Macroeconomics is the study of income

ECONOMIC POLICIES TRY TO HELP COUNTRIES ENJOY STRONG AND STABLE GROWTH IN INCOMES
What is macro about?

- Macroeconomics is the study of income.
  - Why do incomes vary over time?
  - Why do they differ across countries?
  - Why do they differ among people?

- If we try to answer all these questions at the same time, we may not be any to answer any. So we take it one step at a time.

- First, we ignore variation among people within a country. We pretend that everyone within a country makes the average income of that country.

- Second, we make a distinction between short-run changes in income and long-run changes in income.
Income: Long Run vs. Short Run

• The long-run component of income is called the trend or potential income.

• Fluctuations around the trend or potential are the short-run component of income.
  
  • When income is above trend, the economy is said to be in the boom phase of the cycle or in an expansion; when income trend, the economy is experiencing a slowdown or a slump.

  • Output gap: the difference between income and its trend (or potential)
    – Negative output gap: income is below trend
    – Positive output gap: income is above trend
Main indicator of interest

Eye of the bird: Real income per person
(a.k.a. real GDP per capita, real output per capita)

Other indicators:
Unemployment rate
Inflation rate
Interest rate
Exchange rate
U.S. real income per person (a.k.a. US real GDP per capita)

Note: Data for 1929–2014 are from the U.S. Bureau of Economic Analysis, NIPA Table 7.1. Data before 1929 are spliced from Maddison (2008).
There are two main components of real GDP (or of real GDP per capita)

- The first is the **trend**. The trend is generally upward and reflects technological progress and ‘factor accumulation’

- The second component is the **business cycle (or cyclical fluctuations)**. This refers to the movements around the trend.

  - When real GDP is above its long-run trend, the economy is said to be in the boom phase of the cycle or in an expansion; when real GDP is below its long-run trend, the economy is experiencing a slowdown or a slump.

  - Output gap (or GDP Gap): the difference between real GDP and its long-run trend
    - When output is about its long-run trend, the GDP gap is positive
    - When output is below its long-run trend, the GDP gap is negative
UNDERSTANDING TREND INCOMES
Catch-up growth over last half-century
Real GDP per equivalent adult – log scale
Constant 2005 US$ (PWT 6.3 data)
Growth over last half-century in selected countries
Real GDP per equivalent adult – log scale
Constant 2005 US$ (PWT 6.3 data)
Two short-cuts to understanding macro

<table>
<thead>
<tr>
<th>• Comparing micro and macro</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Fish demand and supply</td>
</tr>
<tr>
<td>– Aggregate demand and aggregate supply</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>• Parable of Robinson Crusoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Circular flow of income</td>
</tr>
<tr>
<td>– Aggregate demand and aggregate supply</td>
</tr>
</tbody>
</table>
National income identity

The expenditure approach to measuring GDP
• Measures total spending on final goods and services produced within a nation during a specified period of time

• Four main categories of spending: consumption \((C)\), investment \((I)\), government purchases of goods and services \((G)\), and net exports \((NX)\)

• \(Y = C + I + G + NX\)
Inputs, Output and Efficiency
A General View of Growth

- $Y = F(\text{Policies, Institutions, Geography, Shocks or Something Else})$

- Policies
  - Macroeconomic Policies
  - Openness to trade

- Institutions
  - Extent of Rule of Law; Protection of Property Rights; Quality of Bureaucracy

- Geography;
  - Sachs: the “bad latitude” problem; Jared Diamond’s “guns, germs and steel”

- Shocks
  - Terms of trade shocks
  - Political conflict
  - Financial crises

- Something Else
  - Foreign Aid?
  - Resource Curse?
  - Expectations/Motivation?
**Sustained high growth in developing economies is a post-World War II phenomenon.**

