness of a currency is not related to
  - Population, size or military power: Switzerland, Danmark, Singapore are small countries
  - Per capita income: Egypt, Afganistan are very poor countries
  - Trade deficit: USA has a very large trade deficit
- Value of fiat money is based on *confidence* of the people and markets who use it
- Sound money corresponds to responsible *economic policies* which countries implement
- *Past performance* is very important to establish confidence for a currency

Evolution of fiat money

- Societies always find ways to facilitate trade
- In prisoner of war camps, cigarettes become money
- In the island of Yap, stones were used
- First, gold was minted by governments to guarantee weight and purity
- Then gold certificates were issued because they are easier to carry and change hands
- Eventually the relation with gold was broken to give us *fiat money*
- Money is really a *social convention*
- It has value because people accept it
- Like the USDollar or the Euro in Turkey

Who creates money?

- Production of fiat money is very profitable
- Issuing authority gets real resources from the public in exchange for pieces of paper
- Everywhere money creation is a public monopoly
- The monetary authority whics issues currency is usually called the *Central Bank* (CB)
- The same function in the US is fulfilled by the *Federal Reserve System* (Fed) composed of regional Federal Reserve Banks
- CB controls the money supply with *monetary policy*
- We go into details of money creation such as *Open Market Operations* (OMO) in week 11 (Ch.18)

Measuring the quantity of money

- There are several definitions of quantity of money
- Definitions may differ among countries due to institutional frameworks
- Different assets are ranked by their liquidity
- *Currency* is by defition the most liquid asset
- *Base money* is currency plus deposits held by the banks at the CB
- Then *deposits at the banks* are added
  - Demand deposits (vadesiz mevduat)
  - Time deposits (vadeli mevduat)
  - Repurchase agrements (REPOs)
  - In Turkey we also include FX (foreign exchange) deposits in the Banks

Money supply in Turkey

		Dec.06 (Billion YTL)	(Billion USD)	As % of M2Y+R
C -	Currency in Circulation	24,7	17,4	9,0
BM -	C + Bank Deposits at CB	22,8	16,1	8,3
M1 -	BM + demand deposits	47,5	33,5	17,3
M2 -	M1 + time deposits	185,1	130,7	67,3
M2Y -	M2 + FX deposits	286,5	202,3	104,2
M2 + R -	M2 + Repos	187,6	132,4	68,2
M2Y + R -	M2Y + Repos	275,0	194,2	100,0

Quantity Theory of Money

- *Quantity equation*: transactions based

$$M * V = P * T$$

(Money * Velocity = Price * Transactions)

- It is an identity that always holds by definition
- If V and T is constant, an increase in M causes aproportional increase in P
- Replace T by Y = GDP and P = CPI
- Quantity equation: *income based*

$$M * V = P * Y$$

- V = Income velocity of circulation
- The assumption of constant V gives a one-to-one relation between M and P = *Quantity Theory of Money*

Money demand function

- The nominal amount of money held will depend on the price level
- *Real money balances* measure the purchasing power of money

$$M/P$$

- *Money demand* function: higher the income, higher real money is demanded

$$(M/P) = (M/P)^d = k\,Y$$

$$M\,(1/k) = P\,Y$$

$$V = 1/k$$

- Income velocity of circulation and k reflect the same characteristic of the economy: the willingness to hold money

Money, prices and inflation

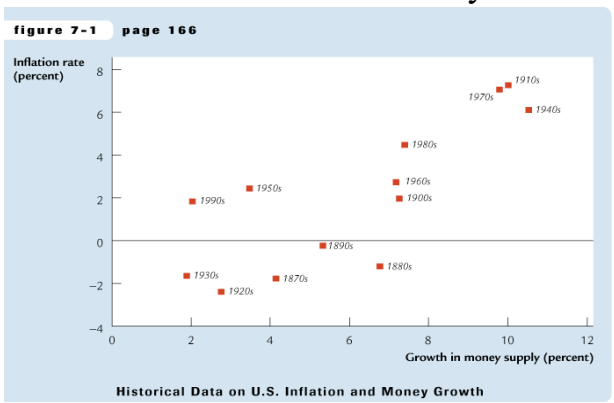
- Production function determines output Y
- Income velocity V is constant in the short run (depends on institutional framework, etc)
- Money supply determines nominal output PY
- Price level P is the ratio of output to nominal income
- In the *long run* changes in money supply will cause correponding changes in the price level
- For low levels of inflation we can write the following equality

% change in M + % change in V = % change in P + % change in Y

Inflation and money growth

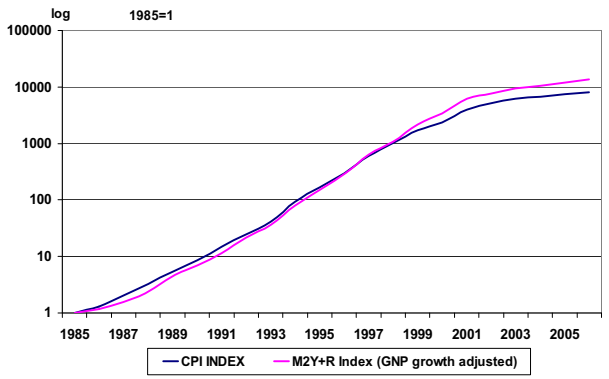
- A famous dictum by Nobel-prize winner economist Milton Friedman: *Inflation is always and everywhere a monetary phenomenon*
- The rule for the long run is simple:
  - if CB does not print money, then there is *no inflation*
  - if there is inflation, then the CB must have *printed money*
- This is a truism: it is by definition true both empirically and theoretically
- What needs to be explained is why some countries in some periods print more money than other countries and periods

US: inflation and money



World: inflation and money

Money and prices in Turkey



Seignorage

- Revenue of government from printing money is called "*seignorage*" (beylik hakkı)
- Even at zero inflation economic growth permits seignorage revenues to government
- Because money is not an interest-bearing asset
- Inflation may be caused by the efforts of a government to generate more seignorage revenues
- With positive inflation, those who hold money pay an *inflation tax* on their money holdings
- Typically, during wars many nations print money to finance military expenditures
- In moderate inflation countries seignorage can be an important *source of revenue*

Interest rate: real and nominal

- *Nominal* interest rate: that's the interest rate existing at the markets
- *Real* interest rate: after inflation adjustment

$$r = i - \pi$$

- *Fisher equation* (valid for low inflation)

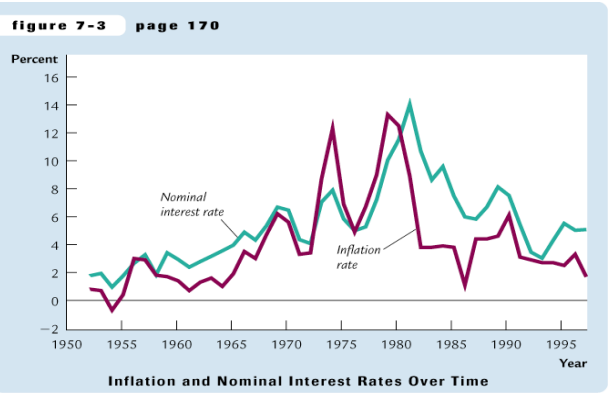
$$i = r + \pi$$

- For high inflation

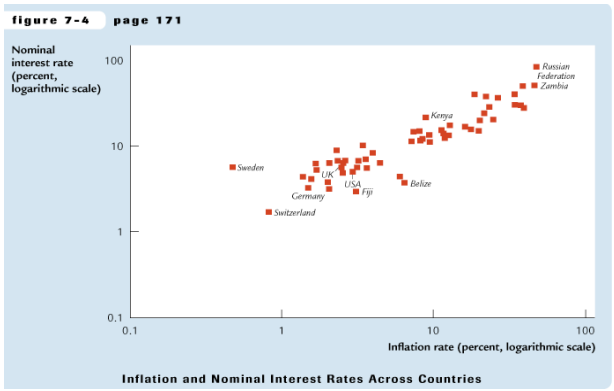
$$1 + r = (1 + i) / (1 + \pi)$$

- *Fisher effect*: nominal interest rate and inflation move together
- An increase in i may not mean an increase in r (vice versa)

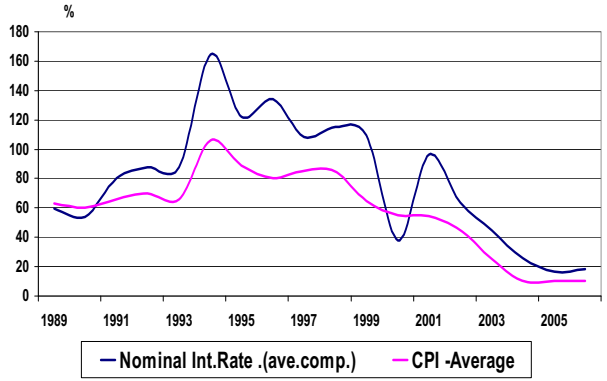
US: inflation and nominal interest



World: inflation and nominal interest



Turkey: inflation and interest rates



Real interest: ex ante & ex post

- How do we measure the real interest rate r?
- From past inflation or future inflation
- *Ex ante*: expected r when contract agreed
- *Ex post*: realised r at the end of contract
- Ex ante requires expected inflation π^e
- Ex post works with realised inflation π
- Fisher equation becomes

$$i = r + \pi^e$$

- Changes in expected inflation will change the nominal interest rate
- If markets expect inflation to increase, nominal interest rates will rise

Cost of holding money

- Money does not earn interest
- *Opportunity cost* of holding money is nominal interest income lost
- Higher the inflation higher nominal interest
- Therefore higher loss from holding money
- Demand for liquidity depends on interest as well as income
- *Money-liquidity demand* function:

$$(M/P)^d = L(i, Y)$$

- Higher income increses demand for real money balances
- Higher nominal interest rate reduces demand for real money balances

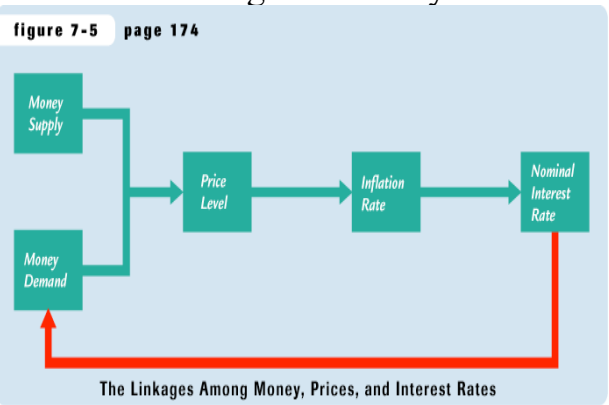
Role of expectations

- Expectations play a very important role in money demand
- Putting Fisher effect, money demand and supply of money together

$$M / P = L(r + \pi^e, Y)$$

- Level of real money balances depend on *expected inflation*
- Prices are not determined only by the supply of money (Quantity Theory of Money)
- It also depends on expectations of future prices
- Which in turn represent expectations of future money supply

Linkages of money



Inflation and incomes

- Economists disagree with many of the complaints by the layman about inflation
- Inflation and incomes move together
- Because price increases correspond to similar increases in the incomes of their producers
- *Implicit illusion*: people want their income to go up by 60 % while prices remain constant
- Inflation is not cost of living (*hayat pahalılığı*)
- Economic well being depend on real income and relative prices, not nominal income and prices
- In France newspaper cost 1.2 Euro, in England 0.70 Sterling, in Japan 100 Yen: so what?

Costs of expected inflation

- Economists distinguish four major categories of costs due to the existence of inflation
- *Shoeleather costs*: inconvenience of living with low levels of money holdings (banking often)
- *Menu costs*: changing prices often
- *Variability in relative prices*: inefficiencies in resource allocation due to illusions or rigidities
- *Taxes*: interest income and capital gains taxes
- Losing a *stable measure* of income and wealth
- *Currency substitution*: people move to FX
- Disencouraging long term contracts
- They all reduce economic welfare by *wasting scarce resources*

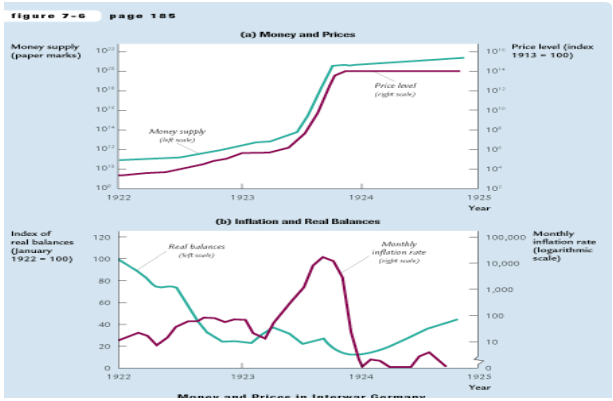
Costs of unexpected inflation

- *Redistribution* of wealth between creditors and debtors
- When inflation rises, deptors benefit and creditors loose because ex post real interest rate will be lower than ex ante (even negative)
- When inflation falls, creditors benefit and debtors loose because ex post real interest rate will be higher than ex ante
- *Volatile* (highly variable) inflation therefore poses big problems for creditors
- Inflation volatility increases *risk premium* on lending and therefore ex ante and ex post nominal and real interest rates go up

Hyperinflation

- Practical definition:
  - Monthly inflation above 20 %
  - Annual inflation above 200 %
- Once hyperinflation starts, prices very rapidly explode to 1000 % per month
- Payment systems collapse, economy goes back to barter
- Sections of population lose their life savings
- Often results in political chaos, military intervention, revolution, etc
- Rise of Hitler is attributed to German hyperinflation of 1920s
- Turkey *did not* experience hyperinflation

Examples of hyperinflation



Classical dichotomy

- *Real variables*: relative prices, real interest rate, output, money real balances, etc.
- Determined by real factors: stock of capital and labour, scarcity, saving rate, etc.
- *Nominal variables*: inflation, nominal interest rate, nominal wage, etc.
- Determined by monetary factors: money supply, money demand, etc.
- Classical dichotomy: seperation of real and nominal variables
- *Monetary neutrality*: money is like a veil over the real economy
- Money does not influence real economy and is not influenced by it

OPEN ECONOMY

Chapter 5

Defining "open economy"

- Every country has economic relations with the outside world
- *A closed economy* in the strict sense of the word is impossible
- Three major categories external economic relations
  - Trade in *goods and services*: exports and imports
  - Flows of *finance*: borrowing and lending
  - Cross-border *investment*: foreign capital
- Key question: what are the *constraints* on these?
- Closed economies limit some or all
- Open economies put few constraints
- Minor constraints on some may exist even in open economies

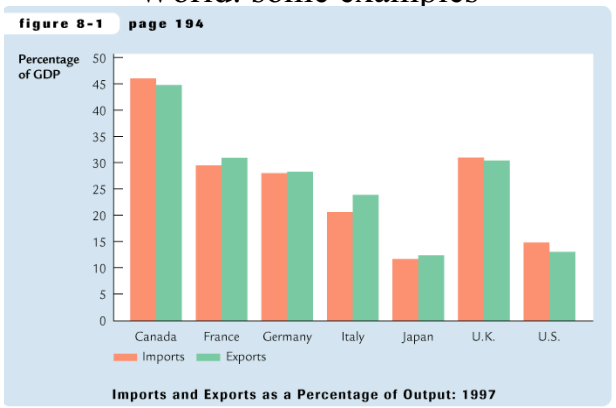
Foreign trade

- It includes trade in *goods* as well as *services*
- In daily language exports and imports only refer to *merchandise trade* (cars, shirts, etc)
- For economists, they also include trade in services (tourism, transport, insurance, etc)
- Trade balance figures published by the DİE gives the difference between commodity exports *fob* (Free on Board) and imports *cif* (Cost Insurance Freight)
  - Trade deficit if imports are higher than exports
  - Trade surplus if imports are less than exports
- Trade balance published by the CB includes the shuttle trade (bavul ticareti), gold imports, transit trade but excludes transport costs

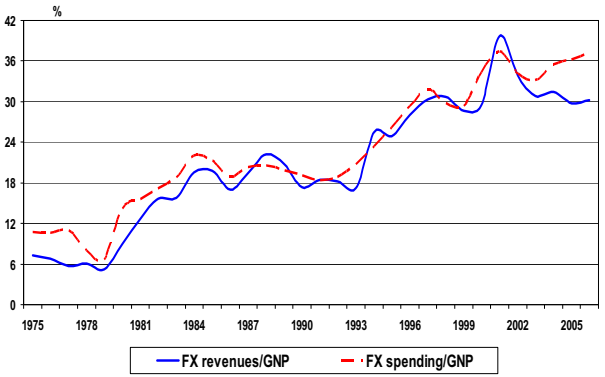
What determines trade

- The *ratio* of exports and imports to GDP is a good measure of the importance of foreign trade for an economy
- There are *large variations* among countries in the ratio of exports and imports to GDP
  - Small economies must trade more reap benefits of specialisation
  - Higher per capita income usually implies more foreign trade
  - Countries self-sufficient in agriculture and mining will need less trade
  - Open economies trade more
  - Members of custom unions trade more

World: some examples



Turkey opens to the world 1975-2006



Capital flows

- Key word: *convertibility* or capital mobility
- Capital mobility is the right to buy and sell foreign exchange (FX) and transfer it in and out off the country freely
- It is a recent phenomenon for Turkey (1989) and many other developing countries
- Capital mobility expanded during the last decade
- Government or the private sector may borrow abroad in FX
- *Portfolio investment* in emerging markets
- *Direct foreign investment* (FDI) can also be considered as part of capital flows

Balance of Payments

- The relations with outside world are summarised in the Balance of Payments
- CB prepares and publishes it every month
- It has *four* important parts:
  - *Current Account*
  - *Capital Account*
  - *Net Errors and Omissions*
  - *Reserve Changes*
- BoP is an *accounting sheet*: it is always in balance by definition
- Any of its parts may have deficits or surpluses but their sum is always equal to zero

Current account

- The current account is the equivalent of the profit and loss statement for companies
- It covers all the *revenues and expenditures* (in FX) of the country with the outside world
  - Exports and imports of merchandise
  - Transit trade, shuttle trade and gold
  - Invisible revenues and expenditures of tourism, transport, interest, dividends and others
  - Transfers of workers remittances and official aid
- *Current account balance* is a key magnitude that markets closely watch everywhere
  - A deficit means FX spending above FX earnings
  - A surplus means FX earnings above FX spending

Capital account and others

- Capital account resembles the balance sheet of the companies
- Capital account includes all financial movements to and from the economy
- Foreign Direct Investment – FDI : inflow and outflow of direct investment
- Portfolio investment in stocks and bonds
- Financial debt transactions by government and the private sector, short term and long term
- *Net Errors and Omissions* capture unaccounted movements of FX
- *Reserve change* refers to the changes in the FX reserves of the CB

BoP: current account (new)

I -	CARİ İŞLEMLER HESABI	I -	CURRENT ACCOUNT
İzmet ve Yatırım Geliri Dengesi(A+B+C)		Goods, Services and Income (A+B+C)	
	Mal ve Hizmet Dengesi (A+B)		Goods and Services (A+B)
A.	DIŞ TİCARET DENGESİ	A.	GOODS
1.	Genel Mal Ticareti	1.	General Merchandise
1.1	İhracat f.o.b.	1.1.	Exports f.o.b.
1.1	İhracat f.o.b.	1.1.1.	Exports f.o.b.
1.1	Bavul Ticareti	1.1.2.	Shuttle trade
1.1	Uyarlama: Diğer Mallar	1.1.3.	Adjustment: Classification
1.2	İthalat f.o.b.	1.2.	Imports f.o.b.
1.2	İthalat c.i.f.	1.2.1.	Imports c.i.f.
1.2	Uyarlama: Navlun ve Sigorta	1.2.2.	Adjustment: Coverage
1.2	Uyarlama: Diğer Mallar	1.2.3.	Adjustment: Classification
2.	İşlem Gören Mallar	2.	Goods for Processing
3.	Tamir Gören Mallar	3.	Repairs on Goods
4.	Parasal Olmayan Altın (net)	4.	Non Monetary Gold (net)
B.	HİZMETLER DENGESİ	B.	SERVICES
1.	Taşımacılık	1.	Transportation
2.	Turizm	2.	Travel
3.	İnşaat Hizmetleri	3.	Construction Services
4.	Finansal Hizmetler	4.	Financial Services
5.	Diğer Ticari Hizmetler	5.	Other Business Services
6.	Resmi Hizmetler	6.	Government Services
7.	Diğer Hizmetler	7.	Other Services
C.	YATIRIM GELİRİ DENGESİ	C.	INCOME
1.	Doğrudan Yatırımlar	1.	Direct Investment
2.	Portföy Yatırımları	2.	Portfolio Investment
3.	Diğer Yatırımlar	3.	Other Investment
D.	CARİ TRANSFERLER	D.	CURRENT TRANSFERS

BoP: capital account (new)

B.	SERMAYE HESABI	B.	CAPITAL ACCOUNT
C.	FİNANS HESABI	C.	FINANCIAL ACCOUNT
8.	Yurtdışında Doğrudan Yatırım	8.	Direct Investment Abroad
9.	Yurtiçinde Doğrudan Yatırım	9.	Direct Investment in Turkey
10.	Portföy Hesabı-Varlıklar	10.	Portfolio Investment- Assets
11.	Portföy Hesabı-Yükümlülükler	11.	Portfolio Investment- Liabilities
11.1.	Hisse Senetleri	11.1.	Equity Securities
11.2.	Borç Senetleri	11.2.	Debt Securities
12.	Diğer Yatırımlar-Varlıklar	12.	Other Investment- Assets
12.1.	Merkez Bankası	12.1.	Monetary Authorities
12.2.	Genel Hükumet	12.2.	General Government
12.3.	Bankalar	12.3.	Banks
12.4.	Diğer Sektörler	12.4.	Other sectors
13.	Diğer Yatırımlar-Yükümlülükler	13.	Other Investment- Liabilities
13.1.	Merkez Bankası	13.1.	Monetary Authorities
13.2.	Genel Hükumet	13.2.	General Government
13.3.	Bankalar	13.3.	Banks
13.4.	Diğer Sektörler	13.4.	Other sectors
	Cari,Sermaye ve Finansal Hesaplar		Current, Capital and Financial Account
D.	NET HATA VE NOKSAN	D.	NET ERRORS AND OMMISSIONS
	GENEL DENGE		GLOBAL BALANCE
E.	REZERV VARLIKLAR (*)	E.	RESERVE ASSETS
14.	Rezerv Varlıklar	14.	Reserve Assets
15.	Uluslararası Para Fonu Kredileri	15.	Use of Fund Credits and Loans
16.	Ödemeler Dengesi Finansmanı	16.	Exceptional Financing

Turkey: BoP (latest)

(Milyar ABD Dolar)	2007 OCAK-TEMMUZ	2007 OCAK-TEMMUZ	Değişim
CARİ İŞLEMLER HESABI	*-21,4*	*-21,8*	*-0,5*
İhracat f.o.b.	50,0	62,1	12,2
İthalat f.o.b.	-74,7	-87,6	-13,0
Mal Dengesi	*-24,7*	*-25,5*	*-0,8*
Hizmet Gelirleri	12,3	14,3	2,0
Hizmet Giderleri	-6,2	-7,7	-1,5
Mal ve Hizmet Dengesi	*-18,6*	*-18,9*	*-0,3*
Yatırım Gelirleri	2,7	3,7	1,0
Yatırım Giderleri	-6,3	-7,6	-1,3
Mal, Hizmet Yatırım Geliri Dengesi	*-22,2*	*-22,8*	*-0,6*
Cari Transferler	0,8	0,9	0,1
FİNANS HESABI	*27,8*	*31,0*	*3,2*
Yurtdışında Doğrudan Yatırım	-0,1	-1,7	-1,6
Yurtiçinde Doğrudan Yatırım	9,4	12,7	3,3
Portföy Hesabı-Varlıklar	-0,3	-1,5	-1,2
Portföy Hesabı-Yükümlülükler	1,1	10,1	9,0
Diğer Yatırımlar-Varlıklar	-4,1	-5,2	-1,1
Diğer Yatırımlar-Yükümlülükler	21,9	16,6	-5,3
Cari,Sermaye ve Finansal Hesaplar	*6,4*	*9,2*	*2,7*
NET HATA VE NOKSAN	1,3	1,3	0,0
GENEL DENGE	*7,8*	*10,5*	*2,8*
REZERV VARLIKLAR	-7,8	-10,5	-2,8
Resmi Rezerviler	-3,9	-7,9	-4,0
Uluslararası Para Fonu Kredileri	-3,9	-2,6	1,2

Current account 1994-2006

Billion US$	1994-2006	Share in GNP (%)	1994-2000	2002-2006	2006
Exports (TUIK - fob)	507	*18*	171	305	85
Imports (TUIK - cif)	-806	*-28*	-292	-473	-137
Trade Balance (TUIK)	-299	*-10*	-122	-167	-52
Shuttle Trade	48	*2*	24	22	6
Trade Balance (fob)	-185	*-6*	-79	-104	-36
Gold	-25	*-1*	-10	-14	-3
Merchandise Balance	-211	*-7*	-87	-119	-40
Turism Revenues	123	*4*	42	73	17
Total Service Revenues	243	*8*	120	107	24
Transfers	42	*1*	31	8	2
Total Service + Transfers	285	*10*	151	114	26
Tourism Spending	-24	*-1*	-10	-12	-3
Total Service Spending	-107	*-4*	-53	-47	-11
Services + Transfers Balance	178	*6*	98	68	15
Merch.+Service+Trans. Balance	-34	*-1*	11	-51	-25
Investment Income Balance	-56	*-2*	-23	-28	-7
Current Account Balance	-90	*-3*	-14	-79	-31
Net Error and Omission	8	*0*	3	6	-3
External Balance	-82	*-3*	-11	-73	-35

Capital account 1994-2006

Billion US$	1994-2006	%	1994-2000	2002-2006	2006
External Balance	-82	100	-11	-73	-35
Foreign Direct Investment	38	-46	3	32	19
Outgoing	-6	8	-2	-4	-1
Incoming	45	-54	6	36	20
Real Estate	7	-9	0	7	3
Portfolio Inv. (stocks)	12	-14	2	10	2
Non-debt Finance	50	-61	5	42	21
Finance Requirement	-32	39	-6	-31	-13
TL bills purchased	9	-12	-7	21	6
Bonds sold	24	-30	13	11	3
IMF Loand	7	-9	4	-7	-5
Other Gov't and CB	-16	19	-7	-8	-2
Total Public Sector	25	-31	3	17	3
Securities bought abroad	-16	20	-5	-10	-4
Borrowing by Banks	28	-34	10	28	11
Borrowing by Others	63	-77	20	46	20
Total Private Sector	64	-78	25	64	27
Total Foreign Borrowing	81	-99	28	81	30
CB Reserve change	-35	43	-20	-35	-6
Banks reserve change	-15	19	-2	-15	-10
Total Reserve change	-50	61	-22	-50	-16

Net exports

- Putting foreign trade into our national income identity

$$Y = C + I + G + NX$$

- Superscript *d* means domestic and *f* means foreign or imported
- Exemple: C^d = domestic consumption

$$Y = C^d + I^d + G^d + EX$$

- $C = C^d + C^f$ also for I and G

$$Y = (C - C^f) + (I - I^f) + (G - G^f) + EX$$

- $C^f + I^f + G^f = IM$ therefore $EX - IM = NX$

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

- Net exports = output – domestic spending

Net capital outflow

- We must now look at the *saving-investment* relation in an open economy

$$Y = C + I + G + NX$$
$$Y - C - G = I + NX$$
$$Y - C - G = S$$
$$S = I + NX \text{ or}$$
$$NX = S - I$$

- $S - I$ = *Net capital (out)flow* CF (Net Foreign Investment NFI in 3rd ed.)
- It shows excess/deficit of savings compared with investment
- An open economy may invest more than it saves
- Net capital flow = net exports

CF = NX

- NX corresponds to the current account of the balance of payments (BoP)
- CF corresponds to the capital account of the BoP (net errors and reserve change = 0)
- Current account and trade balance are same
- Capital account and net foreign investment also
- If we spend more than we produce, we have a current account *deficit* (negative NX) financed by borrowing from abroad (negative CF)
- If we spend less than we produce, we have a current account *surplus* (+ NX) implying that we pay back debt or lend abroad (+ CF)
- Always NX = CF

Small open economy - SOE

- *Small Open Economy* – SOE – must accept the world interest rate as given
- Small countries with large neighbors fit into this description: Canada and US, Danemark and Germany
- For SOE, domestic interest rate will always be *equal* to the world interest rate r^*

$$r^d = r = r^*$$

- Any variation in domestic interest rate causes massive inflows or outflows of capital
- Therefore, we must also assume *perfect capital mobility* otherwise this may not hold even if the economy has a small population

The model

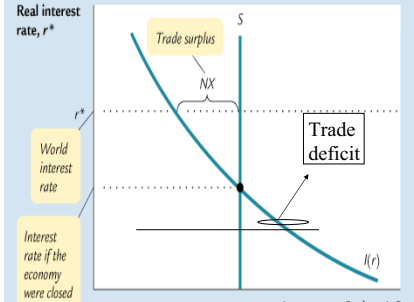
- In the long run output Y is *fixed* by capital and labour stocks and technology (production function)
- *Consumption* is a function of disposable income
- *Investment* is function of the real interest rate
- Net exports are equal to net foreign investment

$$NX = (\overline{Y} - \overline{C} - \overline{G}) - \overline{I}$$
$$NX = [\overline{Y} - C(\overline{Y} - \overline{T}) - \overline{G}] - I(\overline{r^*})$$
$$NX = \overline{S} - I(\overline{r^*})$$

- Trade balance is determined by the difference between saving and investment at the world interest rate r^*
- Trade deficit is not simply a trade phenomenon; it also reflects a *saving-investment gap* in the economy

Saving and investment in SOE

figure 8-2 page 200



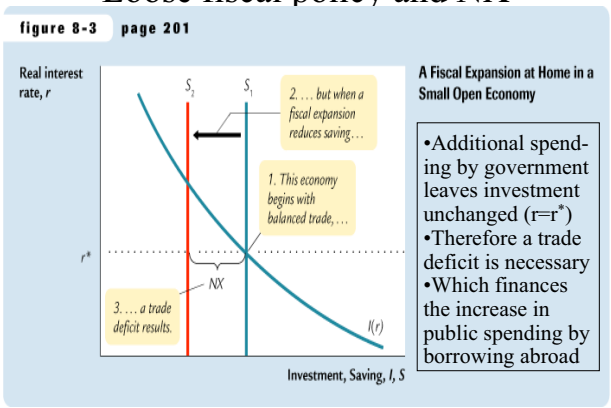
Saving and Investment in a Small Open Economy

- The interest rate is fixed by r^*
- Trade deficit changes to adjust saving and investment
- If investment is higher than saving this requires a trade deficit

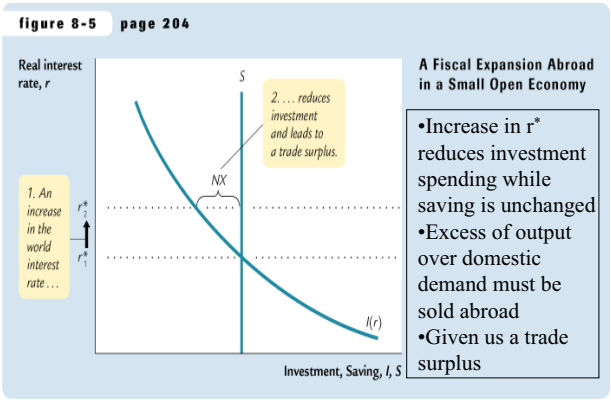
Fiscal policy and trade balance

- Let us see the impact of fiscal policy for SOE
- Government increases spending or reduces taxes: *expansionary* (loose) fiscal policy
- This reduces national savings S
- Therefore the trade deficit increases
- What is the logic of it?
- Additional spending has to be supplied from somewhere because output is fixed
- Interest rate is unchanged so investment remains constant
- Increase in imports provides the goods and services caused by increased government spending
- *Trade deficit* goes up

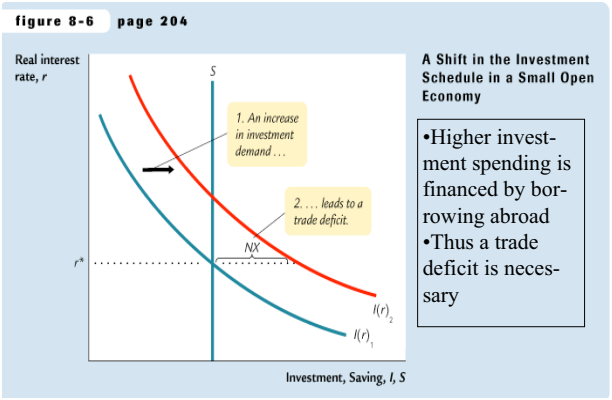
Loose fiscal policy and NX



World interest rates increase



Shift in investment demand



Policy issues

- Current account deficits are not simply a matter of export competitiveness or other trade issues
- Current account deficits represent an *excess of spending* over production capacity of the economy
- National income identity implies a lack of national savings compared to investment demand
- *Governments deficits* may or may not be the cause of the trade deficit
- US had a budget surplus but large current account deficit; Japan had the opposite
- Trade deficit may not necessarily be a bad thing if it is caused by a boom in productive investment and financed through FDI, even portfolio investment

Exchange rates

- Each country has its own *currency*
- Economic relations with the world require the transformation of local currency prices into prices of trading partners
- Exchange rates fulfill this function
- Inflation differentials among nations make it necessary to distinguish between *nominal* and *real* exchange rates
- The exchange rate, the interest rate and inflation are three *fundamental nominal variables* (prices) of macroeconomic analysis
- The more open the economy the more important exchange rates become

Nominal exchange rate

- Nominal exchange rate (*ner*) is the ratio at which local currency buys foreign currencies
  - 1 million TL buys 0.66 US$ (TL/$ ner)
  - 1 US$ buys 110 Yen (US/Yen ner)
  - 1 Euro buys 1.84 million TL (Euro/TL ner)
- Attention: we must express TL exchange rate as the number of FX units bought by TL
- Not as the number of the TL units bought by FX
- In other words, the vertical (X) axis of the graph must be in TL, not in FX
  - *Depreciation-devaluation* means less FX per TL
  - *Appreciation-revaluation* means more FX per TL

Real exchange rate

- *Real exchange rate* (rer) is calculated after taking into account the purchasing power of the two currencies
- An identical shirt costs 50 Euro in Germany and 50.000.000 TL in Turkey
- Implied rer_{shirt} : 1 million TL = 1 Euro
- Current *rer*: 1 million TL = 0.55 Euro
- In Turkey you need 27.5 Euro to buy the same shirt that costs 50 Euro in Germany
- TL is *undervalued* at this *ner* for shirts
- Real exchange rate = nominal exchange rate x ratio of price levels

$$rer = ner \times P^d/P^w$$

Real exchange rate and NX

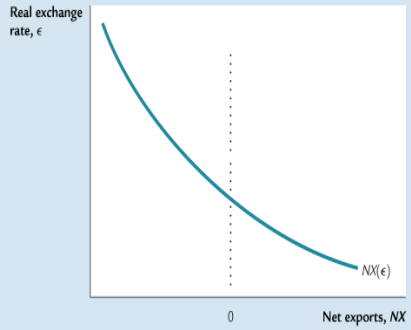
- Depreciation of TL makes Turkish products competitive abroad and exports increase while imports decrease because they are more expensive
- Apreciation of TL makes foreign products cheap in in Turkey and imports increase while exports fall
- Depreciation moves the current account deficit from deficit to surplus
- Apreciation moves the current account either from surplus into deficit or increases the deficit
- *NX function* becomes

$$NX = f\,(rer)$$

- NX < 0 for high rer and NX > 0 for low rer

Net exports function

figure 8-7 page 208



Net Exports and the Real Exchange Rate

- The "0" vertical line shows trade balance
- To its left is trade deficit
- To its right is trade surplus

The FX market

- Exporters and importers *demand TL* (supply FX) in the FX market (negative or positive)
- Financial instutions *supply TL* (demand FX) in the FX market (negative or positive)
- Demand for TL comes from Net Exports

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

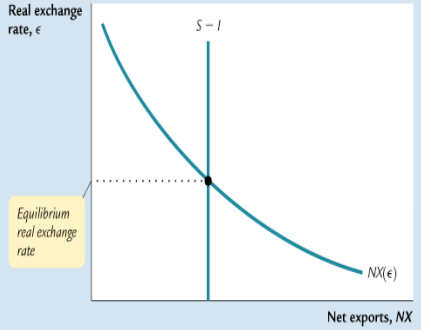
- Supply of TL comes from Net Foreign Investment

$$CF = S - I$$

- *FX market* reflects both
  - the saving-investment and output-spending decisions
  - and the current account and the capital account of the BoP

Equilibrium in the FX market

figure 8-8 page 209

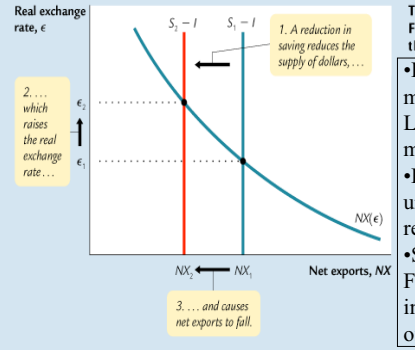


How the Real Exchange Rate Is Determined

- At higher rer the supply of TL from S-I is higher than the demand for TL from NX, causing a fall in the price of TL
- The opposite for lower rer

SOE: fiscal policy and exchange rate

figure 8-9 page 210

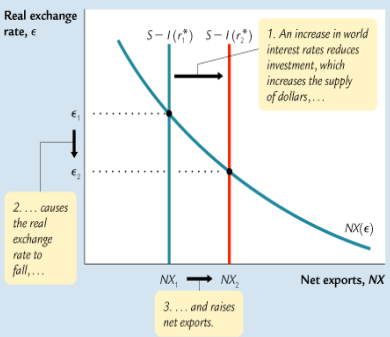


The Impact of Expansionary Fiscal Policy at Home on the Real Exchange Rate

- Behind the FX market lies the Loanable Funds market
- Fall in S keeps $r = r^*$ unchanged but reduces S – I
- Supply of TL to the FX market falls, increasing the price of TL

SOE: world interest and exchange rate

figure 8-10 page 211

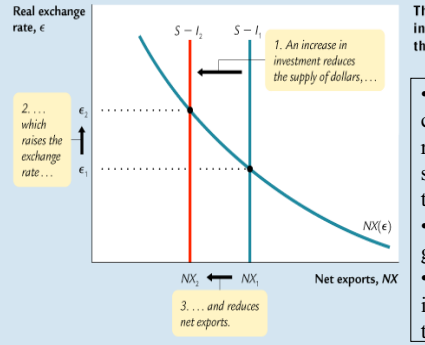


The Impact of Expansionary Fiscal Policy Abroad on the Real Exchange Rate

- Increase in r^* reduces investment but S is unchanged
- Higher supply of TL to the FX market lowers the price of TL
- Thus exports go up, causing a trade surplus

SOE: shift in investment demand

figure 8-11 page 212

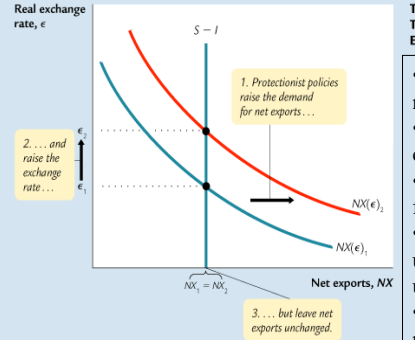


The Impact of an Increase in Investment Demand on the Real Exchange Rate

- Higher I with constant S reduces the supply of TL to the FX market
- The price of TL goes up
- Thus higher imports and a trade deficit

SOE: trade policy and exchange rate

figure 8-12 page 213



The Impact of Protectionist Trade Policies on the Real Exchange Rate

- Imports become more expensive
- S and I are constant
- Demand for TL from NX increases
- Price of TL goes up and NX remains unchanged
- Less imports reduces exports

