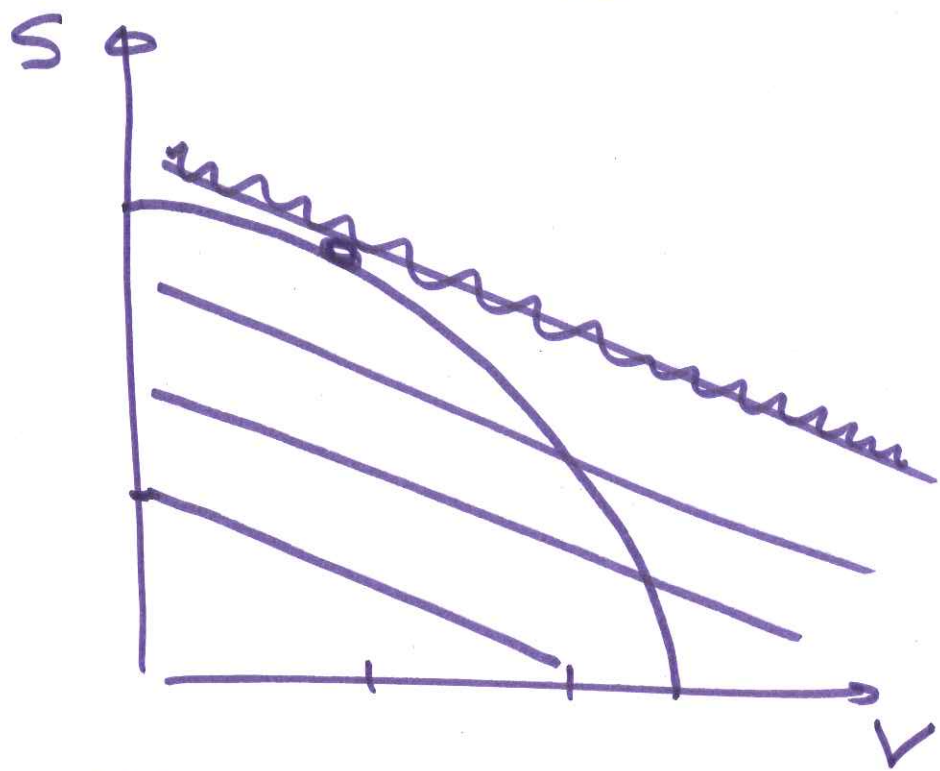


9-8-11

PPF



MAX $S \cdot p_s + V \cdot p_v$
 SUBJECT TO PPF.

ISOVALUE LINE

GIVEN p_s, p_v
 COMBINATIONS OF V & S THAT
 GIVE SAME VALUE/REVENUE

$$\bar{V} = S \cdot p_s + V \cdot p_v \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} \bar{V} = S \cdot p_s$$