<table>
<thead>
<tr>
<th>Economy</th>
<th>Period of high growth</th>
<th>Per capita income At start of growth period</th>
<th>2005¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botswana</td>
<td>1960-2005</td>
<td>210</td>
<td>3,800</td>
</tr>
<tr>
<td>Brazil</td>
<td>1950-1980</td>
<td>960</td>
<td>4,000</td>
</tr>
<tr>
<td>China</td>
<td>1961-2005</td>
<td>105</td>
<td>1,400</td>
</tr>
<tr>
<td>Hong Kong SAR</td>
<td>1960-1997</td>
<td>3,100</td>
<td>29,900</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1966-1997</td>
<td>200</td>
<td>900</td>
</tr>
<tr>
<td>Japan</td>
<td>1950-1983</td>
<td>3,500</td>
<td>39,600</td>
</tr>
<tr>
<td>Korea</td>
<td>1960-2001</td>
<td>1,100</td>
<td>13,200</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1967-1997</td>
<td>790</td>
<td>4,400</td>
</tr>
<tr>
<td>Malta</td>
<td>1963-1994</td>
<td>1,100</td>
<td>9,600</td>
</tr>
<tr>
<td>Oman</td>
<td>1960-1999</td>
<td>950</td>
<td>9,000</td>
</tr>
<tr>
<td>Singapore</td>
<td>1967-2002</td>
<td>2,200</td>
<td>25,400</td>
</tr>
<tr>
<td>Taiwan Province of China</td>
<td>1965-2002</td>
<td>1,500</td>
<td>16,400</td>
</tr>
<tr>
<td>Thailand</td>
<td>1960-1997</td>
<td>330</td>
<td>2,400</td>
</tr>
</tbody>
</table>


**Note:** A 7 percent cutoff was chosen because growth at these rates produces very substantial changes in incomes and wealth: Income doubles every decade at 7 percent.

¹In constant 2000 U.S. dollars.

**The five common characteristics of sustained high growth**

- Openness
- Import knowledge
- Exploit global demand

- Leadership and governance
- Credible commitment to growth
  - Credible commitment to inclusion
  - Capable administration

- Macroeconomic stability
- Modest inflation
- Sustainable public finances

- Market allocation
- Prices guide resources
- Resources respond to prices

- Future orientation
  - High investment
  - High saving rates
INCOME INEQUALITY
U.S. real income per person (a.k.a. US real GDP per capita)

Note: Data for 1929–2014 are from the U.S. Bureau of Economic Analysis, NIPA Table 7.1. Data before 1929 are spliced from Maddison (2008).
GDP per person, Top 0.1% and Bottom 99.9%
## Basic Facts About Income Inequality

<table>
<thead>
<tr>
<th>Concept of income inequality</th>
<th>Cross-country inequality</th>
<th>Within-country inequality</th>
<th>Global inequality</th>
</tr>
</thead>
<tbody>
<tr>
<td>What it measures</td>
<td>Inequality of <em>average</em> incomes across countries</td>
<td>Differences between incomes of the rich and the poor within a country</td>
<td>Differences between incomes of the rich and the poor, ignoring the country to which they belong</td>
</tr>
<tr>
<td>What the evidence shows</td>
<td>Divergence</td>
<td>Increasing inequality in many countries (for example, Brazil, China, United States), but low and stable levels in many others (for example, Canada, France, Japan)</td>
<td>Convergence</td>
</tr>
</tbody>
</table>
‘Global Inequality’ ("Imagine there’s no countries"): Evolution of the World Distribution of Income
Inclusive Growth

“A unifying framework for all this [new] work can be summarized in two words: Inclusive growth. We want growth, but we also want to make sure:

• that people have jobs—this is the basis for people to feel included in society and to have a sense of dignity;

• that women and men have equal opportunities to participate in the economy—hence our focus on gender;

• that the poor and the middle class share in the prosperity of a country—hence the work on inequality and shared prosperity;

• that, as happens, for instance when countries discover natural resources, wealth is not captured by a few—this is why we worry about corruption and governance;

• that there is financial inclusion—which makes a difference in investment, food security and health outcomes; and

• that growth is shared just not among this generation but with future generations—hence our work on building resilience to climate change and natural disasters.”