Large open economy - LOE

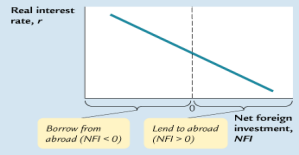
- For *large open economies* and economies with imperfect capital mobility the equality of domestic and world interest rates is not realistic
- For LOE, Net Capital Flows become a function of *the real interest rate*

$$CF = CF(r)$$

- *CF* is a decreasing function of the interest rate
- High domestic interest rates cause an inflow of financial capital while low interest rates cause an outflow
- Closed economy without capital mobility: *vertical* CF curve
- Small open economy: *horizontal* CF curve

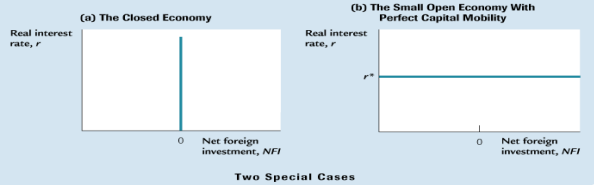
CF curves for LOE

figure 8-15 page 225



How Net Foreign Investment Depends on the Interest Rate

figure 8-16 page 225



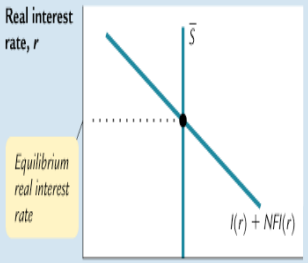
Two Special Cases

The model for LOE

- In SOE, because the interest was given from outside, the model determined only the exchange rate
- In LOE, both the interest rate and exchange rate will be determined *by the model*
- Two dependent variables require two independent markets for *loanable funds* and *foreign exchange*
- CF function *will link* the two markets
- Domestic interest rate will now work through its effects both on investment decision of firms and portfolio decisions of financial sector
- The exchange rate will depend on the interest rate
- The LOE model is more realistic for Turkey

LOE: market for loanable funds

figure 8-17 page 227

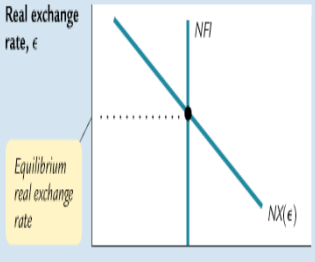


The Market for Loanable Funds in the Large Open Economy

- National savings remain unchanged
- On top of investment, CF is now a function of the real interest rate
- Capital flows are determined by the real interest rate

Market for FX

figure 8-18 page 227

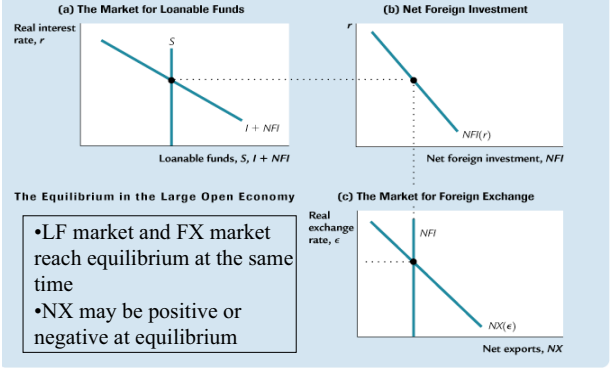


The Market for Foreign Currency Exchange in the Large Open Economy

- CF still represents the supply of TL to the FX market and is vertical (independent of the exchange rate)
- NX is similar to small open economy

Equilibrium in LOE

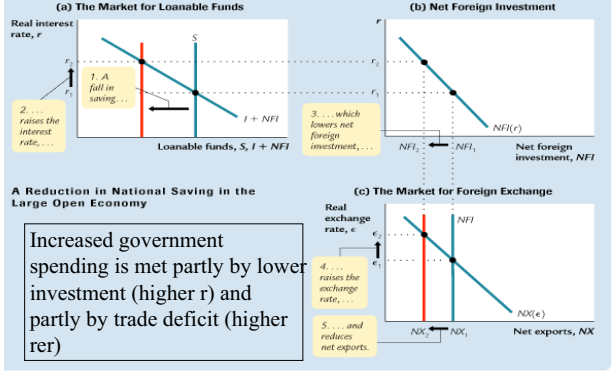
figure 8-19 page 228



- LF market and FX market reach equilibrium at the same time
- NX may be positive or negative at equilibrium

Loose fiscal policy in LOE

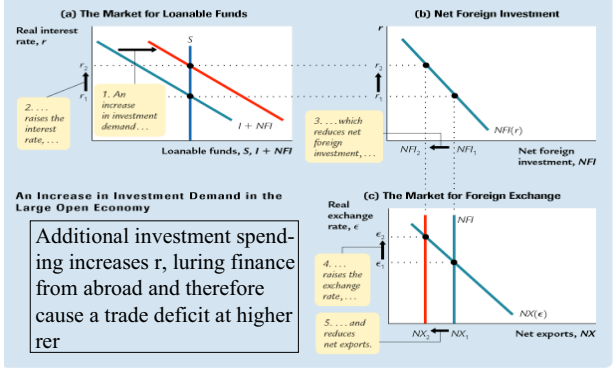
figure 8-20 page 229



Increased government spending is met partly by lower investment (higher r) and partly by trade deficit (higher rer)

Shift in investment for LOE

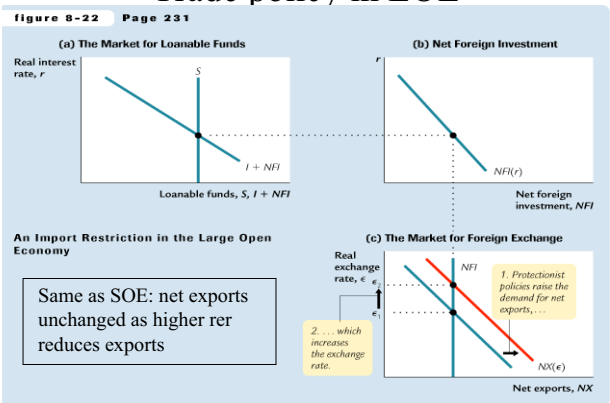
figure 8-21 page 230



Additional investment spending increases r, luring finance from abroad and therefore cause a trade deficit at higher rer

Trade policy in LOE

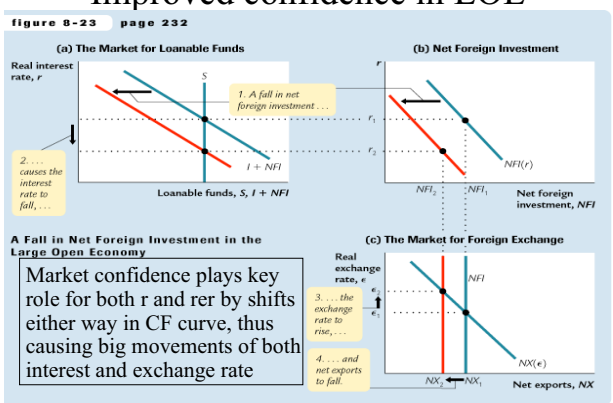
figure 8-22 Page 231



Same as SOE: net exports unchanged as higher rer reduces exports

Improved confidence in LOE

figure 8-23 page 232



Market confidence plays key role for both r and rer by shifts either way in CF curve, thus causing big movements of both interest and exchange rate

Inflation and nominal exchange rate

- *Differentials in inflation* are usually reflected into nominal exchange rate
- Using the formula: $rer = ner \times P^d/P^w$

  % change in rer = % change in ner + % change in domestic inflation + % change in world inflation
- From this we obtain

  % change in ner = % change in rer + difference in inflation rates ($p^w - p^d$)
- This is calculeted as in index: 100 at a base year; > 100 implies appreciation, < 100 depreciation
- In Turkey TERK (*Tartılı Efektif Reel Kur*) measures inflation adjusted trends in the exchange rate

World: inflation and ner

figure 8-13 page 216

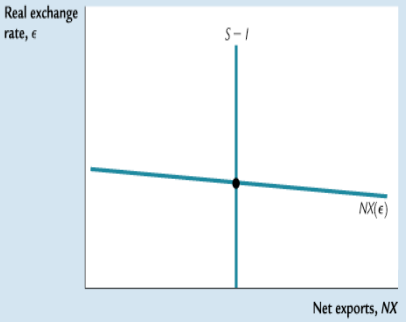
Inflation Differentials and the Exchange Rate

Purchasing power parity - PPP

- Nominal exchange rates reflect many aspects of the economy, including monetary and fiscal policy
- It is at times difficult to use them for international comparaisons of GDP and GNP
- *Purchasing power parity* (PPP) exchange rates bypasses many such problems
- It consists of comparing the prices of *a basket* of goods and services in both currencies
- World Bank calculates PPP exchange rates
- Per capita income in Turkey (2002) is 6.120 *$* PPP versus 2.500 *$* in current exchange rate
- Reflecting that life is much cheaper in Turkey

NX function with PPP

figure 8-14 page 217



Big Mac exchange rates

- *The Economist* calculates and publishes the prices of Big Mac hamburger sold by Macdonalds food chain thoughout the world.
- Big Macs are produced to the same specification in every country in the world, thus facilitating international comparaisons
- Dividing the local price with the price in US gives the exchange rate which equates BigMac prices
- Higher actual exchange rate implies undervalued currency
- Lower actual exchange rate implies overvalued currency
- The figures are from 2000; Turkish figure is 2002

BigMac exchange rates

Country	Local Currency Unit	Local price of BigMac 31.01.2007	Actual exchange rate of the US$	Big Mac price in US$	Comparaison: overvalued (+) undervalued (-)
Switzerland	Franc	6,30	1,3	5,04	57
Sweden	Crown	32,00	7,0	4,59	43
Britain	Pound	1,99	0,5	3,90	21
Euro Area	Euro	2,94	1,3	3,82	19
Turkey	Lira	4,55	1,410	3,23	0
South Korea	Won	2900,00	942	3,08	-4
Canada	Dollar	3,63	1,2	3,08	-4
Chile	Peso	1570,00	544	3,07	-5
Brazil	Real	6,40	2,1	3,00	-7
Hungary	Forint	590,00	197	3,00	-7
Mexico	Peso	29,00	10,9	2,66	-17
Argentina	Peso	8,25	3,11	2,65	-18
Czech Rep.	Crown	52,10	21,5	2,41	-25
Japan	Yen	280,00	121	2,31	-28
Poland	Zloty	6,90	3,0	2,29	-29
South Africa	Rand	15,50	7,3	2,14	-34
Russia	Ruble	49,00	26,5	1,85	-43
Thailand	Baht	62,00	34,7	1,79	-45
Malaysia	Ringght	5,50	3,5	1,71	-47
Egypt	Pound	9,09	5,7	1,60	-50
China	Yuan	11,00	7,8	1,42	-56
United States	Dollar	3,22	1	3,22	0

PART THREE: GROWTH THEORY THE ECONOMY IN THE VERY LONG RUN

Ch.7: Economic Growth I
Ch.8: Economic Growth II

Week 4

The reality of economic growth

- Probably the most important economic characteristic of the last two centuries has been the rapid growth of output both in *absolute and in per capita terms*
- The standard of living of today's adult population is uncomparably higher than that of their parents and grandparents for all countries of the world
- Yet very large differences in the standard of living is visible to the naked eye among continents, countries and regions
- Ch. 7 and 8 look at the theory of economic growth
- To gain insights and better understanding of the phenomenon of economic growth and the factors that influence it

Comparing GNP per capita

per capita dollars, 2004	PPP, Gross National Income (1)	GNI-PPP as % of US	Gross National Income (2)	(1) / (2) %
US	39.710	100	41.400	96
Japan	30.040	76	37.180	81
Germany	27.950	70	30.120	93
Greece	22.000	55	16.610	132
Argentina	12.460	31	3.720	335
Russia	9.620	24	3.410	282
Mexico	9.590	24	6.770	142
Brazil	8.020	20	3.090	260
Turkey	7.680	19	3.750	205
China	5.530	14	1.290	429
Egypt	4.120	10	1.310	315
India	3.100	8	620	500
Pakistan	2.160	5	600	360
Bangladesh	1.980	5	440	450
Nigeria	930	2	390	238

Measuring the quality of life

	PPP Gross Nat. Income dollars, 2004	Rank	Life Exp. at birth, 2003	Rank	Mortality rate under-5, 2003	Rank	Illiteracy rate Adult total 2002	Rank	Fertility rate (births per woman), 2003	Rank	Phone Subs. (per 1000 pop.) 2003	Rank
US	39.710	1	77	4	8	5	0	1	2,0	6	1.164	3
Japan	30.040	2	82	1	5	2	0	3	1,3	2	1.151	4
Germany	27.950	3	78	2	5	3	0	2	1,3	1	1.443	1
Greece	22.000	4	78	3	5	4	9	6	1,3	3	1.356	2
Argentina	12.460	5	74	5	20	6	3	5	2,4	9	396	9
Russia	9.620	6	66	11	2	1	1	4	1,3	4	362	10
Mexico	9.590	7	74	6	28	7	10	8	2,2	8	449	7
Brazil	8.020	8	69	8	35	8	12	9	2,1	7	487	6
Turkey	7.680	9	69	9	39	10	12	10	2,4	10	662	5
China	5.530	10	71	7	37	9	9	7	1,9	5	424	8
Egypt	4.120	11	69	10	39	11	44	13	3,1	13	212	11
India	3.100	12	63	13	87	13	39	12	2,9	11	71	12
Pakistan	2.160	13	64	12	98	14	51	14	4,5	14	44	13
Bangladesh	1.980	14	62	14	69	12	59	15	2,9	12	16	15
Nigeria	930	15	45	15	198	15	33	11	5,6	15	33	14

Solow's model of growth

- Nobel-prize winner economist *Robert Solow* developed the basic framework of growth theory in the second half of 1950s
- Most of today's growth theory is built on Solow's original growth model
- The model looks at the changes in the quantity of factors of production (labour and capital) and the production technology and how they affect the level of change in total output and income
- Chapter 7 analyses the impact of *saving* as a source of capital accumulation and *population growth* on output
- Chapter 8 introduces *technological change*

The accumulation of capital

- Solow growth model is designed to show how growth in the capital stock, growth in the labour force and advances in technology interact in an economy
- We will build the model *in three steps*
- In order to establish how the supply and demand for goods and services determine the accumulation of capital
  - First we examine the case of fixed labour force and unchanging technology
  - Second, we introduce changes in labour supply while still keeping technology constant
  - Third, we take the case of changing technology

Supply of goods

- We start with the *goods and services market*
- The production function summarises the relations between inputs of capital and labour and output

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

- Solow assumes constant returns to scale

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

- Which makes it possible to express all magnitudes in terms of the labour force L

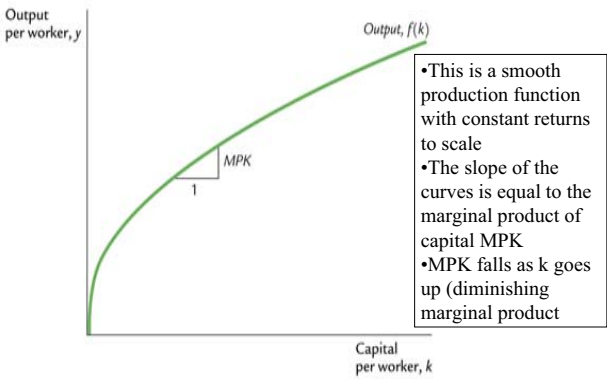
$$Y / L = F(K / L, 1)$$

$$y = f(k)$$

- The slope of the production function is the marginal product of capital (MPK)

$$MPK = f(k + 1) - f(k)$$

The production function



- This is a smooth production function with constant returns to scale
- The slope of the curves is equal to the marginal product of capital MPK
- MPK falls as k goes up (diminishing marginal product

Demand for goods

- Simple model: no foreign trade and no government
- The demand for goods and services come from consumption and investment spending
- In per labour format, aggregate demand is

$$y = c + i$$

- Assume constant fraction s of income is saved:

$$c = (1 - s)\,y \quad , (0 < s < 1)$$

- Investment-saving equality is easy to calculate

$$y = (1 - s)\,y + i$$

$$i = s\,y$$

$$i = s\,f(k)$$

- The last equation relates the accumulation of new capital to the existing stock of capital

Growth in the capital stock

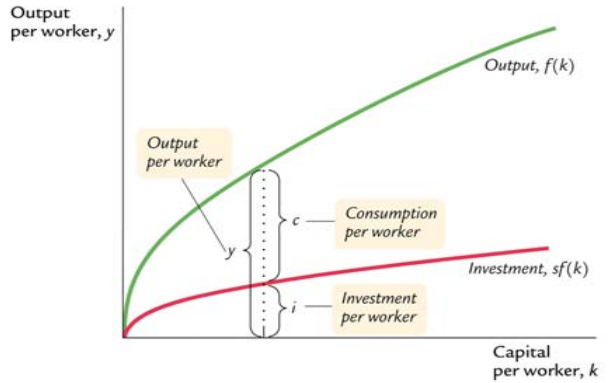
- In this format, the amount of capital stock per labour becomes the key determinant of economy's output
- Two forces influence capital stock:
- *Investment* refers to new plant and equipment and increases the capital stock
- *Depreciation* refers to wear and tear of capital and reduces the capital stock
- Depreciation is calculated as a percentage of capital stock, called the depreciation rate δ

Change in capital stock = investment - depreciation

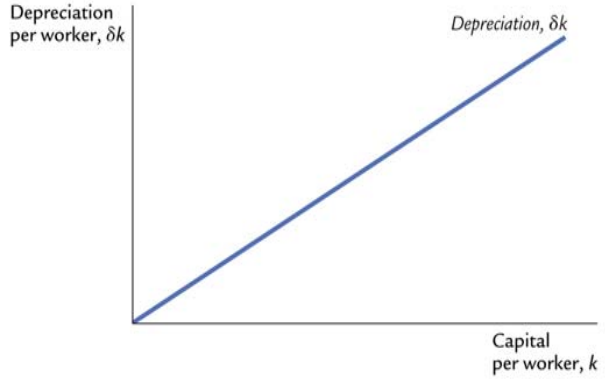
$$\Delta k = s\,f(k) - \delta k$$

- Only investment above wear and tear will cause an increase in the capital stock

Output, consumption and investment



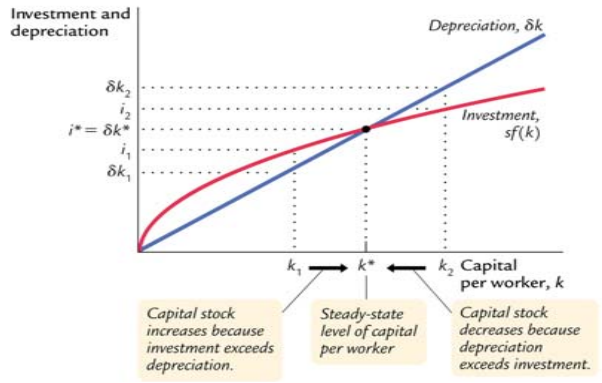
Depreciation



Steady-state

- Growth theory does not permit the use of a key concept of economics: equilibrium
- We introduce a new concept to replace it
- *Steady-state* is the equivalent of equilibrium for growth theory
- In normal static equilibrium all change stops
- But in a growing economy, by definition there has to be change in the capital stock
- Steady-state describes the situation where capital stock per worker and other per worker magnitudes remain constant while capital stock increases
- For our model, steady-state is obtained at $\Delta k = 0$
- The next graph shows steady state visually

Steady-state in Solow's model



Characteristics of steady-state

- Once the economy reaches the stock of capital per labour k^* there will no longer be any change in k
- In this simple model where there is no population increase or technological change, capital per labour remains constant at steady state
- But gross investment is positive and is equal to the depreciation
- At any other level of capital per labour ratio k, investment will be either too small or too large compared to depreciation and capital per labour will therefore be either falling or rising
- It is possible to construct *numerical examples* showing how the economy reaches steady state

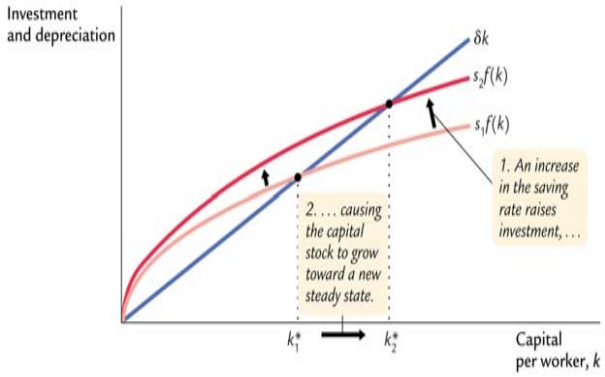
Japanese and German growth

- Both Japan and Germany experienced very high growth rates of output in the period after 1945
- Their growth performance led to theories of Japanese and German "*miracle*"
- This "miracle" can be explained by the Solow growth model above
- In both countries physical capital had been destroyed during the war
- At lower levels of k, investment was higher than depreciation and led to rapid increases in output per labour
- Once they have reached high levels of k, growth rate slowed down to normal levels

Saving and economic growth

- But this is not the whole story
- Japan and Germany also have high saving rates
- Solow model shows that saving rate is a key determinant of the steady state capital stock
- An economy with a higher saving rate will have a higher level of capital per labour at the steady state
- And its output per labour will also be higher
- Changes in the saving rate implies shifts in the investment curve
- Higher saving rate s causes the investment curve to shift upward while lower saving rate shift the investment curve downward
- Saving is the basic source of *capital accumulation*

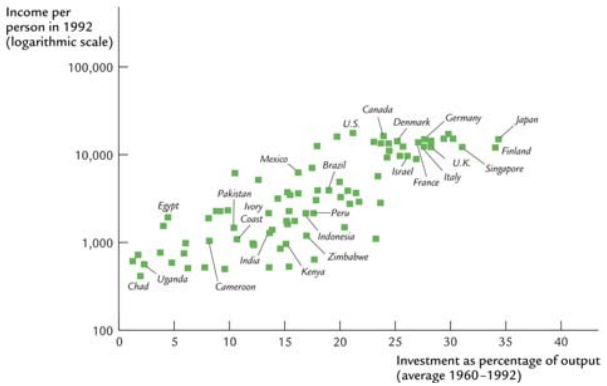
Saving and steady-state



Saving and investment

- Remember our original question: why some countries have higher standards of living?
- Solow growth model supplies a first answer
- If a nation devotes a larger fraction of its income to saving and investment it will have a high steady-state level of capital and output
- Empirical data clearly shows the positive relation between the fraction of income saved and the standard of living
- The next graph is a scatter diagram for 84 countries with the national saving on one axis and GDP per capita on the other axis
- The strong *positive correlation* is obvious

World: saving and GDP per capita



The Golden Rule of consumption

- There is a *dilemma* about saving
- The aim of capital accumulation is not more production for itself but more production for *more consumption*
- Society should be *maximising consumption*
- We can prove that there exists a steady state capital stock per labour that maximises *consumption per labour*
- It is called the *Golden Rule of Consumption* because at all other levels of capital stock per labour, consumption per labour will be lower
- In other words, there is an *optimal level* of savings as too much investment is also bad for consumption

Comparing steady-states

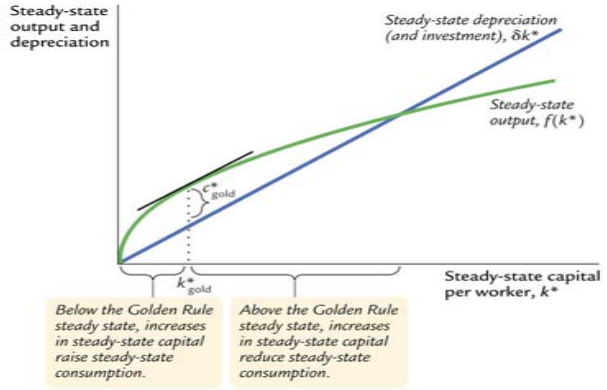
- Consumption is equal to output *minus* investment
- At steady-state, investment is equal to the depreciation of capital stock
- We can denote the steady-state as

$$c^* = f(k^*) - \delta k^*$$

- Assume we can set the saving rate s as we wish
- We want to find the value of s which maximises consumption per labour
- The result is simple mathematically
- When the marginal product of capital MPK is *equal* to the depreciation rate δ consumption per labour is at its maximum level

$$MPK = f(k^*_{gold}) = \delta$$

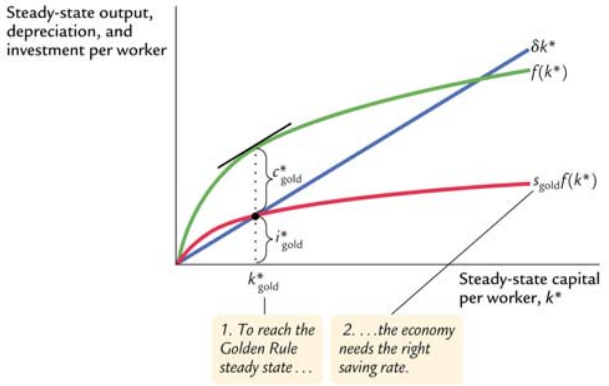
The Golden Rule of consumption



Saving and the Golden Rule

- Simple model without foreign trade or government, no population increase and unchanging technology
- Under these conditions, there is only *one saving rate* at which consumption per labour is the highest
- Higher saving rates give higher output levels but lower levels of consumption
- Lower saving rates give both lower output and consumption levels
- Higher saving rates are not always *a virtue* in Solow growth model
- It is possible to construct *numerical examples* about the maximisation of consumption and the Golden Rule

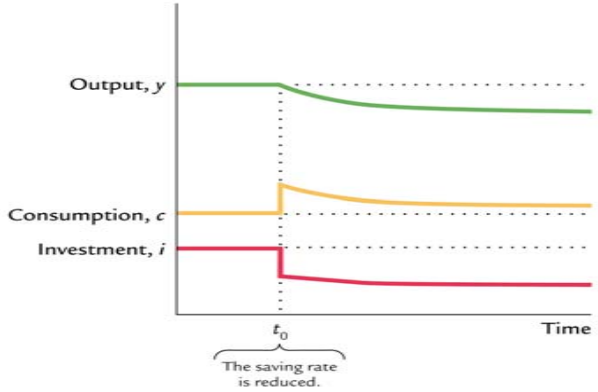
Saving and the Golden Rule



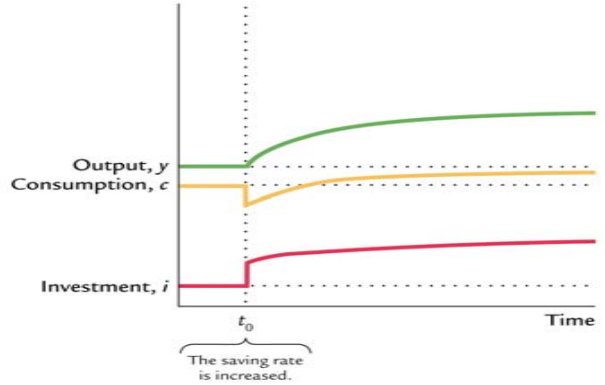
Transition to the Golden Rule

- What about the behaviour of consumption, investment and output during the *transition* from a non-golden rule steady-state to the golden rule steady-state?
- If we start with *too much* capital, consumption increases immediately with lower savings
- If we start with *too little* capital, consumption first falls but then increases with higher savings
- This second alternative is usually difficult for policy makers because *future* high consumption requires a period of lower consumption *today*
- For developing countries, future well-being depends on how much consumption is *sacrificed* today

Starting with too much capital



Starting with too little capital



Population growth

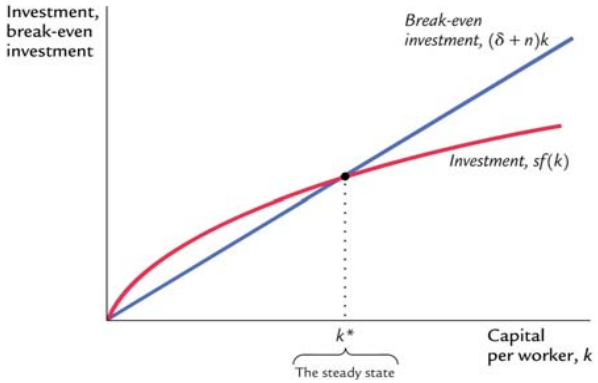
- We can now relax the assumption of constant labour force and see what happens when population also grows at a constant rate
- Let n be the annual growth rate of population
- Now the increase in capital stock has to be adequate for the increase in population

$$\Delta k = i - (\delta + n)\, k$$

- The term $(\delta + n)\, k$ gives us the *break-even investment*: the level of investment required for depreciation plus equipping the additional labour force with the same level of k
- Steady-state condition now becomes

$$\Delta k = s f(k) - (\delta + n)\, k$$

Population growth in Solow model

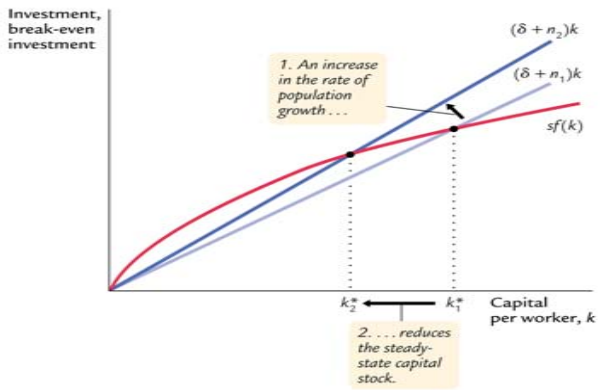


Effects of population growth

- Population growth gives us another clue about why some countries are rich and others are poor
- Higher population growth corresponds to an *upward shift* in the break-even investment line
- Because more savings are now required just to keep the additions to the labour force equipped with the same level of capital stock
- Other things being equal, countries with *higher* population growth will have *lower* capital stock and output levels
- Population growth also affects the criterion for the Golden Rule because we must add n to δ

$$MPK = f(k^*_{gold}) = n + \delta$$

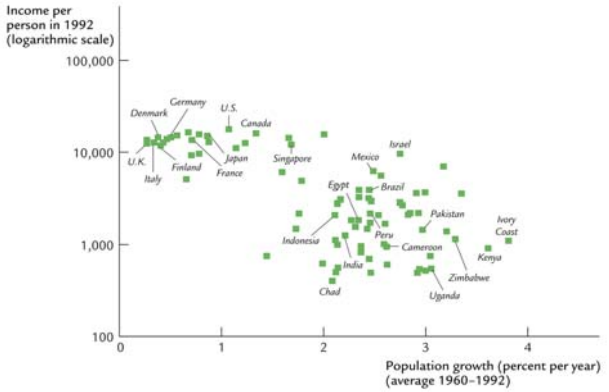
Impact of population growth



Population growth in the world

- *World experience*: countries with high population growth usually have lower levels of capital stock per labour and therefore lower levels of output
- The scatter diagram in the next graph shows the result of World Bank research on 84 countries
- All the countries with *high* population growth have *low* standards of living
- Attention: *reverse causality* is also a possibility
- Countries may not be poor because of high population growth but poverty may cause high population growth
- Usually, high population growth is considered *undesirable* by economists

World: impact of population growth



Technological progress

- Finally, we can introduce *change in technology* into our model
- Technological progress will mean *exogenous* increases in the society's ability to produce goods and services from *given* capital and labour stocks
- Why we use the word "*exogenous*"?
- In order to underline the fact that it is not very easy to attribute *precisely* how much of it comes from improved machines, from better educated workforce and from more efficient management
- In developed economies, most of the increase in per capita income results from higher *labour productivity* due to technological progress

Efficiency of labour

- A simple way of handling exogenous technological progress in the Solow model is to imagine it as a factor which increases the *efficiency of labour*
- We rewrite the production function

$$Y = F (K , L \times E)$$

- The term $L \times E$ measures the number of *effective workers* L and the efficiency of each worker E
- We then assume the efficiency of workers E to grow at a constant rate g
- It is also possible to call it *labour-augmenting technical progress*
- While the labour force L grows at n, the number of effective workers will now grow at the rate $n + g$

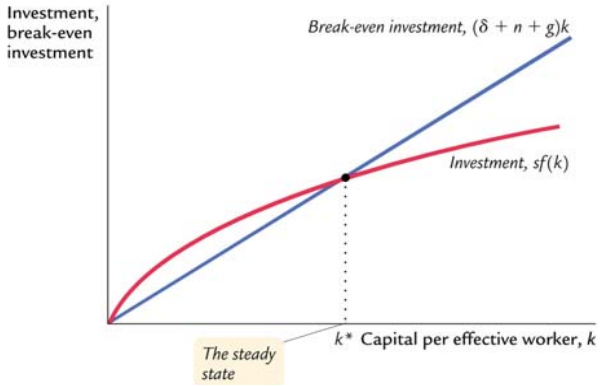
Steady-state with technical progress

- All variables, y, k and c has to be redefined for the effective worker (exemple: $k = K / L + E$)
- But we must also include the rate of technical change g in our steady state equation

$$\Delta k = s f (k) - (\delta + n + g) k$$

- As before, the change in capital stock equals investment minus break-even investment ($\delta + n + g$)k
- To keep k *constant*, the economy needs δk for depreciation, $n k$ to provide capital for new workers and $g k$ to provide capital for effective workers
- The inclusion of *exogenous* technical progress does not alter substantially the long run steady-state equilibrium of the economy

Technical progress in Solow model



Effects of technical progress

- Both capital and output per effective worker is constant in the steady-state equilibrium
- *Output per labour* increases at the rate of technical progress g
- The growth in total output of the economy is equal to the growth of population n plus the rate of technical progress g
- According to Solow model, *only* technical progress can explain persistently rising living standards
- The *Golden Rule* becomes

$$MPK = f (k^*_{gold}) = n + \delta + g$$

- or, if we move depreciation rate δ to right side

$$MPK - \delta = n + g$$

Technical progress in Solow model

Steady-State Growth Rates in the Solow Model With Technological Progress

Variable	Symbol	Steady-State Growth Rate
Capital per effective worker	$k = K/(E \times L)$	0
Output per effective worker	$y = Y/(E \times L) = f(k)$	0
Output per worker	$Y/L = y \times E$	g
Total output	$Y = y \times (E \times L)$	$n+g$

Are world economies converging?

- The model predicts economies with *lower* capital stock to grow *faster* by increasing capital per labour
- And eventually all economies should attain steady-states with *similar* levels of capital stock and output
- There is some empirical evidence to support this argument as many economies in Asia and Europe reduced the gap with the US
- But poverty persists and there are other economies who have not been able to break the *vicious circle* of low productivity, poverty, disease, etc
- Obviously, many *meta-economic factors*, such as culture, politics, sociology, etc play important roles in the growth performance of different nations

Policies to promote growth

- An effective *education system* which covers all the citizens provides crucial human capital to labour force and increases the long term growth rate
- Higher *saving rates* corresponding to lower consumption levels improve growth performance
- Healthy *public finances* and the macroeconomic stability such as low inflation that results from them contribute to high saving and investment rates
- Encouraging and supporting *technological research* and development becomes more and more important as capital per labour reaches steady-state levels
- *Democracy*, the rule of law, an open and free society and political stability are also vital factors of growth

Is there a world slowdown?

- The world economy has experienced very fast growth rates after 1945
- But the growth of productivity seems to have slowed in major developed economies after 1970s
- There has been heated debate among economists about the causes of this phenomenon ever since
- Some believe that it is mainly a *measurement problem*: growth continues but it became more difficult to measure it
- Others blame it on the increase in oil prices or declining quality of education or the end of revolutionary technical breakthroughs
- There is no *conclusive evidence* for either view

World: slowdown in growth

The Slowdown in Growth Around the World

Country	GROWTH IN OUTPUT PER PERSON (PERCENT PER YEAR) 1948–1972	1972–1995	1995–2000
Canada	2.9	1.8	2.7
France	4.3	1.6	2.2
West Germany	5.7	2.0	
Germany			1.7
Italy	4.9	2.3	4.7
Japan	8.2	2.6	1.1
United Kingdom	2.4	1.8	2.5
United States	2.2	1.5	2.9

Source: Angus Maddison, *Phases of Capitalist Development* (Oxford: Oxford University Press, 1982); and OECD National Accounts and International Financial Statistics.
Note: Data before 1995 for Germany refer to West Germany; after 1995, to the unified Germany.

The sources of growth

- Much effort has gone into calculating *the sources of the growth* of output in an economy
- Theoretically it is simple:
  Growth in output = contribution of capital
  + contribution of labour
  + contribution of technical change
- The last part is the most difficult to estimate
- Solow was the first to propose a way of measuring the contribution of technical chage: therefore it is at times called "*Solow residual*"
- It is also called "*total factor productivity*" because other factors such as education, human capital, management, etc. are included in it

US: the sources of growth

Accounting for Economic Growth in the United States

Years	Output Growth $\Delta Y/Y$	=	SOURCE OF GROWTH Capital $\alpha\Delta K/K$	+	Labor $(1-\alpha)\Delta K/K$	+	Total Factor Productivity $\Delta A/A$
			(average percentage increase per year)				
1950–1999	3.6		1.2		1.3		1.1
1950–1960	3.3		1.0		1.0		1.3
1960–1970	4.4		1.4		1.2		1.8
1970–1980	3.6		1.4		1.2		1.0
1980–1990	3.4		1.2		1.6		0.6
1990–1999	3.7		1.2		1.6		0.9

Source: U.S. Department of Commerce, U.S. Department of Labor, and the author's calculations.The parameter α is set to equal 0.3.