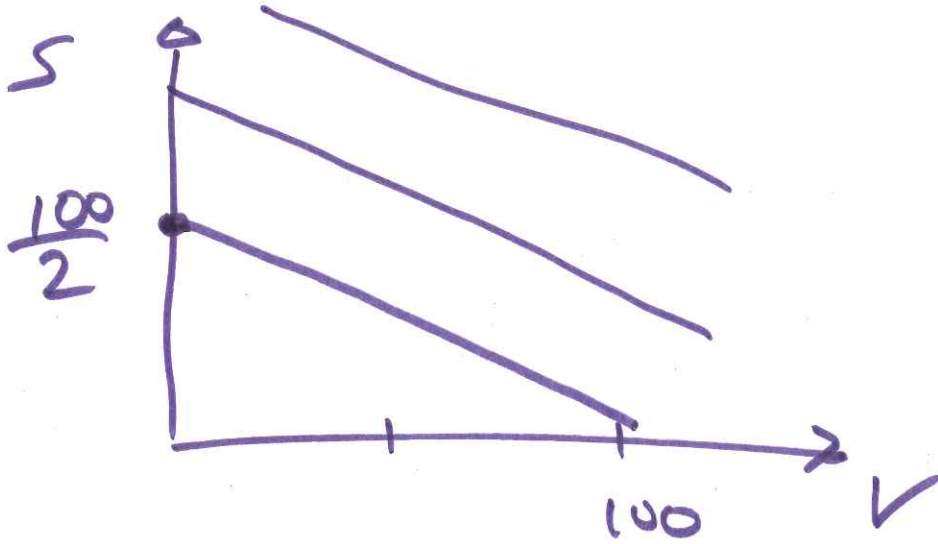
EX: $p_s = 2, p_v = 1$

$\bar{V}_1 = 100, \bar{V}_2 = 200, \dots$

$$\bar{V} = S \cdot 2 + V \cdot 1$$

$$\bar{V}_1: \boxed{100 = S \cdot 2 + V \cdot 1}$$

$$\bar{V}_2: 200 = S \cdot 2 + V \cdot 1$$

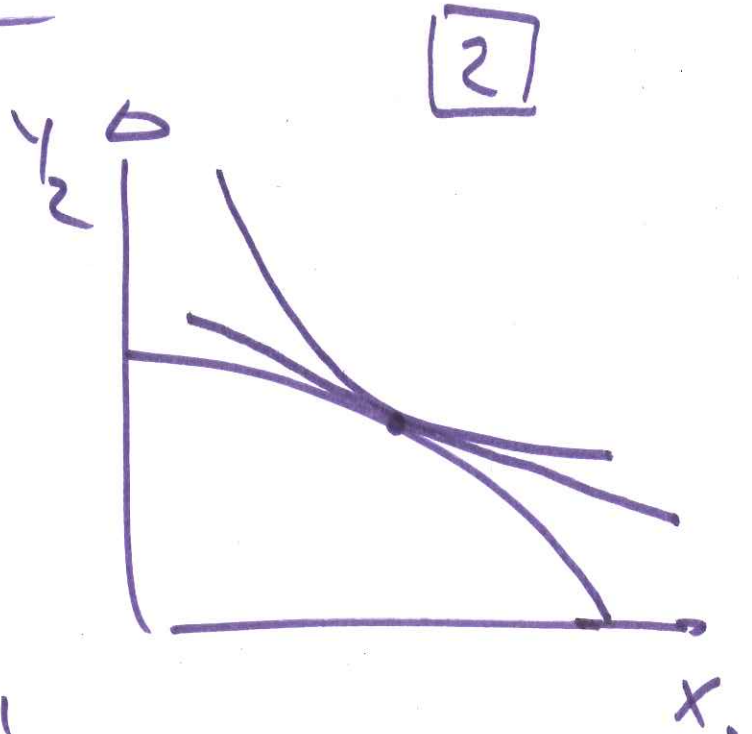
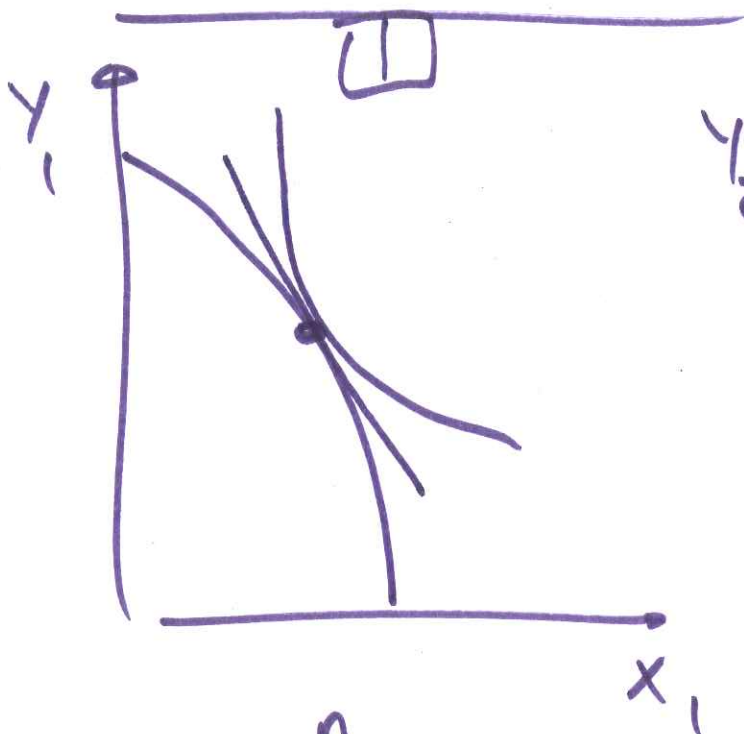