Unemployment

- Two components of unemployment rate
  - Cyclical unemployment – related to the business cycle
    - Natural rate of unemployment – the unemployment that would prevail even in the absence of business cycles (even at “full-employment’)

- In a slump, the actual unemployment rate rises above the natural rate; cyclical unemployment is high
- In a boom, the actual unemployment rate falls below the natural rate; cyclical unemployment is low.
Actual and natural rates of unemployment in the U.S., 1960-2007

Unemployment rate

Natural rate of unemployment

Percent of labor force

UNDERSTANDING CYCLICAL RELATIONSHIPS
List of Figures
(see Data_National Sheet in ‘Okun’ Database)

• **Real Income**
  – Plot of raw data
  – Plot of logged data and trend (HP)
  – Plot of cycle component (HP)
  – Plot of logged data, trend and cycle (HP)

• **Unemployment Rate**
  – Plot of raw data
  – of data and trend (HP)
  – Plot of cycle component (HP)
  – Plot of data, trend and cycle (HP)
  – Cycle components between U and Y

• **Unemployment Rate**
  – Plot of data and trend (average)
  – Plot of cycle component (average)
  – Plot of data, trend and cycle (average)
  – Cycle components between U (average) and Y (HP)
Real Per Capita Income

Real Per Capita Income, Thousands of 1982-84 Dollars

Real Income – HP Trend

Real Per Capita Income

Real Per Capita Income, Thousands of 1982-84 Dollars

- Real Per Capita Income
- Trend Component

Real Income – Cycle
(after removing HP trend)
Real Income – Trend and Cycle
Unemployment Rate

[Graph showing the unemployment rate from 1980 to 2020, with peaks around 1983, 2008, and 2020.]
Unemployment Rate – HP Trend
Unemployment Rate – Cycle (after removing HP trend)
Unemployment Rate – Trend and Cycle
Cyclical Components of Output (Income) and Unemployment
Unemployment Rate
Trend = Sample Average
Unemployment Rate – Cycle
(Deviations around Sample Average)
Unemployment Rate – Trend and Cycle
Cyclical Components –
Real Income (HP), UR (Average)
Okun’s Law  
(“Levels” or “Gap” version)

\[ u_t - u_t^* = \beta (\ln y_t - \ln y_t^*) + \varepsilon_t \quad \beta < 0 \]

\[ u = \text{unemployment rate} \]
\[ u^* = \text{natural rate of unemployment} \]

\[ \ln y = \text{natural log of output (or output per capita)} \]
\[ \ln y^* = \text{natural log of potential output (or output per capita)} \]

We measure \( u_t^* \) and \( y_t^* \) with HP filter (“lambda” = 100).
Okun’s Law
(“Changes version”)

\[ \Delta u_t = \alpha + \beta y_t + \omega_t \]

\[ \Delta u = \text{change in unemployment rate} \]
\[ (\text{i.e. } \Delta u_t = u_t - u_{t-1}) \]

\[ y = \text{growth rate of real GDP} \]

• The “changes” version follows from the “levels” or “gap” version under certain assumptions (for example, if \( u^* \) and \( \Delta y^* \) are constant)
Estimates of Okun’s Law

<table>
<thead>
<tr>
<th></th>
<th>Gaps Version</th>
<th></th>
<th>Changes Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemp. Cycle</td>
<td>-0.44***</td>
<td>Change in Unemp.</td>
<td>-0.40***</td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td></td>
<td>(0.05)</td>
</tr>
<tr>
<td>Constant</td>
<td>N/A</td>
<td>Constant</td>
<td>0.47***</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td></td>
<td>(0.12)</td>
</tr>
<tr>
<td>Obs</td>
<td>41</td>
<td>Obs</td>
<td>40</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.69</td>
<td>R-sq</td>
<td>0.60</td>
</tr>
</tbody>
</table>
The flattening of the “Phillips Curve”

From its peak in the 1970s, the average level of inflation has fallen as a result of central banks’ disinflationary policies. What is also noticeable is that the relationship between cyclical unemployment and inflation appears to have moderated as the level has fallen.
THE ROLE OF MONETARY POLICY:
1) KEEP AVERAGE INFLATION LOW
2) STABILIZE CYCLICAL FLUCTUATIONS
Many different interest rates

