



Lecture 3

AAE 374 Fall 2008

- Announcements:
 - PS1 on Web (Due 9/24)
 - Appleyard up shortly
 - Sections this week are key for the PS



Overview of today's lecture

- Purchasing power parity and What Are Exchange Rates (Really)?
- Current Trade Picture
- Ricardian (Labor based) Trade model



PPP Measurement

- **PPP:** A way to figure out what a dollar (Pound, Mark, etc.) is really worth “on the ground” in a country. Examples: iPod Index, Big Mac Index
- TGIF is one of the fanciest places in Dehli and outrageous (like \$8 for an appetizer, \$5 for a drink). How are they getting away with this?



CommSec iPod nano index (2 gigabytes, US dollars, January 2007)	
Brazil: \$327.71	Mexico: \$154.46
India: \$222.27	US: \$149.00
Sweden: \$213.03	Japan: \$147.63
	Hong Kong: \$147.63
	Canada: \$144.20

- Let's say all I care about is buying a new iPod, so I don't denominate prices in dollars, I denote them in "iPod Units"
- In the US, \$1000 is worth $\$1000/150 \sim 7 \frac{1}{3}$ iPods.
- In India, \$1000 is worth $\$1000/225 \sim 4 \frac{1}{2}$ iPods
- We might conclude dollars don't go very far in India (clearly not true) so we need to consider some *basket* of goods and services that makes sense



Can't we use the exchange rate?

- Exchange rate: going rate in the currency market, i.e. to ship goods and buy financial assets
 - Expect to be driven by prices of tradeable goods
 - But what about non-tradeable goods?
 - Other issues?



Artificial Purchasing Power Parity (PPP) exchange rate is meant to solve these problems



<i>Monthly Incomes</i>	<i>\$110</i>	<i>880 Yuan</i>
<i>Market Exchange Rate</i>	<i>\$1US=8 Yuan</i>	
<i>Incomes converted using Market Exchange Rate</i>	<i>\$110</i>	<i>\$110</i>
<i>Market Basket (q_{ij})</i>		
MP3 Players	<i>1</i>	
Haircuts	<i>1</i>	
<i>Local Prices (p_{ij})</i>		
MP3 Players	<i>\$100</i>	<i>800 Yuan</i>
Haircuts	<i>\$10</i>	<i>2 Yuan</i>
<i>Local Cost of Market Basket</i>	<i>\$110</i>	<i>802</i>
<i>PPP Exchange Rate</i>	<i>1=\$110/\$110</i>	<i>7.3=Y802/\$110</i>
<i>Monthly Incomes in \$PPP</i>	<i>\$PPP 110</i>	<i>\$PPP 120 (=880/7.3)</i>

- Get a market basket and calculate the bill in different countries (Mp3 + haircut. Maybe baskets differ.)
- PPP Exchange rate is Foreign Bill/Home Bill
- Can use PPP Ex rate to compare incomes (in this case where is \$110 “worth more”?)