$$|\text{slope}| = \frac{50}{100} = \frac{1}{2}$$
$$= \frac{p_V}{p_S}$$

9-15-11

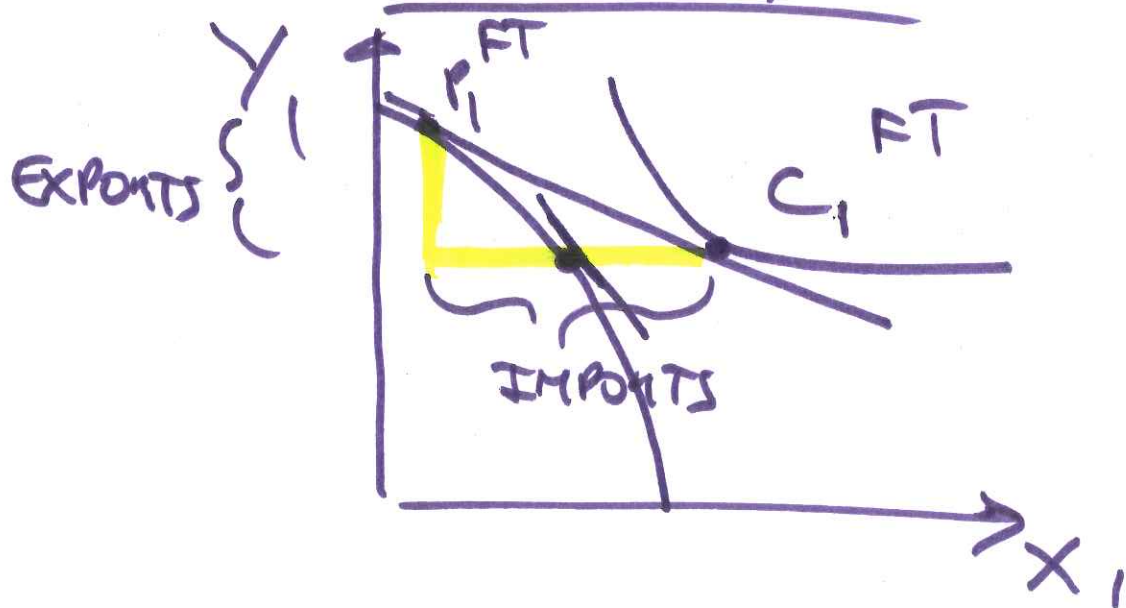
①

2 COUNTRIES

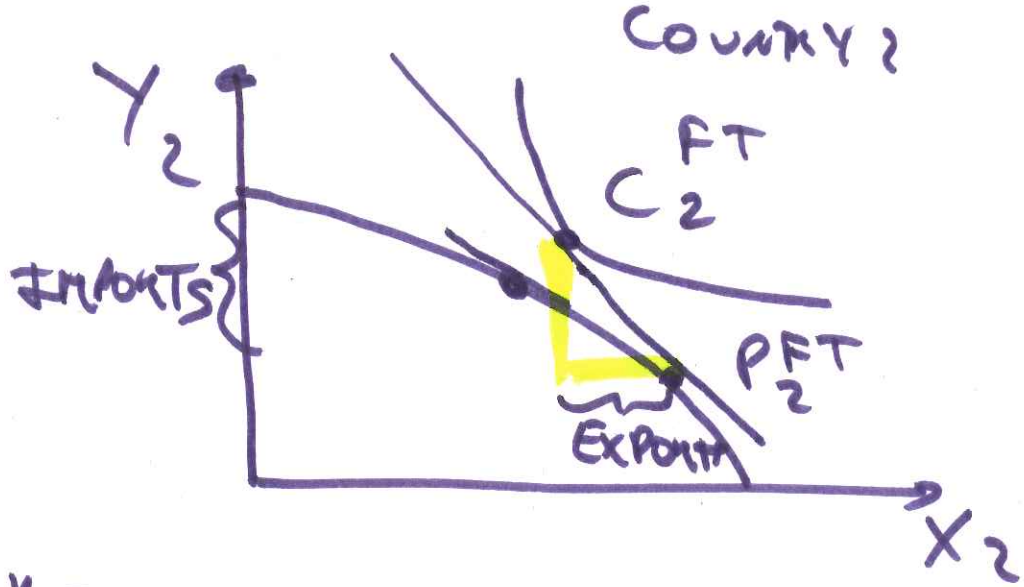


$$\left(\frac{p_x}{p_y} \right)^{A_1} \rightarrow \left(\frac{p_x}{p_y} \right)^{FT} \rightarrow \left(\frac{p_x}{p_y} \right)^{A_2}$$

COUNTRY 1



(2)



REMARK:

DIAGRAMS
NOT
ACCURATE

COUNTRY 2 EXPORTS =
IL 1 IMPORTS

COUNTRY 1 EXPORTS =
IL 2 IMPORTS

PROD. FUNCTIONS

3

HOME.

Q_i 's = UNIT LABOR COEFF /
REQUIREMENTS

= # UNITS OF LABOR
NEEDED TO PRODUCE 1
UNIT OF OUTPUT

$$= \frac{1}{APL} = \frac{1}{MPL}$$

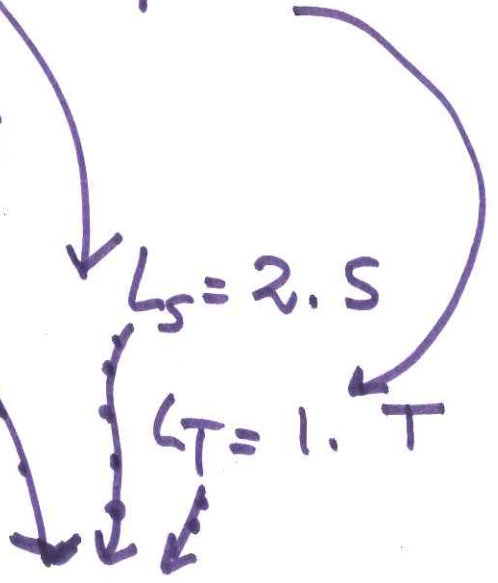
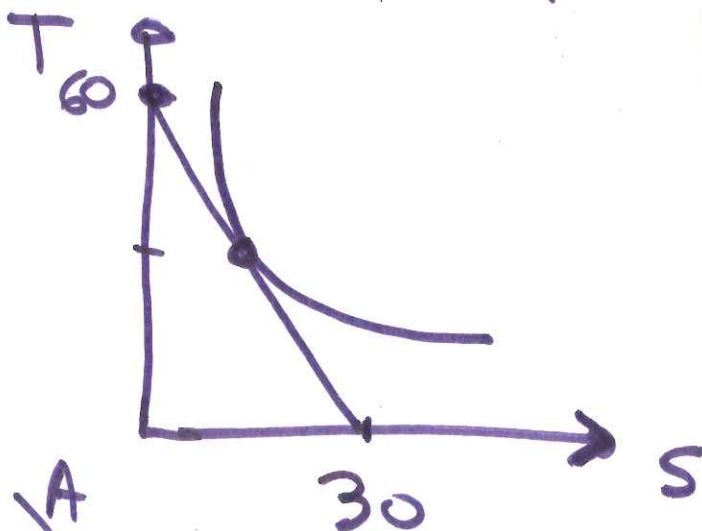
SOY HOME