• For this lecture:
  – Policy interest rate (can be “set” by central bank)
  – Short-term interest rate
  – Long-term interest rate

• Each of these interest rates can be decomposed into a part that is “real” and a part due to “expected inflation”

• An assumption we make is that by changing the policy interest rate the central bank can influence other interest rates

• The relationship among short-term and long-term interest rates is called the ‘yield curve’ or the ‘term structure of interest rates’
"I bought Billy an educational toy..."

"Wham!"

"POP!"

"Wham! Wham! Wham!"

"Wham! Wham! Wham!"

"POP! POP! POP!"

"I'm hoping he grows up to be Fed Chairman!"
How Should Central Banks Set the Policy Rate?
The Taylor Rule

\[ r_{cb} = 2 + 0.5(p - 2) + 0.5(GDP \text{ Gap}) \]

- \( n_{cb} \) = nominal federal funds rate
- \( r_{cb} = n_{cb} - p \) = real federal funds rate
- \( GDP \text{ Gap} = 100 \times \frac{Y - Y^*}{Y^*} \)

- The first ‘2’ in the equation is the neutral (long-run) real interest rate (assumed to be 2 percent)
- The second ‘2’ in the equation is the inflation target (assumed to be 2 percent)
- The two ‘0.5’ numbers are values that held for the U.S. in the 1980s and 1990s. They can be different over other periods, and can differ by country.
Taylor Rule (continued)

\[ r_{cb} = 2 + 0.5(p - 2) + 0.5(GDP \text{ Gap}) \]

- If \( p = 2 \) and output is at potential, then monetary policy targets the real policy rate at 2% (and therefore the nominal policy rate is 4%).
- For each percentage point increase in \( p \), monetary policy should be ‘tightened’ by raising the real policy rate by 0.5 percentage points.
- For each percentage point that GDP falls below potential, monetary policy should be ‘eased’ by reducing the real policy rate by 0.5 percentage points.
CENTRAL BANK ACTIONS:
FROM THE SHORT RUN TO THE LONG RUN
When the Fed Wants to “Loosen”

Fed buys T-bills from banks

Fed pays for the T-bills by writing a cheque: injecting liquidity

Banks now have more cash than they want to hold

Banks that want to borrow from other banks can do so at a lower fed funds rate

Fed injects liquidity until fed funds rate has fallen to the Fed’s set “target”

money is cheap
Transition from Short Run to Long Run (1)

• Interest rates and money supply
  – Raising policy interest rates is similar to curbing growth of money supply.
  – Lowering policy interest rates is similar to raising the growth rate of the money supply.

• In the short run, the central bank lowers policy interest rates (i.e. raises the growth rate of the money supply) to stimulate the economy (bring output back to trend; close the output gap)

• But it lowering policy interest rates stimulates the economy, shouldn’t the central bank always keep interest rates low?
Transition from Short Run to Long Run (2)

• ‘Good’ scenario:
  – Central bank has lowered rates because the economy is in a slump (output gap is large). In this case, inflation may not go up much; plus, some stimulus can be justified even if inflation does go up a bit
  
  – The central bank has credibility, that is, people expect it to keep its (medium- to long-run) inflation target. This means that people expect that interest rates will be raised back to neutral once the output gap has closed. Hence, inflation expectations remain anchored.
• ‘Bad’ scenario(s):

- Wrong reasons: Central bank has lowered rates even though the economy is not in a slump (output gap is zero). Or, the central bank may have made a mistake about the size of the output gap. In these cases, inflation may go up (and the stimulus cannot be justified on the grounds that it is helping the economy recover from a slump).

- Right reasons, poor credibility: Central bank may have lowered reasons for the right reasons (economy is indeed in a slump) but it has poor credibility. That is, people expect it will not keep to (or have difficulty keeping to) its medium- to long-run inflation target. This means that people expect that interest rates will not be raised back to neutral once the output gap has closed. Hence, inflation expectations can get unanchored.