Growth in East Asian economies

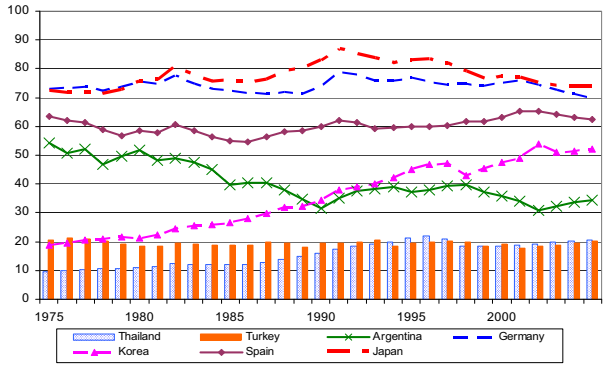
- A spectacular experience of growth in history happened in East Asian economies of Hong Kong, Singapore, South Korea and Taiwan after 1960s
- They were called *Asian Tigers* and were considered "*miracle*" economies
- Recent studies found that a large part of the increase in output was due measured *factor inputs*: increases in labour participation, increases in capital stock and increases in educational training (human capital)
- The contribution of "*total factor productivity*" to their growth was at par with the US
- Some interpreted this finding as a confirmation of the Solow model

Growth in Turkey

- Turkey's growth performance in the last half century corresponds neither to a miracle nor to a failure
- Turkey's saving rate was relatively low until 1980s, fluctuating around 16 % for most of the period
- Saving rate has increased to the 20-25 % range only after 1980s
- *High persistent inflation* is a major cause of the relatively poor growth performance and low saving rate of Turkey
- The decade with the highest average growth rate is 1950s, when growth took off
- During the *last decade* average growth has been poor and the economy faced several financial crises

Per capita GDP relative to US

PPP current US$



Turkey: long term growth rates

Period	GNP	Population	Per Capita GNP	Comments
1923-2006	4,3	NA	NA	No population before 1927
1927-2006	4,4	2,3	2,1	Including war years
1927-1950	2,6	1,8	0,8	Including war years
1929-1939	5,8	2,1	3,7	Reconstruction and "etatism"
1939-1945	-6,0	1,2	-7,2	Economic price of war
1945-1950	6,3	2,1	4,0	Post-war recovery
1950-2006	4,6	2,3	2,2	Democracy,coup d'etat, crisis, etc.
1950-1960	5,8	2,8	2,9	Menderes transforms the economy
1960-1970	6,0	2,5	3,4	Demirel and planned economy
1970-1980	4,4	2,3	2,0	Populism and crisis
1980-1990	5,3	2,4	2,8	Özal opens the economy
1990-2000	3,8	1,8	1,9	Wasted decade
2000-2006	5,6	1,4	3,7	Disinflation and reforms

All annual average growth rates %

PART FOUR: THE ECONOMY IN THE SHORT RUN

INTRODUCTION TO ECONOMIC FLUCTUATIONS

Chapter 9

Plan of Part Four

- In Part Four the we abondon the *flexible prices* assumption of the classical model
- And move to Keynesian models with *sticky prices*
- Chapter 9 lays the foundations for the analysis of short term by defining the concepts of *aggregate demand* and *aggregate supply*
- Chapters 10 and 11 goes into the details of aggregate demand in a *closed economy*: first with the *Keynesian cross* then the *IS-LM* model
- Chapter 12 generalises the short run aggregate demand analysis to an *open economy* by the use of the *Mundell-Fleming* model
- Chapter 13 reviews *aggregate supply* in detail

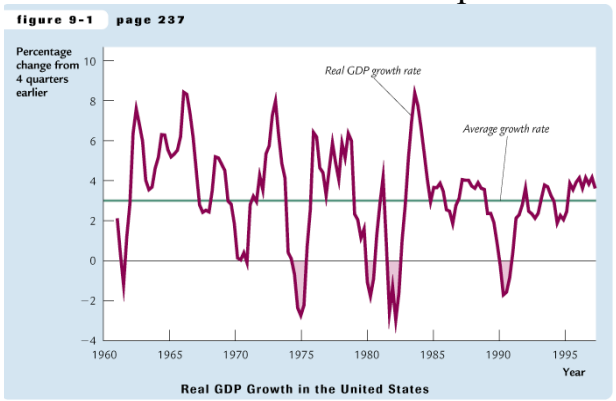
Leaving the classical model

- In Part Two we looked into three important aspects of an economy:
  - Loanable funds market and the real interest rate
  - Supply and demand of money and inflation
  - FX market and the exchange rate
- Throughout we assumed *output Y to be fixed* by the production function and the stocks of the factors of production (labour and capital)
- This facilitated our analysis but it is not realistic for the real world where *large fluctuations* in output are observed everywhere
- In Part Four we develop models where *output Y is a variable* depending on demand

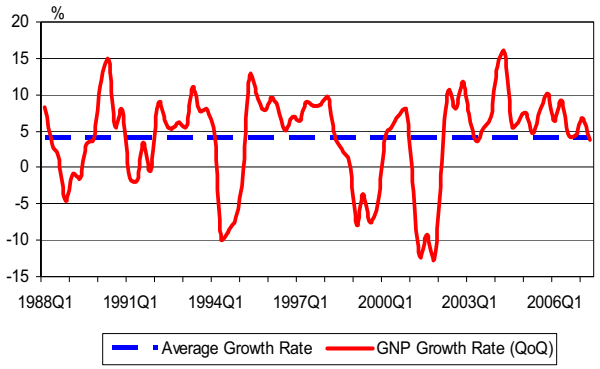
Business cycle

- Ever since market economies came into existence, it became apparent that economic activity changed speed and intensity at different time periods
- Years of booming demand and output were usually followed by years when both demand and output either stagnated or even fell
- These irregular but inevitable fluctuations in economic activity and output are called the "*business cycle*" (konjonktür)
- A cycle is constituted by a boom period followed by a recession period
- Duration of the cycle *varies* through history and also from country to country

US: Fluctuations in output



Turkey: fluctuations in output



Flexible *versus* sticky prices

- The basic difference between the models of the short run and the classical model of the long run is that output Y becomes *variable* in the short run
- The basic theoretical difference between the two is the *behaviour of market prices*
- Normal supply-demand models work through the *rapid adjustment* of prices to excess demand and excess supply in the markets
- The classical model assumed *flexible prices*
- The short run replaces it with the assumption of *sticky prices*
- Which means that prices remain *unchanged* despite excess supply in the markets

Sticky prices

- Short run price flexibility exists mainly in *perfectly competitive* markets (FX market, loanable funds market, stock and commodity exchanges, etc)
- Imperfect competition is the rule in most markets where the producer is a *price setter,* not a price taker
- Faced with a fall in demand, suppliers adjust in the short run the level of production but leave prices unchanged despite large excess supply
- *Labour markets* also exhibits similar behaviour partly because of unions and collective bargaining
- Price stickiness *varies* from market to market
- Exemple in the book: magazine prices that change only at very long intervals (newspapers in Turkey)

Different time periods

- Assumptions change depending on time horizons
- The *short run* assumes sticky prices, therefore capital and labour may not be fully employed and output fluctuates from year to year (Chs.9-13 of Part Four)
- The classical *long run* assumes flexible prices, fixed but fully employed stocks of capital and labour, implying fixed output (Chs.3, 4 and 5 of Part Two)
- The *very long run* assumes flexible price, fully employed but changing capital and labour stock or growth over several years in the economy (Chs.7 and 8 of Part Three)

Aggregate demand and supply

- In the model with flexible prices output Y depends on technology and stocks of capital and labour
- In the short run with sticky prices output Y will also depend on *demand* for goods and services, requiring a supply-demand model
- *Aggregate demand and aggregate supply* model (*AD-AS*) will be our first tool
- Aggregate functions are much more complicated than usual *single market* (microeconomic) supply-demand schedules
- Both AD and AS don't represent only one market
- But the interaction of *several markets* such as goods and services, labour, FX, money, etc.

Aggregate demand

- Aggregate demand summarises the *inverse relationship* between the quantity of output demanded and the price level
- In other words, how the quantity of goods and services demanded in the economy varies at different price levels
- There are several ways we can derive an aggregate demand schedule and curve
- We start by a simple explanation based on *Quantity Theory of Money* (QTM)
- This is a first approach to get a feel about it
- More complicated models and explanations will follow in the next chapter

QTM and aggregate demand

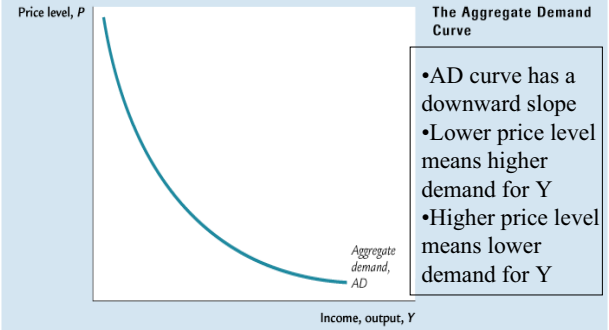
- From Quantity Theory of Money equation we obtained the demand for *real money balances*

$$M / P = (M / P)^d = k Y$$

- Assume M and k=1/V are both constants
- Arithmetically, any increase in P must correspond to a fall in Y and *vice versa*
- How does it work in the economy?
- People need more money at the same Y due to higher price level P
- With constant M interest rates will increase reducing investment and consumption spending
- The fall at Y reduces demand for real money
- New equilibrium is with a lower output level Y

Aggregate demand curve

figure 9-2 page 242

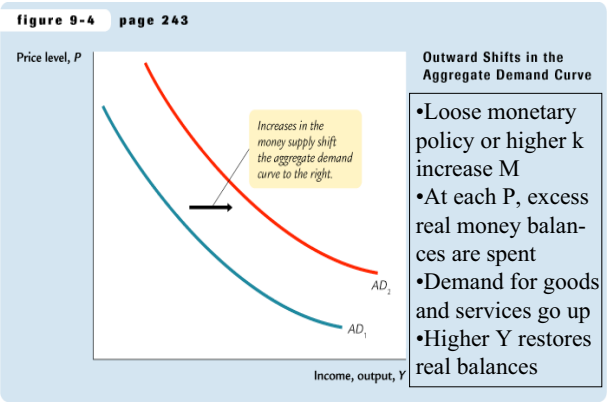


Shifts in the AD curve

- In this simple model M and k=1/V were constants
- Changes in these will cause shifts in the AD curve
- An increase in the money supply M will cause an *outward shift* in the AD curve
- Because higher M at given price level P and output Y implies *real balances* are too high
- Spending the additional money increases demand output to bring equilibrium to real money balances
- Reduction in the money supply M will cause an *inward shift* in the AD curve
- Again the mechanism works through the change in *real money balances*
- Changes in k = 1/V also cause shifts in AD curve

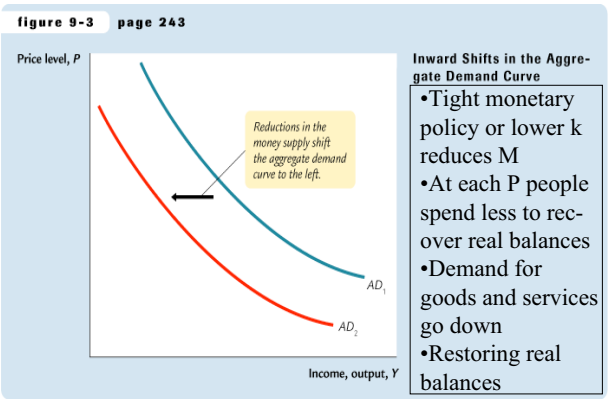
Increase in M and AD

figure 9-4 page 243



Decrease in M and AD

figure 9-3 page 243

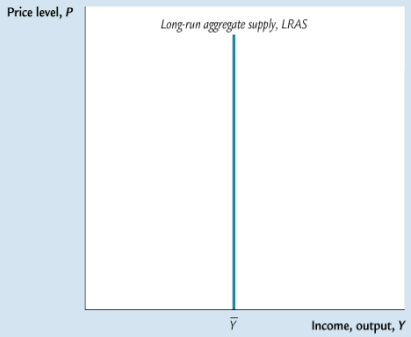


Aggregate supply

- Aggregate supply summarises the *positive relationship* between the quantity of output supplied and the price level
- In other words, how the quantity of goods and services *supplied* in the economy varies at different price levels
- The relation between the price level and the supply depends on the time horizon adopted
- In analysing the aggregate supply, we distinguish between *short run* and *long run* aggregate supply: *SRAS* and *LRAS*
- Long run aggregate supply curve is *vertical* because output is independent of the level of prices

Long run: vertical AS

figure 9-5 page 245

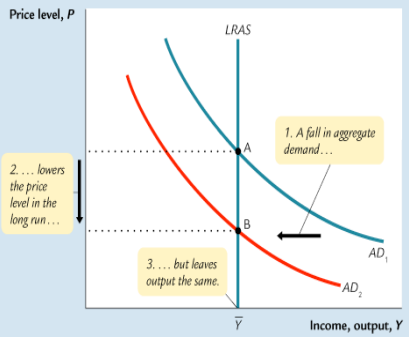


The Long-Run Aggregate Supply Curve

- LRAS corresponds to Y fixed by the stocks of capital and labour and technology
- $\bar{Y}$ is the *full employment* or *natural* level of output

Long run: shifts in AD

figure 9-6 page 245



Shifts in Aggregate Demand in the Long Run

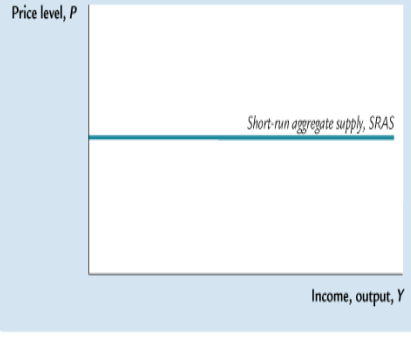
- Loose monetary policy leaves long run output unchanged
- Affects only prices
- *Classical dichotomy* holds

Aggregate supply in the short run

- What is the meaning of "*sticky prices*"?
- Firms are reluctant to change prices of goods and services supplied with every short run fluctuation in demand
- Therefore the price level in the economy remains *unchanged* even if output fluctuates in the short run
- SRAS curve becomes *horizontal*
- Changes in demand will only effect output level without causing any variation in the price level
- This is a very *restrictive* assumption
- In the coming chapters this assumption will be relaxed in order to obtain an *upward sloping* SRAS curve that is more realistic

Short run: horizontal SRAS

figure 9-7 page 246

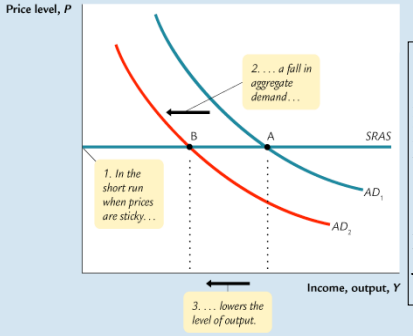


The Short-Run Aggregate Supply Curve

- *Sticky prices*
- Producers keep prices unchanged at different levels of demand
- Supply adjust to changes in demand by increasing or decreasing output

Short run: shifts in AD

figure 9-8 page 246

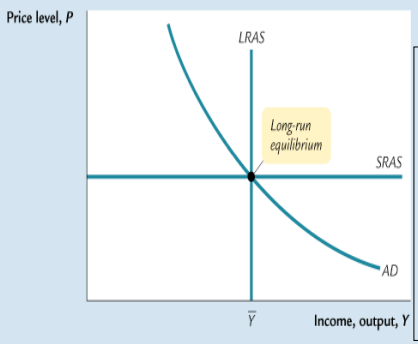


Shifts in Aggregate Demand in the Short Run

- A fall in aggregate demand reduces output but keeps prices unchanged
- Symmetrically, demand and output will increase jointly at constant (sticky) prices

Equilibrium in AD-AS model

figure 9-9 page 247



Long-Run Equilibrium

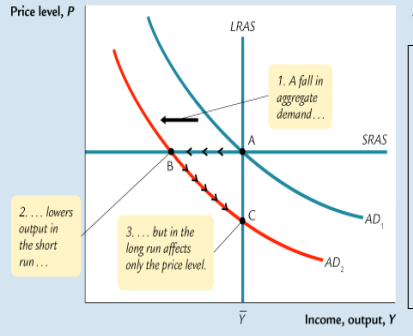
- An economy is in long run equilibrium when the three curves AD, LRAS and SRAS intercross
- We usually take this as our starting point during examples

Shocks and stabilisation

- *The long run equilibrium* is reached when the three curves AD, SRAS and LRAS cross at the same point
- Long run equilibrium helps us analyse situations which correspond to departures from it and the macroeconomic policies that restore it
- Exogenous factors that may move the economy away from equilibrium are called *shocks*
  - *Demand shocks* shift the AD curve
  - *Supply shocks* shift the AS curve
- *Stabilisation policy* refers to macroeconomic decisions by governments to offset shocks
- Monetary and fiscal policy are the main tools
- In this chapter we can only look at *monetary policy*

Demand shock: fall in AD

figure 9-10 page 248

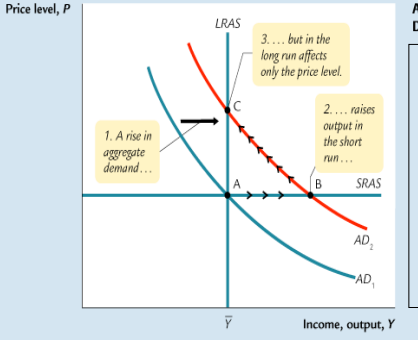


A Reduction in Aggregate Demand

- Fall in demand reduces output in the short run
- Which in the long run cause a fall in the price level
- Long run output is unchanged

Demand shock: increase in AD

figure 9-11 page 250

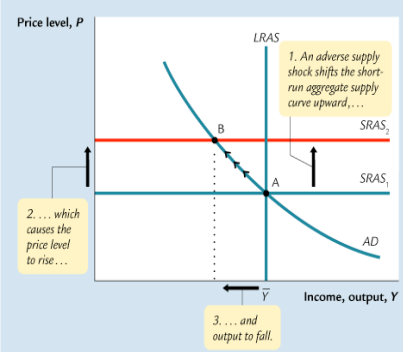


An Increase in Aggregate Demand

- An increase in demand means higher output in the short run
- But inflation shifts the SRAS in the long run
- Long run output is fixed

Adverse supply shock: SR

figure 9-12 page 251

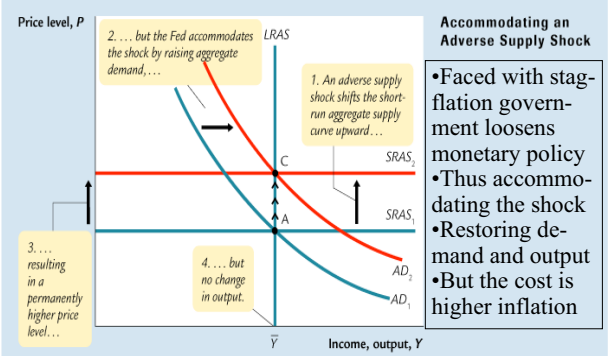


An Adverse Supply Shock

- Adverse shock:
  - Jump in oil price
  - An earthquake
  - A drought
  - Political turmoil
- Lower output and higher prices in the short run
- Inverse relation between Yand P called *stagflation*

Policy response to shock: LR

figure 9-13 page 252



Accommodating an Adverse Supply Shock

- Faced with stag-flation govern-ment loosens monetary policy
- Thus accommo-dating the shock
- Restoring de-mand and output
- But the cost is higher inflation

Oil price increases and policy

- Oil and energy are important inputs used by all the sectors in the economy
- OPEC increased the price of one barrel of oil from $ 2.5 to $ 40 (15 fold) in the period form 1973 to 1981
- *Stagflation* appeared in many countries
- Some countries like the US accommodated this shock by loose policies and faced high inflation
- Others like Germany and Japan didn't accommo-date and kept inflation under control
- US had to face a severe recession later in early 1980s to fight against high inflation
- Irresponsible policies in the short run result in a crisis and *larger sacrifices* later

AGGREGATE DEMAND I

Chapter 10

Keynes and the classics

- Macroeconomics as a separate field was established by Lord *John M. Keynes* of Cambridge University
- *General Theory of Employment, Interest and Money* was first published in 1936
- The *Great Depression* in 1930s left many people wondering about the relevance of classical economics for economic policy making
- Keynes introduced the concept of *aggregate demand*, whose failure he claimed was the cause of the depression
- We now move to the Keynesian analysis
- First with the *Keynesian cross*, then the *IS-LM model* which is an extention of it

More on aggregate demand

- Understanding well Keynesian analysis is crucial
- Our objective is to go into the details of the AD curves by relaxing some of the strict assumptions we used in our introduction to AD
- The model of aggregate demand developed here is the leading interpretation of the theory of Keynes
- It is called the *IS-LM model*
- The model tries to understand what happens to aggregate demand by analysing in detail *three markets*: the goods and services market, the loanable funds market and the *money market*
- The model always assumes that prices are fixed, corresponding to a horizontal SRAS curve

More on aggregate demand

- We move to *Ch.10: Aggregate Demand I*
- Our objective is to go into the details of the AD curves by relaxing some of the strict assumptions we used in our introduction to AD
- The model of aggregate demand developed in here is the leading interpretation of the theory of Keynes
- It is called the *IS-LM model*
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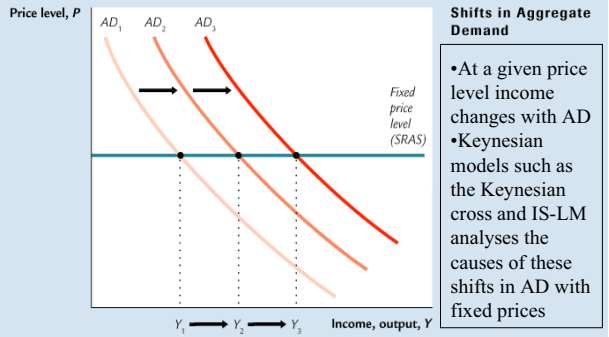
- The model always assumes that prices are fixed, corresponding to a horizontal SRAS curve

Shifts in aggregate demand

figure 10-1 page 257



Shifts in Aggregate Demand

- At a given price level income changes with AD
- Keynesian models such as the Keynesian cross and IS-LM analyses the causes of these shifts in AD with fixed prices

Keynes and the goods market

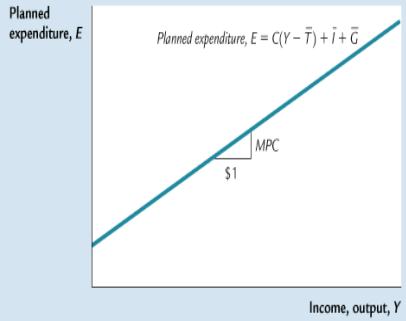
- We go back to the national income identity
- Assumptions: as in the classical models, we assume a *closed economy without inflation*
- We start by looking at the spending plans of the economic actors in the economy
- *Planned expenditure* is $E = C + I + G$
- Adding the consumption function C, and keeping $\overline{G}$, $\overline{T}$ and $\overline{I}$ as given from outside the model, we get

$$E = C(Y - \overline{T}) + \overline{I} + \overline{G}$$

- Equilibrium in the goods market require planned expenditure to be equal to output $E = Y$
- We use the *Keynesian cross* to depict the way the model works

Planned expenditure

figure 10-2 page 259

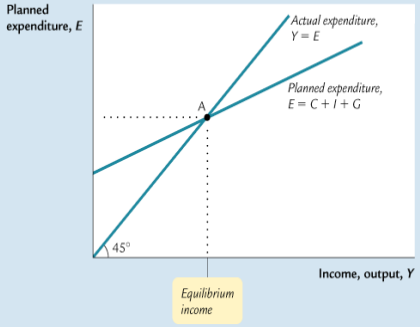


Planned Expenditure as a Function of Income

- Consumption function is reflected on the curve
- *Marginal Propensity to Consume* (MPC) determines its slope

Goods market equlibrium

figure 10-3 page 260

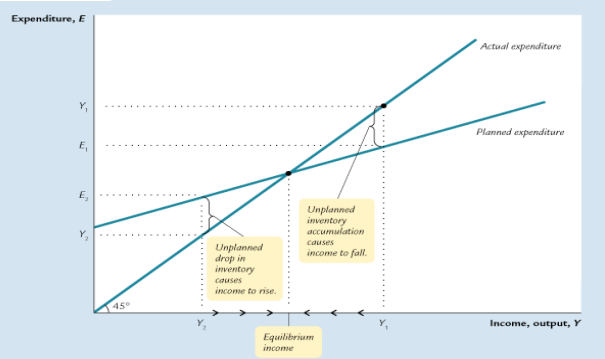


The Keynesian Cross

- Attention to the 45^0 line where Y = E
- At point A, planned expenditure is equal to output
- Consumption adjusts E to Y

Adjustment to equilibrium

figure 10-4 page 261



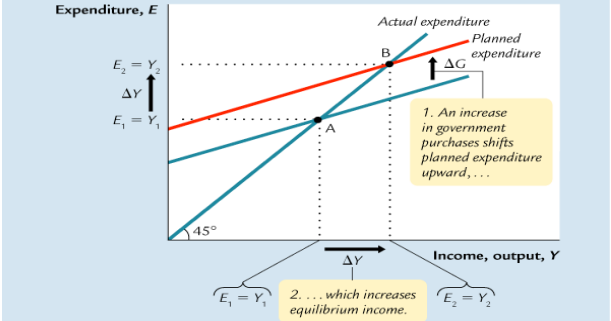
The Adjustment to Equilibrium in the Keynesian Cross

Change in G and output

- Changing some of the spending items kept constant permits better understanding of the equilibrium
- Begin with an *increase* in government spending G while taxes T is constant
- Higher G will shift the planned expenditure curve E upwards: there is now more spending E at every level of output Y
- More spending means a a higher output
- In other words, additional spending by the government results in higher level of income
- Suddenly, government spending and deficits become *beneficial* for the economy
- The relation between ΔG and ΔY is interesting

Effect of government spending

figure 10-5 page 262



An Increase in Government Purchases in the Keynesian Cross

Multiplier: spending

- The coefficient that links ΔG to ΔY is called government *spending multiplier*
- Initial spending by the government increases somebody's income, who then consumes part of it, and so it goes on
- *Marginal Propensity to Consume – MPC –* is the key factor because it determines how much of the additional income is spend
- Multiplier is:

$$\Delta Y = 1/(1 - MPC) \times \Delta G$$

- Higher marginal propensity to consume implies larger positive effect of additional government spending on the level of output

Multiplier: taxes

- Reduction in taxes have similar effects on output by increasing disposable income of consumers
- The formula for *tax multiplier* is little different

$$\Delta Y = MPC / (1 - MPC) \times \Delta T$$

- Assuming MPC = 0.60

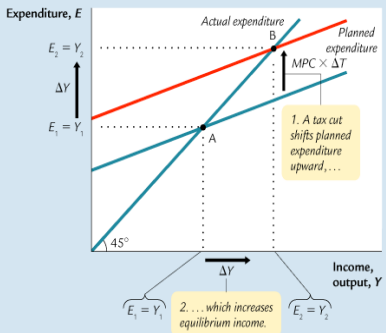
$$Multiplier_{spending} = 1/ (1 - 0.6) = 2.5$$

$$Multiplier_{taxes} = 0.6 / (1 - 0.6) = 1.5$$

- Government can also use tax reductions to revive demand in the economy
- *Ceteris paribus*, the multiplier effect of tax reductions is smaller than a same size increase in government spending

Effect of tax decrease

figure 10-6 page 265



A Decrease in Taxes in the Keynesian Cross

Cutting taxes to stimulate demand

- In 1964 an important experiment in Keynesian economic policy was undertaken in the US in 1964
- *J.F.Kennedy* became President of the US in 1961
- Some of the brightest economists were invited by him to join the *Council of Economic Advisors*
- In line with Keynesian analysis they proposed *a large tax cut* to stimulate aggregate demand
- In 1964 and 1965 US economic growth was higher and unemployment was lower
- In 2001 President *G.Bush* adopted a similar policy of tax cuts
- Again the demand responded positively, leading to higher growth of GNP and lower unemployment

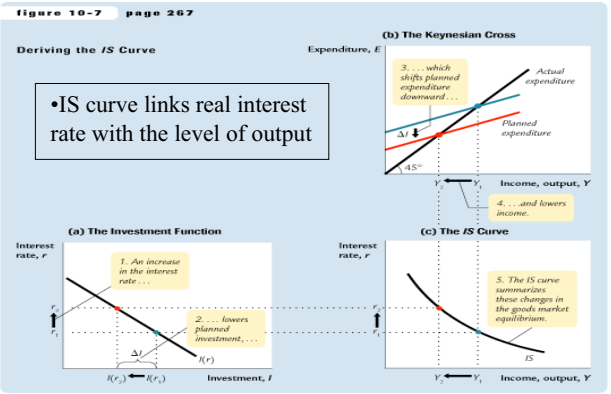
No more "crowding out"

- One major difference between Keynesian and the classical immediately becomes visible
- In the classical model, an increase in government spending while taxes remained constant resulted in lower investment
- Budget deficits *crowded out* private investment because output is constant
- In the Keynesian model the same event had no effect on the level of investment
- Plus, consumption increased after the budget deficit
- There is *no crowding out* in the Keynesian model
- The increase in output Y allows more spending overall in the economy

Investment and the interest rate

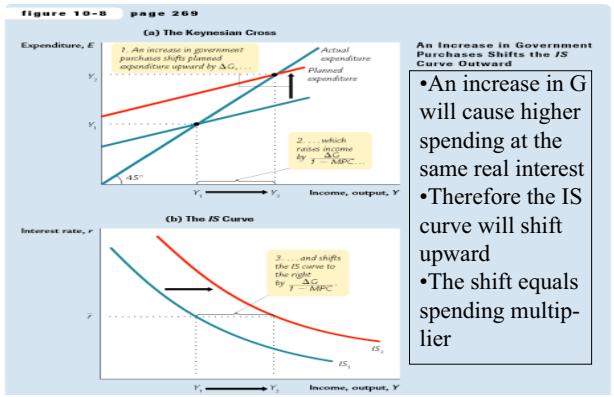
- Taking the level of investment as constant is not realistic
- We can relax this assumption by making investment a function of the real interest rate
- This assumption introduces the *saving-investment* relation and the *loanable funds market* to our model
- Different levels of real interest will correspond to different levels of investment and therefore of planned expenditure E and output Y
- Linking different interest rates to output levels give us the *investment-saving curve* (IS)
- IS summarises what happens at the Keynesian cross and the loanable funds market at the same time

Deriving the IS curve



•IS curve links real interest rate with the level of output

Fiscal policy and the IS curve



An Increase in Government Purchases Shifts the *IS* Curve Outward

•An increase in G will cause higher spending at the same real interest
•Therefore the IS curve will shift upward
•The shift equals spending multiplier

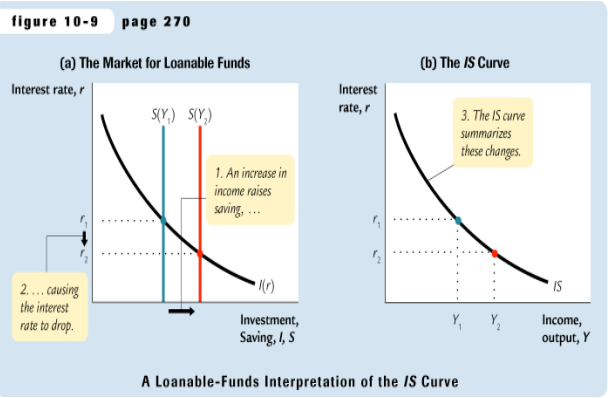
IS and the loanable funds market

- We have already mentioned that the *loanable funds market* lies behind the IS curve
- From national income identity, we know that in a closed economy *saving = investment*

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

- Ceteris paribus, an increase in income Y will raise the supply of savings in the loanable funds market
- Therefore a higher level of income Y will correspond to a lower real interest rate r
- On the same IS curve Y and r move in *opposite directions*
- In turn, an increase in G means both higher Y and r which in turn explains why IS must *shift* to the left

IS curve and loanable funds



Money market and liquidity

- We now proceed to explain the money market
- Keynes introduced the theory of *liquidity preference* by showing that money demand is also influenced by the interest rate
- Classical theory takes real money balances as a function of income only, independent of the real interest rate

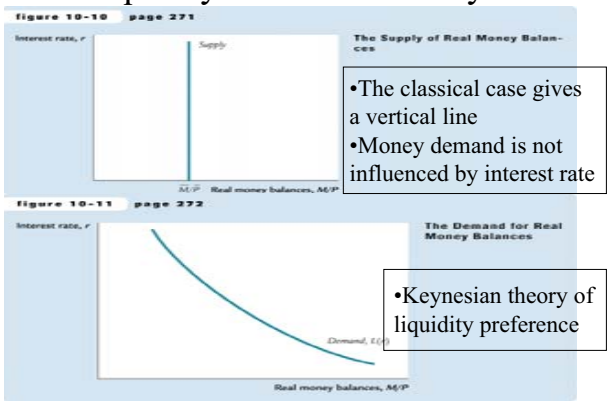
$$(M/P)^d = kY = (M/P)^s$$

- *Keynesian liquidity preference function*:

$$(M/P)^d = L(r) = (M/P)^s$$

- Keynesian *liquidity preference function* and the quantity of money supplied together determine the interest rate in the money market

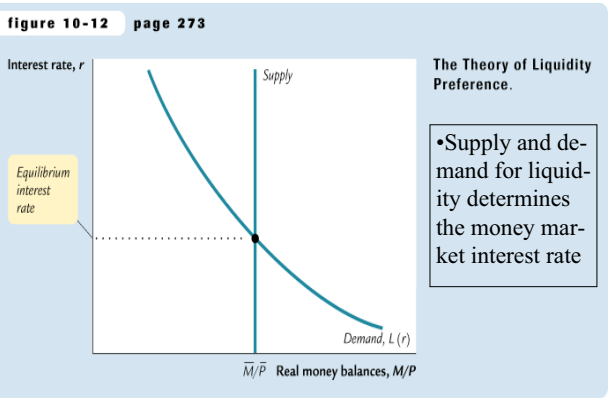
Liquidity: classics and Keynes



•The classical case gives a vertical line
•Money demand is not influenced by interest rate

•Keynesian theory of liquidity preference

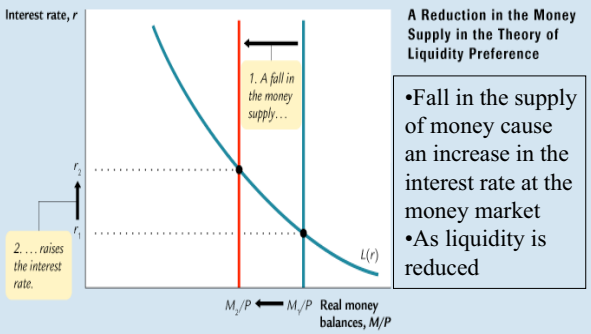
Money market equilibrium



•Supply and demand for liquidity determines the money market interest rate

Tight monetary policy

figure 10-13 page 274



A Reduction in the Money Supply in the Theory of Liquidity Preference

•Fall in the supply of money cause an increase in the interest rate at the money market
•As liquidity is reduced

Monetary policy and interest rates

- The impact of tight monetary policy on interest rates depend on *the time horizon*
- As predicted by the theory, *in the short* run both real and nominal interest rates will increase
- At the same time inflation starts to fall
- Leading in the *medium term* to lower real and nominal interest rates
- *Case Study* (p.273) "Did Paul Volkcker's Monetary Tightening Raise or Lowe Interes Rates?"
- The same trend is observed in Turkey
- After hitting their peak during the financial crisis in 2001 nominal and real interest rates have been falling along with inflation

Income and money demand

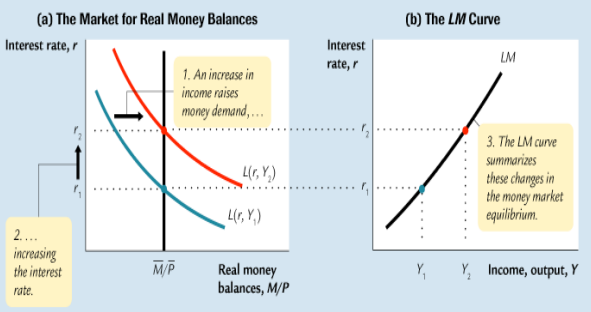
- From QTM we know that money demand is also closely related to the *level of income*
- We add income to the money demand function

$$(M/P)^d = L(r, Y) = (M/P)^s$$

- Larger income will imply bigger demand for real money balances and *vice versa*
- There will be a different money demand schedule for each level of income Y
- Increases in income *shift* the money demand curve upward, falls in income *shift* it downward
- Thus we establish a relation between output and the interest rate through the money market
- Higher levels of income mean higher interest rates

Deriving the LM curve

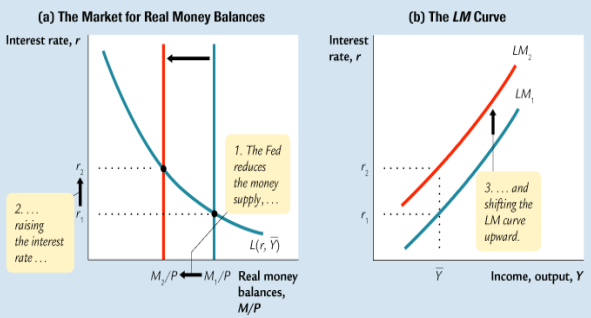
figure 10-14 page 275



Deriving the *LM* Curve

Tight money and the LM curve

figure 10-15 page 276



A Reduction in the Money Supply Shifts the *LM* Curve Upward

QTM and the LM curve

- Liquidity preference function is can also be derived from the *Quantity Theory of Money*
- One way is to make the velocity of circulation a function of the interest rate

$$V = V(r)$$

- V changes with the interest rate in the money market: higher interest levels reduce the demand for real money balances and *vice versa*
- QTM now becomes

$$M \times V(r) = P \times Y$$

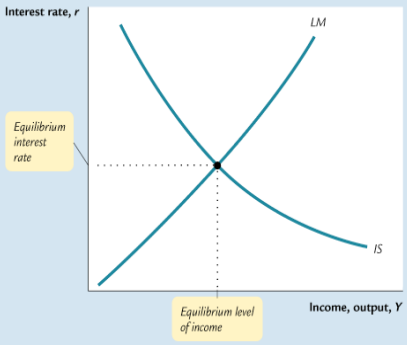
- Higher level of output is now compatible with constant M and P through an increase in real interest rate in the money market

The short run equilibrium

- We have all the pieces of an IS-LM model
  1) $Y = C(Y - T) + I(r) + G \longrightarrow$ IS
  2) $M/P = L(r, Y) \longrightarrow$ LM
- The resulting level of output Y and the real interest rate r assure equilibrium in *all three markets*
  - the goods and services market
  - the loanable funds market
  - the money market
- Equilibrium in the IS-LM model allows us to see the full effects of any change in exogenous variables and economic policy on *output and the interest rate* for the closed economy
- Open economy will be next

IS-LM equilibrium

figure 10-16 page 278

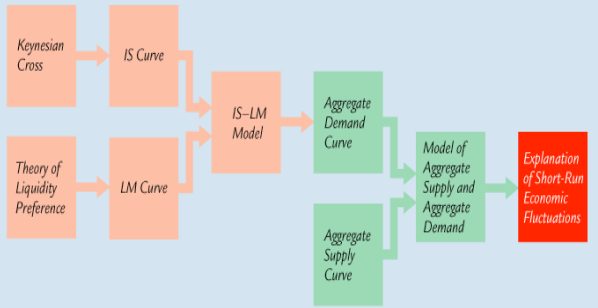


Equilibrium in the *IS–LM* Model

•At the intersection of IS and LM curves we find the equilibrium values of output and real interest rate
•Goods and services and loanable funds markets and the money market are in equilibrium

Summary of the short term

figure 10-17 page 279



The Theory of Short-Run Fluctuations

Aggregate Demand II

Chapter 11

Plan of Chapter 11

- Ch. 9 and Ch. 10 developed two basic models to explain economic fluctuations: AD-AS and IS-LM
- Ch. 11 keeps the assumption of *closed economy*
- First we analyse causes of potential fluctuations in income
- We use changes in the exogenous variables (G, T and M) in the IS-LM model
- Second we show *the link* between IS-LM and AD-AS models
- To gain valuable insights into the causes of economic fluctuations
- We also rewiew the causes and effects of the *Great Depression* of 1930s

IS-LM and fluctuations in income

- We start from IS-LM *equilibrium*
- First we see the impact of fiscal policy on output and interest rates in the short run
- Expensionary *fiscal policy* will increase both output and the interest rate while contractionary fiscal policy will reduce them
- Then we study the impact of monetary policy on output and the interest rate in the short run
- Loose *monetary policy* will increase output by reducing the interest rates while tight monetary policy reduces output by increasing interest rate
- Then we take a close look at the *interaction* between fiscal policy and monetary policy

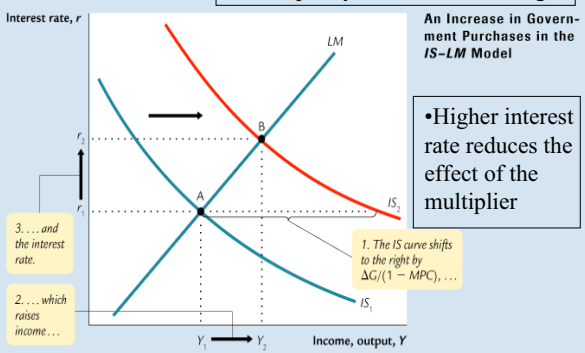
Fiscal policy: G and T

- *Fiscal policy* involves changes in government spending G or taxes T
- We only change *one at a time*, keeping the other constant
- *Expensionary* fiscal policy means bigger G (or smaller T) corresponding to a larger *budget deficit* (or reduction in budget surplus) G – T
- *Contractionary* fiscal policy means less G (or larger T) corresponding to a smaller budget deficit (or an increase in budget surplus) G – T
- The *income multiplier* is an important tool in analysing the effects of fiscal policy changes

An increase in G (T constant)

figure 11-1 page 283

•Fiscal policy leaves LM unchanged

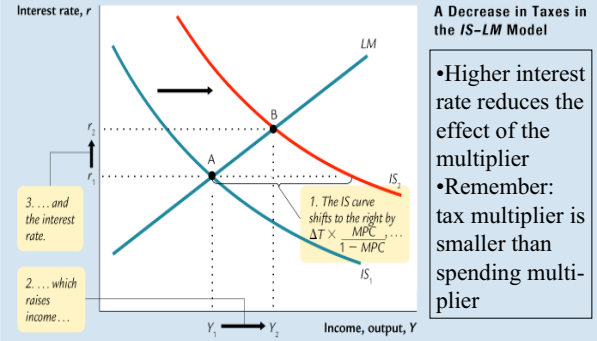


•Higher interest rate reduces the effect of the multiplier

A fall in T (G constant)

figure 11-2 page 285

•Fiscal policy leaves LM unchanged



•Higher interest rate reduces the effect of the multiplier
•Remember: tax multiplier is smaller than spending multiplier

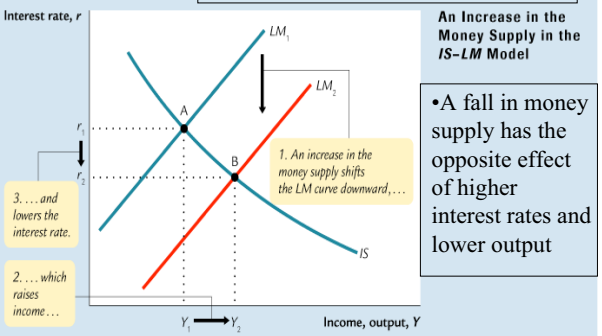
Monetary policy: changes in M

- Monetary policy: CB changes the *money supply*
- Changes in money supply M shift the LM curve
- *Loose* monetary policy means an increase in M, therefore lower interest rates and higher output in the short run
- *Tight* monetary policy means a fall in M, therefore higher interest rates and lower output in the short run
- An important issue is called *monetary transmission mechanism*
- How does monetary expension results in higher spending in the economy?
- Attention: we still assume *fixed prices* (no inflation)

An increase in M

figure 11-3 page 285

•Monetary policy leaves IS unchanged



•A fall in money supply has the opposite effect of higher interest rates and lower output

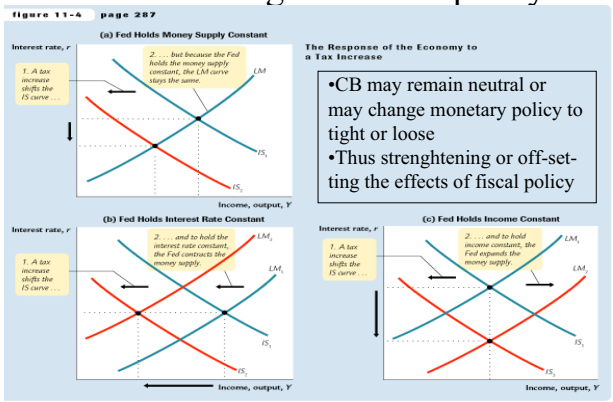
Policy interaction

- In real life, it is unrealistic to believe that only fiscal or monetary policy will change, one a time
- CB may adopt different policies depending on the circumstances when faced with a change in fiscal policy
- CB's independence is also very important
- Exemple: the government increases T (or reduces G) for tight fiscal policy
- Let us look at *three policy options* for the CB:
  - Do nothing (*unchanged* MP)
  - Try to keep the interest rate constant (*tight* MP)
  - Try to keep the level of output constant (*loose* MP)

Monetary policy is important

- We take the case of *fiscal tightening* implemented through an increase in taxes T
- If CB decides to do nothing thus leaving money supply unchanged (*neutral* monetary policy) tight fiscal policy results in lower interest rate and lower output
- If CB decides to keep interest rate constant, it has to *reduce money supply* thus output falls even more than neutral monetary policy
- If CB decides to keep output constant it has to *increase money supply* thus interest rate falls even more than neutral monetary policy
- Therefore the end result depends on monetary policy

CB choices against fiscal policy



Monetary policy tools

- Until now we always assumed money supply to be easily controllable by the Central Bank
- Empirical research does not confirm it
- There are serious *measurement problems* about the quantity of money available in the economy
- Another issue is the ability of the CB to control it
- Demand for money may create its own supply (circulation of dated checks and "bono" in Turkey)
- Many CBs prefer today to control *money interest rates* (discount rate in Turkey)
- These have no measurement problems and serve as a good signal of the intentions of the CB to the financial markets

Exogenous shocks to IS-LM

- In the real world, many of the shocks faced by an economy involves developments outside its borders but we are still in a closed economy model
- Willingness to take risks and to invest may vary from nation to nation and period to period
- Keynes called it "*animal sprits*" of the capitalists
- *Pessimism* about the future means a downward shift in the investment curve, depressing demand and output and validating the pessimism of the firms
- *Political events* will also have a strong influence on the behaviour of firms and households both in the goods and services and loanable funds markets and the money market

Lessons to be learned

- Monetary and fiscal policy are very influential in the short run
- Innocent looking moves by CB have important consequences for the future of the economy
- Fluctuations in output are more often caused by *policy decisions* of the government and the CB than by external and uncontrollable events
- Policy makers also commit *mistakes* due to lack of proper information and data or wrong economic theories and analysis
- Big econometric models may help in case of information deficiency but they are away from being adequate in times of fluctuations

Multiplier estimates for the US

table 11-1 page 289

The Fiscal-Policy Multipliers in the DRI Model

Assumption About Monetary Policy	$\Delta Y/\Delta G$	$\Delta Y/\Delta T$
Nominal interest rate held constant	1.93	−1.19
Money supply held constant	0.60	−0.26

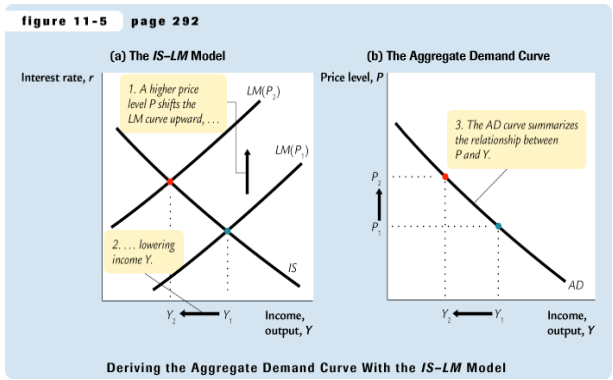
Note: This table gives the fiscal-policy multipliers for a sustained change in government purchases or in personal income taxes. These multipliers are for the fourth quarter after the policy change is made.
Source: Otto Eckstein, *The DRI Model of the U.S. Economy* (New York: McGraw-Hill, 1983), 169.