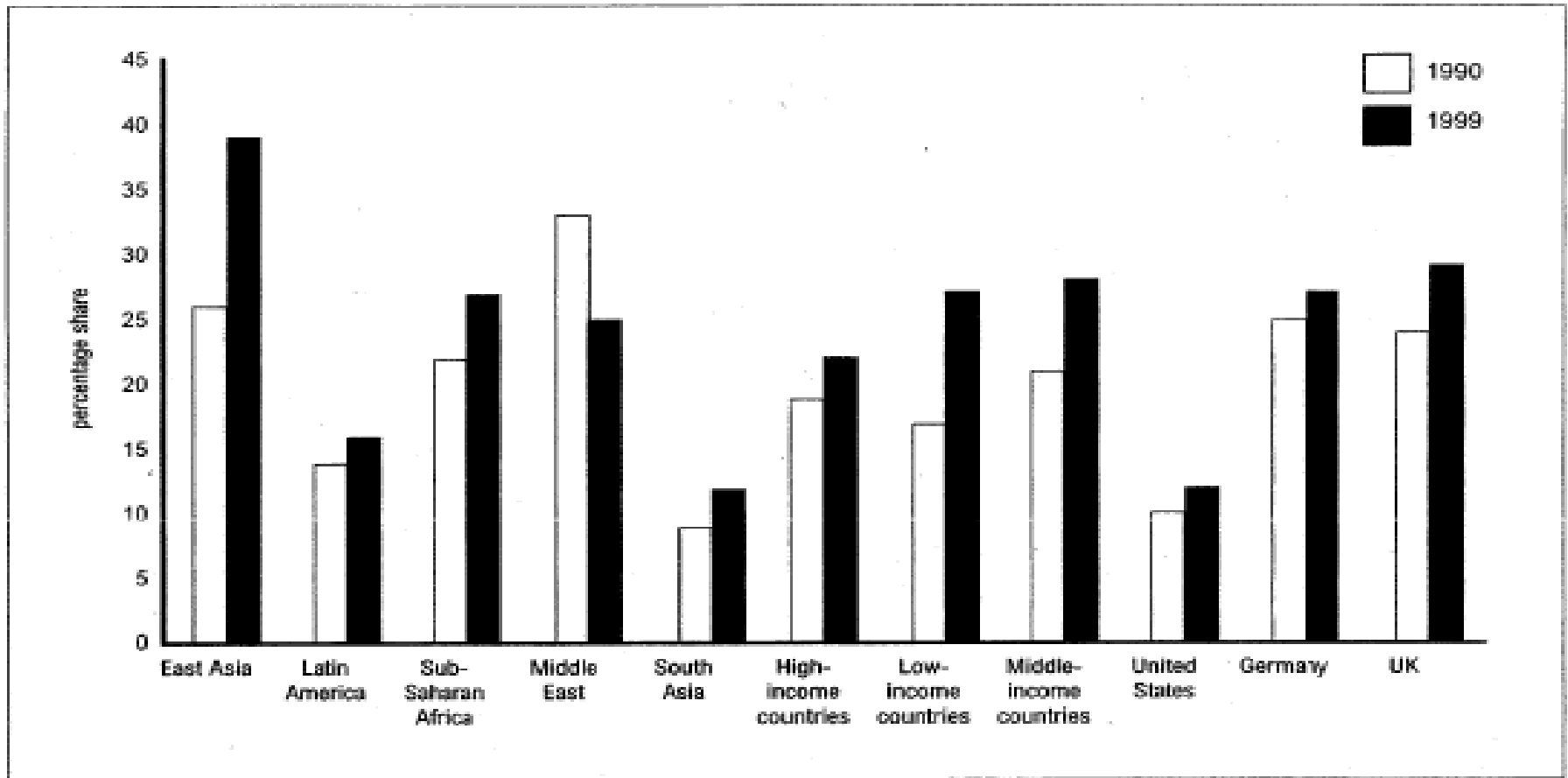
Globalization & Growth of Trade

TABLE 12.1 Trends in World Exports, 1970–1997

	1970	1980	1983	1990	1996	1997
World exports						
Nominal value (billions of dollars)	312	2,002	1,814	3,401	5,231	5,394
Real value (billions of 1980 dollars)	590	2,002	1,620	2,076	2,987	2,909
Share of world exports (%)						
Developed countries	71.9	66.3	64.1	74.6	78.5	76.5
Developing countries	17.6	27.9	24.9	17.8	17.3	18.9
Centrally planned economies and their successors	10.5	8.8	11.0	7.5	4.2	4.6

Sources: John Sewell et al., *Growth, Exports, and Jobs in a Changing World Economy: Agenda 1988* (New Brunswick, N.J.: Transaction Books, 1988), tab. A. 1; World Bank, *World Development Report, 1992: Development and the Environment* (New York: Oxford University Press, 1992), tab. 14; International Monetary Fund, *World Economic Outlook, May 1996* (Washington, D.C.: International Monetary Fund, 1996), tabs. A22, A23, A29, and A31.

- Growth of trade globally (todaro 12.1 → ~7% annual growth of trade)



- Growing % of GDP that is traded (Oxfam figure 1.2)
 - Can we explain the exception here?
 - Why is the US % so low?