- Wrong reasons, poor credibility: Worse case scenario – inflation may kick up because central bank has intervened at the wrong time; and problem is compounded as inflation expectations get unanchored.
CENTRAL BANK ACTIONS:
THE LONG RUN
Normal economic growth requires a certain amount of money supply growth to facilitate growth in transactions. Money growth in excess of this amount leads to inflation. Inflation is “too much money chasing too few goods”

[Note: we’re simplifying by assuming that the ‘velocity of money’ is constant.]

As we have learnt, in the long-run, $\Delta Y/Y$ (growth rate of real GDP) depends on growth in inputs and on technological progress.

Hence, the Quantity Theory of Money predicts a long-run one-for-one relation between changes in the money growth rate and changes in the inflation rate.

Note: During hyperinflations, the quantity theory of money can hold even in the short run.
A monetary expansion leads to an increase in output in the short run but has no effect on output in the medium run.

The difference between $Y$ and $Y_n$ sets in motion the adjustment of price expectations.

In the medium run, the AS curve shifts to $AS''$ and the economy returns to equilibrium at $Y_n$.

The increase in prices is proportional to the increase in the nominal money stock.
U.S. data on inflation and money growth, decade averages
International Data on Inflation & Money Growth

Inflation rate (percent, logarithmic scale)

Money supply growth (percent, logarithmic scale)
Understanding Hyperinflations

Three ways to finance G

• Taxation

• Borrowing

• Inflation
Hyperinflation

**What is it?**
- $\pi \geq 50\%$ per month

**What causes it?**
- Excessive money supply growth.

**Does that work?**
- Only for a short time.
  - Because money ceases to function as a store of value, and may not serve its other functions (unit of account, medium of exchange), people start conducting transactions with barter or a stable foreign currency.
  - Because people are no longer willing to subject themselves to the “inflation tax,” it ceases to be a source of revenue for the government.

**How is it stopped?**
- Proximate step: stop printing money.
  - At a more fundamental level: it requires a credible announcement of government fiscal reform (i.e. cuts in government spending, increases in tax revenue, new sources of borrowing or some combination of all three) and follow-through.
### ‘Classic’ hyperinflations

#### Seven Hyperinflations of the 1920s and 1940s

<table>
<thead>
<tr>
<th>Country</th>
<th>Beginning</th>
<th>End</th>
<th>(P_T/P_0)</th>
<th>Average Monthly Inflation Rate (%)</th>
<th>Average Monthly Money Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Oct. 1921</td>
<td>Aug. 1922</td>
<td>70</td>
<td>47</td>
<td>31</td>
</tr>
<tr>
<td>Germany</td>
<td>Aug. 1922</td>
<td>Nov. 1923</td>
<td>1.0 x 10^{10}</td>
<td>322</td>
<td>314</td>
</tr>
<tr>
<td>Greece</td>
<td>Nov. 1943</td>
<td>Nov. 1944</td>
<td>4.7 x 10^{6}</td>
<td>365</td>
<td>220</td>
</tr>
<tr>
<td>Hungary 1</td>
<td>Mar. 1923</td>
<td>Feb. 1924</td>
<td>44</td>
<td>46</td>
<td>33</td>
</tr>
<tr>
<td>Hungary 2</td>
<td>Aug. 1945</td>
<td>Jul. 1946</td>
<td>3.8 x 10^{27}</td>
<td>19,800</td>
<td>12,200</td>
</tr>
<tr>
<td>Poland</td>
<td>Jan. 1923</td>
<td>Jan. 1924</td>
<td>699</td>
<td>82</td>
<td>72</td>
</tr>
<tr>
<td>Russia</td>
<td>Dec. 1921</td>
<td>Jan. 1924</td>
<td>1.2 x 10^{5}</td>
<td>57</td>
<td>49</td>
</tr>
</tbody>
</table>