$$S = \frac{1}{2} L_S$$

TEXTILES HOME

$$T = \frac{1}{1} L_T$$

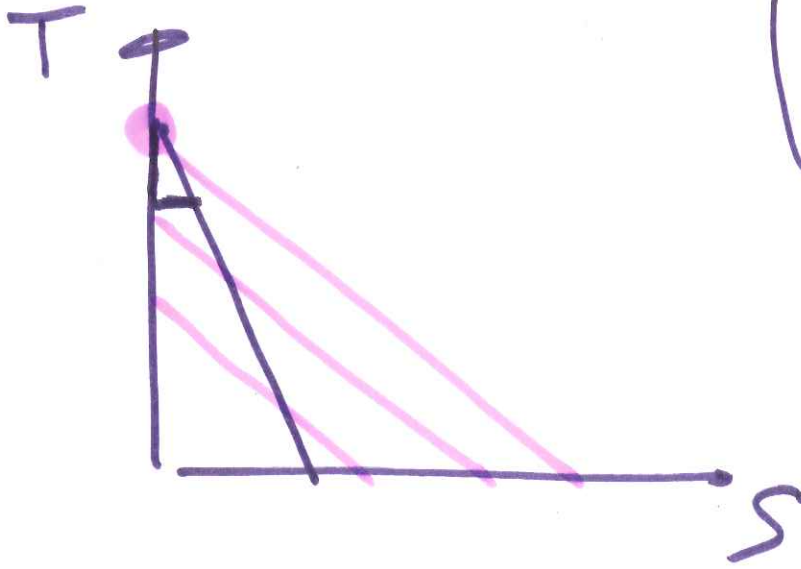
$$\bar{L} = 60 = L_T + L_S$$



$$60 = 1 \cdot T + 2 \cdot S$$

$$\left(\frac{P_S}{P_T} \right)^A = 2$$

④



$$\left(\text{SCORE} \right) = 1 = \frac{P_S}{P_T}$$

$$\left(\text{SCORE PPF} \right) = 2$$

$$a_S = 2$$

$$a_T = 1$$

HOME
CA
IN
TEXT

$$\frac{1}{6} \left[\frac{a_T}{a_T^*} \right] < \frac{3}{2} = \left[\frac{a_S}{a_S^*} \right] \quad (5)$$

FOREIGN
CA
IN
SOY

$$\left[\frac{a_S^*}{a_S} \right] = \frac{3}{2} < \frac{6}{1} = \left[\frac{a_T^*}{a_T} \right]$$

Ricardian Model Example used in lecture :

Consider a model with two countries (Home and Foreign (*)), two goods (Textiles and Soy) and one input (Labor). The production technologies are specified by the following unit labor requirements:

	Home	Foreign (*)
Soy	2	3
Textiles	1	6

Labor endowments in each country: 60 units. Preferences are “nice” and identical across countries. Assume that Textiles is used as a numeraire ($p_T = 1$) and the free trade prices are: $p_S / p_T = 1.5$

Results:

	Home Autarky	Home Free Trade	Foreign (*) Autarky	Foreign (*) Free Trade
p_S / p_T	2	1.5	1/2	1.5
w / p_T	1	1	1/6	1/2
w / p_S	1/2	0.6	1/3	1/3
p_T	1	1	1	1
p_S	2	1.5	1/2	1.5
w	1	1	1/6	1/2
AC_T	1	1	1	3
AC_S	2	2	1/2	1.5

Remarks:

- (1) Trade arises because of differences in technology.
- (2) Under Free trade each country exports the commodity that they have a Comparative Advantage on (i.e. Home exports Textiles and Foreign exports Soy).
- (3) In Autarky, both Textiles and Soy are produced in the two countries. Under Free trade home specializes in Textiles and Foreign in Soy.
- (4) Free trade is better than autarky for both countries. One way to show this is to notice that the real wage in terms of the import commodity goes up and the real wage in terms of the export commodity remains the same. Therefore workers are better off. Since labor is the only factor this implies that everybody is better off.
- (5) Trade does not equalize wages across countries. The Home country has a better technology so its real wages are higher than the ones in Foreign both in autarky and free trade.
- (6) Average Costs: the exporter of a particular good can produce it cheaper than the importer.