From IS-LM to aggregate demand

- Now we can relax the assumption of fixed price level and link the IS-LM model with AD curves
- IS represents the goods-services market and loanable funds market: both work in *real variables*
- LM represents the money market where the *price level* enters into the demand function for money
- Higher price level reduces real money balances and *shifts upward* the LM curve: lower output
- Lower price level increases real money balances and *shifts downward* the LM curve: higher output
- IS-LM corresponds to an implicit *inverse relation* between the price level and output, as in the AD curve

Price level and output

From the IS-LM model to the AD curve

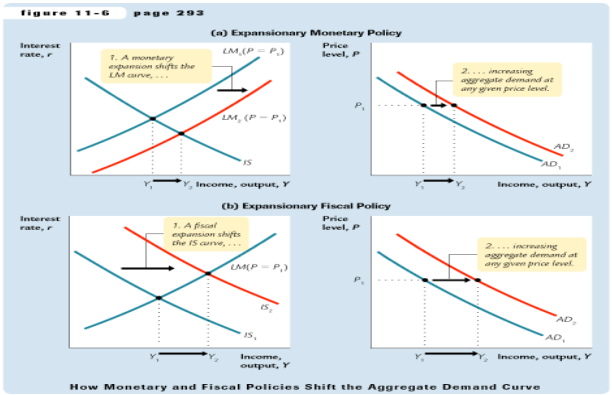


The effects of economic policy

- We can apply our usual method of modifyig *fiscal and monetary policy* to see how IS-LM and AD may be made work together
- *Expansionary* fiscal policy will shift the AD curve upward
- *Contractionary* fiscal policy will shift the AD curve downward
- *Loose* monetary policy will shift the AD curve upward
- *Tight* monetary policy will shift the AD curve downward
- There exists a *one-to-one relation* between the behaviour of IS-LM model and the AD curves

IS-LM and AD with policy changes

figure 11-6 page 293



How Monetary and Fiscal Policies Shift the Aggregate Demand Curve

Equilibrium in the long run

- IS-LM model for the short run:

$$Y = C(Y - T) + I(r) + G \quad \text{(IS)}$$
$$M / P = L(r, Y) \quad \text{(LM)}$$

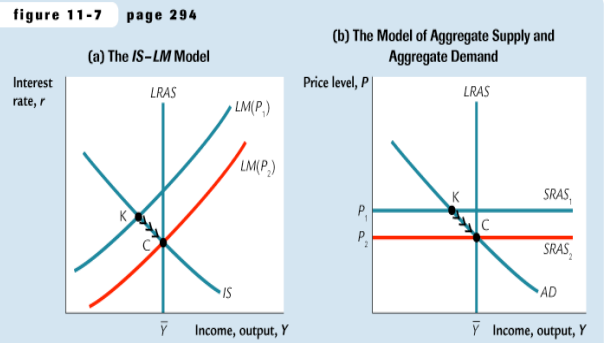
- To move to AD-AS model, we need the fixed output level for the long run and the sticky price level for the short run

$$Y = \bar{Y} \quad \text{(Long run fixed output)}$$
$$P = P_1 \quad \text{(Sticky prices)}$$

- These together constitute the long run and short run conditions for macroeconomic equilibrium
- If the price level is not right (say P_2) for the long run equilibrium, then SRAS curves will *shift down* due to the recession in the economy

IS-LM and AD-AS in equilibrium

figure 11-7 page 294



The Short-Run and Long-Run Equilibria

The Great Depression

- We already noted that macroeconomic analysis developed after the *Great Depression* in the world economy during 1930s
- Heated debate continues among economists about what caused such a severe depression
- First we look at US data from 1929 to 1940
- Some attribute the depression to shocks to IS curve
- Some argue that the depression was due to shocks to LM curve
- Others blame falling prices (deflation)
- Fears of large scale depression are often voiced in the world

US in depression: real variables

table 11-2 page 296

What Happened During the Great Depression?

Year	Unemployment Rate (1)	Real GNP (2)	Consumption (2)	Investment (2)	Government Purchases (2)
1929	3.2	203.6	139.6	40.4	22.0
1930	8.9	183.5	130.4	27.4	24.3
1931	16.3	169.5	126.1	16.8	25.4
1932	24.1	144.2	114.8	4.7	24.2
1933	25.2	141.5	112.8	5.3	23.3
1934	22.0	154.3	118.1	9.4	26.6
1935	20.3	169.5	125.5	18.0	27.0
1936	17.0	193.2	138.4	24.0	31.8
1937	14.3	203.2	143.1	29.9	30.8
1938	19.1	192.9	140.2	17.0	33.9
1939	17.2	209.4	148.2	24.7	35.2
1940	14.6	227.2	155.7	33.0	36.4

Source: Historical Statistics of the United States, Colonial Times to 1970, Parts I and II (Washington, DC: U.S. Department of Commerce, Bureau of Census, 1975).
Note: (1) The unemployment rate is series D9. (2) Real GNP, consumption, investment, and government purchases are series F3, F48, F52, and F66, and are measured in billions of 1958 dollars. (3) The interest rate is the prime Commercial

US in depression: nominal variables

table 11-2 (cont.) page 297

Year	Nominal Interest Rate (3)	Money Supply (4)	Price Level (5)	Inflation (6)	Real Money Balances (7)
1929	5.9	26.6	50.6	–	52.6
1930	3.6	25.8	49.3	−2.6	52.3
1931	2.6	24.1	44.8	−10.1	54.5
1932	2.7	21.1	40.2	−9.3	52.5
1933	1.7	19.9	39.3	−2.2	50.7
1934	1.0	21.9	42.2	7.4	51.8
1935	0.8	25.9	42.6	0.9	60.8
1936	0.8	29.6	42.7	0.2	62.9
1937	0.9	30.9	44.5	4.2	69.5
1938	0.8	30.5	43.9	−1.3	69.5
1939	0.6	34.2	43.2	−1.6	79.1
1940	0.6	39.7	43.9	1.6	90.3

Paper rate, 4–6 months, series x445. (4) The money supply is series x414, currency plus demand deposits, measured in billions of dollars. (5) The price level is the GNP deflator (1958 = 100), series E1. (6) The inflation rate is the percentage change in the price level series. (7) Real money balances, calculated by dividing the money supply by the price level and multiplying by 100, are in billions of 1958 dollars.

Shocks to IS

- The stock market crash in 1929 reduced the wealth of citizens, inducing them to save more and consume less (consumption function shifts down)
- Investment in housing collapsed partly because of "*overbuilding*" in the period before
- Crisis hit the banking sector resulting in large numbers of banking failures damaging the financial sector as well as consumer confidence
- Government spending was reduced while taxes went up order to fight against bigger budget deficits
- A *vicious circle* was set in motion, each factor aggravating the effects of the previous one to end in the Great Depression

Shocks to LM

- Money supply fell by 25 % from 1929 to 1933
- It was the wrong decisions of the Fed which led to such a substantial fall in money supply
- Less money implied an upward shift in the LM curve which depressed aggregate demand
- Nobel-price winner *Milton Friedman* blames the depression on unnecessarily tight monetary policy
- But real money balances rose in this period because prices fell even faster than money supply
- There was no increase in interest rates that an upward shift in the LM curve would require
- Still, reductions in the money supply have certainly aggravated the situation

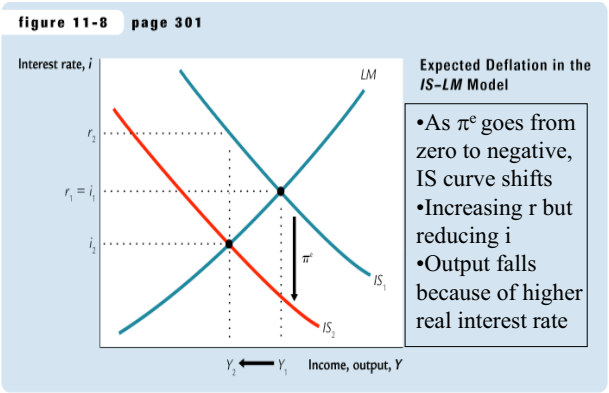
Deflation and depression

- Could deflation or falling price level itself be the cause of a long depression?
- Not in IS-LM model: falling prices raise output
- Through *Pigou effect*: when prices fall the purchasing power of the money holdings increase, which may induce the consumers to spend more
- Many economists in 1930s believed that falling prices would eventually bring the economy back to full employment output
- This belief is now much disputed
- Nominal interest rates can't be negative; deflation therefore results in very high real interest rates, depressing investment and consumer demand

Effects of expected deflation

- Remember the formula for nominal interest rate
  $i_{exante} = r + \pi^e$ or $r = i - \pi^e$
- If expected inflation π^e is negative, then real interest r will be higher than nominal interest i
- IS-LM model becomes
  $Y = C(Y - T) + I(i - \pi^e) + G$ IS
  $M / P = L(i, Y)$ LM
- π^e becomes part of the IS curve, in other words *expectations of deflation* will shift it downwards
- And cause contraction in output because of higher real interest rates even if nominal interest rate is very low or zero

Expected deflation and the IS



Japanese economy in 1990s

- Economic growth came to a halt in Japan during the last decade after the bubble in Tokyo stock exchange and in real estate market burst in 1990
- CPI has been on a slow downward path for the most of the period
- Consumer spending stagnated due to expectations of lower prices in the future
- Long recession increased the non-performing loans of the banks and led to reduced lending
- Firms refuse to invest even at *near zero* nominal interest rates
- Fears of deflation and a cycle similar to Japan were also voiced for the US economy recently

The liquidity trap

- In Japan in 1990s and the US in 1930 interest rates reached very low levels, almost zero
- This situation is described by some economists as a *liquidity trap*
- In the sense that loose monetary policy no longer has an expansionary impact on aggregate demand
- Because economic actors hold on to the additional liquidity provided by the monetary authority
- *Zero* is the lower limit for the nominal interest rate
- Therefore when prices are falling (deflation) real interest rate will be positive even at zero nominal interest rate
- Price deflation may cause a liquidity trap

Turkey and the Great Depression

- Turkey did not feel the impact of the great depression as hard as the industrial countries
- Turkish economy in 1930s was dominated by *subsistence agriculture*
- But areas which produced export crops suffered heavily
- GNP continued to grow as population increased and improvements in agriculture took their effect
- Still there was serious deflation inthe economy: the price level *fell by half* in the first half of 1930s
- In those days, the government was obliged to make *nominal cuts* in the salaries of civil servants

Turkey during 1930s

	GNP growth	GNP Level	Inflation	Price Level
1929	21,6	100	2,2	100
1930	2,2	102	-24,2	76
1931	8,9	111	-13,9	65
1932	-10,7	99	-14,5	56
1933	16	115	-11,3	49
1934	6	122	2,1	51
1935	-3	119	10,4	56
1936	23,2	146	11,3	62
1937	1,5	148	3,4	64
1938	9,5	162	-4,9	61
1939	6,9	174	1,7	62
1940	-4,9	165	25,4	78

Aggregate Demand in the Open Economy

Chapter 12

Open economy in the short run

- It is time to relax the assumption of a closed economy and go into the details of the short run behaviour of *an open economy*
- We combine IS-LM and AD-AS models with the analytical tools that were developed in *Ch.5* while looking at the open economy in the long run
- In Ch.5 output Y was constant; in this chapter output Y will fluctuate, its actual level of depending on *aggregate demand*
- We distinguish among different *exchange rate regimes* (fixed or floating exchange rates)
- We begin with a *small* open economy but proceed to look at a *large* open economy

Mundell-Fleming model

- Two economists, *Robert Mundell* and *Marcus Fleming* generalised the IS-LM model to open economies in 1960s and received the *Nobel prize*
- The model explores the effects of policy changes or exogenous shocks on output, interest rates, prices and the exchange rate in the short run
- Mundell had in mind *Canada*: a small country which has very close commercial and financial ties with the US economy
- We start with a *small open economy* with perfect capital mobility where the domestic real interest rate r is equal to the world real interest rate r^*

$r = r^*$

Structure of the model

- IS-LM model for the closed economy was based on three markets
  - *Goods and services market* determines the level of output Y (Keynesian cross)
  - *Loanable funds market* determines the interest rate r (saving and investment)
  - *Money market* also determines interest rate r (liquidity demand and supply)
- For the open economy we need a *fourth market* which reflects the relations with the outside world
- The *exchange rate* is determined in the *FX market*
- The model combines the tools in Ch.11 with those in Ch.5

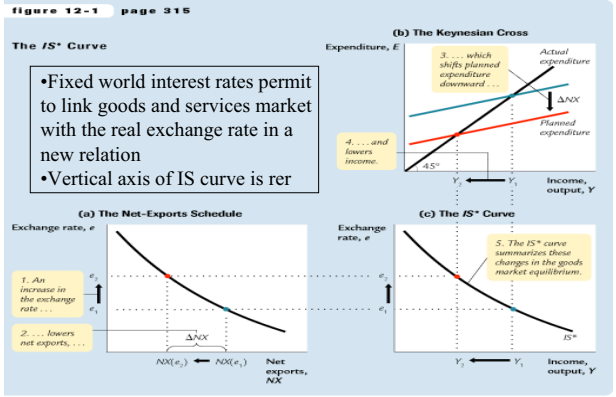
Goods market and IS curve

- Goods and services market now includes *foreign trade* or the current account of the BoP
- Net Exports NX is defined as a function of the real exchange rate (not nominal er)

$$Y = C(Y - T) + I(r^*) + G + NX(\text{rer})$$

- Goods market relates the level of output to the exchange rate on the IS curve
- Appreciation of currency (high rer) reduces output through a fall in net exports
- Depreciation of currency (low rer) increases output through increases in net exports
- This allows us to establish an *inverse relation* between the real exchange rate and level of output

Net exports, AE and IS



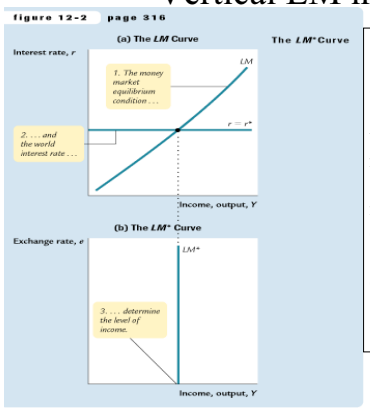
Money market and LM curve

- The money market is similar to closed economy except that for SOE interest rate is equal to the world interest rate

$$M / P = L(r^*, Y)$$

- In other words, small open economies cannot use the interest rate as a policy tool: domestic interest rate cannot deviate from world interest rate r^*
- LM curve of a SOE is therefore *vertical*
- This is a very interesting situation: the real exchange rate has no impact on output level in SOE
- Why? Because money market equilibrium and therefore the level of output is determined by the world interest rate

Vertical LM in SOE



•Distinguishing feature of SOE is equality of world and domestic interest rates
•With fixed interest rates, there is only one equilibrium point on the LM curve
•Therefore, for a given money supply M, the LM curve is independent of rer
•Implying a vertical LM curve
•Attention: this is true for fixed money supply

Equilibrium in SOE

- Mundell-Fleming model for SOE

$$Y = C(Y - T) + I(r^*) + G + NX(\text{rer}) \quad \text{IS}$$

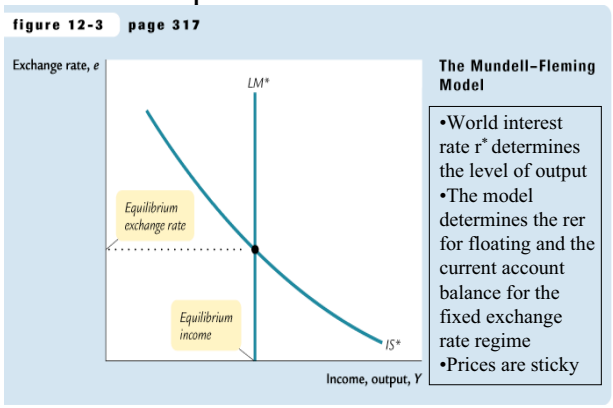
$$M / P = L(r^*, Y) \quad \text{LM}$$

- IS equation summarises the goods market plus the loanable funds market
- Liquidity demand is determined by the (fixed) world interest rate
- The exchange rate is determined by the interaction of trade balance and capital flows
- Prices are fixed in the short run (*sticky prices*)
- To move ahead, we need an assumption about the exchange rate regime: we start with *floating* exchange rates

Floating exchange rates

- We evaluate exchange rate regimes later
- In case of floating exchange rate regime, nominal and real exchange rates are determined by *demand and supply in the FX market*
- The CB (less often the Treasury) may intervene in FX market by selling or buying FX in order to steer or stabilise the exchange rate
- But CB does not guarantee any exchange rate and despite its intervention market forces could move the exchange rate in opposite direction
- Capital account liberalisation often leads to floating exchange rates
- Turkey floated its exchange rate in *February 2001*

Equilibrium in SOE

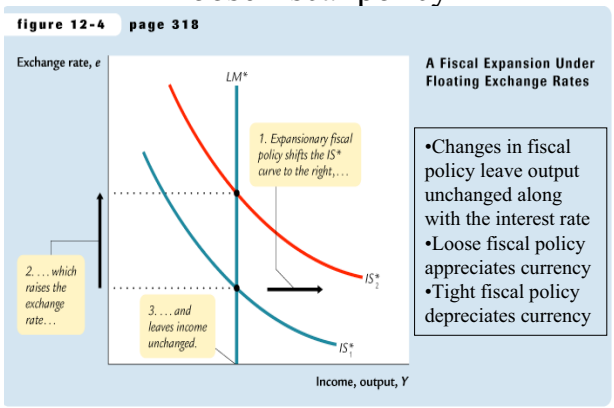


•World interest rate r^* determines the level of output
•The model determines the rer for floating and the current account balance for the fixed exchange rate regime
•Prices are sticky

Fiscal policy

- What are the effects of *fiscal policy* on short run equilibrium of the economy?
- *Loose* fiscal policy (higher G or lower T) shifts the IS curve upwards but output Y remains unchanged (vertical LM curve) and currency appreciates
- *Tight* fiscal policy (lower G or higher T) shifts the IS curve downwards but output Y remains unchanged (vertical LM curve) and currency depreciates
- More/less spending by government leads to more/less borrowing abroad which appreciates/depreciates the currency and cause a fall/rise in net exports
- Fiscal policy *is not effective* for SOE with floating exchange rate regime

Loose fiscal policy

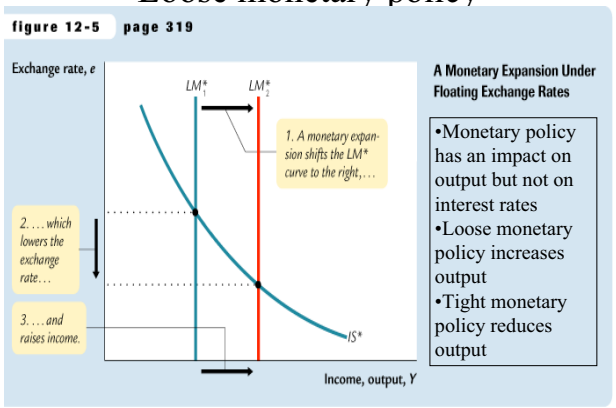


- Changes in fiscal policy leave output unchanged along with the interest rate
- Loose fiscal policy appreciates currency
- Tight fiscal policy depreciates currency

Monetary policy

- An increase in money supply with r^* and fixed prices imply *a shift to left* of the vertical LM curve because real money balances are higher
- Currency depreciates while output increases
- The model works through *capital outflow* due to excess liquidity which lowers the real exchange rate
- Depreciation of the currency increases net exports and therefore aggregate demand, leading to higher level of output Y
- A fall in money supply has the opposite effect
- Because output responds to monetary policy, we can claim that monetary policy *is very effective* for SOE with floating exchange rate regime

Loose monetary policy

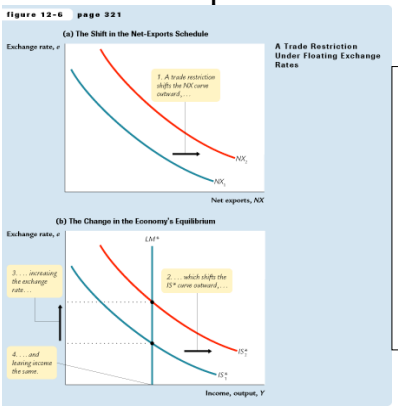


- Monetary policy has an impact on output but not on interest rates
- Loose monetary policy increases output
- Tight monetary policy reduces output

Trade policy

- When analysing a model we also look at the effects of *protectionist trade policies*
- What happens if the government decides to impose import restrictions to improve the trade deficit?
- Import protection shifts the *NX curve* upward, because imports are lower at every exchange rate
- Therefore shifts the *IS curve* upwards due to more spending on domestic output
- Vertical LM curve implies that output is unchanged while the currency appreciates
- Trade restrictions have *no impact* on output
- Exports fall along with imports because currency gains value

Import restrictions



- Trade policy leaves output and interest rates unchanged
- Only real exchange rate is affected
- Less imports increase the demand for TL in the FX markets
- Thus appreciating the currency
- And reducing exports

Policy with floating exchange rates

- What did we learn about the effectiveness of macroeconomic policy for SOE?
- Fiscal policy *is not effective* because the pressure it exerts on interest rates results in capital flows
- These determine the exchange rate and net exports move in the *opposite direction* to policy intentions
- Monetary policy *is effective* because the pressure it exerts on interest rates are in line with the intentions of the policymakers
- Attention: in SOE the interest rate is fixed by r^*
- Therefore monetary policy delivers the targeted results through its influence on the *exchange rate*, not on the interest rate

Fixed exchange rate regime

- A fixed exchange rate may also be called "*peg*" or "*pegged*" exchange rate
- To fix the exchange rate, CB announces in advance its *buying and selling rates* for FX
- Nominal exchange rate is usually fixed (peg) but may also be moving along a path (*crawling peg*)
- It is the preferred regime for non-convertible currencies (restricted capital mobility)
- CB must have large FX reserves for the fixed exchange rate regime to have *credibility*
- It must also be ready to *support* the fixed exchange rate by high interest rates even if this implies a lower level of output

Hard and soft peg

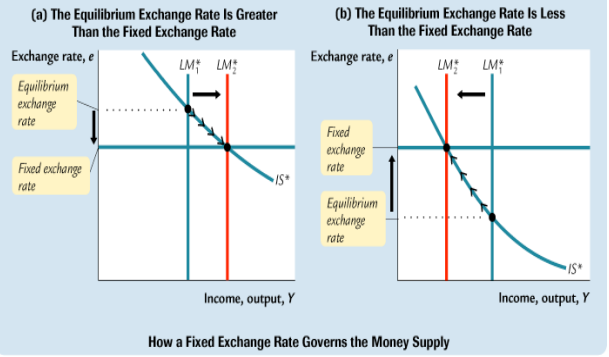
- If the fixed exchange rate is backed only with the credibility of the CB it is called a "*soft peg*"
- Why "soft" Because the CB keeps the right to change its policy and devalue or revalue the currency at its discretion
- Formal and legally binding committment to the fixed exchange rate is called a "*hard peg*"
- "*Currency Board*" (para kurulu) puts strict (often legally binding) limits to the discretion of the CB
- CB can only issue currency against FX at the fixed exchange rate
- It means there is no monetary policy and no lender of last resort for the financial system

What fixes the exchange rate?

- A fixed exchange rate regime requires the CB to become *a buyer and seller of FX* at the exchange rate it has fixed
- It has to buy all FX supplied by the financial markets and pay TL for it
- It has to buy all TL supplied by the financial markets and pay FX for it
- Therefore market exchange rate cannot move above or below the rate fixed by the CB
- Any exchange rate system where the CB *commits itself* to buying and selling FX at an exchange rate it announces corresponds to fixed exchange rates
- Such as Turkey from 1989 to February 2001

Deviations from fixed er

figure 12-7 page 323



The Gold Standard

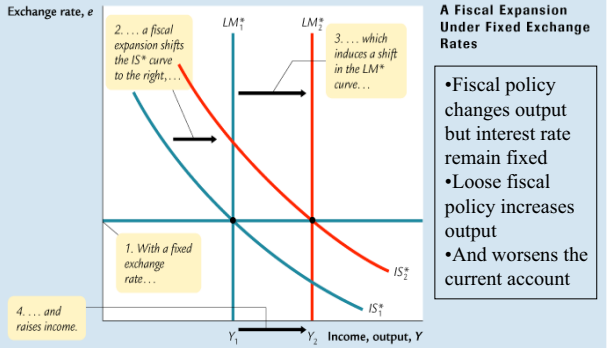
- Floating exchange rates became popular only in the second half of the 20th century
- Up until the Great Depression, the world economy worked on the *gold standard*
- For gold coins, there is no need for an exchange rate as the quantity of gold in the coin makes it suitable for international circulation
- In the Gold Standard, every country fixed the value of its (paper) currency to *an amount of gold*
- It was the duty of the CB to exchange the currency for gold at this price
- Gold circulated among countries to settle payments due trade balances or other causes

Fiscal policy with "peg"

- How does fiscal policy work in SOE with fixed exchange rate regime?
- *Loose* fiscal policy: higher G (lower T) shifts IS curve upward and puts pressure on interest rates
- CB has to buy the FX from capital flowing in
- Loose fiscal policy is translated into loose monetary policy as money supply increases and *LM curve* shifts right
- With fixed exchange rates, the effect of fiscal policy is amplified through changes in the money supply
- Therefore output increases for loose fiscal policy and decreases for tight fiscal policy
- Fiscal policy is *very effective* in SOE with a peg

Fiscal policy with peg

figure 12-8 page 325

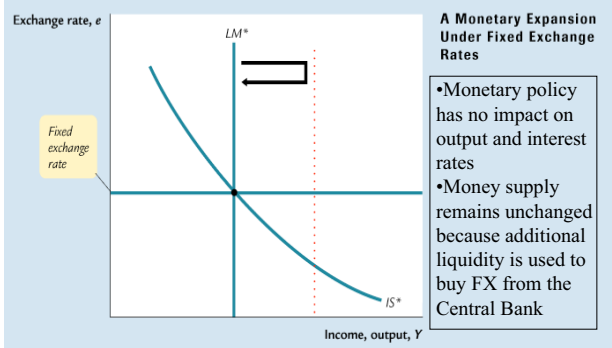


Monetary policy with peg

- How does monetary policy work in SOE with fixed exchange rate regime?
- *Loose* monetary policy: CB increases the money supply M by through open market operations
- LM curve shifts to left, putting downward pressure on the exchange rate and the interest rate
- But the markets react by returning the additional liquidity to the CB to buy FX
- As money supply is reduced LM curve shifts back to its original position and output is unchanged
- CB has not been able to increase money supply due to its efforts to peg the exchange rate
- Monetary policy *is ineffective* for peg regimes

Monetary policy with peg

figure 12-9 page 325

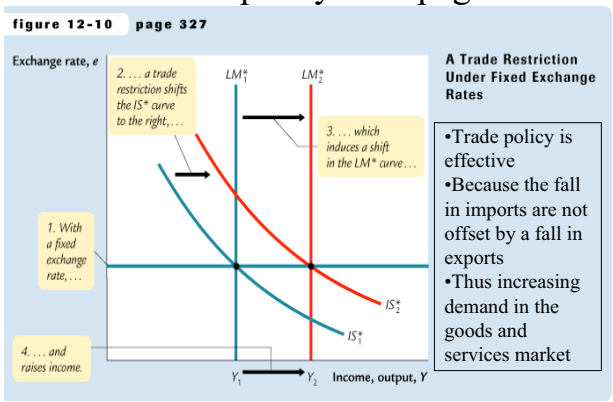


Trade policy with "peg"

- We repeat the exercise about *import restrictions* for the case of a fixed exchange rate regime
- Both the NX and the IS curves both shift upward after trade restrictions which reduces imports
- The fall in imports has no impact on the exchange rate which means that net exports increase
- With capital flows *unchanged*, additional FX coming from the trade balance has no buyers and the CB must buy it and pay TL
- Money supply increases and *LM shifts* to right
- As a result output Y increases after trade restrictions
- In other words, protectionist trade policy *is effective* with a peg regime

Trade policy with peg

figure 12-10 page 327



Policy in open economy

- We can now summarise the effects of fiscal and monetary policies for SOE
- Mundell-Fleming model shows that effectiveness of fiscal and monetary policies in open economy depends on the exchange rate regime
- Under *floating exchange rates* fiscal policy becomes ineffective while monetary policy is effective
- Under *fixed exchange rates* fiscal policy is effective but monetary policy is not
- Attention: in both cases we assumed *perfect capital mobility*
- It must be remembered that fixed exchange rate regimes usually don't allow capital mobility

Policy effects in SOE: summary

	Exchange Rate Regime					
	Floating			Fixed		
	Impact On					
Policy	Y	e	NX	Y	e	NX
Fiscal expansion	0	▲	▼	▲	0	0
Monetary expension	▲	▼	▲	0	0	0
Import restriction	0	▲	0	▲	0	▲

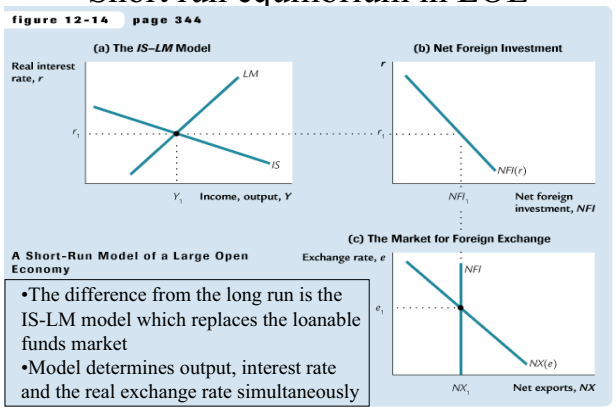
Large open economy

- As in the long run, we now move to the analysis of a *large open economy* with imperfect capital mobility
- The main difference between SOE and LOE arises from the way the interest rate is determined
- In LOE r is not equal to r^* and may be higher or lower depending on the conditions
- LOE therefore must have *Capital Flows* as a function of the interest rates
- Model becomes:

$$Y = C(Y - T) + I(r) + G + NX(\text{rer}) \quad \text{IS}$$
$$M / P = L(r, Y) \quad \text{LM}$$
$$NX(\text{rer}) = CF(r) \quad \text{LOE}$$

- Alternatively we may replace *NX* with *CF* in IS

Short run equilibrium in LOE

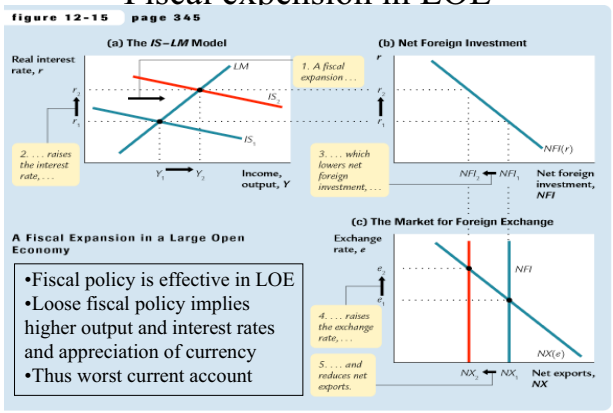


- The difference from the long run is the IS-LM model which replaces the loanable funds market
- Model determines output, interest rate and the real exchange rate simultaneously

Policy in LOE

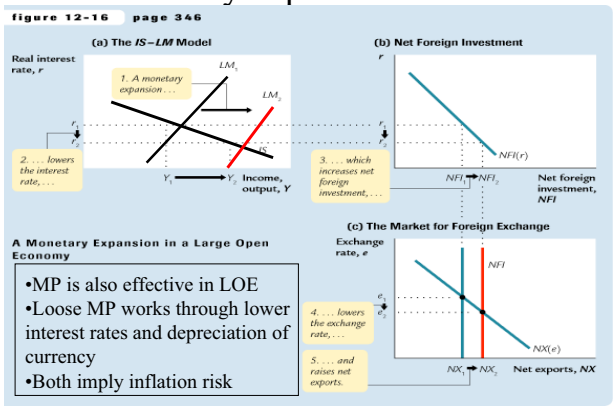
- We will look at the impact of a change in fiscal policy and monetary policy in the LOE
- We assume floating exchange rate regime
- Expensionary *fiscal policy* increases demand but also the interest rate, thus causing an appreciation of the currency because of capital inflows
- Expensionary *monetary policy* reduces interest rates which raises investment spending while depreciating the currency, both increases output
- Fiscal policy starts from the goods and services market and then move to money and FX markets
- Monetary policy starts from the money and FX markets then move to goods and services market

Fiscal expension in LOE



- Fiscal policy is effective in LOE
- Loose fiscal policy implies higher output and interest rates and appreciation of currency
- Thus worst current account

Monetary expension in LOE



- MP is also effective in LOE
- Loose MP works through lower interest rates and depreciation of currency
- Both imply inflation risk

Political economy of CF

- In case of imperfect capital mobility, *the stability* of the CF function becomes crucial
- Politics or any other disturbing event may cause *large shifts* in the CF curve, which in turn affect the exchange rate, etc.
- Short run performance of the economy depends to a large extent on the stability of the CF curve
- *Currency substitution* (dollarisation) by domestic residents will mean less stable CF curves
- And result in higher volatility of output as *residents attack* their own currency (CF shifts up and down violently and frequently)
- Turkey's recent crisis is a case of sudden CF shift

Interest rate differentials

- SOE assumption on for domestic interest rate being equal to the world interest rate is far too restrictive and is not true in the real world
- *Country risk* varies from one country to another and from one period to another
- *Nominal* exchange rate movements also imply additional costs for cross border capital flows
- Expectations of future changes in nominal exchange rates therefore influence capital flows
- If an economy is considered high risk plus there exists expectations of devaluation, domestic interest rate will be higher in order to cover these risks (*risk premium*)

Model with risk premium

- Domestic interest rate will be equal to world interest rate plus a *risk premium*

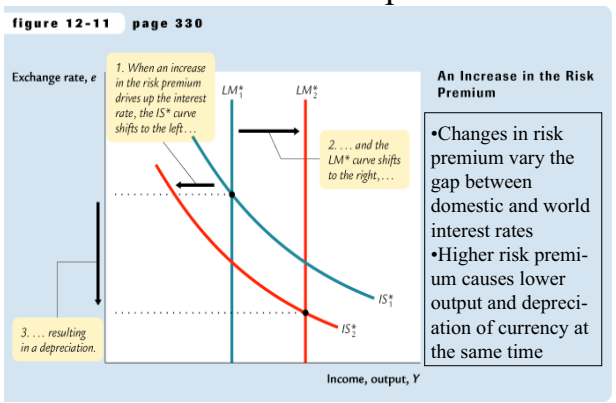
$$r = r^* + \theta$$

- Putting this into the model

$$Y = C(Y - T) + I(r^* + \theta) + G + NX(\text{rer}) \quad \text{IS}$$
$$M / P = L(r^* + \theta, Y) \quad \text{LM}$$

- An increase in risk premium means a downward shift in the IS and outward shift in the LM
- Higher r means lower Y and currency depreciation
- Including the risk factor into the model has very interesting consequences
- Ceteris paribus, currency depreciation may be caused by *expectations* of currency depreciation

An increase in risk premium



Financial crisis: Mexico 1994

- Concepts of *risk* and *CF curve stability* help us understand better many recent economic turbulences
- Political problems during a presidential election changed perceptions of risk in Mexico in 1994
- Capital flight started putting pressure on the peso
- This means an upward shift in the CF curve
- CB sold FX to protect the peso but that reduced both the money supply and FX reserves at the same time
- Eventually there was no other alternative but *to float the peso* which immediately lost half its value
- *US and IMF* moved in to lend very large sums to Mexico in order to prevent a full meltdown in the economy

Financial crisis: Asia 1997

- Three years later financial crisis hit *Asian tiger economies* of Thailand, Korea, Malaysia, Indonesia
- There it was not political problems but sudden awareness of the risks emerging in the *weak financial sectors* of these countries
- Rising interest rates and shifting CF made everything worst by increasing the *risk of default*
- Which was translated into higher FX demand
- Vicious circles of devaluation and interest hikes rapidly set in, damaging both financial and nonfinancial firms
- Again IMF had to move in with a large infusion of funds to rescue these countries from bankruptcy

Financial crisis: Turkey 2001

- Turkey was implementing an "*exchange rate based disinflation program*" supported by IMF in 2000
- Political problems along with troubles at the balance sheets of state banks triggered a *massive attack* on the TL in February 2001
- To protect the peg CB had to keep the money supply constant and interest rates exploded
- This only made things worse as demand for FX rapidly eroded the FX reserves of the CB
- Turkey had *to float* its currency, leading to rapid depreciation of TL and a big recession
- A new stabilisation program was introduced with supplementary financial support from the IMF

To float or to fix!