\(P_T/P_0\) is the price level in the last month of hyperinflation divided by the price level in the first month.
Episodes of Hyperinflation in the 1980s
MONETARY POLICY IN OPEN ECONOMIES: THE IMPOSSIBLE TRINITY
Interest Rate Parity

- If domestic and foreign assets are considered perfect substitutes, then we expect interest parity to hold on average:

\[ r_t - r_{w_t} = \frac{(X_{t+1}^e - X_t)}{X_t} \]

- That is, the interest rate differential between the domestic \((R_t)\) and foreign interest rate \((r_{w_t})\) should be zero, unless the market expects changes in the exchange rate.
  - In practice, interest rate differentials fail to predict large swings in actual exchange rates and even fail to predict which direction actual exchange rates change. Why?

- It could be because domestic and foreign assets are imperfect substitutes. Changes in risk premiums \((\rho_t)\) may drive deviations from interest rate parity

\[ r_t - r_{w_t} = \frac{(X_{t+1}^e - X_t)}{X_t} + \rho_t \]
Example of Interest Rate Parity

We should expect that interest rates on offshore currency deposits and those on domestic currency deposits within a country should be the same if

– the two types of deposits are treated as perfect substitutes,
– assets can flow freely across borders and
– international capital markets are able to quickly and easily transmit information about any differences in rates.
Example of interest rate parity:
Comparing Onshore and Offshore Interest Rates for the Dollar

Source: Board of Governors of the Federal Reserve, monthly data.

London three-month Eurodollar rate less U.S. three-month certificate of deposit rate.
Lack of interest rate parity
(and illustration of risk premium)
Interest Rate Parity (IRP) and Monetary Policy Choices

IRP imposes limits on central bank’s monetary independence.

Why?

• Assume capital can flow in unlimited amounts between domestic and foreign country.
• Suppose now the domestic central bank were to try to keep exchange rates steady.
• At the same time, suppose also that it tries to adjust interest rates (say upwards) in order to attain a separate inflation target.
• Under fully-integrated capital markets, higher domestic interest rates ⇒ large capital inflow into the domestic economy.
• Capital flows in ⇒ the value of the domestic currency will have to go up versus the foreign currency—i.e., appreciation of the domestic currency.
• So the exchange rate cannot be held steady if the interest rate objective takes primacy.
• Suppose now the central bank wants to keep its currency from appreciating.

• To prevent appreciation it must either inject more domestic currency into the market directly, or buy up foreign currency with domestic currency.

• Either way, the domestic currency it issues or pays out is new money ⇒ expansion in domestic liquidity

• Expansion in domestic liquidity ⇒ interest rate falls

• So the interest rate target cannot be achieved if the fixed exchange rate takes primacy.
Conclusion: One of the three must go. Either

• A central bank must give up trying to maintain stability in exchange rates and allow the currency to be determined by the market forces that work through arbitrage, or

• A central bank must give up its independence in setting domestic interest rates; that is, it must align its domestic objectives with the objective of keeping exchange rates stable, or

• Something has to be done to limit capital flows and break the arbitrage that ties together exchange rates and interest rates.
Breaking the Arbitrage that Ties Interest Rates and Exchange Rates:

• The ability to conduct full arbitrage between local and global capital markets depends on the degree to which capital is allowed to flow between the two sets of markets—the degree of capital market integration or linkage between domestic and global markets.

• The degree of capital market integration often depends on the level of development and sophistication of local financial markets and institutions. But it can also be a policy choice
Degree of Capital Market Integration:

- “Full” or complete capital market integration: Few or no legal restrictions or natural market barriers on capital flows between domestic and global capital markets, particularly on currency-related transactions.

⇒ No limit on volume of capital flows between markets. Convertibility of currency on capital account (not just current account).

⇒ Feasible to conduct unlimited arbitrage whenever it makes sense to.
Degree of Capital Market Integration:

- Less than complete capital market integration: Significant capital or exchange controls limit the volume of capital that can flow between domestic and global markets.