Ricardian Model

Main Results

(1) Pattern of Trade: Under free Trade (FT) Each country exports the commodity that they have a Comparative Advantage (CA).

(2) Specialization: In the standard examples under free trade each country fully specializes in the commodity they have a CA.

(3) Gains from Trade: We can show this with a diagram or looking at the real wages in terms of the import commodity.

Remark: under FT real income (or real wages) differ across countries.

(4) Costs: Under FT with complete specialization the exporter country of a particular commodity is the low cost producer.

Steps

- Draw PPF, Indiff. Curves and identify autarky prices and production/consumption bundle
- Identify CA
- Autarky: compute autarky real wages, choose a numeraire, compute average costs.
- Free Trade: taking FT prices as given identify production and consumption points, trade flows, real wages. Choose numeraire and calculate average costs.

Comparative Advantage

"What is prudence in the conduct of every private family, can scarce be folly in that of a great kingdom. If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it of them with some part of the produce of our own industry, employed in a way in which we have some advantage. The general industry of the country, being always in proportion to the capital which employs it, will not thereby be diminished... but only left to find out the way in which it can be employed with the greatest advantage."

(Adam Smith, *The Wealth of Nations*, Book IV:2, Modern Library edition)

Nobel laureate Paul Samuelson (1969) was once challenged by the mathematician Stanislaw Ulam to "name me one proposition in all of the social sciences which is both true and non-trivial." It was several years later than he thought of the correct response: **comparative advantage**. "That it is logically true need not be argued before a mathematician; that it is not trivial is attested by the thousands of important and intelligent men who have never been able to grasp the doctrine for themselves or to believe it after it was explained to them." ¹

What did David Ricardo mean when he coined the term comparative advantage? According to the principle of comparative advantage, the gains from trade follow from allowing an economy to specialise. If a country is *relatively* better at making wine than wool, it makes sense to put more resources into wine, and to export some of the wine to pay for imports of wool. This is even true if that country is the world's best wool producer, since the country will have more of both wool and wine than it would have without trade. A country does not have to be best at anything to gain from trade. The gains follow from specializing in those activities which, at world prices, the country is *relatively* better at, even though it may not have an absolute advantage in them. Because it is relative advantage that matters, it is meaningless to say a country has a comparative advantage in nothing. The term is one of the most misunderstood ideas in economics, and is often wrongly assumed to mean an absolute advantage compared with other countries.

¹P.A. Samuelson (1969), "The Way of an Economist," in P.A. Samuelson, ed., *International Economic Relations: Proceedings of the Third Congress of the International Economic Association*, Macmillan: London, pp. 1-11.



Not so absolutely fabulous

By themselves, low wages do not guarantee economic success

PROTECTIONISTS in rich countries often complain that low wages give emerging economies, such as China or Malaysia, an unfair advantage. If it costs \$16 an hour to employ a worker in America (including fringe benefits), but less than \$1 in China, then, it is argued, as firms are ruthlessly undercut by third-world producers, free trade will threaten the prosperity of today's rich nations. This fear, however, is based upon a confusion of two economic concepts: "absolute advantage" and "comparative advantage".

The distinction was first made by David Ricardo, an economist in the early 19th century. He introduced the concept of comparative advantage, which is the foundation of most economists' belief that all countries gain from free trade.

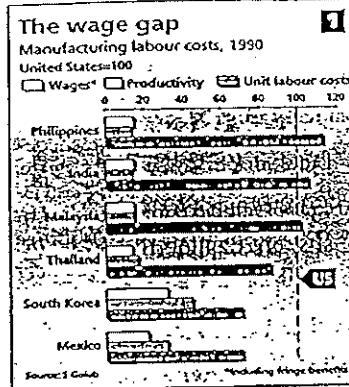
According to the theory, absolute advantage (overall productivity differences between countries) should be reflected in differences in incomes, whereas comparative advantage (variations in productivity differences by sector) will determine the pattern of international trade. This is widely accepted by economists, yet there has been surprisingly little research in recent years to check the facts. A new paper* by Stephen Golub, an economist at Swarthmore College, Pennsylvania, puts the theories of absolute and comparative advantage to the test.