- The choice between floating and fixed exchange rates is not straightforward and clear-cut
- Fixed exchange rates *reduce* uncertainty for exporters and importers
- But may cause *violent turbulences* if external or domestic shocks cause misalignment of rer
- Floating exchange rates *increase* uncertainty for exporters and importers
- But allow the economy to *adjust rapidly* to changing conditions
- Attention: these discussions assume *low inflation* (unlike Turkey) whereas a temporary fixed exchange rate regime may help fight inflation

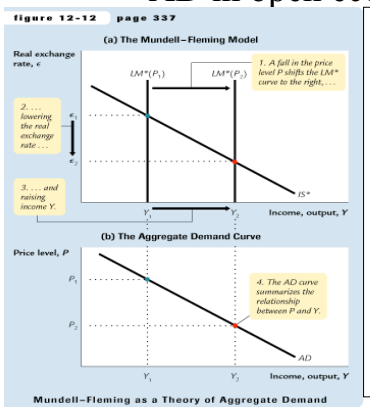
Euro and EMU

- *European Monetary Union* corresponds to a regional very hard peg
- Euro-member countries gave up their national currency and *fixed permanently* the exchange rates among themselves
- Euro is floating against non-member currencies
- Single market in EU makes exchange rate rigidity a strong necesity for members
- For the success of a common currency, economic theory requires high levels of *factor mobility*
- The alternative to exchange rate adjustment is for capital and labour to move to areas with competitive advantages

From IS-LM to AD-AS

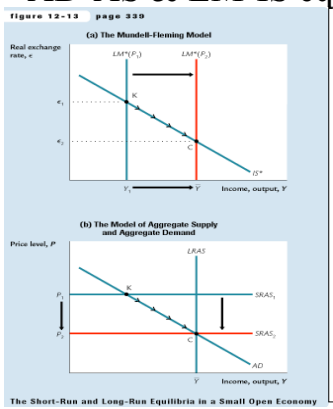
- We can now use the analysis above to show the *the interaction* between the open economy IS-LM model and the AD-AS model
- The link is similar to the one we established for the closed economy
- IS curve is *independent* of the price level
- LM curve is *dependent* on the price level
- Higher prices reduce *real money supply* and shift the LM curve to left, thus cause a lower level output Y
- Lower prices increase *real money supply* and shift LM curve to right, causing higher output level Y
- We can say that the *Mundell-Fleming model* is consistent with a negatively sloped AD curve

AD in open economy



•The Mundell-Fleming model is compatible with a downward sloping AD curve
•Given the nominal money supply M, lower price level cor-responds to a right shift in LM
•Therefore depreciation of currency
•And higher level of output
•Lower price level increases demand for domestic production by making exports more competitive and imports less attractive

AD-AS & LM-IS equilibrium in SOE



•At point K the economy is in short-run but not long-run equilibrium
•Excess supply in goods and services markets due to the recession will put a downward pressure on prices
•As prices fall LM curve shifts right
•And the SRAS curve shifts down
•Eventually bringing the economy to equilibrium point C
•The move from short run to long run equilibrium is through flexible prices

Aggregate Supply

Chapter 13

Towards realism in SRAS

- It is time to relax the key assumption about the short run: *sticky prices*
- *Horizontal SRAS curve* is far too rigid
- Often prices respond to changes in the level of AD and output also in the short run
- In other words, *limited price flexibility* exists in the short run as demand and output varies
- An *upward sloping SRAS* curve would better fit what happens in real economies in the short run
- The real world usually is between the two extreme cases of horizontal or vertical AS curves
- Economists however disagree on the mechanisms behind the observed limited flexibility of prices

Frictions and market clearance

- Without the price mechanism we have no market economy and no economic science
- But *perfect* price flexibility exists only in theory
- Real life markets have many impurities that prevent instantenous adjustment of prices
- These can be called "*frictions*"
- A key question: do markets clear?
- If quantity supplied adjust to demand while price remains unchanged, we claim that markets *don't clear*, i.e. excess supply has no effect on price
- Sticky prices have to assume that some markets, if not all, are not clearing
- Either for goods or for factors (labour)

Expectations and SRAS

- Our final destination will be a *SRAS equation*

$$Y = \overline{Y} + \alpha (P - P^e) \quad \text{where } \alpha > 0$$

- Which link the short run level of output Y to long run output $\overline{Y}$ and the difference between expected and realised price level
- We will also call $\overline{Y}$ the *natural rate output*, as a short cut for the output corresponding to the natural level of unemployment
- If the price level turns out above the expected price level then output will also be higher
- If the price level turns out below the expected price level then output will also be lower
- $1/\alpha$ will be the *slope* of the SRAS curve

Three models of SRAS

- Frictions which cause sticky prices can happen both in labour and goods markets
- Economists first developed theories by looking at the rigidities in the *labour market* and wages
- Later these were extended to rigidities in the *goods markets* to explain directly sticky prices
- We cover three models:
  - The *Sticky-Wage* Model
  - The *Imperfect Information* Model
  - The *Sticky-Price* Model
- Then we will analyse in depth the role of expectations in SRAS and inflation

Sticky Wages Model

- Wages are fixed *nominally*, often through long contracts covering several years
- If prices *increase*, real wages fall and firms hire more workers to produce larger output
- If prices *fall*, real wages increase and firms hire less workers to produce lower output
- During collective bargaining, unions set nominal wages in expectation of a real wage and price level

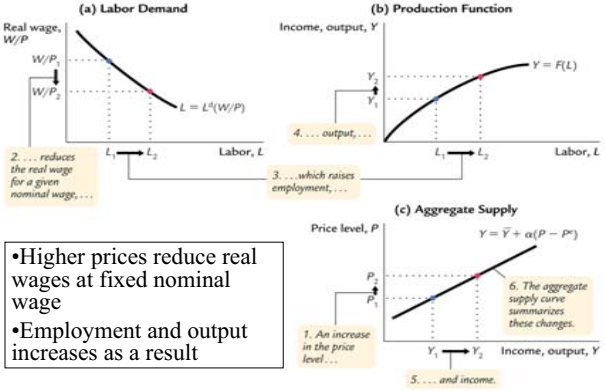
$$W = \omega \times P^e$$

- Dividing both sides with price level P

$$W / P = \omega \times P^e / P$$

- Actual real wages therefore depend on *variations* from expected inflation

Sticky wages and SRAS

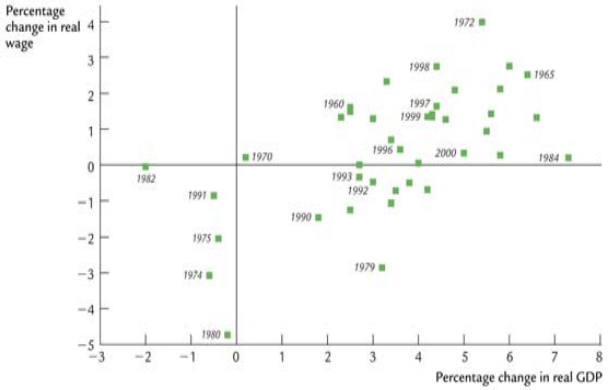


- Higher prices reduce real wages at fixed nominal wage
- Employment and output increases as a result

Real wages in the business cycle

- The results of the model can be tested with data from the real world
- According to the model real wages should fall during boom periods and rise during recessions
- Wage behaviour is said to be *countercyclical*
- Keynes himself held similar views about real wages
- Empirical data from US does not support it
- The observed relation is weak but it still points in the opposite direction: real wages have a tendency to rise faster during booms and fall during recessions
- Wage behaviour is observed to be *procyclical*
- Of course, this may be due to other factors such as technological change, shifts in L^d curve, etc.

US: wages and growth



Imperfect information

- Confusion may also arise also in *goods markets*
- Producers lack the full information to distinguish between changes in *relative prices* from changes in the price level
- When their own price increases, they may take it for a change in its relative price and therefore increase their own production
- In the very short run, there are many fluctuations in relative prices and in demand, making it very hard difficult to distinguish a movement in the *individual market* from the general trend in prices
- *Imperfect information* also gives us an upward sloping SRAS curve

Sticky price model

- Last model assumes that firms don't adjust instantly their prices when demand changes
- For their pricing decisions, firms look at their costs and the expected demand for their product
- Desired price for firms in *flexible markets* become

$$p = P + a\,(Y - \overline{Y})$$

- Desired price for firms in *sticky markets* become

$$p = P^e + a\,(Y^e - \overline{Y}^e)$$

- In both cases, in the long run equilibrium $p = P^e$
- In other words, if firms expect high price and output levels they set their prices high which in turn increases both their cost and the price level
- *Sticky prices* imply procyclical real wages

Summary

- All three models give an *upward sloping SRAS* or

$$Y = \overline{Y} + \alpha\,(P - P^e)$$

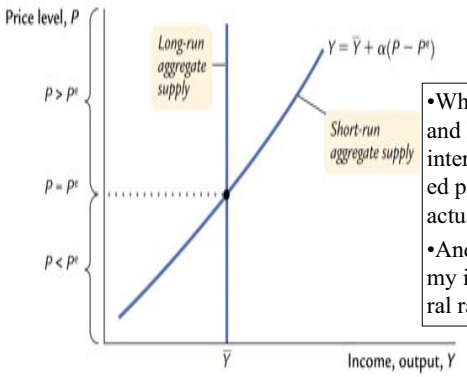
- Prices are neither fixed nor perfectly flexible, depending on frictions and on expectations
- If the price level is *higher* than expected price level, then output exceeds its natural rate
- If the price level is *lower* than expected price level, then output falls short of its natural rate
- These models can be classified by the way each handles the key assumptions about *market clearance* and the *market* they emphasise
- *A comparaison* among the three interpretations of the upward sloping SRAS curve is useful

Comparing three models

•The matrix below summarises the three models of an upward sloping aggregate supply curve depending on their position on market clearance and the market where they see frictions

		Market with Imperfection: Labour	Market with Imperfection: Goods
Markets Clear?	Yes		**Imperfect Information Model** Supplier confuse changes in the price level with changes in relative prices
	No	**Sticky Wage Model** Nominal Wages adjust slowly	**Sticky Price Model** The prices of goods and services adjust slowly

SRAS and LRAS



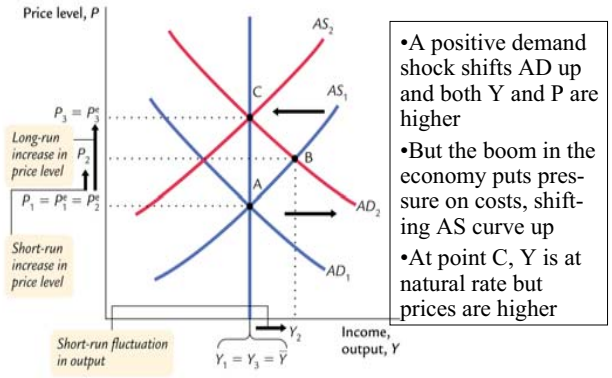
•Where SRAS and LRAS curves intersect, expected price level is actual price level

•And the economy is at the natural rate output

AD and AS together

- We can now put our AD-AS model to work in order to explain short run fluctuations
- We start with an economy in its short and long run equilibrium: *three curves* intersect at the same point
- Assume a *demand shock*: AD shifts upwards
- In the short run both output and prices will rise
- As output exceeds natural rate and prices are above expected level, both costs and prices increase
- *Shifting SRAS* curves up
- Eventually the economy comes back to its natural rate output but at a *higher price level*
- Provided CB *accomodates* the demand shock
- With money supply constant, AD will shift back

Effects of an increase in demand



•A positive demand shock shifts AD up and both Y and P are higher

•But the boom in the economy puts pressure on costs, shifting AS curve up

•At point C, Y is at natural rate but prices are higher

Inflation and unemployment

- This analysis clarifies a major economic issue
- Economic policy-makers always face a *dilemma*
- Loose policies may increase output in the short run but at the cost of *higher inflation*
- Tight policies may contain inflation in the short run but at the cost of output remaining *below natural rate* for some time
- In other words, there is a strong *trade-off* in the short run between an increase in output (always desirable) and an increase in inflation (always undesirable)
- This trade-off between output and inflation is called the *Phillips curve*, after the English economist who established it for the first time in 1950s for England

Deriving the Phillips curve

- Phillips curve relates actual inflation in the economy to expected inflation, to cyclical unemployment and to supply (cost) shocks

$$\pi = \pi^e - \beta\,(u - u^n) + \nu$$

Actual inflation = inflation expectations – β (deviation from full employment) + supply shocks

- Deviations from full employment is inversely related to deviations from natural rate of output (*Okun's law*)
- Our equation for the SRAS curve

$$P = P^e + (1/\alpha)\,(Y - \overline{Y})$$

is therefore consistent with the Phillips curve

SRAS and the Phillips curve

- It is worth emphasising the relation we have just established between the Phillips curve and the SRAS
- In the SRAS, *ceteris paribus*, levels of output higher than the natural rate of output correspond to higher price levels and vice versa
- Phillips curve states the same phenomenon but uses the level of unemployment instead of output
- In other words, our interpretation of SRAS which includes price expectations corresponds to the same *macroeconomic essentials* as the Phillips curve
- Both show the link between *nominal and real variables* that break the classical dichotomy

Three causes of inflation

- The Phillips curve equation show three seperate forces that influences the level of inflation
- The first term refers to expectations about inflation that prevail in the economy: *inflation inertia*
- The second term refers to business cycle in terms of unemployment: *demand inflation*
- The third term refers to cost aspects in the economy: *cost inflation*
- Inflation is a *very complex macroeconomic phenomenon* that needs to be well understood, especially for students in Turkey
- Now we shall look in detail to these three types of inflation

Adaptive expectations

- In both formulations, the determination of inflation expectations in the economy becomes a key factor
- A widely used assumption also supported by empirical evidence relates inflation expectations to actual inflation in the last period
- *Adaptive expectations* assume that firms expect last year's inflation to prevail this year

$$\pi^e = \pi_{-1}$$

- In this case, the Phillips curve becomes

$$\pi = \pi_{-1} - \beta (u - u^n) + \nu$$

- In other words, *last period's inflation* enters into the determination of this years inflation along with the cyclical unemployment and supply shocks

Inflation inertia

- Let us look at the meaning of adaptive expectations for inflation
- First assume that there is *no supply shock* ($v = 0$)
- Then assume that unemployment is at its *natural rate* ($u - u^n = 0$)
- The formula tells us that this years inflation will be equal to last year's inflation

$$\pi = \pi_{-1}$$

- *Inflation inertia* refers to this interesting event whereby past inflation determines current inflation
- For inflation to fall either inflation expectations must be reduced or unemployment must increase or a positive supply shock must happen

Demand pull inflation

- The second term in the Phillips curve equation summarises the demand side of inflation
- The term $\beta (u - u^n)$ is a measure of the deviation of unemployment from its natural rate
- If unemployment is *below* its natural rate, obviously the economy is booming and this exerts an upwards pressure on inflation
- If unemployment is *above* its natural rate, the economy is in a recession and this exerts a downward pressure on inflation
- *Demand-pull inflation* happens when low unemployment which is the same thing as high growth rate pulls inflation up through excess demand in markets

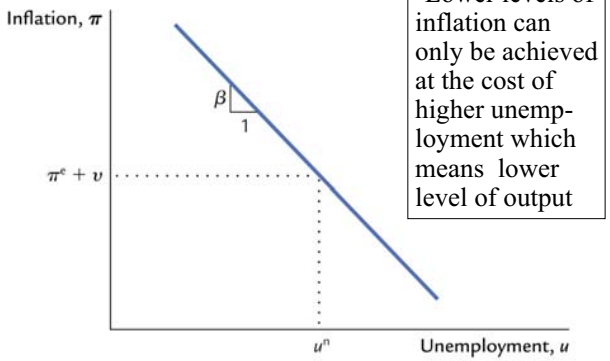
Cost push inflation

- The third term ν represents supply shocks which affect the costs of producers
- Attention: these are *cost shocks* unrelated to the business cycle or inflation expectations
- Fluctuations in oil price, movements in nominal exchange rates, changes in indirect taxes, etc. imply changes in the cost structure for the whole economy
- In Turkey, agricultural support prices set by the government has the same effect
- In such cases, with unchanged expectations and cyclical unemployment the SRAS will shift upwards and inflation will rise
- That's why it is called *cost-push inflation*

Short run Phillips curve

- The Phillips curve has very important consequences for economic policy makers
- In the *short run*, it may be possible to increase output and reduce unemployment even below natural rate by increasing aggregate demand through fiscal or monetary policy
- Economy therefore produces more but has to pay the price of higher inflation
- Inflation is the *opportunity cost* of lower unemployment and higher growth rate in the short run
- Phillips curve makes the short term *trade-off* between inflation π and unemployment u very visible and easy to understand and analyse

Trade-off between π and u

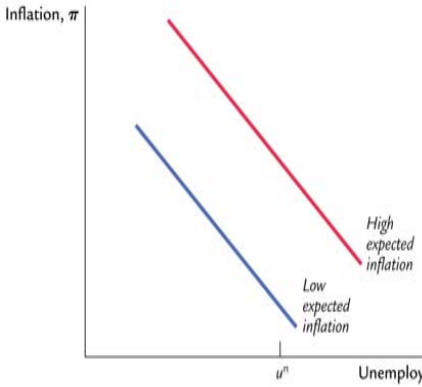


- Lower levels of inflation can only be achieved at the cost of higher unemployment which means lower level of output

Expectations and Phillips curve

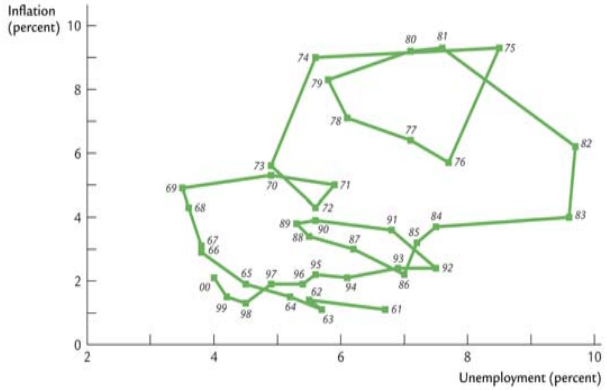
- A stable trade-off between inflation and unemployment exists only if governments *don't use* it to reduce unemployment at the cost of higher inflation
- Once markets understand what the policy makers are doing they start planning for higher inflation
- The change in price expectations corresponds to an *upward shift* of the Phillips curve
- Now the economy will have *higher levels* of inflation at every level of unemployment
- In the longer run, as economic players adapt their inflation expectations to the new situation the short run relation between inflation and unemployment breaks down

Shifts in Phillips curve



- When inflation expectations change, Phillips curve shifts
- Up for higher inflation expectations
- Down for lower inflation expectations

US: inflation and unemployment



Disinflation and sacrifice ratio

- Once high inflation sets in and becomes chronic, it is very painful both economically and socially to reduce it to normal levels
- The process of containing and reducing high inflation is called *disinflation*
- Disinflation requires a period of high unemployment
- *Sacrifice ratio* is the output lost by the economy during the process of disinflation
- *Okun's law* calculates the sacrifice ratio as 2.5 % more cyclical unemployment for 1 point fall in inflation for the US
- High inflation rates as experienced by Turkey require correspondingly higher sacrifice ratios

Sacrifice ratio in practice

- US inflation had reached 10 % by 1981
- After the disinflation efforts of the Fed under Chairman Volcker, it fell to less than 3 % in 1986
- But during this period unemployment reached record levels
- Total output lost was equal to *19 % of annual GDP* of the US economy
- Disinflation caused a total of 9.5 % more unemployment during this period
- There is *no free lunch* in life: every economy has to pay the price for high inflation eventually
- The question is: when?
- The price is usually cheaper today than tomorrow

US disinflation in 1980s

Unemployment During the Volcker Disinflation

Year	Unemployment Rate, u	Natural Rate, u^n	Cyclical Unemployment, $u - u^n$
1982	9.5%	6.0%	3.5%
1983	9.5	6.0	3.5
1984	7.4	6.0	1.4
1985	7.1	6.0	1.1
			Total 9.5%

Is painless disinflation possible?

- Phillips curve formula points to an alternative approach to disinflation
- Let us assume that people have *rational expectations*
- If they can be convinced that the government is serious about disinflation, they will revise down their inflation expectations accordingly
- As the Phillips curve shifts down, the sacrifice ratio is reduced because there is no longer the need for a long recession to change expectations
- The *credibility* of policy is vital for this to happen
- Credibility is the same thing as *confidence* by economic actors in policymakers: government for fiscal policy and the CB for monetary policy

Exchange rate based disinflation

- One way of reducing inflation at low sacrifice ratio is to control the nominal exchange rate
- Like in Turkey during 2000, exchange rate becomes a *nominal anchor* for prices
- "*Stand-by Arrangement*" with IMF aims to enhance the credibility of the program
- Phillips curve *shifts down* substantially, leading to faster growth with falling inflation but also to large current account deficits
- Disinflation does not require a sacrifice but involves important risks
- If confidence is eroded NFI shifts violently up and a *financial crisis* follows

Natural-rate hypotesis and hysteresis

- Calculations of the sacrifice ratio are based on the natural rate of unemployment
- *Natural rate hypotesis* assumes that fluctuations are short term events while the long term level of unemployment is determined by the *classical model*
- Some economists disagree with this view, claiming that recessions, financial crisis and depressions leave permanent scars on the economy
- Productive capital and human skills may be lost forever, animal sprits can be broken
- *Hysteresis* decribe the long-lasting influence of past history on the natural rate
- Hysteresis will *raise* the sacrifice ratio

Our tool box

- *Our toolbox* to analyse economic fluctuations now contains the following:
  - The Keynesian cross of income and spending
  - AD-AS curves linking output and prices
  - IS-LM curves linking output and interest rate
  - IS-LM curves linking output and exchange rates
  - Capital flows (CF) as a function of interest rate
  - Relation between nominal and real interest rates
  - Relation between nominal and real exchange rate
  - Inflation expectations and the Phillips curve
  - Risk premium depending on policy credibility
  - Natural rate of output (production function)

The full model

- It is therefore possible to assemble a full model of the economy in the short run
- The full model will have seven equations
  - Equation One – *IS Goods Market Equlibrium*

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

  - Equation Two – *LM Money Market Equlibrium*

$$M / P = L(r, Y)$$

  - Equation Three – *FX Market Equlibrium*

$$NX(rer) = CF(r - r^*)$$

  - Equation Four – *Real and Nominal Interest Rate*

$$i = r + \pi^e$$

The full model (cont.)

  - Equation Five – *Real and Nominal Exchange Rate*

$$rer = ner\ P / P^*$$

  - Equation Six – *Aggregate Supply*

$$Y = \overline{Y} + \alpha (P - P^e)$$

  - Equation Seven – *Natural Rate of Output*

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

- Many of the models we have been studying are *special cases* of this large model model
- E.g. *classical closed economy* corresponds to
  - $P^e = P$ (Perfect foresight for price level)
  - $L(i, Y) = (1/V)Y$ (Quantity Theory of Money)
  - $CF(r - r^*) = 0$ (no international capital flows)

End of Part Four

- We thus come to the end of Part Four dealing with the short term fluctuations in output, price level, employment, the interest rate and the exchange rate
- Part Four emphasised *theory and models* because we aimed at better understanding of the basic mechanisms behind the the business cycle
- Policy issues were raised mainly *to clarify* the different characteristics of the equilibrium point
- And the discussion was consciously kept simple
- Our next task is to relate these models to *real life macroeconomic problems* by taking a much closer look at economic policy issues
- In the end, all macroeconomics is about *policy*

Ch.6: Unemployment
Ch.14: Stabilisation Policy

Week 9

Unemployment

- In order to move rapidly to short term analysis, we had postponed the study of Ch.6 on unemployment in Part Two
- Before moving on to policy issues, we now define and understand in depth a word that is very often used in macroeconomic analysis: *unemployment*
- Unemployment is the single most important economic magnitude watched by economists as well as politicians and the man in the street in all industrial economies
- Unemployment is not a simple economic event at par with many other events: it is a *social and political* problem with far reaching consequences

Definitions

- We begin by defitions of key concepts related to population and employment
- *Adult population*: the number of people of working age (15-64 years) in a country
- *Labour force*: total number of adult people who either work (employed) or are searching work (unemployed)
- *Labour-force participation rate*: the percentage of the labour force in the adult population

Labour force / Adult population

- *Unemployment rate*: the percentage of the unemployed in the labour force

Unemployed / Labour force

International comparaisons

%	USA	Japan	EU-15	Poland	Turkey
15-64 years in Population	67	67	67	70	65
Participation Ratio	75	78	71	64	52
Unemployment Rate	5,5	4,7	8,3	19,0	10,3
Agriculture	2	5	4	18	34
Industry+Construction	20	29	27	29	23
Services	78	67	69	53	43
Payroll/Total	92	85	84	73	51
Female/Total	47	41	44	45	27

Some observations

- Countries with high population growth have *younger populations*, therefore the proportion of adult population is relatively lower
- Rich countries have higher *participation rates*, meaning that more people work despite a larger share of the population going to higher education (university, post-graduate work)
- Industrialised countries have a higher percentage of *females* in the labour force
- Developed countries have a larger share of employment in *industry*
- *Payroll employment* (wage-salary earners) is also very high in mature market economies

Structural unemployment

- Macroeconomic textbooks are written for *mature* (developed) market economies
- Where the capital stock is large enough for the economy to employ all those wishing to work at the ongoing wage rate
- In less developed economies the *stock of capital* is not sufficient to employ the labour force productively
- Adults who can't find jobs simply because there are not enough factories, offices, fields, etc. constitute *structural unemployment*
- In this case large unemployment persist even when the economy is growing at full speed

Disguised unemployment

- Another problem facing less developed economies is called "*disguised unemployment*" (gizli işsizlik)
- Many people, especially in agriculture and urban services seem to be working
- But they have very *low productivity* and therefore earn very little income
- This is due to lack of productive high-paying jobs in the economy, itself due to the capital constraint
- Turkey has large (and unmeasured) *disguised and structural unemployment*
- Structural and disguised unemployment make Turkish unemployment figures somewhat irrelevant and not a meaningful indicator of economic activity

Self-employed labour

- Wages and salary earners constitute around *90 %* of the labour force in in developed economies
- Employers, self-employed and unpaid family-labour comprises the remaining *10 %*
- In Turkey, of the 22.9 million employed in 2005, only 12.8 million or 55 *%* are wage and salary earners (including temporary agricultural workers)
- 10.1 million (45 *%*) are either self-employed (23 %), or family labour (16 %), or employers (5 %)
- This explains why unemployment is less of an issue in Turkey compared with developed economies
- Economic development will increase the political and social importance of unemployment over time

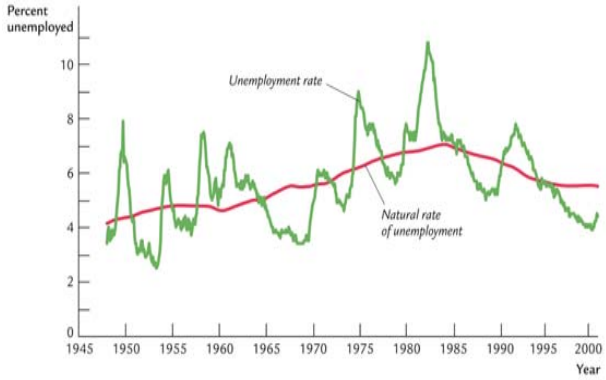
Civilian employment in Turkey

By category (2007Q2)	millions	%
Unpaid family labour	3,4	15%
Self-employed	5,2	22%
Wage or salary earner	11,7	50%
Daily wage earner	1,8	8%
Employers	1,3	5%
Total civilian employed	23,3	100%
Unemployed	2,3	8,9%
Labour Force	25,6	100%
By sector	**millions**	**%**
Agriculture	6,4	27,7%
Mining	0,1	0,6%
Manufacturing industry	4,2	18,1%
Energy, gas and water	0,1	0,5%
Construction	1,4	5,9%
Trade, restaurants, hotels	4,8	20,6%
Transport, communication	1,2	5,3%
Financial institutions	1,1	4,6%
Social and personal services	3,9	16,9%

Important warning

- The study of structural and disguised unemployment does not fall under macroeconomics but *growth theory and development economics*
- Macroeconomics deals with those people who were either previously employed but are no longer employed or enter the labour market for the first time and can't find jobs
- *Natural rate of unemployment* and *cyclical unemployment* refer to this category of unemployed
- *It is not* possible to reduce structural or disguised unemployment with macroeconomic policies
- But it is possible to reduce cyclical unemployment with macroeconomic policies

Unemployment in the US

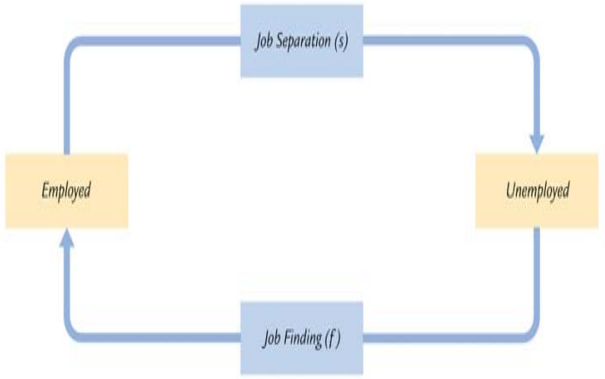


Mechanics of unemployment

- Employment (E) and unemployment (U) are not static *stock* concepts, but correspond to dynamic *flows*
- In every economy, every day some people leave their jobs, others take new jobs, some retire, some enter the labour market, etc
- *Job separation* (s) means leaving a job for a reason
- *Job finding* (f) means getting a job of a kind
- Unemployment changes depending on the relative size of the two numbers
- In other words, if the two numbers are equal unemployment will remain constant

$$f \times U = s \times E$$

Employment flows



Frictional unemployment

- People change jobs for a many reasons, including personal reasons like marriage, birth, better pay, health, etc
- Or because they lost their jobs
- Some companies go bankrupt while others grow fast and hire workers even in booms
- Some regions may have excess demand for workers while others have excess supply
- Finding a new job as a rule requires time
- This is called "*frictional unemployment*"
- In a modern large economy some leve of frictional unemployment is unavoidable
- It is probably not less than 3 %

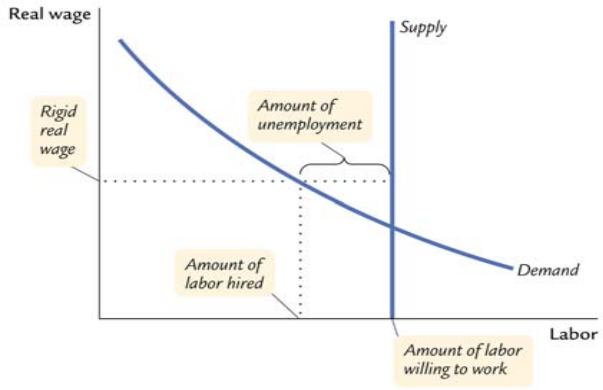
Unemployment insurance

- In most economies public authorities try to reduce friction in the labour market by setting employment agencies to match labour demand and supply
- "*İş ve İşçi Bulma Kurumu*" was set for this purpose
- In many economies the government also provides an income for a limited period to the unemployed called "*unemployment insurance*"
- Unemployment insurance is financed through the premiums paid by the employed and from the government budget
- It may however increase the natural rate of unemp-loyment as being jobless inflicts *less pain* on the unemployed

Real-wage rigidity

- *Real-wage rigidity* may be another cause of unemployment
- Real-wage rigidity is similar to *sticky wages*
- It requires a labour market that does not clear
- If market real wages are too high compared with the equilibrium (full employment) real wage, unemployment will be the result
- And firms will not be able to reduce real wages despite an excess supply of workers in the labour market
- This is also called "*wait unemployment*" because workers wait to get employed at the ongoing real wage rate instead of accepting a lower wage

Real wage rigidity



Unemployment and minimum wages

- Some economist argue that *minimum wage laws* result in higher unemployment because they prevent workers and firms to agree at a lower real wage
- Minimum wages constitue a *price floor* and typically imply a *surplus* of supply over demand if binding
- There has been much debate about this view by reference to the real world
- Empirical research has shown that in the US minimum wage legislation affect mainly teenage part-time employment
- Perverse results were also obtained where employment has increased after the introduction of minumum wages

Labour unions

- *Labour unions* have monopoly power in the labour market because they prevent non-union workers to bid down wages
- Unions and employers set real wages not at the market but through negociations called *collective bargaining* (toplu sözleşme)
- Unions obtain higher wages and improved job security for their members (*insiders*)
- Some argue that these benefits are obtained at the cost of higher unemployment for those who are not union members (*outsiders)*
- Union membership varies from country to country and is relatively low in Turkey in most sectors

Strength of the unions

Union Membership as a Percentage of Employment

Country	Percentage Union Workers	Country	Percentage Union Workers
Sweden	84	Germany	33
Denmark	75	Netherlands	28
Italy	47	Switzerland	28
United Kingdom	41	Japan	26
Australia	34	United States	16
Canada	33	France	11

Source: Clara Chang and Constance Sorrentino, "Union Membership Statistics in 12 Countries," *Monthly Labor Review* (December 1991): 46–53.

Efficiency wages

- *Efficiency wages* theory claims that it is in the interest of firms to pay higher than equilibrium level of real wages to their workers
- To increase their productivity by better nutrition for low wage countries
- To reduce worker turnover and save on training costs and initial low productivity
- To prevent *adverse selection* and encourage better qualified workers to apply for jobs
- To fight *moral hazard* and induce workers to put more effort into their performance
- Unemployment results from the self interested behaviour of firms

Patterns of unemployment

- Unemployment does not affect all the groups in an economy homogenously
- *Level of education* is important as undereducated sections of society lack the skills for activities where labour shortages exist
- *The young* who enter into the labour market for the first time have very hard time because they lack work experience
- Racial, ethnic or sexual *discrimination* has a strong impact
- Big differences may exist among regions
- The crisis in 2001 hit hardest the *young and educated* in large urban centers in Turkey

Labour underutilisation

Alternative Measures of Labor Underutilization

Definition		Percentage in March 2001
U-1	Persons unemployed 15 weeks or longer, as a percentage of the civilian labor force (includes only very long term unemployed)	1.2 %
U-2	Job losers and persons who have completed temporary jobs, as a percentage of the civilian labor force (excludes job leavers)	2.4
U-3	Total unemployed, as a percentage of the civilian labor force (official unemployment rate)	4.6
U-4	Total unemployed, plus discouraged workers, as a percentage of the civilian labor force plus discouraged workers	4.8
U-5	Total unemployed plus all marginally attached workers, as a percentage of the civilian labor force plus all marginally attached workers	5.3
U-6	Total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percentage of the civilian labor force plus all marginally attached workers	7.6

Note: Marginally attached workers are persons who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the recent past. *Discouraged workers*, a subset of the marginally attached, have given a job-market related reason for not currently looking for a job. *Persons employed part time for economic reasons* are those who want and are available for full-time work but have had to settle for a part-time schedule.
Source: U.S. Department of Labor.

Unemployment in the US

Unemployment Rate by Demographic Group: 2000

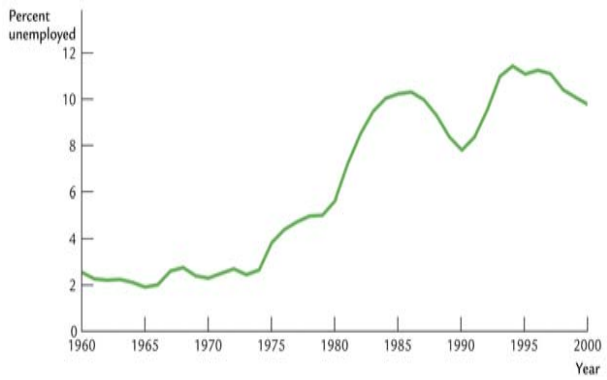
Age	White Male	White Female	Black Male	Black Female
16-19	12.3	10.4	26.4	23.0
20 and over	2.8	3.1	7.0	6.3

Source: U.S. Department of Labor.