⇒ Capital markets are segmented and arbitrage between from one market to another is expensive or impossible.
"Impossible Trinity"

"Impossible Trinity" or Policy Trilemma—The following three things are incompatible:

- Fully integrated capital markets (which would require interest rate parity)
- Independent or autonomous monetary policy (i.e., CB can target policy interest rates, as in the Taylor’s Rule we discussed)
- Fixed ("stable") exchange rates (x)
Monetary Policy in ‘Small’ Open Economies

The Impossible Trinity

- Perfect Capital Mobility
- United States
- Hong Kong
- Monetary Policy Autonomy
- China
- Stable Exchange Rates
Savings, Investment and the Financial Sector

• Financial sector = Intermediary

• Accepts savings (part of income that is not consumed) from workers in the form of deposits

• Makes loans to firms who carry out the investment
Savings and Investment in a Global Economy

- **trade surplus**: exports greater than imports (means domestic savings are greater than domestic investment)
- **trade deficit**: imports > exports (means domestic savings are less than domestic investment)
- a country with a trade deficit is a net borrower from the rest of the world
THE ROLE OF FISCAL POLICY: IMPORTANT FOR BOTH TREND AND CYCLE
Role of Government

Government’s decisions:

• Decide how much to spend: G

• Decide how to finance the spending
Deciding how much to spend

• Is it something that the private sector does not already provide? (e.g. defense)

• Does it add to the productivity of the economy? (e.g. infrastructure)

• Does it give happiness? (e.g. public parks)

• Does it meet distributional goals? (e.g. transfers; unemployment benefits during recessions)
Decide how to finance the spending

Three ways to finance G

• Taxation

• Borrowing

• Inflation
Deciding whether to tax or borrow

- One option: “balanced budget rule” (government spending should equal tax revenues each year)

- Why balanced budget rule may not be a good idea
  - Suppose government spending goes up temporarily (e.g. due to war); under balanced budget rule, would have to raise tax revenues
  - Suppose economy goes into recession (income is less than potential), and so tax revenues drop; under balanced budget rule, options would be either to cut spending or raise tax rates

- A better rule
  - Finance temporary increases in government spending or temporary shortfalls in tax revenues by borrowing
  - Finance permanent increases in government spending by a permanent increase in tax revenues
U.S. Debt-to-GDP ratio

Source: Finance and Development, March 2009; Paying the Piper, Carlo Cottarelli.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Long Run</th>
<th>Short Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>- Called ‘natural rate of unemployment’</td>
<td>- Generally related to the cycle in incomes</td>
</tr>
<tr>
<td></td>
<td>- Depends on institutions &amp; policies</td>
<td>- Relationship is called Okun’s Law</td>
</tr>
<tr>
<td>Inflation</td>
<td>- Depends on institutions and policies</td>
<td>- Can be related to cycle in incomes</td>
</tr>
<tr>
<td></td>
<td>- Often related to difference between growth in money supply and income (or output) growth; relationship is called the ‘Quantity Theory of Money’</td>
<td>- Relationship is called Phillips Curve</td>
</tr>
<tr>
<td></td>
<td>- Many central bank set an ‘inflation target’ for the medium- to long run</td>
<td>- Phillips Curve has ‘flattened’ in recent years</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>- Depends on balance between saving and investment</td>
<td>- Can be influenced by actions of the central bank</td>
</tr>
<tr>
<td></td>
<td>- Distinction between ‘nominal’ and ‘real’ interest rates</td>
<td>- Central banks set interest rate targets based on output gaps and inflation gaps (Taylor Rule)</td>
</tr>
<tr>
<td></td>
<td>- Nominal interest rate = real interest rate + expected inflation (Fisher equation)</td>
<td>• Output gap = difference between output and trend</td>
</tr>
<tr>
<td></td>
<td>- Called the neutral rate ($r^*$)</td>
<td>• Inflation gap = difference between inflation and target</td>
</tr>
<tr>
<td>Exchange Rates</td>
<td>- Related to long-run difference in incomes (productivity) – the Balassa-Samuelson effect</td>
<td>- Related to movements in interest rates (interest rate parity)</td>
</tr>
</tbody>
</table>