Macroeconomics

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1. Measuring economic output
   - GDP
   - Inflation
2. Growth
   - Economic Growth
3. Money and Inflation
   - Money and Inflation
4. Economic policy
   - Fiscal and monetary policy

Motivation

- Microeconomics shows how individuals respond to market conditions (and their changes)
  - Government (or central bank) might want to change these conditions with certain **economic policy**
- We want to look at larger groups (**aggregation**)
  - We want a simplified description of the economy (important for individuals - planning, forecasting)
  - It is useful to measure general tendency of the development of prices (inflation/deflation), un/employment, and output (economic growth, note that output is also equal to income)
- Households own production factors, offer these to firms, firms produce goods that get consumed by households
  - production factor markets (labor market, capital market/loanable funds market), as well as a representation of the whole economy - AS/AD model

Motivation

- Daily news headlines:
  - Growth estimates - falling back into recession, overcoming the crisis etc.
  - Central Banks throughout the world perform quantitative easing setting *interest rates* close to zero
  - Europe faces *deflation*
  - Economic *growth* in China - considerably slower from 14% to 8.5%
- Macroeconomic issues often part of policy debates
- Macroeconomic situation influence politics considerably (eg labeling politicians successful or not)
- Macro-economists try to explain *quite complicated* system of all firms, people and events (*the* economy)
- Predictions are often imprecise ("Q: Why did God create economists? A: In order to make weather forecasters look good.")

Outline

GDP Definition

- Gross Domestic Product = market value of all final goods and services produced in a given economy in a given year
  - expressed in money paid for the goods and services
- Flow variable (sum per period)
- We can (equivalently) measure it as:
  - (Aggregate) Income
  - (Aggregate) Expenditure
- In the whole economy *Income* = *Expenditure* because each $ you spend is income for someone else
- Estimated by national statistical offices four times a year

GDP Content

- What is included in GDP?
  - Only the value of finished goods (byproducts don't count)
  - Only goods and services sold for the first time (re-selling the same car over and over is not generating value)
  - Inventories
- What is not included in GDP
  - Goods and services not sold on the market (e.g. household tasks - valuable, but not sold on a market) (could be quite significant in certain developing countries (undeveloped services sector)
  - Illegal activities ("black economy")
    - Unreported activities ("gray economy")

Real x Nominal GDP

- GDP is measured in monetary terms (tons of steel vs. books sold vs. haircuts performed etc.)
- **Nominal GDP** = sum of the products of quantity and (current) price for all goods and services $\Rightarrow$ change of either P or Q changes the product
  - nominal GDP influenced by price level changes $\rightarrow$ might be misleading ($\downarrow Q$ and more pronounced $\uparrow P \rightarrow \uparrow GDP_N$)
- **Real GDP** = sum of the products of quantity and (**constant**) price for all goods and services $\Rightarrow$ real GDP changes only with changes of Q, not P (prices fixed at the levels of certain year)
- **GDP Deflator** = $\frac{Nominal\ GDP}{Real\ GDP} \approx$ price level change (there are also other measurements of price level changes, PPI, CPI etc.)

GDP Decomposition

- National income accounts identity:
  - $Y = C + I + G + NX$
- Y Domestic product
- C Consumption, goods and services bought by households
- I Investment, goods bought for long-term production (machines, building etc.)
- G Government purchases (government expenditures)
- NX Net export or surplus with foreign countries ($NX = IM - EX$)

GDP's Importance

- Good proxy variable to assess economic performance of a country
- Per capita x Total $\Leftrightarrow$ Economic Power x Economic Level

#	Country	GDP (mil $)	GDP p/c ($)
1	USA	16,768,050	53,001 (#9)
2	China	9,469,124	6,959 (#82)
3	Japan	4,898,530	38,468 (#24)
4	Germany	3,635,959	44,999 (#18)
5	France	2,807,306	44,099 (#20)

- The more the better? Correlation between GDP and e.g. HDI (life expectancy, literacy etc.)
  - at the same time, criticized for ignoring other important aspects of quality of life
  - but GDP measurement was not developed to measure the quality of life...

Inflation

- Overall **increase** of price level
- Terms:
  - Inflation - increase
  - Deflation - decrease
  - Disinflation - inflation slowdown

Measuring Inflation

- GDP Deflator
- **Consumer Price Index** (CPI)
  - Arbitrary chosen prices important in standard **consumer's basket**
  - Including: Food, Transportation, Schools, Culture, Gasoline, Electricity...
- CPI aggregates price changes of selected goods in time
- CPI and Deflator similar but different
  - CPI watch fixed basket of goods with fixed weights
  - CPI updated only once a decade (because it needs to maintain consistency - otherwise the numbers are incomparalbe)$\Rightarrow$ is it still relevant?