Unemployment in the EU

- After several decades of full employment and labour importation through immigrants, many European economies experienced very high levels of unemployment in *1990s*
- Some blame it on *overgenerous* unemployment benefits which discourage workers to look for jobs
- Others blame it on labour laws which make hiring and firing of workers very difficult for firms in the EU (*labour market rigidities*)
- Others believe big sectoral shifts coupled with lack of geographical mobility are the main causes
- Unemployment levels in EU core countries are now lower but still very high compared with the past

Unemployment in the EU



PART FIVE MACROECONOMIC POLICY DEBATES

Stabilisation Policy

Chapter 14

Plan of Part Five

- The previous three parts have developed a large *tool-box of theories* to analyse the short run fluctuations in an economy
- It is now time to apply them to some of the debates over macroeconomic policy
- Ch.14 looks at different attitudes towards the role of monetary and fiscal policy in smoothing short run fluctuations (*stabilisation policy*)
- Ch.15 undertakes a detailed analysis of *public debt and the budget*
- Some of the policy issues of the *Turkish economy* will be covered now but many others will be given later

On the stability of the economy

- Behind many heated debates, we find fundamental differences of opinion on the stability of a market economy
- Usually linked directly to the political philosophy of the economists in question
- The left (liberal in the US) believes that market economies are *inherently unstable* and experience large fluctuations in output when left on their own
- The right (conservative in the US) claims that market economies are *naturally stable* and large fluctuations in the past are due to policy mistakes
- It is possible to find these two basic attitudes toward the market economy behind all policy debates

Issues in question

- The disagreements among economist can be analysed under two headings
- The first is the role that government in general and macroeconomic policy making in particular must play in the economy
- Should policy be *active or passive*?
- The second is the nature and the instruments of intervention by the government in the economy
- Should policy be conducted *by rule or by discretion*?
- As a rule, those economist who prefer active policy will also believe in the superiority of policy by discretion while those for passive policy will support policy by rule

Relevance for Turkey

- The arguments may seem far off from discussions about economic policy in Turkey
- Why? Because they are about economies with relatively low levels of inflation (single digit)
- Turkish inflation averaged 80 % per year in the 1990s, compared to EU average of less than 3 %
- *High inflation* implies a high level of unstability in the economy, therefore high output volatility and frequent financial crisis (in 1994 and 2001)
- Public opinion in Turkey was more preoccupied with privatisation, populism, large budget deficits, effective regulation, etc. instead of macroeconomic policy issues

The case for active policy

- Part Three taught us that external *demand or supply shocks* may cause recessions, inflation, unemployment and economic hardship
- Also that fiscal and monetary policy responses to these shocks may prevent the undesirable effects such as recession, unemployment, etc of these shock
- Many economists consider it wasteful not to use these policy instruments to stabilise the economy
- Other economists are critical of government's ability to increase stability in the economy by intervening actively
- We will now look at the arguments *against* active economic policy

Lags and economic policy

- Effects of a change in economic policy take time to work out in the economy
- The time difference is called "*lags*"
- *Inside lags* refer to the time lost between the shock and adequate policy response to it
- *Outside lags* refer to the time it takes economic policy to have the desired effects on the economy
- With fiscal policy the inside lag is long because the budget process is complicated in a democracy but the outside lag is short
- With monetary policy the inside lag is short because Central Bank can act quickly but the outside lag is long

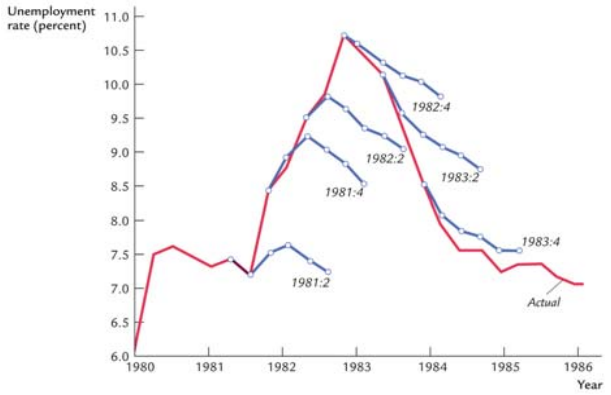
Automatic stabilisers

- On the fiscal policy side, most modern economies have now have built-in countercyclical policies
- Typically, a slowdown in economic activity and higher unemployment reduce tax revenues and increase unemployment insurance payments
- Therefore budget deficit goes up (loose fiscal policy) automatically as the economy enters a recession
- In turn during boom periods tax revenues are buoyant and unemployment insurance claims are low
- Therefore the budget moves into surplus (tight fiscal policy) to off-setting the boom in the economy
- Automatic stabilisers correspond to fiscal policy *without* an inside lag

Difficulties in forecasting

- Successful stabilisation policy requires predicting accurately future economic conditions
- When forecasts are wrong, fiscal or monetary policy based on those forecasts may aggravate fluctuations in the economy
- If a recession is forecast while the economic boom continues, loose monetary or fiscal policy could result in *accelerating inflation*
- If a revival of inflation is forecast while the economy is slowing down, tight fiscal or monetary policy could result in a *deeper recession*
- To find appropriate indicators for the economy and for accurate forecasts become vital for policymaking

Mistakes in forecasting



The Lucas critique

- Prominent US economist Robert Lucas founded the "*rational expectations*" school in macroeconomics
- Any change in policy by definition has an influence on the expectations of economic actors about the future behaviour of the economy
- The change in expectations resulting from the policy move may either *neutralise or amplify* the effects of the policy change on the economy
- If the impact of policy on expectations are not taken into account, policy will not be effective and policy recommendations will fail to give desired results
- The calculation of the sacrifice ratio during disinflation is a good exemple of "*Lucas critique*"

The historical record

- It is very difficult to refute economic theories by looking at the empirical data
- Many economists believe that the active role played by the government in macroeconomic policy in the last 50 years *reduced fluctuations*
- Others attribute the lower output volatility observed during this period to *automatic stabilisers* resulting from bigger government or improvements in central banking practises
- Some even claim that lower output volatility of the recent period is due not to better economic policies but to improved data collection: output is *as volatile as ever*

US: the stability of 1990s

- Most economist agree that the decade of 1990s stand out as a period of *remarkable stability* for the US
- Stability can be measured by comparing the averages and standard deviations of the relevant variables
- The variables are the growth rate, inflation and unemployment level
- *Average* inflation and unemployment fell in 1990s while growth stayed strong
- *Standard deviation* measures the volatility of the variables
- All three exibit the lowest standard deviation figures for 1990s, meaning that low inflation and unemployment was achieved with *less fluctuations*

US: the stability of 1990s

The U.S. Macroeconomic Experience, Decade by Decade

	1950s	1960s	1970s	1980s	1990s
Real GDP Growth					
Average	4.18	4.43	3.28	3.02	3.03
Standard deviation	3.89	2.13	2.80	2.68	1.56
Inflation					
Average	2.07	2.33	7.09	5.66	3.00
Standard deviation	2.44	1.48	2.72	3.53	1.12
Unemployment					
Average	4.51	4.78	6.22	7.27	5.76
Standard deviation	1.29	1.07	1.16	1.48	1.05

Note: Real GDP growth is the growth rate of inflation-adjusted gross domestic product from four quarters earlier. Inflation is the rate of change in the consumer price index over the previous 12 months. Unemployment is the monthly, seasonally adjusted percentage of the labor force without a job.
Source: Department of Commerce, Department of Labor, and author's calculations.

Discretion versus rules

- How monetary policy should be conducted by the CB has been the focus of a lively debate in macroeconomic theory for some time
- The choice is between *discretion or rules*
- *Discretion* implies a degree of freedom for policy makers, who implement policies as they see fit
- CB has a large room for manoevre and may set its own targets as well pick the tools of its preference
- *Rules* are announced in advance and are independent of prevailing conditions
- Targets and tools of CB are fixed by the rule
- Policy can be discretionary or rules-based and yet be either active or passive

Rules for monetary policy

- M.Friedman's proposal is *a passive policy* rule of steady growth of money supply at 3 % per annum
- Irrespective of the conditions, CB increases the money supply (e.g. M3) at this fixed rate
- An alternative would be to propose *an active policy rule* which relates the growth in the money supply to deviations from natural rate unemployment

Money growth = 3 % + (unemployment rate – 6 %)

- The first part term keeps the change in money supply constant irrespective of the business cycle
- The second term implies looser or tighter monetary policy according to the business cycle

Distrust of politics

- Arguments against discretion are often based on *fears of misuse* of such powers by policymakers
- Democratic government require political parties
- The main objective of political parties is to win the elections to come to or to keep power
- Therefore they will be inclined to use discretion for policies that will benefit them in elections even if these have negative effects in the long run
- Manipulation of the economy for electoral gain is called the *political business cycle*
- Rule based policies such as "balanced budget laws" or "nominal GDP growth rule" minimise the influence of politics on the economy

More on politics of stabilisation

- Both in the US and in other developed countries, the place of a political party in the political spectrum gives important clues about its position on macro-economic policy debates
- Democrats in the US and *the left* in Europe are sensitive to unemployment and more willing to increase taxes and government spending (thus budget deficits)
- Republicans in the US and *the right* in Europe are sensitive to inflation and more willing to reduce taxes and government spending (thus balanced budgets)
- Central bankers usually have *conservative instincts*

Politics and economy in the US

Real GDP Growth During Republican and Democratic Administrations

President	YEAR OF TERM First	Second	Third	Fourth
Democratic Administrations				
Truman	−0.6	8.9	7.6	3.7
Kennedy/Johnson	2.3	6.0	4.3	5.8
Johnson	6.4	6.6	2.5	4.8
Carter	4.6	5.5	3.2	−0.2
Clinton I	2.7	4.0	2.7	3.6
Clinton II	4.4	4.4	4.2	5.0
Average	3.3	5.9	4.1	3.8
Republican Administrations				
Eisenhower I	4.6	−0.7	7.1	2.0
Eisenhower II	2.0	−1.0	7.2	2.5
Nixon	3.0	0.2	3.3	5.4
Nixon/Ford	5.8	−0.6	−0.4	5.6
Reagan I	2.5	−2.0	4.3	7.3
Reagan II	3.8	3.4	3.4	4.2
Bush (elder)	3.5	1.8	−0.5	3.0
Average	3.6	0.2	3.5	4.3

Source: Department of Commerce

Time inconsistency in discretion

- The main advantage of discretion is the *flexibility* it gives to policymakers against new and unknown shocks and circumstances
- But discretionary policy has one structural weakness
- *Time inconsistency* explains this weakness
- It corresponds to the *renegation* of an announced policy after private decisions are based on it
- In other words, a policymaker has an incentive to *renege* once markets take seriously the policy announcement of the policymaker
- Time inconsistency means private agents must take into consideration the *risk of renegation*
- Which in turm reduces the *effectiveness* of policy

Other examples of time inconsistency

- Below we have three examples of time inconsistency
- To encourage investment the government announces *tax breaks*: once factories are built, government has an incentive to tax them to increase tax revenues
- To encourage good behaviour a parent announces *a punishment* for a certain behaviour of the child: after the child misbehaves, the parent is tempted to forgive because punishment is unpleasant for the parent as well as the child
- To encourage hard work, a teacher announces a *final exam*: seeing that students have studied hard for the exam he is tempted to cancel it thus saving on the additional effort of grading the papers

Theory of time inconsistency

- The theory of time consistency is based on the *utility* to the public authority of achieving some targets
- The utility is measured by the *loss function*
- The trade-off between unemployment u and inflation π for the Central Bank is summarised in the following loss function

$$L(u, \pi) = u + \gamma \pi^2$$

- γ in the equation reflects how much the CB *dislikes* inflation
- For low levels of γ the CB may increase its utility if it reneges its inflation target once markets base their expectations on that level of inflation
- Only *high levels* of γ prevent such a renegation

Credibility of an inflation fighter

- Inflation and overall CB behaviour constitute relavant examples of time consistency
- If the markets accept CB's *inflation target*, inflation expectations and thus the Phillips curve shits down
- Upon which the CB can increase growth rate further by *loose monetary policy* at the cost of little more inflation than that expected by markets
- *Credibility* of the CB is built by not being tempted from the short term gains from time inconsistency
- Exemple from Turkey: in December 1999 Central Bank announced a crawling-peg exchange rate until July 2001 but floated the TL in February 2001
- Time inconsistency destroys credibility

Importance of credibility

- Policymakers can use the advantages of discretion only if they have credibility earned through a long period of faithfully keeping promises
- Even one *policy reversal* will be remembered forever and the credibility will be lost for very long time
- If the CB announces a target of low inflation but then loosens monetary policy to fight against unemploy-ment, next time the CB commits itself to fight inflation the public will not believe it
- Therefore the sacrifice ratio will be much higher during a necessary disinflation
- Just think: who in Turkey would trust the CB if it came up with another exchange rate peg? Nobody

Monetarism

- Economists who advocate passive rule-based policies are usually called "*monetarists*"
- M.Friedman is considered the father of monetarism
- He had two passive rules: one fixing the growth of the money supply (let's say at 3 %), the other fixing the growth of nominal GDP (let's say at 4 %)
- A third recently popular policy is to fix inflation (let's say at 1 %) and adjust the money supply and interest rates to achieve that level of inflation (also called *inflation targeting)*
- Monetarism always require rules to be expessed in terms of *nominal variables*, not in real variables such as unemployment or real growth

Inflation targeting

- *Inflation targeting* became popular in 1990s because
  - Velocity of circulation can be volatile, making rules based on the supply of money impractical
  - Nominal GDP is a difficult measure which is published with a minimum lag of several months
- Inflation targeting gives *flexibility* to Central Banks about the instrument they use to achieve the targeted level of inflation (often set by the government)
- It increases *accountability* for monetary policy as deviations from the target are very visible
- New Zealand, Australia, Canada, Finland, Israel, Sweden, Spain and the UK use inflation targeting
- *In Turkey* inflation targeting began in 2005

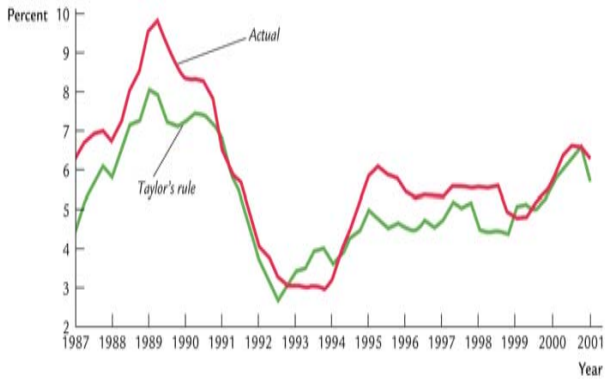
Taylor's rule for monetary policy

- Current US undersecretary fo Treasury *John Taylor* is famous for a monetary policy rule
- Fed Chairman *Alan Greenspan* is rumoured to use this rule in setting up US monetary policy
- *Taylor's rule* links Fed's short term interest rates (Nominal Federal Funds Rate - NFFR) to inflation and to output gap $[(Y - \bar{Y}) / \bar{Y}]$

$$NFFR = \text{Inflation} + 2\ \% + 0.5\,(\text{Inflation} - 2.0) - 0.5\,(\text{Output Gap})$$

- Actual interest rates set by Greenspan fit almost perfectly those predicted by the Taylor's rule

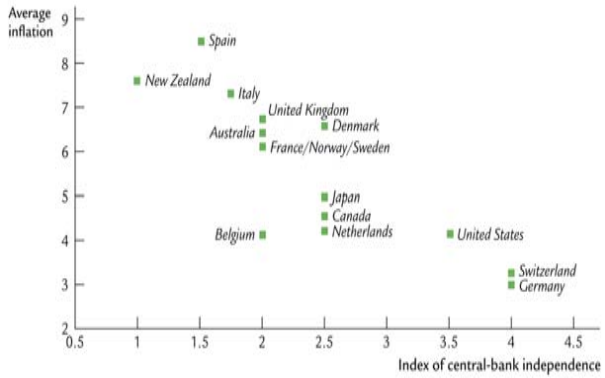
Taylor's rule and Fed policy



Central Bank independence

- Another issue which attacted attention lately is the *degree of independence* of the CB from politics
- CB is by defition a public institution and as such controlled by the government through appointments
- CB independence aims to prevent the kind of short term political interference from the government that leads to political business cycles
- It is secured by law and through long terms (4 to 8 years) for the appointed executives and managers
- Emprical research has shown a *strong positive relation* between indexes of CB independence and low inflation in the long run
- CB has recently gained its independence in Turkey

Inflation and CB independence



Rules for fiscal policy

- Many countries contemplated constraing the freedom of governments to run budget deficits
- "*Balanced Budget Laws*" are not practical because Parliaments who enact them can always change them
- In the short term fiscal deficits and surpluses can act as automatic stabilisers for the economy
- "*Maastricht criteria*" is an exemple of fiscal policy rule: EU members have upper limits to budget deficit (3 % of GDP) and public debt (60 % of GDP)
- This is an issue of serious debate today because EU faces risk of deflation which requires loose FP
- IMF stabilisation programs also follow strict fiscal policy rules

Policy in an uncertain world

- There is a limit to what economic theory can offer to improve economic policy
- Policy is always implemented in a *real world* much more complicated than theoretical models
- Political and sociological factors, mentalities and egos play important roles in real life
- Policymakers are not always competent
- Bureaucratic hierarchies have inertia, much turf fighting and often the wrong incentive systems
- Circumstances change much faster than economic theorists can keep up with them
- Still, despite all these shortcomings, the *advice of the economist* is always sought by the public

"Some defunct economist..."

- Keynes wrote the following paragraph in 1936, in his famous General Theory

  "... The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back..."
- Economic ideas, including erroneous ones, influence our daily lives more than we usually give credit

Government Debt and Budget Deficits

Chapter 15

Objective of the chapter

- The structure and health of public finances is a vital question for all economies in the world, poor or rich, developed or underdeveloped, small or big
- Because *fiscal policy* has very important macroeconomic effects and consequences
- Typically, macroeconomic theory shows that the government's ability *to spend more* when needed may help move an economy out of a recession
- Yet, both citizens and *financial markets* usually worry about budget deficits and public debt
- We will use this chapter to look in details into *Turkey*'s public finances: taxes, government spending, budget deficits and public debt

Origins of public debt

- Governments have always borrowed from the private sector in order to spend more than revenues
- Often to finance *expensive wars*
- Even in modern times, financing wars is a major cause of rapid increases in the size of public debt
- Public debt may also rise in peace times due to *large deficits* of the public sector
- Ottoman rulers at first used the Galata Bankers
- Later borrowed from financial markets abroad which led to "*Duyun-u Umumiye*" (debt administration)
- Remember the relation between *stocks and flows*
- The change in net public debt in any period is equal to the deficit of the public sector in that period

Measuring public debt

- Absolute figures are not very meaningful in international comparaisons because of differences in population and thus GNP levels
- The preferred method is to compare public debt with national income, i.e. as a *% of GNP*
- *Gross debt* is total outstanding debt of central government plus other public institutions
- *Net debt* is gross debt minus public debt held by public institutions (CB, public enterprises, etc.)
- The distinction between *foreign debt* and *domestic debt* is important if the Treasury has to borrow in the currencies of other countries
- Capital mobility may make this distinction obsolete

Public debt in the world

For 2001	Public Debt as % of GDP		Public Debt as % of GDP
Japan	119	Portugal*	55
Italy*	108	Ireland*	54
Belgium*	105	Spain*	53
Canada	101	Finland*	51
Greece*	100	Sweden*	49
Turkey	75	Germany*	46
Denmark	67	Austria*	40
United Kingdom	64	Netherlands*	27
United States	62	Australia	26
France*	58	Norway	24

(*) Euro member (Maastricht criteria: 60 %)

US: public debt since 1790

Why is it important?

- High debt/GNP ratio is *undesirable* from the perspective of public and policymakers
- It limits the *freedom* of government to stear the economy during the business cycle
- *Interest spending* eats a large part of government revenues, leaving less for public services
- Fears of default on debt increases the *risk premium* and thus the real interest rate, starting a vicious circle
- Some argue that borrowing by government reduces private investment (*crowding-out* effect)
- And hurts the *generational* distribution of income
- Countries which have a large part of public debt in *FX* and held by *foreigners* face additional constraints

Issues for developed economies

- We begin by looking at the problem of public debt for *developed economics*
- Very low (zero) population growth and progress in medical science resulted in longer *life expectancy* for most developed countries
- Rise in *elderly population* mean pensions and medical aid to them will have to financed by a smaller number of persons in the labour force
- This will put pressure on public finance of the developed countries who already have large public deficits
- High public debt today will aggravate the situation in many developed countries

Developed countries: getting older

table 15-2 page 411

The Elderly as a Percentage of the Working-Age Population

Country	1990	2030
Germany	24	54
Italy	24	52
Japan	19	49
Canada	19	44
United Kingdom	27	43
France	23	43
United States	21	36

Source: Long-Term Budgetary Pressures and Policy Options, Congressional Budget Office, May 1998, p. 4. This table shows the number of people age 65 and older expressed as a percentage of the number of people ages 20 to 64.

- The table shows how the number of elderly dependents for each working person will grow in the future
- This is not yet a major issue for Turkey thanks to high population growth

US: long-term fiscal projections

table 15-3 page 412

Fiscal Policy Projections: U.S. Federal Government (All Variables Expressed as a Percentage of GDP)

	YEAR					
	2000	2010	2020	2030	2040	2050
Government receipts	21	20	20	20	20	20
Government expenditure	21	20	22	25	30	43
Budget deficit	0	−1	1	5	10	23
Government debt	42	21	17	40	93	206

Source: Long-Term Budgetary Pressures and Policy Options, Congressional Budget Office, May 1998, p. 20. These projections show what will happen over time if no policy changes are made. They assume that discretionary spending, such as spending on defense, science, the environment, and education, will fall as a percentage of GDP from 6 percent in 1997 to 4 percent in 2008 (as current law requires) and will thereafter remain constant as a percentage of GDP. Note that the budget deficit is not exactly equal to expenditure minus receipts because of rounding.

Issues for developing countries

- Developing countries usually have *high* population growth rates and low shares of elderly in the population
- In turn, some developing countries had persistent and large *public deficits* leading to very high levels of public debt
- Aggravated by the fact that a significant portion of public debt is held in *FX and by foreigners*
- Turkey is one of them and is not alone
- Issues such as populism, high inflation, financial crisis, currency substitution, etc. that are relevant for Turkey and other developing countries with similar problems will be analysed later

Public finance and the budget

- *Government's budget* summarises public finances
- All revenues of government as well as all spending by the government is recorded in the budget
- The budget is approved and audited by the legislative branch (Parliament)
- The executive branch (government) cannot undertake any expenditures outside the budget
- The size of the budget *relative to GNP* is a good indicator of the size of the government
- Government revenues are mainly *taxes*
- Government spending covers many items
- *Budget deficit* implies net fresh borrowing by the government

Tax revenues in the World

Tax revenue (% of GDP)	1988	1997	Change (%)
Italy	35,4	41,6	17,5
France	37,0	38,9	5,1
Israel	36,8	35,7	-3,0
Sweden	35,8	35,2	-1,7
United Kingdom	32,0	33,4	4,4
Poland	35,1	33,1	-5,7
Germany	23,7	26,5	11,8
Greece	26,4	20,4	-22,7
Brazil	14,7	19,8	34,7
Turkey	11,0	19,1	73,6
United States	17,5	18,8	7,4
Egypt, Arab Rep.	18,6	16,6	-10,8
Mexico	13,1	13,0	-0,8
Argentina	8,5	12,4	45,9
India	10,5	9,1	-13,3

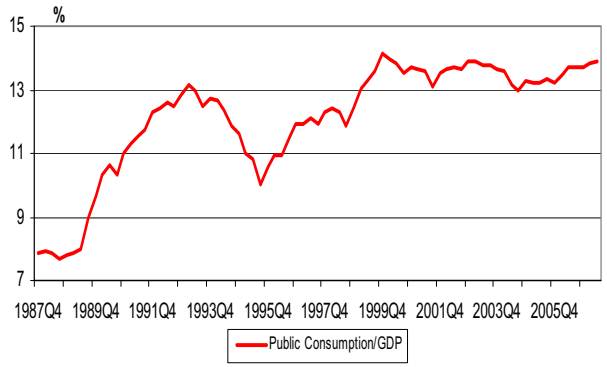
Source: World Bank

- Citizens pay more taxes in the EU
- US has a lower tax rate than European countries
- Turkey has relatively low but rapidly rising tax revenues compared with its development level
- The figure is much higher for Turkey in 2002

Turkey: financial overview

- Let us review Turkey's public finances
- *Consolidated budget* refers to central administration, plus local governments and public institutions with annex budgets (universities, funds, etc)
- In the past, Turkish governments also spent substantial sums outside the budget, such as unfunded duty losses of state banks (called "*off-budget*")
- One way of measuring the size of the government is to look at *public consumption* in GNP data
- Public consumption *includes* all purchases of goods and services by the government but *excludes* transfer payments such as interest, social security, subsidies to agriculture, etc.

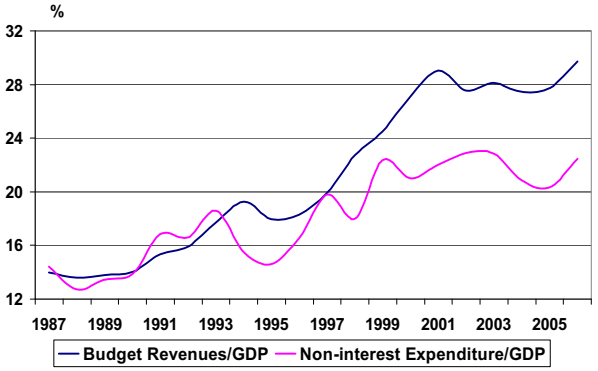
Turkey: public consumption in GNP



Budget items

- *Primary balance* of the budget is:
  Revenues – Non-Interest Spending
- *Total spending* is:
  Non-interest spending + interest payments
- *Overall balance* of the budget is
  Revenues – total spending
- The budget will have a surplus or deficit depending on the size of revenues and spending
- Turkey had deficits in the consolidated budget for very long time but not always primary deficits
- First we look at revenues and non-interest spending as a percentage of GNP
- Then we review the composition of both items

Turkey: budget trends



Turkey: Fiscal revenues

	2000	2004	2005	2006
Total Government Revenues	100	100	100	100
Taxes on Income	31,4	24,4	22,9	19,2
Income Tax	18,6	16,4	15,4	18
Corporate Tax	7,0	8,0	7,4	1,2
Taxes on Wealth	1,0	1,4	1,4	0,7
Taxes on Goods&Services	34,0	38,0	38,1	31,1
VAT	15,0	10,8	9,4	6,8
Petroleum Cons. Tax	9,8	14,5	14,6	11,4
Other	9,2	36,3	37,7	49,0
Tax on Foreign Trade	12,8	15,5	14,5	17,1
Other	20,7	20,7	23,2	31,9

Turkey: budget spending

As % of Total Spending	2000	2004	2005	2006
Expenditures	100,0	100,0	100,0	100,0
A.Personnel	21,4	20,5	22,0	21,2
B.Other Current	7,8	2,9	3,1	18,2
C.Investments	5,3	9,0	9,9	6,8
D.Interest Payments	43,8	40,1	31,6	25,8
D1.Foreign Borrowing	3,5	4,3	4,3	3,7
D2.Domestic Borrowing	40,2	35,5	27,2	21,7
E.Transfer to SEEs	1,9	1,0	0,7	0,4
F.Other Transfers	19,9	26,5	32,6	27,6
Primary Balance	15,4	18,6	24,9	-1,6
Budget Balance	-28,4	-21,5	-6,7	-2,6

Turkey: budget spending

%	2000	2004	2005	2006
Revenues	100	100	100	100
Non-interest Spending	78,5	76,3	73,3	76,2
Primary Balance	21,5	23,7	26,7	23,8
Personnel	29,8	26,1	23,6	21,8
Other current	10,9	3,6	3,4	18,6
Investments	7,4	11,5	10,6	7,0
Transfer to SEEs	2,6	1,3	0,8	0,1
Other Transfer	27,8	33,8	35,0	28,7
Non-interest Spending	100	100	100	100
Personnel	38,0	34,2	32,2	28,6
Other current	13,8	4,8	4,6	24,4
Investments	9,4	15,0	14,5	9,2
Transfer to SEEs	3,4	1,7	1,0	0,1
Other Transfer	35,4	44,3	47,7	37,7

Correcting for inflation

- *Inflation* causes major distortions in budgets
- Interest payments are in *nominal terms*
- Remember the nominal interest rate:

$$i = r + \pi$$

- Applying to public debt stock D

$$i\,D = r\,D + \pi\,D$$

- If π is not zero, real interest payments will be lower than nominal interest payments
- Higher the inflation, bigger the bigger distortion
- If r = 2 % and π = 8 % (therefore i = 10 %) only a fifth of interest payments correspond to real interest payments
- The rest simply *compansate* inflation

Operational budget balance

- The correction of interest expenditures can be understood as an application of "*inflation accounting*" to public finances
- In our tables, it is called "*monetary correction*"
- IMF undertakes this difficult calculation for Turkey
- The corrected figure for the budget balance is called "*operational balance*"
- It answers one simple question: what would be the budget balance if inflation was zero but everything else was the same
- A nominal budget deficit may turn into an operational budget surplus after the monetary correction to adjust for inflation is undertaken

On the tables

- Depending on the nominal interest rate and inflation, real interest payments are much smaller than nominal interest payment
- Operational deficit is also well below nominal deficit for the same reason
- One table gives *total public sector balances* as a % of GNP, covering both consolidated budget and off-budget spending ("duty losses") for 1993-2001
- Another important distinction is between gross debt, net debt, adjusted debt, etc. as % of GNP
- *Consolidated budget debt* constitutes almost 95 % gross public debt
- Treasury also publishes *real interest paid* on debt

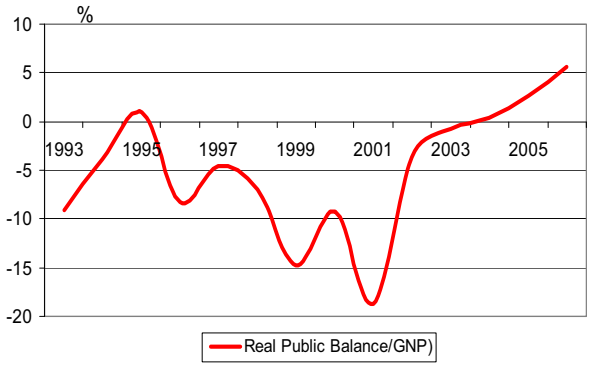
Adjusting GNP

- In high inflation environments, current price GNP needs adjustment for inflation to measure debt ratio
- GNP is a *flow magnitude* that is based on the average inflation for the year (GDP deflator)
- Whereas public debt is a *stock magnitude*, corresponding to the level of prices at the last day of the year, therefore higher than average price level
- One way of adjusting GNP is to take figures for the last half of the year plus the first half of the coming year (*centered GNP*)
- An alternative method is to convert GNP to FX by using the average nominal exchange rate of the year and compare it with year-end debt stock in FX

Turkey: public sector balance

As % of GNP	1993	1994	1995	1996	1997	1998	1999	2000	2001	average 1994-2001
Primary balance										
Consolidated Budget	-2,5	3,5	3,4	1,3	-0,2	4,1	1,5	4,2	4,6	2,2
Off-budget Spending	-3,1	-2,5	0,4	-2,6	-1,8	-2,6	-3,5	-1,9	1,3	-1,8
Total Public Sector	-5,6	1,0	3,9	-1,3	-2,1	1,6	-2,0	2,3	5,9	0,4
Interest Expenditures										
Net nominal interest payments	6,0	10,1	9,1	11,9	11,0	16,4	22,1	21,9	23,5	14,7
Monetary Correction	2,6	4,8	4,9	6,0	10,2	11,5	9,7	12,7	16,4	8,8
Reel interest payments	3,4	5,3	4,2	5,9	0,8	4,9	12,4	9,2	7,1	5,9
Total Public Sector										
Nominal Balance	-11,7	-9,1	-5,2	-13,1	-13,1	-14,8	-24,1	-19,6	-17,6	-14,3
Operational Balance	-9,1	-4,2	-0,3	-7,1	-2,9	-3,3	-14,4	-6,9	-1,2	-5,5
Public Debt										
Implicit Real Interest Rate	12,5	17,1	13,9	17,0	2,6	13,1	25,5	17,9	9,4	14,3
Net Public Debt (center-GNP)	27,1	31,0	30,2	34,8	31,2	37,5	48,6	51,3	75,7	-

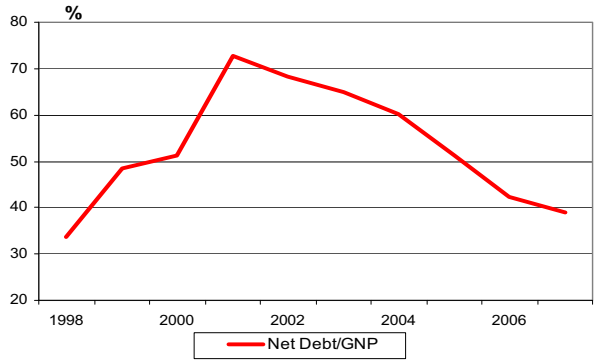
Real public balance 1993-2006



Net Public Debt

% of GNP	2000	2001	2006	2007Q2
Consolidated Budget	63	101	60	56
Domestic	41	69	44	41
Foreign	22	32	16	14
Other Public Sector	5	6	3	3
Domestic	2	2	3	2
Foreign	3	5	1	1
Gross Public Debt	68	107	63	58
CB Assets	9	13	8	7
Net Foreign Assets	6	-1	12	12
Other Assets (Net)	3	14	-4	-5
Public Sector Deposits	2	3	6	7
Consolidated Budget	1	1	4	4
Other Public Sector	1	2	2	2
Unemployment Insurance	0	1	4	4
Gross Public Assets	11	17	18	18
Net Public Debt	57	90	45	41
Net Foreign Debt	19	38	5	3
Net Domestic Debt	38	53	40	38
Net Public Debt (Ce	51	73	42	39

Trends in Net Public Debt



Public Debt: TL and FX

	2001 Year-end	2006 Year-end	Oct-07	Real Change 2007 (%)	Real Change 2007/2001
billion YTL					
Total TL debt	79	217	229	-0,5	37,9
Total FX debt	99	128	107	-20,9	-48,7
Foreign debt	56	93	79	-20,4	-33,0
Domestic FX debt	44	35	29	-22,2	-68,8
Total debt	178	345	336	-8,1	-10,4
billion US$					
Total TL debt	55	154	193	25,1	252,9
Total FX debt	69	91	91	-0,5	31,3
Foreign debt	39	66	67	0,1	71,4
Domestic FX debt	30	25	24	-2,2	-20,1
Total debt	124	245	284	15,6	129,5
$/TL (mill. TL)	1,44	1,41	1,19	-15,6	-17,6

Real Interest on Public Debt

Real interest rate (annualised) %	Apr-03	2003 Average	2004 Average	2005 Average	2006 Average	Jul-07
Total Domestic Debt	11,0	12,8	12,0	8,9	8,6	10,0
Public	9,4	8,8	9,0	6,9	7,4	10,3
TL	15,2	12,4	10,0	7,9	7,2	11,0
FX	-10,5	-4,7	3,3	-0,7	8,6	1,4
Market	12,6	16,4	14,1	9,9	9,1	9,9
TL	27,9	26,1	17,1	12,5	9,3	11,5
FX	-14,6	-5,6	3,0	-1,1	7,9	-0,6
Foreign Debt*	-11,0	-4,1	4,2	0,0	8,5	0,6
Total Debt*	3,3	7,2	8,6	5,4	8,6	6,8

Turkey: an evaluation

- Turkey had large *off-budget spending* by successive governments in 1990s
- Real (operational) deficits of the public sector are relatively small compared with the nominal deficits but vary substantially from year to year
- Public debt was relatively low until 1998 but exploded after that date
- 1999 is the *worst year* for operational deficit with a deficit of 15 % of GNP
- 1993 is the second bad year: 9.1 % of GNP
- Don't forget: the economy went through serious crisis both in 1994 and 2001
- Fiscal improvement since 2001 is very visible

Capital assets and the budget

- Companies publish two different sets of accounts
- *Profit-loss statement* corresponds to the budget of the government: it covers flows
- *Balance sheet*, where the assets and liabilities of the company are registered, takes a picture of stocks
- Therefore the budget deficit should be measured as the change in debt *minus* change in assets
- A deficit may correspond to an increase in assets, as such not so harmful
- A surplus may result from depleting assets, or the opposite of what it is believed
- Some governments began publishing public balance sheets to improve *fiscal transparency*

Unaccounted liabilities

- Yet some *future liabilities* of the government may not be included in public debt
- The main issue here evolves around public pension (retirement) programs (SSK, Emekli Sandığı)
- The commitment to pay pensions in the future becomes a liability if adequate funds are not set aside today to pay these pensions
- Unfortunately, most public pension plans are based on "*pay as you go along*" systems of paying current pensions with current revenues
- These *unfunded pension liabilities* is calculated to be larger than public debt itself for many countries
- Off-budget "*duty losses*" were unaccounted liabilities for the Turkish government

Business cycle

- Budget balance also depends on the business cycle
- "*Automatic stabilisers*" like income tax and unemployment insurance imply larger deficits during recessions and smaller deficits or even surpluses during booms
- One way of dealing with this problem is to calculate a "*cyclically adjusted budget balance*"
- We can also call it "*structural budget balance*"
- A balanced budget in the structural sense may run deficits during recessions and a budget which seems balanced during a boom may hide structural deficits
- Balancing the budget over the life of the business cycle seems like a reasonable proposition

Generational accounting

- Can we talk about the distribution of income and welfare among *different generations*?
- Does a large public debt transfer burden from current to future generations?
- The basic idea is to look evaluate fiscal policy over the life time of the people
- Many factors influence the results
- Where did the spending go? If it went to schools and investment, then clearly the generation which shall pay it back has also benefited from it
- One easy way is to compare the forced savings of working life paid into public pension plan with retirements benefits derived from it

Traditional view of debt

- Most economists view debt as the *by-product* of fiscal policy
- If asked by policymakers to comment on fiscal policy, either lower taxes or more spending, they will use the analysis that we learned in the previous chapters
- Loose fiscal policy will stimulate consumer spending, leading to higher output and lower unemployment in the short run but will only affect prices in the long run
- Not all economists agree with this view
- Those who disagree refer to comments made by English economist *David Ricardo* in 1817

Ricardian equivalence

- The traditional view assumes that when government runs a deficit consumers look only at their *individual finances* and neglect the wider picture
- *Ricardian analysis* assumes that consumers are also aware of the long term effects of the deficit
- As governments cannot run deficits forever, sooner or later they have to raise taxes or lower spending in order to reduce public debt
- And the consumer will take into consideration the effect of this future fiscal burden
- So that if government spends more today, consumers will spend less and the net effect of loose policy will be negligeable

Is it relevant?