Start with the notion of absolute advantage. If low wages automatically meant low costs, the world's poorest country would dominate world trade. It does not, because differences in wages reflect differences in productivity. Low wages in emerging economies go hand-in-hand with low productivity.

The reason for this link between wages and productivity is that if within an economy wages are less than the value of the output of an extra worker, firms will want to hire more workers and will thus push up wages. International trade will also tend to equalise labour costs per unit of output. If a country's unit labour costs are below world levels, increased demand for its goods, and hence for labour, will drive up either wages or the currency.

Using this framework, Mr Golub demonstrates that the so-called "unfair" advantage of developing countries is nothing of the sort. In 1990 manufacturing wages in Malaysia were only 15% of those

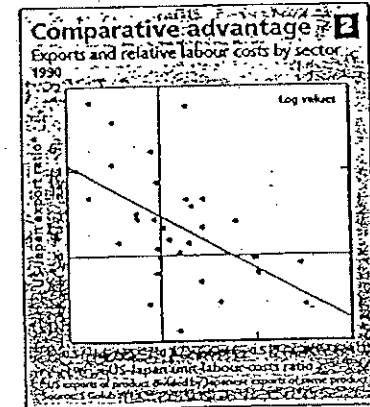
ECONOMICS FOCUS



in America. Comparing productivity levels in different countries is trickier, because the value of output per person has to be converted into a common currency using some measure of purchasing-power parity (ie, taking account of differences in price levels). Mr Golub estimates that Malaysia's average productivity in manufacturing was also about 15% of America's. In other words, average unit labour costs were roughly equal in the two countries.

Indeed, across a range of developed and developing countries, Mr Golub finds a broad correlation between wage levels and productivity. Chart 1 shows that cross-country differences in labour costs are much smaller than wage gaps alone suggest. According to Mr Golub's calculations, average unit labour costs in India and the Philippines were actually higher than in America in 1990.

Maybe, but another popular fear is



that as developing nations acquire the latest technology, their productivity will soar to western levels, giving them a huge cost advantage. Yet both theory and experience suggest that rising productivity will be matched by either higher wages or a stronger exchange rate. Over the past two decades South Korea, which has seen the biggest productivity leap of the economies studied, has also seen the biggest rise in real wages.

Indeed, in most emerging economies wages have risen even faster than productivity, narrowing the gap in unit labour costs with America. One big exception is Mexico, where wages fell after the 1980s debt crisis.

Comparatively speaking

Although average unit labour costs should tend to converge across countries, there will still be big differences between sectors, because countries' productivity gaps with America will differ from one industry to another. This is what gives rise to comparative advantage, the driving force behind international trade. If countries specialise in goods in which they have a comparative advantage—ie, those in which their relative productivity is higher—they will all gain.

Wages are roughly the same in different sectors, but if a developing country's productivity relative to America is higher than average in textiles, say, then its unit labour costs in textiles will be below America's. On the other hand, in more sophisticated industries, such as complex machinery, a developing country's productivity relative to America's will be below average—ie, America has a comparative advantage.

In theory, countries will be net exporters of goods in which they have a comparative advantage. Mr Golub puts this to the test by comparing bilateral trade flows and unit labour costs in different manufacturing sectors. In the majority of cases, relative productivity differences and hence differences in unit labour costs across sectors do seem to explain trade patterns in rich and poor countries alike.

Chart 2 shows a significant negative correlation between the ratio of American to Japanese exports in a particular industry and America's unit labour costs relative to Japan's in the same sector. Indeed, in terms of both absolute and comparative advantage, Mr Golub finds that the results for Japan are the most consistent with economic theory of all the countries studied. So much for the popular view that "Japan is different".

* "Comparative and Absolute Advantage in the Asia Pacific Region". By Stephen Golub. Federal Reserve Bank of San Francisco Working Paper, forthcoming