Let’s continue with our three-lecture overview of international economics. Last class we talked about some nuts and bolts of international trade, which is considered the micro branch of international economics. Today we’ll first review some of the analytical tools from last lecture in more detail, and then we’ll turn towards international finance, which is considered the macro branch of international economics. Then we’ll develop a couple of simple models of the open economy, or open economy macroeconomics.

Note that in the economic model we have developed in this course, the neoclassical model of economics, trade is efficient and thus should always be encouraged on that ground but one can also think of arguments against that view (equity, natl security, etc.)

In order to open the economy, we’re going to allow for trade of goods and services, as well as financial capital flows. In addition we’ll need to model the market for foreign currency, in which the price will be known as the exchange rate e.

So we add back in the fourth element of AD:  \( AD = C + I + G + NX \)

What determines the level of NX?

\[ NX = X - M \] (M not to be confused with money)

We can analyze what affects exports X and imports M separately.

Our exports are other counties’ imports and vice-versa.

So if we can explain why we demand goods from other countries, we also have a theory for why they demand our goods.

So let’s just model the function for M:

\[ M = f(Y,e) \]

\( e = \) exchange rate (can think of this as the price of goods in other countries relative to ours)
\( Y = \text{income} \)

Assuming imports are a normal good, as our national income rises we demand not only more \( C \), but also more \( M \)

that means for the other countries, that \( X = f(Y^*,e) \)
where \( Y^* \) is the income level in the other countries (can just think of us as trading with one other country if you want to simplify your thinking on this matter)

so \( NX = f(e,Y,Y^*) \); can write as \( f(e, Y/Y^*) \)

\( NX \) is negatively related to \( Y \) (increases in \( Y \) make imports rise so make \( NX \) smaller), positively related to \( Y^* \) and negatively related to \( e \)

what determines \( e \)?
It is the price of buying a $ in terms of another currency (again, easiest probably to just think of us as having one other country or set of countries, say the Euro bloc or China, to think through these problems)

compare foreign exchange market for US$ with price \( (e) \) of \( €/$, and market for Euros with price \( (1/e) \) of $/€—use correct Euro symbol€ -basically an epsilon with two crossbars

my favorite exchange rate site: http://www.x-rates.com/

the two actual prices from Tue. Apr. 5 as you see in x-rates.com: .71 €/$ and $1.42/€

the demand and supply of currency in the foreign exchange market are derived demand and supply from people who either want to buy goods and services, or financial assets

what happens if income rises in the U.S.? [cet. par.]
--demand for imports increases and the U.S.$ depreciates (shift rightward of supply of U.S. currency in the $ market; same as shift rightward of demand in the Euro market)

what happens if interest rates rise in the U.S. (including increase in stock market returns)?
--demand for U.S.$ increases and demand for other currency (use the Euro) decreases, so both curves shift; in the $ market, demand shifts right and supply shifts left, so both forces lead to an
appreciation of the $; meanwhile in the Euro market, supply shifts right and demand shifts left, so both forces lead to a depreciation of the Euro.

what happens if price levels change? say the price level in the U.S. rises? again, assume it is a change relative to another country --demand for U.S.$ decreases and demand for other currency (e.g. the Euro) increases, so both curves shift; in the $ market, demand shifts left and supply shifts right, so both forces lead to an depreciation of the $; meanwhile in the Euro market, supply shifts left and demand shifts right, so both forces lead to an appreciation of the Euro.

note if interest rates or prices are rising everywhere by the same amount, then there is no effect on the exchange rate

what if US prices are rising (i.e., inflation)? then the exchange rate moves in the opposite direction and offsets this rise
consider the theory of purchasing power parity, which says that goods should cost the same in different countries once the exchange rate is taken into account

plug a webpage for understanding this somewhat challenging concept further (some people get it right away, some people need to think about it for awhile):
http://economics.about.com/cs/money/a/purchasingpower.htm

see the Economist’s big mac index as a way to illustrate the idea:
http://www.economist.com/node/17257797?story_id=17257797
why is Switzerland so high?

also interesting to note how much price variation there is within countries and also within trading blocs:
http://www.economist.com/node/17361454?story_id=17361454

next class we’ll continue this discussion by developing our formal macroeconomic model further and explicitly modeling capital flows so that interest rates get into this model too, since they don’t appear in the NX function
Why trade?