- It is at times very difficult to prove or refute economic theories by empirical research
- Often tax cuts and/or additional public expenditures stimulate consumer spending and deficits give the results foreseen by the traditional view
- But, at other occasions, consumers refuse to spend more as if they understand Ricardian equivalence perfectly well
- There are examples from US in contradiction with the Ricardian equivalence hypotesis
- Yet in *Japan* efforts of the government to stimulate consumer spending by loose fiscal policy have not been very successful during the last decade

Public debt and monetary policy

- Many economists believe that large public debts reduce the *scope and effectiveness* of monetary policy instruments
- Tight monetary policy to curb inflation increases real interest rates, therefore the burden of the Treasury and may cause an explosion of debt
- This is what happened in Turkey in 2000
- Governments with large debts may be tempted to *monetise* debt, in other words use inflation to reduce the real value of public debt
- Attention: for this to happen the *average maturity* of public debt must be long (3-6 months in Turkey; up to over 10 years in stable economies)

Public debt and politics

- Those economists who support passive policy are usually very sceptical of budget deficits and high public debt that these entail
- They see important risks, not only economically but also politically, in the ability of governments to run large budget deficits
- Some even consider it *dangerous for democracy*
- One remedy that has often been proposed is to limit budget deficits my law or by constitution
- *Constitutional economics* demand a "*balanced budget*" requirement to be included in the constitution
- It may not be all that practical

Foreign debt

- In economies with low inflation and developed financial markets, the government always borrows in its *own currency*
- Even if held by foreigners, this is not considered as "foreign debt"
- Countries with unstable macroeconomic indicators (such as high and volatile inflation) must borrow *in FX from foreigners* because they refuse to accept the risk of local currency
- The existence of FX denominated and foreign-held public debt constitutes an *additional burden* on economic policy by putting pressure on the exchange rate and through fear of default

PART SIX: MORE ON THE MICROECONOMICS BEHIND MACROECONOMICS

Ch.16 – Consumption

Ch. 17 – Investment

Plan of Part Six

- Macroeconomic aggregates are constituted by the behaviour of individual households and firms
- Therefore we must understand the micro foundations of macro aggregates
- Ch. 16 looks at the theories of *consumer behaviour*, from the simple consumption function to the effect of wealth and permanent income
- Ch. 17 examines the determinants of three types of *investment spending*: business fixed investment, residential investment and inventory investment
- Ch. 18 deals with the supply and demand for *money*
- Ch.19 of Part Five and the Epilogue will be studied later in the last week of the course

Plan of Ch.16

- Some parts of Ch.16 are *not included* in our course syllabus
- "*16-2 Irving Fisher and Intertemporal Choice*" uses indifference curves and budget constraints
- You will become familiar with these analytical tools later in EC202 Microeconomics (second semester)
- Two final parts of Ch. 16, "*16-5 Robert Hall and the Random-Walk Hypothesis*" and "*16-6 David Laibson and the Pull of Instant Gratification*" are new theoretical developments
- They are interesting but not so relevant for the purpose of this course
- Therefore they will also be excluded

Consumption

- The decision of the households to use part of their income for consumption and keep the rest as saving has important macroeconomic implications
- In the long run savings of households are required for economic growth and development
- But in the short run a fall in consumption also reduces aggregate demand and therefore output
- Until now we used a simple relation between consumption and disposable income summarised in the *consumption function* C

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

- Now we look at the theories of three prominent economists: *Keynes, Modigliani and Friedman*

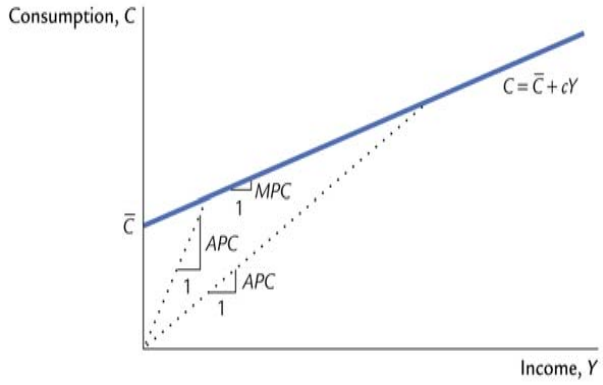
Keynes's conjectures

- *Conjecture*: a conclusion or supposition derived from incomplete evidence
- Keynes did not have computers and sophisticated statistical techniques to generate reliable data
- He had to use introspection and casual observation
- *First conjecture*: marginal propensity to consume lays between one and zero: people neither consume nor save all their income
- *Second conjecture*: average propensity to consume falls as income rises: higher income allows higher level of savings despite more consumption
- *Third conjecture*: interest rate is not important for decisions to consume: it only affects portfolio choice

Keynesian consumption function

- The simple linear consumption function relating disposable income Y to consumption C
  $C = \overline{C} + cY$ where $\overline{C} > 0$ and $0 < c < 1$
- $\overline{C}$ corresponds to minimum consumption required even if income is zero for people to live
- This function exhibits the three properties posited by Keynes
- Marginal propensity to consume c is between zero and one
- The interest rate is not included in the equation
- Average propensity to consume obtained from
  $APC = C / Y = (\overline{C} / Y) + c$
  falls as Y rises

Keynesian consumption function



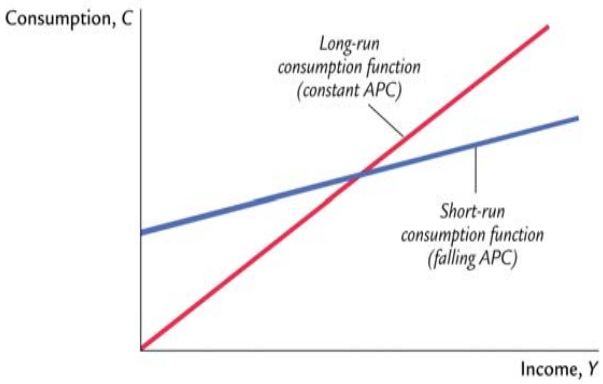
Early empirical successes

- Early empirical studies in the US and UK seemed to confirm Keynes's conjectures
- Households with higher incomes consumed a lower percentage of their income compared with households with lower incomes
- During recessions when income fell, the share of consumption in GNP increased
- During booms when income increased, the share of consumption in GNP fell
- In other words the was a very strong correlation between income and consumption
- Effects of the interest rate on consumption spending and savings could be neglected in the analysis

Consumption puzzle

- However, empirical studies on longer periods came up with surprising results
- Nobel-prize winner economist *Simon Kuznets* found a different kind of relation between consumption spending and the level of income
- Demonstating that over long periods of time the share of consumption in income remained very stable despite substantial increases in per capita and total income
- *The consumption puzzle* is solved by admitting there is not one but two consumption functions
- Keynesian function corresponds to the short run, in the long run consumption behaves differently

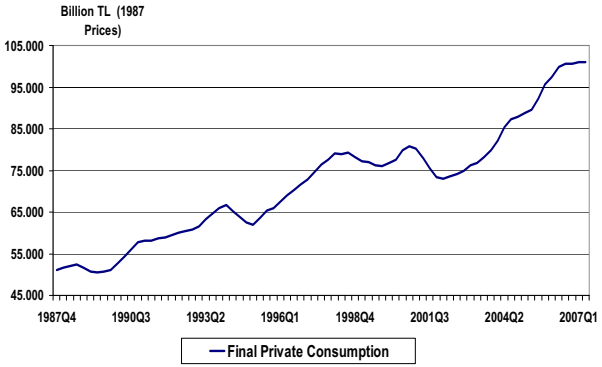
Consumption puzzle solved



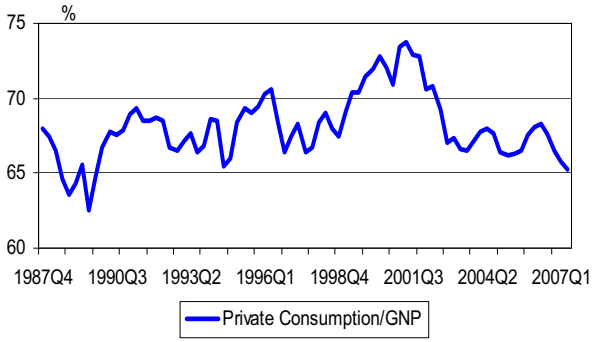
Private consumption in Turkey

- Final private consumption spending (özel nihai tüketim harcamaları) is the largest spending item in Turkey's GNP
- It constitutes about two thirds of all spending
- Using the current GNP series, we see an increasing trend in real consumption from 1987 to 2005
- Its share in GNP has remained constant untill 2001 and fell substantially since then
- But there are large fluctuations both in actual real consumption and in the share of consumption in GNP depending on the business cycle
- Turkish data confirm the distinction between short run and long run behaviour of consumption

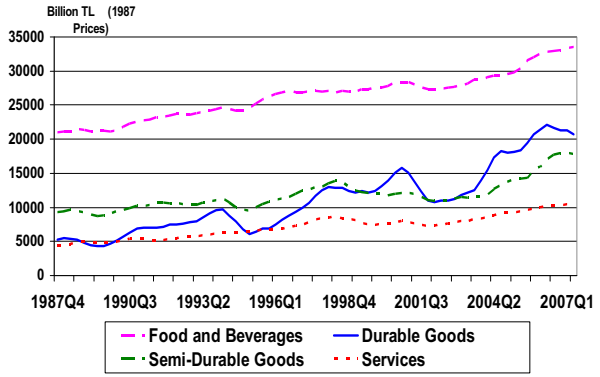
Turkey: final private consumption



Turkey: share of private consumption in GNP



Turkey: consumption disaggregated



Modigliani: life-cycle hypotesis

- An explanation to the puzzle was supplied by another economist, *Franco Modigliani*, who received a Nobel-prize for his discovery
- His insight is simple: people move consumption from those periods income is high to those periods when income is low
- Obviously, the most general case will be of people who save while they work in order to be able to continue spending during their retirement
- The concept of "*life-cycle*" reflects this attitude of the citizens in a modern economy
- The model works by including wealth along with income as a determinant of consumption

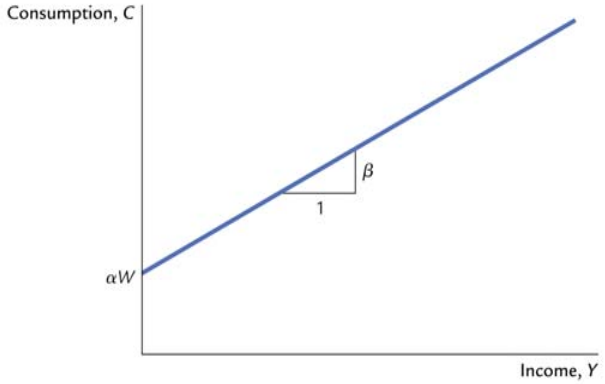
Life-cycle consumption function

- Consider a consumer who expects to live T years, has a wealth of W and expects to earn income of Y p.a. until he-she retires after R years
- Assuming zero interest rate, the consumer must divide lifetime resources to T years, which gives us the consumption function below:

$$C = (W + R\,Y) / T$$
$$C = (1 / T)\,W + (R / T)\,Y$$
$$C = \alpha\,W + \beta\,Y$$

- This new function makes current consumption depend on both income and wealth
- α and β are the marginal propensities to consume out of wealth and income respectively

Life cycle consumption function



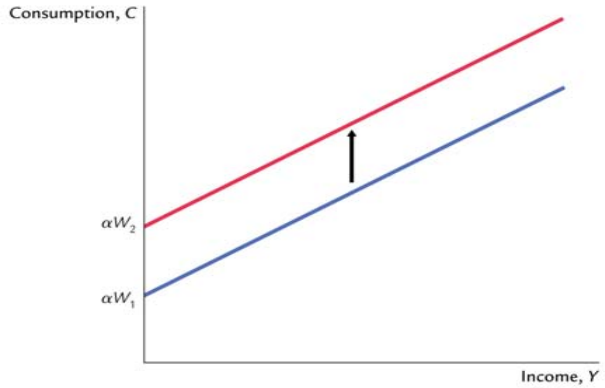
Implications of the model

- For any given level of wealth W, the model yields a consumption-income relationship similar to our earlier models
- The intercept of the function with the vertical axis is not fixed by $\overline{C}$ as in Keynes but depends on the level of wealth
- What about the consumption puzzle?
- The model solves it because average propensity to consume now becomes

$$C / Y = \alpha\,(W / Y) + \beta$$

- Wealth does not vary with income in the short run but goes parallel to it in the long run, causing *shifts* in the consumption function

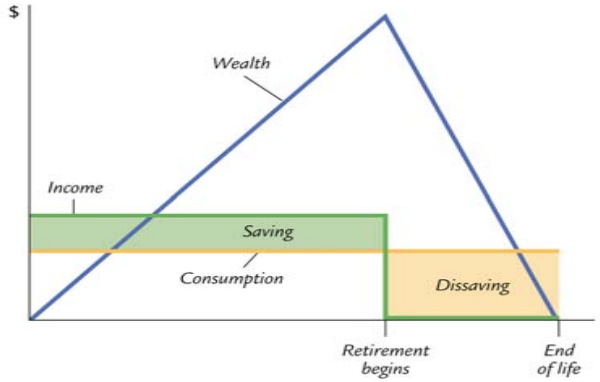
Shifts in the consumption function



Age and consumption

- Modigliani's insight is to understand that people have have two different phases in their adult lives
- While they can be productively employed, they enjoy high incomes of which they save a part in order to protect their standard of living when they stop being productive in older years
- Thus in the first phase they accumulate wealth
- Increases in their wealth correspond to shifts in the short run consumption function because the constant C goes up accordingly
- Then they dissave during retirement
- The model solves the consumption puzzle related to the Keynesian consumption function

Life-cycle consumption



Friedman: permanent income hypotesis

- Another Nobel-prize winner economist *Milton Friedman* proposed the *permanent income* hypotesis as a solution to the consumption puzzle
- The insight is again simple: people do not spend any new income unless they are convinced that it is not a chance or transitory event
- Behind this we find the realistic conjecture that a person's income does not usually follow a regular pattern over a lifetime
- There are very often random and temporary changes in income
- The model is based on distinguishing lasting and temporary changes in the level of income

Permanent income: model

- Friedman suggested to view current income Y as the sum of two component, permanent income Y^P and transitory income Y^T

$$Y = Y^P + Y^T$$

- Permanent income is average income over a longer period, say a few years
- Transitory income is the random or unexpected deviations from the average (permanent) income
- In case of sudden falls or jumps in income, people do not alter their consumption spending until they are sure that the change is permanent
- Friedman's consumption function becomes

$$C = \alpha\,Y^P$$

Permanent income: implications

- Friedman's hypotesis solves the consumption puzzle through the concept of *permanent income*
- Average propensity to consume becomes

$$APC = C / Y = \alpha Y^P / Y$$

- When a boom or a recession results in actual income above or below the permanent level, only a small portion of the change in income is reflected into consumption spending
- It takes time to adjust consumption to income
- But, as the permanent income rises in the long run, so does consumption spending accordingly
- Therefore APC falls when income rises in short run but stays constant in the long run

Consumption: wrap-up

- Keynes's simple consumption function related the level of consumption to the current income
- It was a good assumption to start with but not sufficient for more sophisticated analysis
- Current work suggest *wealth, expected future income and the interest rate* also need to be added as factors that influence the level of consumption along with current income
- One thing is certain: as long as consumers continue to spend negative shocks to aggregate demand result in mild and short lived recessions
- In turn, if consumers refuse to spend, economies face deep and long recessions

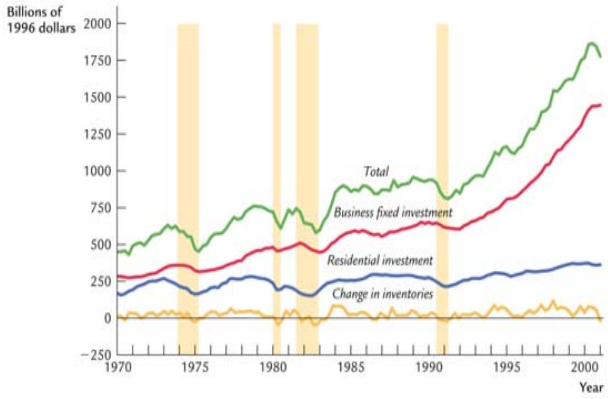
Investment

- The share of investment spending in GNP is much smaller than that of consumption
- Investment spending varies among nations but its average is usually between 15 % to 35 % of GNP
- Investment spending is much more volatile than consumption spending
- At times, especially in the early days of a recession the fall in investment spending may even be larger than the total fall in income
- Now we take a close look at investment spending
- In order to reach a better understanding of the investment function which plays such a critical role in macroeconomic theory

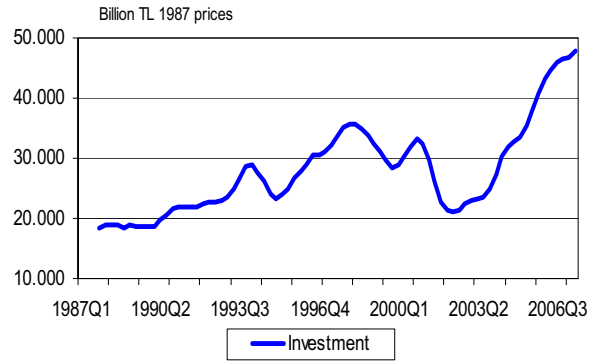
Types of investment spending

- National income accounting distinguishes three basic categories of investment spending
- *Business fixed investment* includes all equipment and structures purchased by firms for use in the production of goods and services
- *Residential investment* includes the new housing that consumers or firms buy buy to live in or to rent
- *Inventory investment* includes those goods that businesses keep as stocks, such as materials and supplies, work in progress and finished goods
- In Turkey, GNP date distinguish between *public and private investment,* plus between *equipment-machinery* and *buildings-construction*

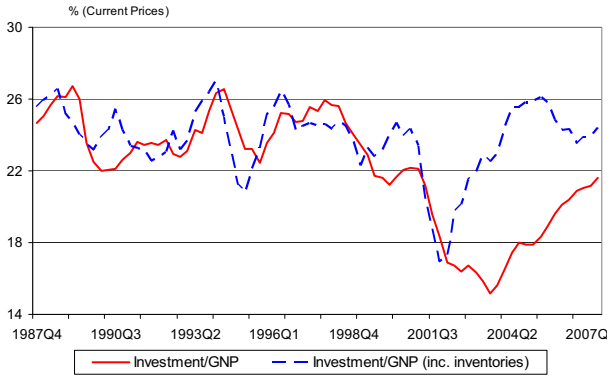
US: Investment data



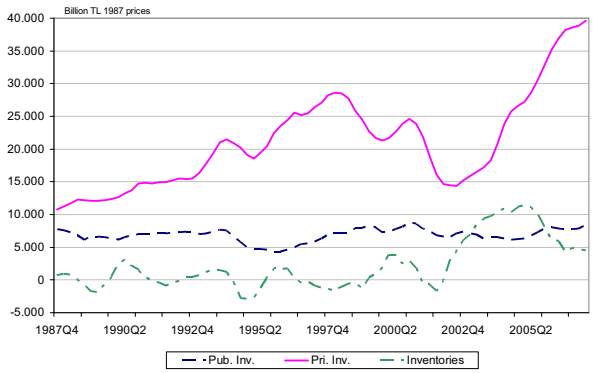
Turkey: total investment spending



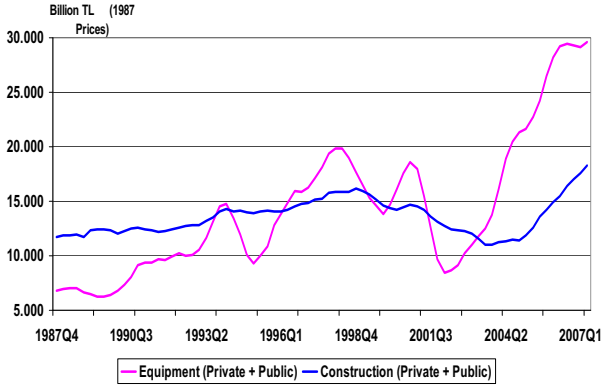
Turkey: investment spending in GNP



Turkey: public-private investment



Turkey: components of investment



Business fixed investment

- It is the largest portion of investment spending
- Anything that is bought for firms for use in future production is included in this category
- It has two important sub-categories:
- *Machines and equipment* include everything inside the factories, plants, shops, offices, etc.
- *Construction* includes all the structures where machines and equipment are housed
- Exemple: spending for a dam is under the item "construction", spending for the turbines, transformers, etc. is under the item "equipment"
- In Turkey both are given seperately for public and private sectors

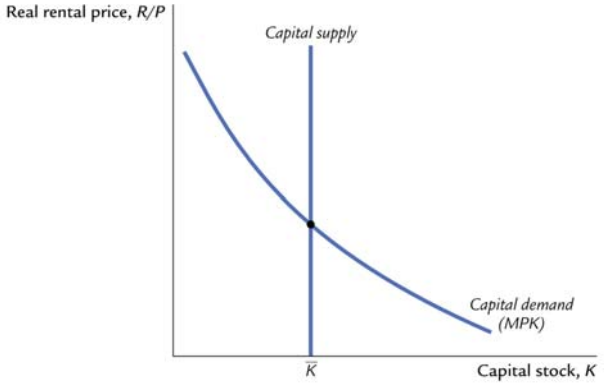
Neoclassical model of investment

- The standart explanation of business investment is called "*neoclassical*"
- The model proceeds by comparing the benefits and costs to firms of owning capital goods
- To establish benefits, it uses the production function to derive the *marginal product of capital*
- Interest rate is taken as the cost of capital
- Level of investment is therefore determined by the marginal product of capital and the interest rate
- It distinguishes between owning capital (rental firm) and using it to produce something (production firm)
- In real life, most firms assume both roles at the same time

Rental price of capital

- The demand for equipment come from firms set with the intention to produce a good or service
- As long as the rental price of equipment is lower than its marginal product, firms make profits by renting equipment for production
- The marginal product curve of capital equipment therefore becomes the demand curve
- We can assume that the supply of equipment is fixed in the short run (vertical supply curve)
- Rental price of capital will be determined at the intersection of demand and supply curves
- The *Cobb-Douglas production function* will facilitate our understanding of this process

Rental price of capital



Cobb-Douglas production function

- Cobb-Douglas is a computable production function with constant returns to scale exhibiting all the characteristics of neoclassical production function

$$Y = A K^{\alpha} L^{1-\alpha}$$

- Marginal product of capital becomes

$$MPK = \alpha A (L / K)^{1-\alpha}$$

- MPK is equal to the rental price

$$R / P = \alpha A (L / K)^{1-\alpha}$$

- The lower the capital stock, higher is its rental price
- The greater the labour employed, higher is the rental price of capital
- The better the technology, higher is the rental price of capital

Cost of capital

- A rental firm must pay interest on capital equipment it buys with the intention to rent to production firms
- If P_K is the purchase price of the equipment and i the nominal interest rate, $i P_K$ is the interest cost of buying equipment with the intention to rent
- Potential changes in the prices of equipment must be covered by the rental price
- $-\Delta P_K$ is the loss or gain on price changes (negative because it is a cost item)
- Wear and tear of equipment, called depreciation will be a fixed fraction of value: δP_K
- Total cost of capital now becomes

$$\text{Cost of capital} = i P_K - \Delta P_K + \delta P_K$$

Determinants of investment

- The real cost of capital is obtained by dividing the equation by the price level P and substituting the real interest rate for the nominal interest rate

$$\text{Real cost of capital} = (P_K / P) (r + \delta)$$

- The difference between the rental price and the real cost of capital is the profit of the rental firm

$$\text{Profit rate} = MPK - (P_K / P) (r + \delta)$$

- The rental firm will continue buying equipment (investing) until the marginal product of capital is equal to its real cost
- Gross investment spending becomes

$$\Delta K = I_n [MPK - (P_K / P) (r + \delta)]$$

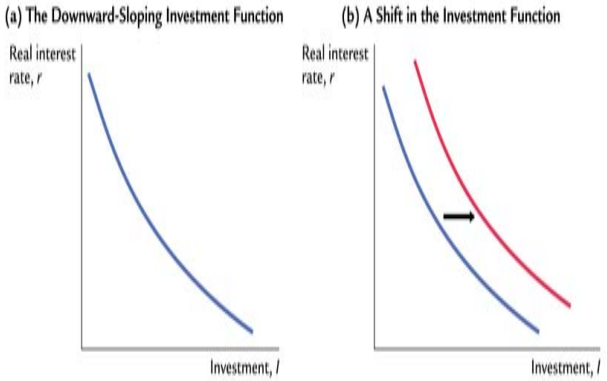
The investment function

- From investment spending we can deduce the investment function

$$I = I_n [MPK - (P_K / P) (r + \delta)] + \delta K$$

- The first part is *net investment* while the second part is replacement investment corresponding to the wear and tear (*depreciation*) in capital equipment
- Changes in the real interest rate will cause changes in investment spending
- Higher interest rates will reduce investment while lower interest rates will increase it
- This gives us a downward sloping investment curve
- The curve will shift with changes in technology and real wages

The investment function



Taxes and investment

- Until now we neglected taxes on capital income
- Obviously, tax laws will influence investment
- Corporate tax (*kurumlar vergisi*) is levied on the profits of firms, therefore on rental income
- A fall in corporate tax will increase the net profit from an investment and therefore acts as an incentive to invest
- High inflation without inflation accounting cause overstatement of profits for firms and higher taxes constitute a disincentive for investment
- Many countries permit investment credits against taxes (*vergi muafiyeti*) to firms in order to encourage investment

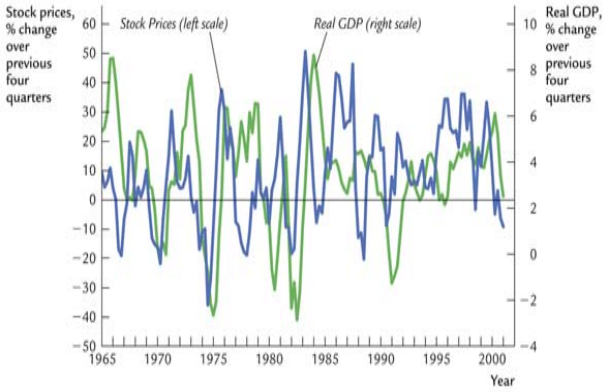
Stock market and "Tobin's q"

- An alternative interpretation was offered by *James Tobin*, a Nobel prize winner
- His hypotesis links the fluctuations in the stock market with the fluctuations in investment
- Firms invest more when stock prices are high, less when they are low, depending on whether the formula below is less or bigger than one

$$q = \frac{\text{Market value of installed capital}}{\text{Replacement cost of installed capital}}$$

- High market value is both a signal and incentive for firms to undertake capital spending
- It also means that firms do not face financing constraints for investment spending

Stock market as an indicator



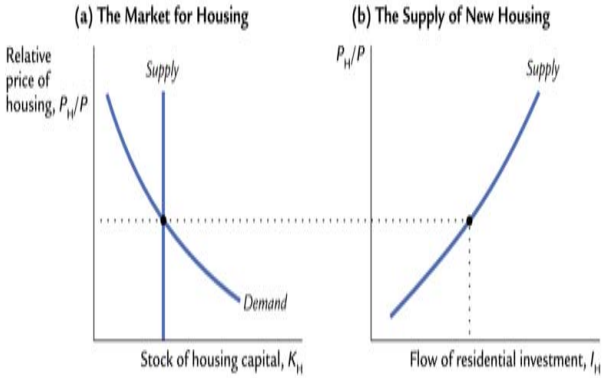
Banking crisis and credit crunch

- Crisis in the banking sector have always and everywhere implied serious downturns in economic activity and investment spending
- Great Depression of 1930s and the current long recession in Japan are good examples
- When the balance sheets of banks are unhealthy they stop lending to firms, which in turn are forced to cut down investment spending
- *Credit crunch* refers to the lack of availability of credit financing for firms
- Turkey experienced a fall in real bank credits to the private sector after 2001
- Fears of a similar problem recently surfaced in US

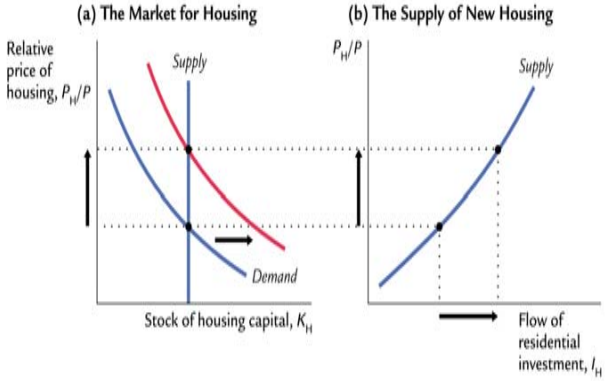
Residential investment

- Investment in new houses is an important item of spending in every country
- In Turkey, private sector investment in housing fluctuated between 7 and 9 % of GNP until 1999
- Since 1999, GNP date shows residential and non-residential construction as a single item
- Residential investment poses a a *stock and flow* issue due to lags of the construction business
- At any moment, house prices are determined by the demand for housing and the stock of houses
- But in the long run the level of house prices will determine the flow of housing supply
- Which will constitute future stocks of houses

Stock and flow in housing



An increase in housing demand



Housing demand and interest rate

- In countries with developed financial sectors and low inflation demand for housing is very closely related to the interest rate
- Because consumers finance their house purchases with long term loans of 20 or 30 years (also called "*mortgage*") from banks and other specialised financial intermediaries
- A fall in long term interest rates imply a reduction in the monthly instalments paid by consumers for the loan and acts like an incentive to buy a house
- An increase in long term interest rates imply higher monthly instalments and reduces the willingness to buy houses

Housing demand and interest rates

How High Interest Rates Reduce Mortgage Eligibility and Housing Demand

Assumptions: 30-year mortgage, $30,000 annual income, 28-percent limit on mortgage payment

Interest Rate	Maximum Possible Loan
5%	$130,397
6	116,754
7	105,215
8	95,398
9	86,997
10	79,766
11	73,504
12	68,053

Inventory investment

- The effects of changes in inventories are normally negligeable but at times of great significance
- It is not the absolute level of inventories but the *change* that is captured by national income accounts
- Inventories are used by firms to *smooth* the level of production over time
- Inventories can also be considered a *factor of production*: spare parts permit fast repair
- Inventories allow firms to avoid *"stock-out"* when faced with unexpected jump in sales
- Usually, production takes time and firms have unfinished and semi-finished products as *work in progress*

The accelerator model of investment

- The *accelerator model* assumes that firms keep inventories proportional to output

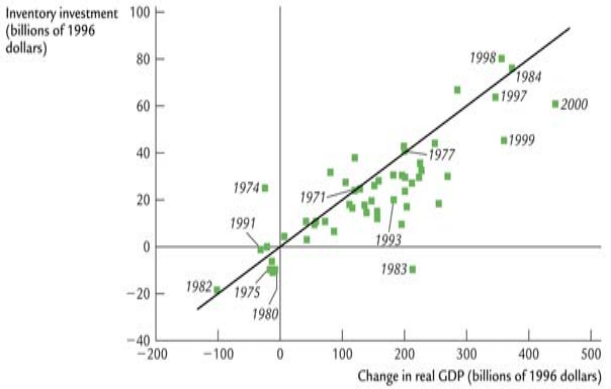
$$N = \beta Y$$

- Inventory investment is change in N

$$I = \Delta N = \beta \Delta Y$$

- The results are interesting: if output remains constant, inventory investment is zero
- But when output goes up and down inventory investment varies in the same direction
- In other words it *amplifies* the fluctuations in output during booms and recession
- β is calculated to be 0.2 for the US economy: a fall in demand of 1 $ cuts spending further by 0.2 $

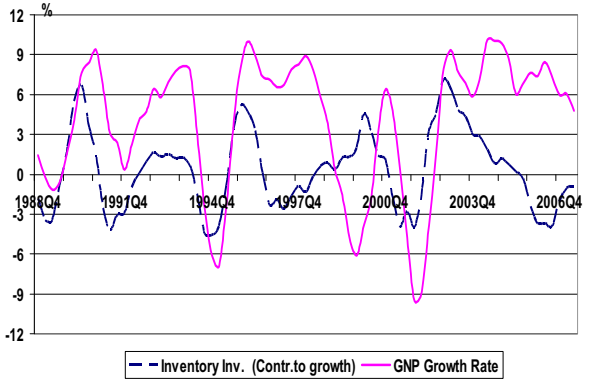
US: inventory investment



Turkey: inventory accelerator

- Changes in inventories aggravate the recessions and recoveries in Turkish business cycles but have very little effect in normal times
- In times of economic crisis, falls in inventories explain a large portion of the fall in GNP
- During a recovery, increases in inventories make major contributions to the growth of GNP
- "*Contribution to growth*" of a spending item is calculated by multiplying its growth rate with its share in GNP
- It shows the change in GNP that can be attributed to that spending item
- Figures since 2001 are very interesting

Turkey: inventory accelerator



Money Supply and Money Demand

Chapter 18

Plan of the Chapter

- We already introduced the basic concepts about money and inflation in Ch. 4
- Liquidity demand, money market and monetary policy played key roles in models of the short term such as the IS-LM analysis
- Ch.18 takes a closer look at institutional setting of the supply and demand for money
- We establish how the *banking system* also creates liquidity in the economy through fractional reserves
- We explain how the *Central Bank* controls the money supply
- We look into the motives behind *money demand*
- And we review *Turkish monetary data*

Money supply

- From Ch. 4 we know that total liquidity in the economy is *not limited* to the currency issued by the Central Bank
- It also includes deposits in the banking system

$$M = C + D$$

- *Demand deposits* and *repos* are the most liquid, time deposits are less liquid assets
- The amount of currency in circulation is relatively small compared with total liquid assets that make up M2Y+R in Turkey
- The relevant slide in Chapter 4 is next
- We start by looking in detail at *bank deposits* and how they affect the supply of money

Turkey: measures of money supply

		Dec.06 (Billion YTL)	Dec.06 (Billion USD)	As % of M2Y+R
C -	Currency in Circulation	21,3	15,0	8,1
BM -	C + Bank Deposits at CB	21,1	14,9	8,0
M1 -	BM + demand deposits	42,4	30,0	16,1
M2 -	M1 + time deposits	170,7	120,5	64,7
M2Y -	M2 + FX deposits	258,3	182,4	97,9
M2 + R -	M2 + Repos	176,2	124,4	66,8
M2Y + R -	M2Y + Repos	263,8	186,2	100,0

From currency to deposits

- To understand how the banking system creates money, let us begin assuming an injection of $ 1000 in currency into the economy
- Assume households and firms do not carry any cash and use banks for all transactions
- $ 1000 printed by the CB immediately goes to a bank (called Bank One) as deposits
- Bank One's balance sheet becomes:

Bank One Balance Sheet

Assets		Liabilities	
Reserves	$ 1000	Deposits	$ 1000

Reserve banking

- Banks keep only *a fraction* of their assets in reserves because reserves don't earn interest
- In other words, usually only a small part of deposits are drawn at any time
- Therefore the *reserve ratio* is determined by tradition and sound banking practise
- The Central Bank will also require banks to hold a certain ratio of *reserves* against their deposits
- Some reserves are held as currency in the branches but a large part is kept as deposits at the Central Bank with the possibility of immediate withdrawal in case of need
- *Reserve ratio* is an important monetary magnitude

From deposits to loans

- Assume the reserve ratio is 0.2 or 20 % of deposits
- Bank One can now lend $ 800 to a customer, earning interest on it
- After the loan, Bank One balance sheet becomes

Bank One Balance Sheet

Assets		Liabilities	
Reserves	$ 200	Deposits	$ 1000
Loans	$ 800		

- Now $ 800 in currency is back in circulation and it will be deposited by the loan customer either at Bank One or at another bank (Bank Two)

The process continues

- To simplify, we assume that the currency goes to Bank Two as new deposit
- Once again, Bank Two puts aside 20 % as reserves ($ 160) and gives the remaining 80 % ($ 640) as a loan to its customer
- Bank Two balance sheet becomes:

Bank Two Balance Sheet

Assets		Liabilities	
Reserves	$ 160	Deposits	$ 800
Loans	$ 640		

- Currency in circulation is again up by $ 640 and it will be deposited either at one of the two banks or at a third bank

Limits of deposit creation

- Bank Three will receive a deposit of $ 640, keep $ 128 in reserves and give a loan of $ 512

Bank Three Balance Sheet

Assets		Liabilities	
Reserves	$ 128	Deposits	$ 640
Loans	$ 512		

- The process will continue in this way
- The creation of deposits by the original $ 1000 in currency injected into the economy by the CB does not go endlessly
- When deposits reach $ 5000 banks must hold $ 1000 as reserves and *deposit creation* stops at that point

Formula for deposit creation

- Below we have the general formula for deposit creation of banks
- In our example, n = 0.2 therefore 1 / n = 5 which means that $ 1000 in currency creates $ 5000 of deposits (money or liquidity)

Original Deposit =	$ 1000
BankOne Lending =	(1 - n) $ 1000
BankTwo Lending =	(1 - n)^2 $ 1000
BankThree Lending =	(1 - n)^3 $ 1000
BankFour Lending =	(1 - n)^4 $ 1000
BankFive Lending =	(1 - n)^5 $ 1000
...	=
...	=
Total Money Supply =	(1 / n) x $ 1000

Key definitions

- *Monetary Base* B: total of currency C held by the public and reserves R of the banks at the Central Bank
- MB is controlled directly by the Central Bank
- *Reserve-deposit ratio* rr : is the fraction of deposits that banks hold in reserve
- It is determined by business policies and laws regulating banks
- *Currency-deposit ratio* cr: is the amount of currency C people hold as a fraction of their holdings of demand deposits D
- It reflects the preferences of households and firms about the form of money they wish to hold

Model for money supply

- Begin with defining money supply M and monetary base B

$$M = C + D$$
$$B = C + R$$

- If we divide the first equation by the second

$$M / B = (C + D) / (C + R)$$

- And divide the right side of the equation by D

$$M / B = [(C / D + 1)] / [(C / D + R / D)]$$

- This is an interesting equation because C / D is the currency-deposit ratio cr and R / D is the reserve-deposit ratio rr
- In other words the model obtains the money supply from monetary base through these two ratios

Money multiplier

- By substituting the two ratios and moving B to the right side of the equation we obtain

$$M = [(cr + 1) / (cr + rr)] \times B$$

- What is the meaning of this equation?
- It tells us how changes in monetary base tightly controlled by the CB will change the total money supply
- In a simpler format, taking m = (cr+1) / (cr+rr), the formula becomes

$$M = m \times B$$

- This is a very important formula
- m is called the *money multiplier* while B is often called *high-powered money*

Some consequences

- We can review our findings about the creation of money by the financial system
- Money supply M is *proportional* to base money B, meaning that any percentage increase in B causes the same percentage increase in M
- Lower the reserve-deposit ratio, higher the money supply M for a given base money B
- Thus a fall in the *reserve-deposit ratio* increases money supply M at constant base money B
- Lower the currency-deposit ratio, higher the money supply M for a given base money B
- Thus a fall in the *currency-deposit ratio* increases money supply M at constant base money B

Balance Sheet of the Central Bank

- We now look in detail at the Central Bank which controls monetary base and through it the money supply in the economy
- CB publishes its accounts on the web
- These are very closely monitored by the financial markets in Turkey
- A key publication is the *Analytical Balance Sheet of the Central Bank of Turkey* (TCMB Analitik Bilançosu)
- It is published weekly and is commented in most newspapers
- Like all balance sheets, it is divided into *Assets* and *Liabilities*

CB balance sheet: assets

- Assets are classified into *Foreign Assets* and *Domestic Assets*
- *Foreign Assets* are in FX and include gold
- They are also called *international reserves* of CB
- FX assets may be in cash or kept as interest earning assets in financial centers abroad
- *Domestic Assets* are in TL
- They correspond to loans given by the CB to domestic financial institutions or to the Treasury or other public institutions
- When the CB buys Treasury bills (T-bills) or government bonds (G-bonds) from the markets, these become domestic assets of the CB

CB balance sheet: assets

A.VARLIKLAR	A.ASSETS
A.1-DIS VARLIKLAR	A.1-FOREIGN ASSETS
A.2-IC VARLIKLAR	A.2-DOMESTIC ASSETS
A.2-a-Nakit Islemler	A.2-a-Cash Operations
A.2-aa-Hazine Borclari	A.2-aa-Treasury Dept
A.2-aa-i-Bankamiz Portfoyu	A.2-ac-Credits to SDIF
A.2-aa-i-b-Ikincil Piyasadan Alinan DIBS	A.2-aa-i-1-DIBS Perior Nov.5, 2001
A.2-aa-ii-Diger	A.2-aa-i-2-DIBS Purchased from Secondary Market
A.2-ab-Bankacilik Sektorune Acilan Nakit Krediler	A.2-aa-ii-Other
A.2-ac-TMSF'na Kullandirilan Krediler	A.2-ab-Credits to the Banking Sector
A.2-ad-Diger Kalemler	A.2-ac-Other Items
A.2-b-Degerleme Hesabi	A.2-b-FX Revaluation Account
A.2-c-IMF Acil Yardim Takip Hesabi(Hazine)	A.2-c-IMF Emergency Assistance (Treasury)(*)

CB balance sheet: liabilities

- Liabilities are also classified into *Foreign Liabilities* and *Domestic Liabilities*
- *Foreign Liabilities* are in FX but may be to foreigners or to domestic residents
- *Domestic liabilities* are in TL and correspond to debts of the CB to third parties
- *Currency issued* by CB is a liability: banknotes represent the debt of CB to their owners
- Deposits by banks (reserves) constitute an important portion of the domestic liabilities of the CB
- Deposits by public institutions, including the Treasury, are liabilities for the CB

CB balance sheet: liabililites

P.YUKUMLULUKLER	P.LIABILITY
P.1-TOPLAM DOVIZ YUKUMLULUKLERI	P.1-TOTAL FOREIGN LIABILITIES
P.1-a-Dis Yukumlulukler	P.1-a-Liabilities to Non-Residents
P.1-b-Ic Yukumlulukler	P.1-b-Liabilities to Residents
P.1-ba-Doviz Olarak Takip Olunan Mevduat	P.1-ba-FX Deposits of Non-Bank Sector
P.1-bb-Bankalarin Doviz Mevduati	P.1-bb-FX Deposits of the Banking Sector
P.2-MERKEZ BANKASI PARASI	P.2-CENTRAL BANK MONEY
P.2-A-REZERV PARA	P.2-A-RESERVE MONEY
P.2-Aa-Emisyon	*P.2-Aa-Currency Issued*
P.2-Ab-Bankalar Mevduati	*P.2-Ab-Deposit of Banking Sector*
P.2-Aba-Bankalar Zorunlu Karsiliklari	P.2-Aba-Required Reserves
P.2-Abb-Bankalar serbest Imkani	P.2-Abb-Free Deposits
P.2-Ac-Fon hesaplari	*P.2-Ac-Extrabudgetary Funds*
P.2-Ad-Banka Disi Kesimin Mevduati	*P.2-Ad-Deposits of Non-Bank Sector*
P.2-B-DIGER MERKEZ BANKASI PARASI	P.2-B-OTHER CENTRAL BANK MONEY
P.2-Ba-Acik Piyasa Islemleri	*P.2-Ba-Open Market Operations*
P.2-Bb-Kamunun TL Mevduati	*P.2-Bb-Deposits of Public Sector*

Turkey: CB-BS assets

(Billion YTL)	Oct06		Oct07		% Change
ASSET	101	100%	106	100%	6
FOREIGN ASSETS	88	88%	90	85%	2
DOMESTIC ASSETS	13	12%	16	15%	31
Cash Operations	14	14%	11	11%	-21
Treasury Dept	18	18%	16	15%	-11
CBRT Portfolio	18	18%	16	15%	-11
Government Domestic Debt Inst.Perior Nov.5, 2001	18	18%	16	15%	-11
Other	0	0%	0	0%	-19
Credits to Banking Sector	0	0%	0	0%	-20
Other Items	-4	-4%	-5	-5%	27
FX Revaluation Account	-2	-2%	5	5%	-377