Unemployment

- Adult population:
  - Labor force:
    - Employed
    - Unemployed
  - Others
- **Unemployment**: $u = \frac{Unemployed}{Labor\ force}$
- Labor force participation rate: $\frac{Labor\ force}{Adult\ population}$
- *Frictional* x *structural* x *cyclic* unemployment

Outline

Motivation

- If GDP really correlates with well-being then its *growth* its quite important
- Economy's ability to grow is one of its main atributes
  - Sustain relative wealth of rich countries
  - Improve relative and absolute wealth of poor ones
- Convergence theory: The poorer you are, the quicker you grow (does it hold?)

Determinants

- GDP growth is primarily affected by *productivity*
- Since GDP is sum of all production, producing more with the same population brings higher product (GDP)
- Productivity: *product per one worker-hour*
- It is not so simple...
  - productivity usually measured as a residual ("what is left unexplained by other factors")

Productivity

- Any change in productivity is conditioned by:
  - Physical capital - tools, machinery etc.
  - Human capital - knowledge, skills, experiences etc.
  - Natural resources - climate for agriculture, oil...
  - Technological knowledge - inventions, computers, management...
- Production function of an economy is thus expressed:
  - $Y = A.F(L, K, H, N)$

Pro-growth Public Policy

- What policies are considered to be good for growth?

1. Encouraging saving and investment
2. Foreign investment
3. Education
4. Property rights and political stability
5. Free trade
6. Control of population growth (poorer countries)
7. Research and Development

Catch-up

- Diminishing returns theory: The larger the capital stock of a country, the smaller impact of investments on growth
- Example:

Country	1960-1991 Invesment (% of GDP)	Growth
South Korea	23 %	7 %
USA	21 %	2 %

- This imply a chance for poor countries $\Rightarrow$*theory of convergence*
- Doesn't always work however

Outline

Money

- An asset used to buy goods, does not equal to wealth
- Three basic functions:
  - Medium of exange (making trade easier, avoiding barter)
  - Unit of account
  - Store of value
- Money is the most liquid asset

Money

- *Commodity x* ***fiat*** money
- Today's money consists of:
  - M1 - cash, deposits on demand
  - M2 - M1 + long-term deposits, assets in mutual funds etc.
- M1:M2 $\approx$ 1:4

Bank Sector

- Two-tier banking system
- Central Bank (ECB system, Czech National Bank, Federal Reserve System. . .)
  - Usually government-independent
  - Regulates circulating money
  - Its objective is either particular level of inflation or unemployment or both
  - Tools: interest rates, open-market operations, reserves requirements
- Commercial Banks (all others: Sberbank, Sparkasse, Société Générale. . .)
  - Lend money and accept deposits

Money Multiplier

- How is money created? Assume 10% reserves requirement
- 1st Bank

Assets		Liabilities	
Reserves	$ 10.00	Deposits	$ 100.00
Loans	90.00		

- 2nd Bank

Assets		Liabilities	
Reserves	$ 9.00	Deposits	$ 90.00
Loans	81.00		

- 3rd Bank...

Money Multiplier

- Original deposit \$ 100.00 induces additional \$ 90.00, 81.00, 72.90... = \$ 1,000.00
  - $original\ deposit + \sum(1 - reserves) \times (additional\ deposit)$
  - $100 + 0.9 \times 100 + 0.9 \times 90 + 0.9 \times 81... = 1000 = 10 \times 100$
  - Multiplier in this example is $10 = \frac{1}{reserve\ requirement}$
- CB does not control money directly, but through commercial banks via money multiplier
- CB especially does not control
  - household's behavior, how much HH deposit
  - bankers willingness to lend

Quantitative Money Theory

- $M \times V = P \times Y$
- M- money, V - velocity of money, P - price level, Y - real product
  - or in marginal values: $m.v = \pi.g$
    - m- money growth, v - velocity change, π - inflation, g - (economic) growth
- Explains inflation and deflation eg:
  - Long lasting slight deflation between 1870-1914
  - Hyperinflations (e.g. Germany 1923, Zimbabwe - but in fact, nearly every decade there is a hyperinflation somewhere in the world)
  - Recent fear of deflation in the West

Outline

Economic policy

- Fiscal policy - government expenditures
  - in additon, governments may seek its goals by other means - taxation, regulation (e.g. minimal wage etc.), trade policy (tariffs, quotas), wealth/income redistribution
  - typical (proclaimed) target: stabilizing policy / growth policy
- Monetary policy - actions of central bank
  - Typical (proclaimed) target: inflation targeting, other goals: exchange rate, interest rates
  - Impossible Trinity (Trilemma): pick two out of the following three:
    - An independent monetary policy; Free capital movements; A fixed foreign exchange rate

Economic policy

- Macroeonomics heavily influenced by various assumptions of their models
  - but real economy very complex - what is "right"?
- A basis of **interventionism**
- Popular in Keynesian schools of thought (Keynesians claim markets fail to clear (in SR) - so "somebody (government) has to intervene")
  - today's "mainstream economics = "neoclassical" microecnomics + "Keynesian" macroeconomics
    - Other approaches valid, but central banks and governments are in general in favor of interventions
  - government has to act (on macro-level) to restore the growth path... ("fighting recessions")
    - Some argue that governments only make it worse
  - Keynesian schools of thought favor demand side interventions

ASAD model