- Buy/import resources one is lacking, sell/export those one has in abundance
- Buy/import goods which are relatively inefficient to produce, sell/export those where one has comparative advantage
- Specialization may permit economies of scale in production for additional comparative advantage
- Thus mutual gains from voluntary trade are possible

Absolute and comparative advantage

- Absolute advantage in the production of a particular good: the agent can produce a good using smaller quantities of resources than can another agent
- Comparative advantage: the agent can produce a good at lower opportunity cost than can another agent (i.e., more efficiently)
- An agent may be at an absolute disadvantage in all goods and still have a comparative advantage in at least one good

Why trade? (cont.)

- When agents differ in the relative efficiency with which they produce different goods, both total output and the welfare of each agent can be increased if each agent specializes in producing the goods for which it has a relative advantage, and then they trade

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Alternative Outputs from One Year of Labor Input</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>In the U.S.</td>
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<tr>
<td>Computers</td>
<td>50</td>
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<tr>
<td>Televisions</td>
<td>50</td>
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<table>
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<tr>
<th>TABLE 3</th>
<th>Example of the Gains from Trade</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>U.S.</td>
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<tr>
<td>Computers</td>
<td>+25,000</td>
</tr>
<tr>
<td>Televisions</td>
<td>-25,000</td>
</tr>
</tbody>
</table>
Supply and demand in international trade

- PPFs for two countries illustrate their different opportunity costs and the potential gains from trade

**Figure 2**
The Gains from Trade

Supply and demand in international trade (cont.)

- In a two-country model without trade restrictions:
  - the price of the good must be the same in both countries
  - the quantity of the good exported from one country must equal the quantity imported by the other

Supply and demand in international trade (cont.)

- Note that factor prices need not equilibrate completely, but this implies pressure towards equalization
- A country can benefit from trade even if wages in the other country are considerably lower than its own wages
What is an exchange rate?

- The price, in terms of one currency, at which one unit of another currency can be bought

Supply and demand in currency markets

- Sources of supply and demand:
  - international trade in goods and services
  - international trade in physical capital
  - international trade in financial capital
- Demand is derived from the demands of foreigners for export goods and services and for domestic assets (capital)
- Supply is derived from the demands of residents for import goods and services and for other countries’ assets (capital)

What is an exchange rate? (cont.)

- In a free exchange system, the exchange rate is the equilibrium price, determined by the intersection of supply and demand
- In a free/floating exchange system, a currency appreciates when its price rises, and depreciates when its price falls (in both cases, relative to the currency in which its price is denominated)
- In a fixed exchange system, the corresponding movements are called revaluation and devaluation.

Supply and demand in currency markets (cont.)

- What sorts of things shift the supply and/or demand curves?
  - changes in a country’s income
  - changes in relative interest rates
  - changes in relative prices

The international monetary system (part 1)

- What is an exchange rate?
- Supply and demand in currency markets

### TABLE 1

<table>
<thead>
<tr>
<th></th>
<th>1975</th>
<th>2003</th>
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<tbody>
<tr>
<td>France</td>
<td>73%</td>
<td>96%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>55</td>
<td>93</td>
</tr>
<tr>
<td>Spain</td>
<td>41</td>
<td>68</td>
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<td>Japan</td>
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<tr>
<td>Mexico</td>
<td>24</td>
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<tr>
<td>Canada</td>
<td>99</td>
<td>88</td>
</tr>
</tbody>
</table>

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Supply and demand in currency markets (cont.)

- The theory of Purchasing Power Parity is that exchange rates will adjust in the long run so that the same good costs the same no matter what currency it is measured in.
- If PPP holds, the exchange rate will reflect the difference in price levels between two countries.

Supply and demand in currency markets (cont.)

- To summarize, exchange rates will tend to appreciate for countries whose:
  - economic growth rates are lower
  - interest rates are higher
  - inflation rates are lower