Turkey: CB-BS liabilities

(Billion YTL)	Oct.06		Oct.07		% Change
LIABILITY	101	100%	106	100%	6
TOTAL FOREIGN LIABILITIES	59	58%	54	50%	-9
Liabilities to Non-Residents	25	25%	20	19%	-18
Liabilities to Residents	34	34%	33	31%	-2
FX Deposits of Non-Bank Sector	18	17%	16	15%	-10
FX Deposits of the Banking Sector	16	16%	17	16%	6
CENTRAL BANK MONEY	42	42%	53	50%	26
RESERVE MONEY	35	34%	41	38%	18
Currency Issued	24	24%	27	26%	14
Deposit of Banking Sector	11	10%	14	13%	28
Free Deposits	11	10%	14	13%	28
OTHER CENTRAL BANK MONEY	7	7%	12	11%	61
Open Market Operations	6	6%	10	10%	67
Deposits of Public Sector	1	1%	2	1%	28

CB balance sheet: evaluation

- End-August, CB-BS stands at 102.3 bill.YTL
- Biggest part of the assets are foreign assets (88 %)
- Domestic assets are loans to government
- Bigger part of liabilities (59 %) are in FX
- Of which more than half (34 %) are FX liabilities to domestic residents (banks)
- TL liabilities, also called Central Bank Money represent 41 % of CB liabilities
- The change in the balance sheet from August 2005 to August 2006 is *nominal*
- To obtain the real change, we must deflate 2006 figures or inflate 2005 figures with CPI inflation in the year to August 2006

CB balance sheet: trends

- During 1990s, the share of domestic assets in total assets fell while total balance sheet stagnated
- Normally, CBs have a large part of their assets in *domestic currency*, up to 90 % for large developed economies with a sound currency
- In Turkey, the fall in domestic assets reflected the efforts of monetary policy to control the *exchange rate* by hoarding substantial reserves of FX
- Since the TL was floated in February 2001, domestic assets moved again to positive territory
- And the total balance sheet of CB increased both in TL and USDollar despite a large real devaluation of the TL

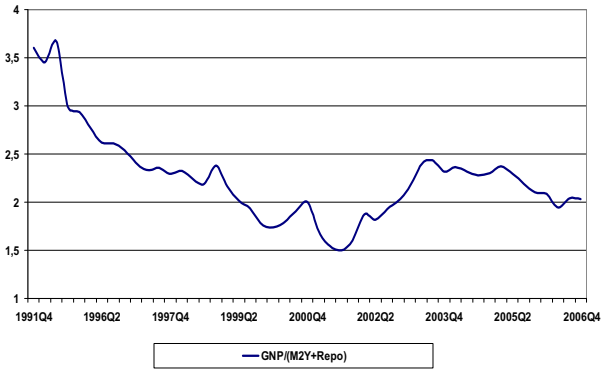
Turkey: Trends in CB-BS

Billion USD	1989	1995	2000	2005	2006
ASSETS	21,2	23,3	22,5	65,7	73,7
Foreign Assets	7,8	15,5	24,2	52,3	64,6
Domestic Assets	13,5	7,8	-1,7	13,4	9,1
LIABILITIES	21,2	23,3	22,5	65,7	73,7
TOTAL FOREIGN LIABILITIES	13,2	17,6	21,1	36,9	44,1
Liabilities to Non-Residents	9,0	12,9	12,9	16,9	17,2
Liabilities to Residents	4,2	4,7	8,2	19,9	26,9
CENTRAL BANK MONEY	8,0	5,7	1,5	28,8	29,6
(%)					
Domestic Assets/Total Assets	63,4	33,3	-7,4	20,4	12,4
Foreign Assets/Total Assets	36,6	66,7	107,4	79,6	87,6

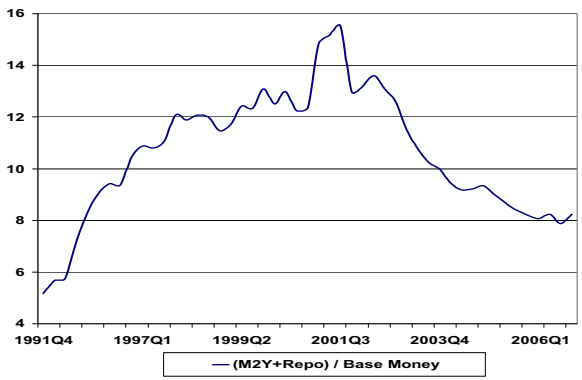
Velocity and money multiplier

- *Velocity of circulation* is obtained by dividing nominal GNP by the money supply
- It may have short term volatility but also a definite long term trend
- M2Y+R divided by nominal GNP has been steadily increasing in Turkey (*financial deepening*)
- *The money multiplier* is also a good measure of the same phenomenon
- The growth of the financial system means that a larger money supply is generated by the same monetary base
- Money multiplier has increased substantially in Turkey during the last decade

Turkey: velocity of circulation



Turkey: money multiplier



Turkey: money and deposits

(Billion USD)	2000	2001	2002	2003	2004	2005	2006
M1	12	8	9	15	22	26	31
Currency in Circulation	5	3	4	7	9	12	15
Sight Deposits	7	4	4	8	13	14	15
M2	49	33	37	57	81	100	123
Time Deposits	37	25	29	42	59	74	93
M2Y	85	72	81	106	138	157	186
F/X Deposits (TL)	36	40	44	49	57	57	63
M2Y+Repo	93	77	83	109	138	160	190

Measuring CB money

- Let us review the liabilities of the CB to gain better understanding of money creation
- Currency in circulation plus the statutory and free reserves of the banks at the CB constitute the monetary base (*base money*)
- By adding extra-budgetary funds and deposits of non-banking sectors with the CB to monetary base we obtain *reserve money*
- By adding the net result of open market operations of the CB and the deposits of the public sector we get *central bank money*
- All of these aggregates are watched closely by markets

Turkey: monetary base

	2002		2003		2004		2005		2006	
(Billion YTL, Billion USD)	TL	$	TL	$	TL	$	TL	$	TL	$
1. BASE MONEY (a+b+c)	10	6	15	11	20	15	30	22	41	29
a.Currency Issued	8	5	11	8	13	10	19	14	27	19
b.Required Reserves of Banking Sector	2	1	2	2	3	2	0	0	0	0
c.Free Deposits	1	1	2	1	4	3	11	8	14	10
2. RESERVE MONEY (1+d+e)	11	7	15	11	20	15	30	22	41	29
d.Extrabudgetary Funds	0	0	0	0	0	0	0	0	0	0
e.Deposits of Non-Bank Sector	0	0	0	0	0	0	0	0	0	0
3.CENTRAL BANK MONEY (2+f+g)	21	13	24	17	25	18	39	29	42	29
f.Open Market Operations	10	6	8	6	4	3	8	6	-1	-1
g.Deposits of Public Sector	0	0	1	1	1	1	1	1	2	1

Other monetary criteria

- There are other monetary policy criteria
- *Net Domestic Assets* is a significant measure of liquidity creation or *monetisation* by the CB
- It is obtained by substracting several items from domestic assets of CB
- *Net Foreign Assets* reflects FX position of the CB
- It is obtained by substacting from foreign assets FX liabilities to non residents (outside world) and FX liabilities to domestic banks
- *Net FX Position* shows the total exchange rate exposure of the CB
- It is obtained by substracting total liabilities in FX from total FX assets

Turkey: monetary aggregates

(Billion YTL , Billion USD)	2002		2003		2004		2005		2006	
	TL	$	TL	$	TL	$	TL	$	TL	$
BASE MONEY	10	6	15	11	20	15	30	22	41	29
+ Currency Issued	8	5	11	8	13	10	19	14	27	19
+ Required Reserves	2	1	2	2	3	2	0	0	0	0
+ Free Deposits	1	1	2	1	4	3	11	8	14	10
NET DOMESTIC ASSETS	7	3	8	3	10	3	-4	-11	-6	-14
+Domestic Assets	23	14	24	17	21	16	18	13	13	9
- FX Deposits of Non-Bank Sector	5	3	7	5	6	5	14	10	19	13
- Extrabudgetary Funds	0	0	0	0	0	0	0	0	0	0
- Deposits of Non-Bank Sector	0	2	0	3	0	5	0	8	0	10
- Open Market Operations	10	6	8	6	4	3	8	6	-1	-1
- Deposits of Public Sector	0	0	1	1	1	1	1	1	2	1
NET FOREIGN ASSETS	3	2	7	5	10	7	35	26	48	33
+ Foreign Assets	51	31	53	38	54	40	70	52	91	64
- FX Liabilities to Non-Residents	37	23	36	25	31	23	23	17	24	17
- FX Deposits of Domestic Banks	11	7	10	7	13	10	13	10	19	14
NET FX POSITION	-3	-2	1	0	4	3	21	15	29	20
+ Foreign Assets	51	31	53	38	54	40	70	52	91	64
- Total Foreign Liabilities	54	33	52	37	50	37	50	37	62	44

How CB creates money?

- There are four instruments at the disposal of the CB to regulate the money supply
- *Open Market Operations* – OMOs (Açık Piyasa İşlemleri) are purchases and sales of T-bills and G-bonds by the CB
- *Reserve requirements* are changes in the deposits banks must keep at the CB
- *The discount rate* is the interest rate charged by the CB to the banks for very short term loans to banks
- *FX operations* are the purchase and sale of FX by the CB
- Developed country CBs use the first three, therefore the fourth instrument is not mentioned in textbooks

Open Market Operations – OMOs

- CBs regularly *buy and sell* T-bills and G-bonds in the bond markets
- When CB buys G-bonds, its domestic assets and domestic liabilities increase, corresponding to an *infusion* of liquidity into the financial system
- When CB sells government paper, its domestic assets and domestic liabilities fall, corresponding to a *reduction* of liquidity in the financial system
- *OMOs* play a dominant role in the conduit of monetary policy for the central banks of large developed economies
- Their role in Turkey is small: 2 % of liabilities in November 2001

Reserve requirements

- CB can at any moment change the *deposit-reserve requirements* for the banking system
- Higher reserve ratio increases domestic liabilities and assets of the CB and at first looks like an infusion of liquidity
- But higher reserve ratio forces the banks to reduce their loans in order to increase their reserves
- Money multiplier falls
- Therefore total *credit stock* in the economy and along with it total liquidity falls
- The opposite holds for a lower reserve ratio
- Changes in the reserve ratio happen seldom because it is a slow and difficult process

Discount rate

- The interest rate at which CBs lend to banks is called the *discount rate*
- In Turkey, the *overnight interest rate* (*o/n rate*) fulfills the same function
- Banks can always borrow from the CB to meet their reserve requirements if the interest they pay to CB is lower than the opportunity cost of funds
- A reduction in the discount rate gives an incentive to banks to borrow from the CB for their liquidity needs
- In other words both the domestic assets and liabilities of the CB increases
- Corresponding to an *infusion* of liquidity into the financial system

FX operations

- CB can also regulate the supply of money by buying and selling *FX* to the financial markets
- When CB buys FX, its foreign assets and domestic liabilities increase, corresponding to an infusion of liquidity into financial markets
- When CB sells FX, its foreign assets and domestic liabilities fall, corresponding to a reduction of liquidity in financial markets
- This instrument is *negligeable* for large developed economy CBs
- FX operations were a *major instrument* for TCMB throughout the 1990s until the February 2001 crisis
- It is no longer an important instrument

Bank failures and money supply

- From August 1929 to March 1933 the money supply fell by 28 % in the US
- In week 7 (Ch.11) we saw that many economists consider the fall in the money supply as the primary cause of the *Great Depression*
- Interestingly, the monetary base increased from 7.1 bill. $ to 8.4 bill.$ during this period
- But the *money multiplier* fell from 3.7 to 2.4
- This is attributed to large nunber of *bank failures*
- *Currency-deposit ratio* of the public increased due to lack of confidence in banks
- *Reserve-deposit ratio* of the banks increased due to fear of bank runs

The Money Supply and Its Determinants: 1929 and 1933

	August 1929	March 1933
Money Supply	**26.5**	**19.0**
Currency	3.9	5.5
Demand deposits	22.6	13.5
Monetary Base	**7.1**	**8.4**
Currency	3.9	5.5
Reserves	3.2	2.9
Money Multiplier	**3.7**	**2.3**
Reserve-deposit ratio	0.14	0.21
Currency-deposit ratio	0.17	0.41

Source: Adapted from Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton, N.J.: Princeton University Press, 1963), Appendix A.

Money demand

- On the other side of the money market we have the *demand for money*
- *Quantity theory of money* assumes money demand to be proportional to nominal GNP

$$(M/P)^d = kY$$

- *IS-LM model* makes the more realistic assumption that money demand is also influenced by interest rates

$$(M/P)^d = L(Y, i)$$

- Remember three functions of money: *i) a medium of exchange, ii) a unit of account, iii) a store of value*
- A unit of accound does not require actual currency
- QTM takes into consideration *only* the first function

Portfolio theories of money demand

- *Store of value* function of money is vitally important for macroeconomics
- Portfolio theories consider money as an instrument in people's *portfolio of assets*
- Money is a *zero risk – zero return* asset
- Because the prices of stocks, real estate or bonds may go up or down while *nominally* money is always equal to itself
- Money demand will depend on *returns* on other assets as well as inflation and wealth

$$(M / P)^d = L (r_s , r_b , \pi^e, W)$$

- This may not be realistic for M1 but may be a valid explanation of *larger aggregates* such as M2Y+R

Currency substitution

- Store of value function takes us to a very important phenomenon for Turkey: *dollarisation*
- High and unstable inflation makes TL unsuitable as a store of value or a unit of account
- Citizens use US$ and DM (Euro) to protect their assets from unexpected fluctuations in inflation and the exchange rate
- Over the years *FX deposits* by residents increased much faster than both TL deposits and GNP
- We don't know the amount of *FX in circulation* but it could be as large as 15-20 bill. $
- Substantial FX circulation and large share of FX deposits put serious *constraints* on monetary policy

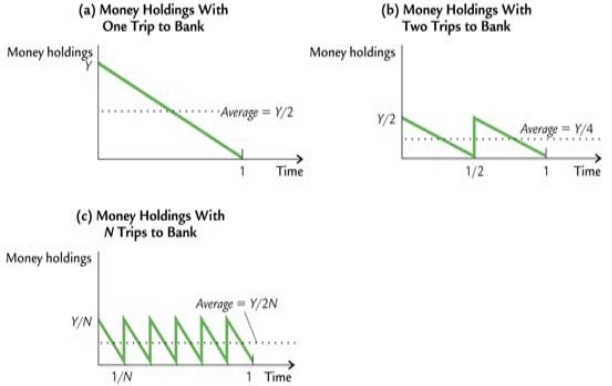
Turkey: currency substitution

Billion USD	1989	1993	2000	2006
Currency in circulation	4	4	5	15
M2Y + Repo (1)	27	42	93	190
FX Deposits (2)	5	17	36	63
CB FX Reserves	6	8	25	61
CB Net FX Position	-5	-2	3	20
GNP	108	181	201	401
% of GNP				
Currency in circulation	3	2	2	4
M2Y + Repo	25	23	46	47
FX Deposits	4	9	18	16
CB FX Reserves	6	4	12	15
CB Net FX Position	-5	-1	2	5
Currency Substitution (2) / (1)	18	40	39	33

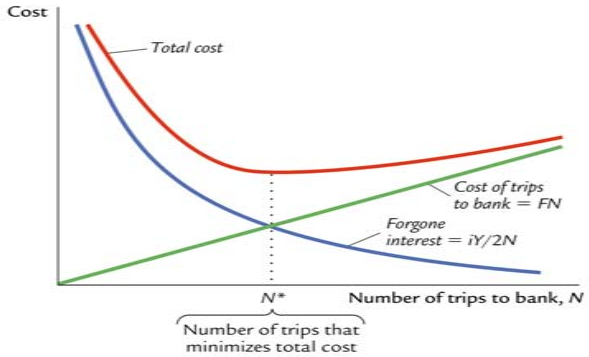
Transaction theories of money demand

- Transaction theories emphasis the role of money (currency, sight deposits) as a *medium of exchange*
- Actual cash at hand or a check account at the bank reduce the number of trips a person has to make to the bank in order to meet payments
- In countries with high inflation and high interest rates the opportunity cost of holding money is high and people will hold as little money as possible
- In countries with no inflation and low interest rates money demand will be higher
- Institutional factors such as the income-payment period, use of credit cards or the size of the underground economy also matter

Transaction demand for money



Cash management model



The instability of money demand

- Financial innovation, banking sector problems, capital flows, currency substitution, underground economy, etc. reduce the *stability* of money demand
- Sophisticated financial techniques have increased the amount of *near money* outside the control of the CB in today's open economies
- *Large fluctuations* in money demand and the velocity of circulation are observed in the short run even in low inflation economies
- These limit the benefits of *monetary aggregates* as targets or tools of monetary policy for CBs
- Forcing CBs to use the *interest rate* as the main instrument of monetary policy

Monetary rules for the interest rate

- If targeting monetary aggregates is not an effective tool to control inflation, what happens to *rules-based* monetary policy?
- Remember *Friedman's rule* of a constant rate of increase in the money supply
- Now the rule must specify how the *discount rate* will behave in different circumstances
- In Ch. 14 we studied the interest rate rule proposed by *John Taylor* and rumoured to be applied by Chairman Greenspan of the Federal Reserve Board
- *Taylor's rule* links the discount rate to variations from targeted inflation and to output gap

$$i_d = \pi + 2.0 + 0.5 (\pi - 2.0) - 0.5 [(Y - \overline{Y}) / \overline{Y}]$$

Macroeconomics of Turkey: populism, globalisation, crisis and disinflation

Week 14

25 December 2007

Populism

- The concept of "p*opulism*" will help us understand better some of the macroeconomic problems faced countries with a history of high inflation like Turkey
- Populism is based on the belief that budget deficits ar not *necessarily harmful* to economy
- Two main versions:
  - Inflation promotes rapid economic growth
  - The budget deficit is self-financing through the Keynesian multiplier
- *Populist policies* shift the AD curve in the short-run, resulting in higher growth and higher inflation
- In the long-run they cause *external deficits* and the economy eventually collapses with an *economic crisi*

Understanding populism

- The word "*populism*" or "*populist policies*" are often used synonymously with "*bad policies*"
- *Populism* is a concept borrowed from politics
- It involves promises and implementation of policies aimed at improving the welfare of the lower income groups in the economy through *public spending*
- Populist policies *disregard* basic principles of macroeconomics about budget balance, exchange rate misalignment, etc.
- Populists spend more for civil servants, for health and education and for investment without first securing adequate resources
- They also *repress* exchange and interest rates

Populist policies

- Populist policies typically increase public spending without a corresponding increase in tax revenues
- *Redistributive income transfers*: higher salaries for civil servants, higher agricultural support prices, earlier retirement for the employed, larger subsidies for basic inputs and utilities, etc.
- *Social spending*: more on health and education, more investment for hospital, schools, etc.
- The budget deficit explodes, often financed by printing more and more money
- While the exchange rate is kept constant to prevent inflation and the interest rate down to promote growth

The populist cycle

- Countries with a tradition of populism have a special type of business cycle called the "*populist cycle*"
- The cycle starts with the *rapid rise* of real wages and other social spending of the government and a jump in public investment for schools, roads, etc.
- This spending spree causes *a boom* in the economy
- In an effort to contain inflation and prolong the boom, both the exchange rate and the interest rate is kept *below* equilibrium levels
- Large public sector and current account deficits appear at the same time and both are financed by short term borrowing abroad ("*hot money*")
- A populist cycle normally last for 3 to 5 years

From boom to bust

- Once financial markets realise the risks, lending from abroad dries up while residents buy FX to protect themselves against the coming devaluation
- In crisis, domestic currency begins a *free fall*, cost-inflation jumps up and domestic demands collapses
- Sudden rise in inflation erodes the gains in real wages, often bringing them back to levels *below* the beginning of the populist cycle
- The *vicious circle* of devaluation, inflation, rising public deficits, etc. destabilises politics
- At this point usually a new government comes to power and applies to the IMF for support and the IMF prescribes very *unpopular remedies*

Before and after convertibility

- The end of the populist cycle is *different* for the case of capital controls and capital mobility
- With capital controls, there is no domestic run on FX and no free fall of currency
- In turn, *shortage of FX* stops imports and therefore domestic production that uses imported inputs
- The last phase of the cycle involves serious shortages and *black markets* for FX and for many goods and services
- With capital mobility, there is no shortages but the depreciation of currency speeds up and unless something is done to restore confidence the economy may end up with *hyperinflation*

Turkey's FX crises

- Turkey experienced *three major populist cycles*
- The *first* happened after 1953 and ended with currency shortages, devaluation and the first major Standby Arrangement with the IMF in 1958
- The *second* was initiated in 1973 by the Ecevit-Erbakan coalition government and continued to the last days of 1979 again with currency shortages, black markets, production halts, erosion of real wages, etc. and ended with the famous 24 January 1980 Stabilisation Package as part of the Standby Arrangement with the IMF
- The *third* coincided with the decision to liberalise the capital account (convertibility) in 1989

Populist cycle begins in 1989

- During 1980s the economy had undergone structural transformation through Özal's market reforms
- The cycle began with *generous* wage and salary increases in the public sector after ANAP lost the local elections in March 1989
- Özal liberalised the capital account *in order* to finance big deficits in the budget through borrowing from international markets ("hot money")
- *Domestic demand* led the boom in Turkish economy in 1990 resulting in a large current account deficit
- The *Gulf war* slowed domestic demand in 1991 despite even looser policies of the government in the election year

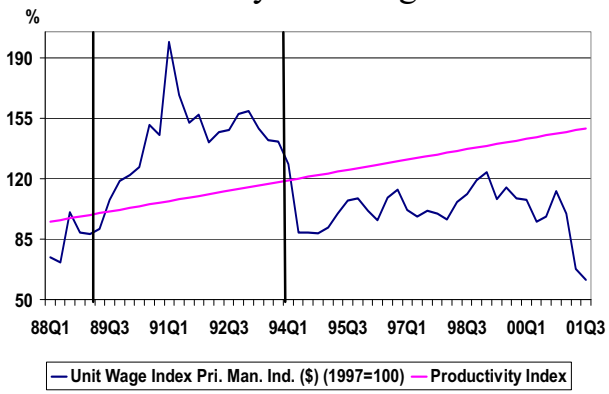
An unsustainable boom

- A coalition between DYP (Demirel) and SHP (İnönü) came to power after the elections in 1991
- Instead of trying to stabilise the economy through *tighter* monetary and fiscal policy the new government continued at full speed with populist policies it had inherited
- By 1993, all the major indicators pointed toward an *unsustainable situation* in the economy
- The primary deficit of the public sector reached 5.6 % of GNP while the operational deficit jumped to 9.1 % of GNP
- The deficit in the current account of the BoP was $ 6 bn. (4 % of GNP)

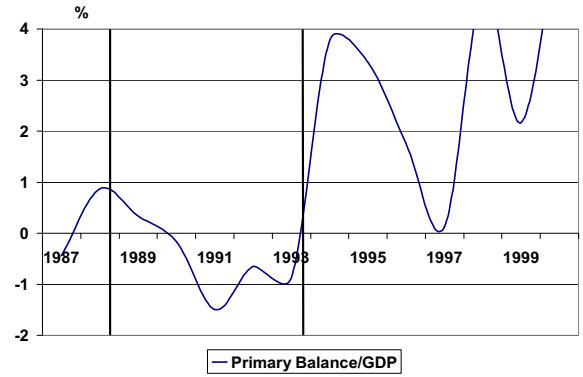
The crisis in 1994

- Çiller was elected to head the DYP and became prime minister in the summer of 1993
- Before the local elections scheduled for April 1994 Çiller *repressed* further the interest rates
- The dollar moved from below 15.000 TL in 1 Jan.1994 to 40.000 TL in April 1994: i.e. there was no currency shortages but *a free fall* of the TL
- A *stabilisation package* as part of a Standby Agreement with the IMF was announced in April
- WPI inflation for 1994 rose to 150 %
- Real wages both for public and private sector employees went down by 40 % or more, to *below* 1989 levels

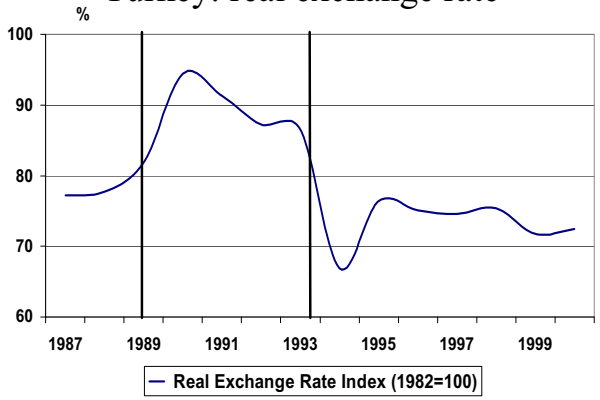
Turkey: real wages



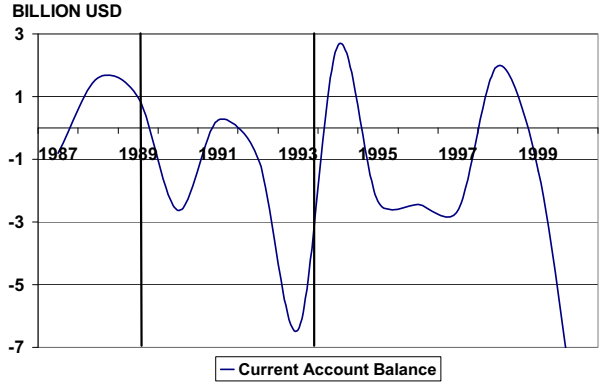
Turkey: primary budget balance



Turkey: real exchange rate



Turkey: current account balance



Meaning of globalisation

- *Globalisation* became a very popular word during the last decade
- Its meaning varies much from one person to other
- For economists, globalisation means increased *integration and interdependence* of national economies, measured by international flows of:
  - Merchandise (trade: exports and imports)
  - Services (invisible trade)
  - Foreign direct investment (FDI)
  - Short and long term borrowing and finance
  - Stock-market portfolio investment
- The increase in these flows puts *serious constraints* on domestic economic policy

Capital mobility

- Before 1990s, international capital mobility was *the exception* not the rule among developing economies
- Constraints on the flows of finance *were lifted* by developing countries in late 1980s and early 1990s
- The process is called "*capital account liberalisation*" or "*currency convertibility*"
- Very strict controls over capital flows existed in Turkey until 1989 when the TL became *convertible*
- *Without* capital mobility, residents in a country are not allowed to buy and accumulate FX freely
- There are many economists in Turkey who believe that the convertible TL did *more harm than good* to the Turkish economy

Globalisation trilemma

- Convertibility of the TL (*capital account liberalisation*) imposes new constraints on economic policy
- *Globalisation trilemma* refers to these constraints
- Policy makers can control only two of the following policy instruments
  - Capital account liberalisation (*convertibility*)
  - Independent monetary policy (*interest rate*)
  - Exchange rates
- The third must be left to the *markets*
- Once the currency is convertible, CB looses control over *either* the interest rate or the exchange rate
- For CB to control both, capital controls must be reimposed (*no convertibility*)

Choice of policy instruments

- After convertibility, the government can either control the interest rate or the exchange rate, *but not both at the same time*
- Command over monetary policy implies letting the exchange rate fluctuate by the *forces of the market*
- Then monetary policy (*discretionary or rules-based*) can be used to fight against recessions
- Stable exchange rates can only be achieved by letting the interest rate fluctuate in the market
- Therefore monetary policy can no longer be used to stabilise economic fluctuations
- Rich countries prefer to control *the interest rate* and float their exchange rates

Example from Turkey

- During 1990s, Turkey targeted *stable exchange rate*
- High interest rates and output volatility are direct consequences of this choice
- What happened in Turkey before and after the 2001 crisis confirm the trilemma
- In 2000, the exchange rate was *stable* because it was fixed by the CB with IMF support
- But the interest rate became *very volatile* in 2000 despite a growing economy and falling inflation
- After 2001 the exchange rate was *floated* and fluctuated wildly throughout the period
- But interest rates remained *relatively stable* despite the financial crisis and later strong recovery

Exchange rate regimes

- What to do about the exchange rate?
- Should we leave it to the market, to be determined by the forces of supply and demand?
- Should the government fix it through the CB?
- The exchange rate regime summarises this choice
- In "*fixed exchange rate regime*", the CB agrees to buy and sell FX at the rate it announces
- It is also called "*pegged*" exchange rate
- "*Crawling-peg*" means that the actual nominal exchange rate changes smoothly over time
- In "*floating exchange rate regime*" market forces determine the value of currency without interference from the CB

The Gold Standard

- From pre-modern times until the Great Depression in 1930s, the world economy worked on the *Gold Standard*
- For *gold coins*, there is no need of an exchange rate as the quantity of gold in represents their value
- In the Gold Standard every country fixed its paper currency to a *certain amount of gold*
- The CB exchanged banknotes for gold at this price
- If actual exchange rates deviated from gold prices gold moved *among countries*
- In the early phase of the Bretton Woods agreement before 1970s, US Dollar was *fixed to gold*
- And countries fixed their exchange rate to the US$

To float or to fix!

- There are *advantages and disadvantages* to both
- Fixed exchange rates help producers by *reducing uncertainty* for exporters and importers
- And protect markets from *external financial shocks*
- But no monetary policy in case of a recession
- And may cause large devaluations in case of a *misalignment* of the real exchange rate
- Floating exchange rates permet *active monetary policy* in case of a recession
- Allows adjustment in case of *real shocks*
- But producers are hurt by *increased uncertainty*
- And it increases the *vulnerability* of the economy to external financial shocks

Convertibility and the exchange rate

- When countries had controls over capital mobility, fixed exchange rates prevailed
- In conformity with the *globalisation trilemma*
- But developing countries continued with fixed exchange rates *after* the removal of capital controls
- Defying the logic of the trilemma
- Turkey during 1990s is a typical example
- This mistake contributed to the *financial crises* encountered by many countries during 1990s
- The *incompatibility* of fixed exchange rates and discretionary monetary policy in case of convertibility is the ultimate cause of the economic crises Turkey experienced in 1994 and 1999-2001

Euro, EMU and currency boards

- *European Monetary Union* is a regional response to this dilemma
- Member countries of EMU (Euroland) give up their national currency and fix permanently the exchange rate among themselves
- The Euro floats against non-member currencies
- The Euro is a logical result of the single market
- Such arrangements are called "*hard peg*" because there is no possibility of exit (devaluation) from the fixed exchange rate
- In a "*Currency Board*" (Para Kurulu) the local currency is pegged to a strong currency (US$, Euro) by law and CB prints money only against FX

Inflation: empirical evidence

- Empirical research has clearly shown that *lower* inflation corresponds to *higher* average growth rates
- Among the so-called "*economic miracles*" of the last decades, there is not one single economy which had two-digit inflation levels
- Turkey *seemed* to defy this rule and grow at a reasonable speed despite high inflation throughout the 1980s and 1990s
- But the performance of the economy between 1998-2002 only confirms the rule
- Real growth for this five year period is *zero*
- Real GNP in 2002 was at the same level as 1998 and per capita GNP is *lower* than five years ago

Inflation: distribution of income

- The most dangerous fallacy of populism lies in the belief that the *distribution of income* can be improved even with large budget deficits
- Average growth rates and improvements in the distribution of income are *positively correlated*
- *Fast growth* achieves better income distribution by offering more job opportunities to the poor, by faster rising real wages and by lower unemployment
- There is *not a single country* with an equitable distribution of income and two-digit inflation level
- Turkey has one of the *worst income* distributions in the world and it gets worst over the years
- *High inflation* is the major cause behind this

Other causes of crises

- It is wrong to attribute *all* economic crises and big devaluations to populist policies
- Meaning large and unsustainable public sector deficits financed with short term borrowing abroad
- Like Turkey's populist periods described above, many crises in *Latin America* fall into this category
- But the financial crises in *East Asian Tigers*, Korea, Thailand and Malaysia happened *despite* healthy public finances
- The pre-crisis booms in these countries were caused by *consumption and investment booms*
- The inability of the CBs to *tighten* monetary policy in time were the main cause of the crisis

"Hot money"

- Short-term foreign borrowing by domestic financial institutions is often called "*hot money*"
- For "hot money" to flow into a country
  - *Local interest rates* must be higher than world interest rates
  - There must be an explicit or implicit *guarantee* of the CB over the future course of the exchange rate
- This implies above average returns for international lenders without risks
- Some of the lending could be *overnight*
- Usually maturity is less than one year
- "Hot money" is a major cause of *instability* for developing countries

Onset of an investment boom

- When there is no large deficit in the budget, a financial crisis can be triggered by the worsening *balance sheets* of financial and non-financial private sector institutions
- An investment boom creates the conditions for *excessive borrowing* by firms, often for real estate developments or other non-tradable investments
- Buoyant domestic demand contributes to the formation of a *"bubble"* in asset markets such as real estate and the stock exchange
- Large current account balances are financed by borrowing abroad with *implicit* government guarantee on the exchange rate

Balance sheet crises

- Sooner or later markets begin to realise the *fragility* of the balance sheets of the financial institutions who borrowed abroad to lend to local investors
- When foreign lending dries up, demand for FX from domestic residents increases
- This corresponds to a substantial upward shift in the *Capital Flows* ***CF*** curve
- When CB tightens monetary policy, high interest rates only make things worse for borrowers
- *Meltdown* in currency and money markets lead to rapid currency depreciation and largescale bankruptcies of financial and non-financial firms
- The economy faces a full scale *financial crisis*

Stabilisation programs

- There is a blueprint to most IMF supported *Stabilisation Programs*
  - *Fiscal tightening* in the form of higher taxes and lower spending by the government, leading to a sustainable budget deficit
  - *Monetary tightening* in the form of higher interest rates to curb investment and consumer spending
  - *Large devaluation* of the currency in order to improve the trade balance and the current account
- In Turkey indirect taxes rise, leading to higher inflation
- IMF supports the program with *FX loans*, which help both the foreign deficit and the budget deficit

Currency substitution

- Residents of a country suffer *big losses* during economic crisis and unexpected depreciation of the currency and the rise in inflation
- When the currency is convertible, they try to protect themselves from such losses by moving their liquid assets from local currency into *FX assets*
- In other words, they *substitute local currency* with a reliable (low inflation = sound) currency
- This is also called "*dollarisation*"
- Dollarisation had started in Turkey before 1989 but accelerated after the crisis in 1994
- *Currency substitution* further intensifies macro-economic instability in the economy

"Phoney money"

- "Old TL" fulfilled only partly the first function of money (medium of exchange) while the other two were left to foreign currencies in circulation
- TL became "*phoney money*" (*dandik para*) and thus always under threat of attack by Turkish citizens
- CB was forced to keep interest rates high in order to defend the TL
- Even in case of a recession, monetary policy could not be loosened for fear of an attack on the TL
- Which amplified the effect of any negative foreign or domestic shock to the economy
- Resulting in very large fluctuations in output and increased *macroeconomic instability*

Disinflation programs

- The only way to get out of the *vicious circle* of inflation, dollarisation, output volatility and macroeconomic instability is to disinflate
- But decades of high and volatile inflation implies a strong *inflation inertia* as economic actors have learned from unsuccessful past efforts by governments that inflation will remain high
- The sacrifice ratio is therefore unaffordable
- IMF moves into the picture to solve the impasse
- *Disinflation programs* receive IMF support even if there is no BoP and FX liquidity problems
- Like the disinflation program initiated in Turkey in 2000 with a Standby Arrangement with the IMF

Nominal anchor

- One way of breaking inflation expectations is to fix the *future course* of exchange rate in advance
- Which reduces costs and inflation without a deep recession and high unemployment
- "*Exchange-rate based stabilisation (disinflation) programs*" were used by many countries with high inflation like Turkey
- At first, inflation goes down and economic growth picks up
- But the fall in inflation is less than the preset fall in nominal depreciation: *currency appreciates*
- The resulting rise the current account deficit is financed *by the IMF* through FX loans

Nominal anchor in 2000

- In Turkey, CPI fell from 68.8 % to 39 % while GNP growth rate rose from - 6.3 % to 6.4 % in 2000
- This was achieved by the *downward shift* in the short-run Phillips curve resulting from the exchange rate anchor
- The sacrifice ratio was *negative* in 2000: falling inflation was accompanied by higher growth rate
- Very low or even negative sacrifice ratios constitute the main attaction of an "*exchange-rate based disinflation program*"
- Unfortunately the government and the public opinion failed to see this point and the program collapsed in 2001

November 2000 - February 2001

- The February 2001 crisis in Turkey's is not of the "*public sector and current account deficits*" kind but of the "*balance sheet troubles*" type
- The crisis was triggered by the detorioration in the *balance sheets of banks*: large duty-losses financed by overnight borrowing at the state banks (Ziraat and Halk) and the currency risks of the private banks
- A *run on liquidity* in November 2000 led to sky high interest rates due to the inability of the CB to act like a normal lender of last resort because of the quasi-currency board rules of the Standby Agreement
- A political turbulance in February was sufficient for a run on TL and the *abandon of the program*

The health of the banking sector

- *Banking sector* plays a key role in macroeconomic stability in all economies, developed and developing
- If problems accumulate in the banking sector, unless governments act for a *quick remedy*, a long period of recession or slow growth follows
- Banks are *vital links* between saving and investment decisions and their problems breaks the circular flow
- When banking system *stops lending* to heal its own problems, investment spending and therefore aggregate demand falls, causing a serious recession
- This hits the balance sheets of the banks because economic slowdown increases *bad loans*
- A dangerous *vicious circle* thus sets in

Moral hazard in banking

- A failure in the banking sector is most undesirable for governments because of its *long term* negative effects on output
- Larger the bank facing failure, the more difficult it becomes to let it fail
- The slogan "*too big to fail*" is often used
- *Deposit insurance schemes* are part of the problem as well as the solution
- Knowing that final risks are born by the taxpayers, banks take *unnecessary risks* in search of large profits totally neglecting risk management
- Individual savers are attracted by higher interest rates offered by banks facing liquidity constraints

Risks in the banking sector

- Banks receive deposits from the public and lend to private firms or to the government
- Deposits have a much shorter maturity than the loan book for all banks
- The *maturity mismatch* corresponds to the difference of the maturity of a bank's assets (loans) and liabilities (deposits)
- *Interest rate volatility* increases the risk of loss for the banks from maturity mismatch
- Banks borrow or accept deposit in FX and lend in domestic currency, implying a *currency mismatch*
- *Exchange rate volatility* increases the risk of loss for banks from currency mismatch

Banking regulation

- Setting interest or exchanges rates right and observing fiscal discipline are necessary but *not sufficient* conditions for macroeconomic stability
- *Efficient regulation* of the banking sector is required to limit possibilities of moral hazard and keep the banking sector in good health
- Capital mobility increases risks in the banking sector by adding *currency mismatches* to traditional maturity mismatches
- A good cushion against risks can be obtained by increasing the capital of the banks by requiring high *Capital Adequacy Ratios* as a percentage of assets
- *Corruption* may lead to enforcement problems

Bank failures in US and Japan

- Problems of the banking sector are observed also in *developed economies*
- At the end of 1980s, *Saving and Loan Associations*, a specific type of bank under US law faced very serious problems of bad loans, corruption and negative net worth
- US government moved in *fast and swiflty*, took over the losses and prevented a banking crisis
- *Japan* faced similar problems with its banking sector after the real estate and stock exchange bubbles burst in the early 1990s
- The *failure* of Japanese government to clean rapidly the banks deepened and prolongued the crisis

Turkey: troubles in the banks

- The crisis in 2001 was in as sense caused by banks but they have also become its *biggest victims*
- Bad risk management in the form of large maturity and currency mismatches meant *big losses* for the banks in 2000-2001
- Corruption and inefficient regulation worsened the final picture: many banks had to be taken over by the *Saving Deposit Insurance Fund* (TMSF)
- A banking *regulatory agency* (BDDK) was established to improve regulation in the future
- To prevent total collapse of private banks the government had to take over banks in difficulty
- Ultimately the taxpayer paid for all

Crisis indicators

- Some signs are considered to be good indicators of the risks of potential crisis in an economy
- Probably the most important indicator is the *current account deficits:* there are very few examples of financial crisis with a current account surplus
- *Russia* is one: it had a large current account surplus when the financial crisis hit in 1998
- The *overvaluation* of the real exchange rate can be another indicator but not always a good one
- Level of *public debt* and borrowing requirements of the Treasury compared to the size of the domestic financial markets is also important
- There exists *no unfailing criteria* to detect crisis