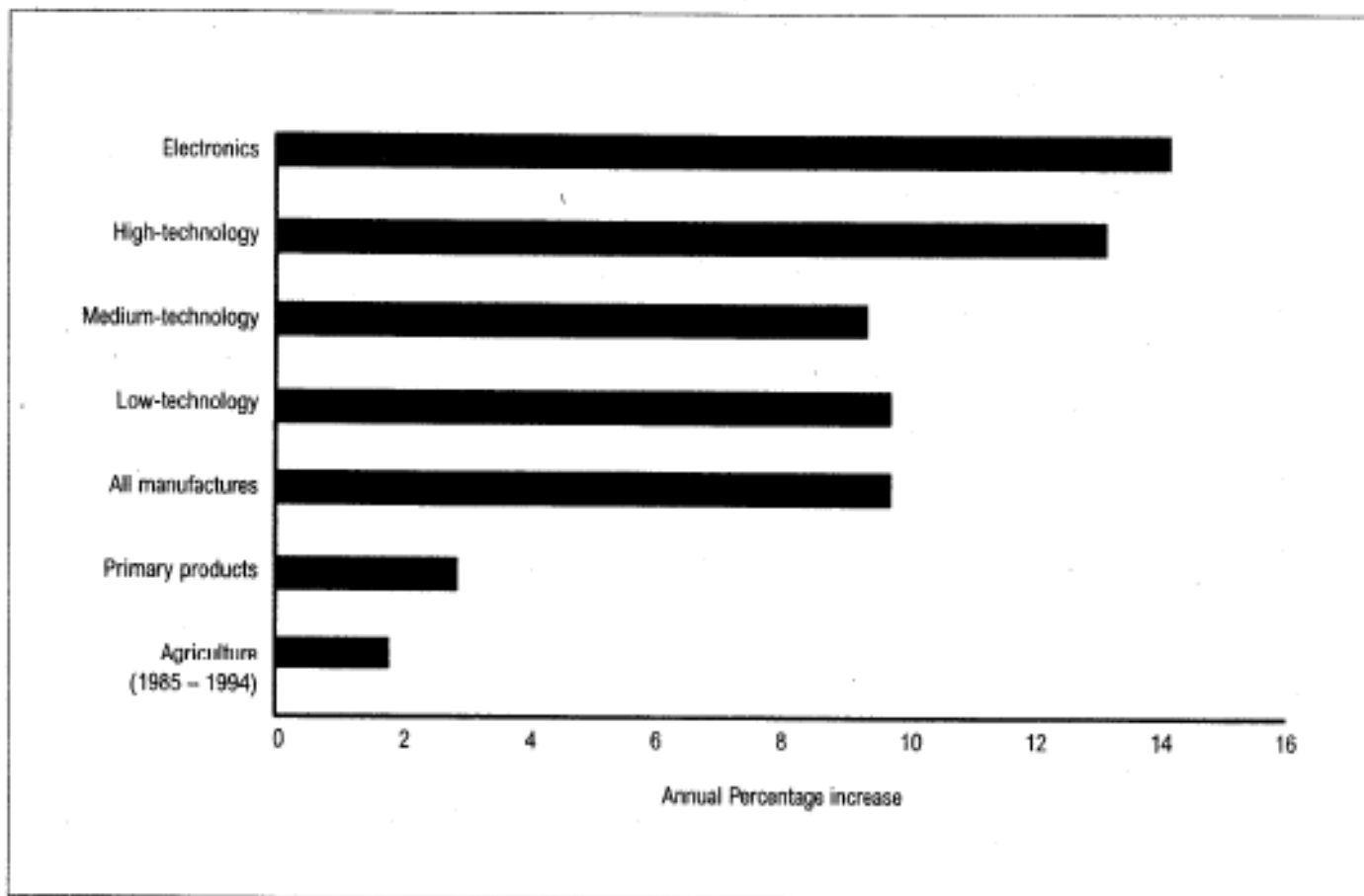


Figure 1.3
Average annual export growth rates
by selected product groups:
1985-98

Sources: UNCTAD 1999 and OECD 2001a

- Evolving composition of trade (Oxfam 1.3 on product group trade growth)

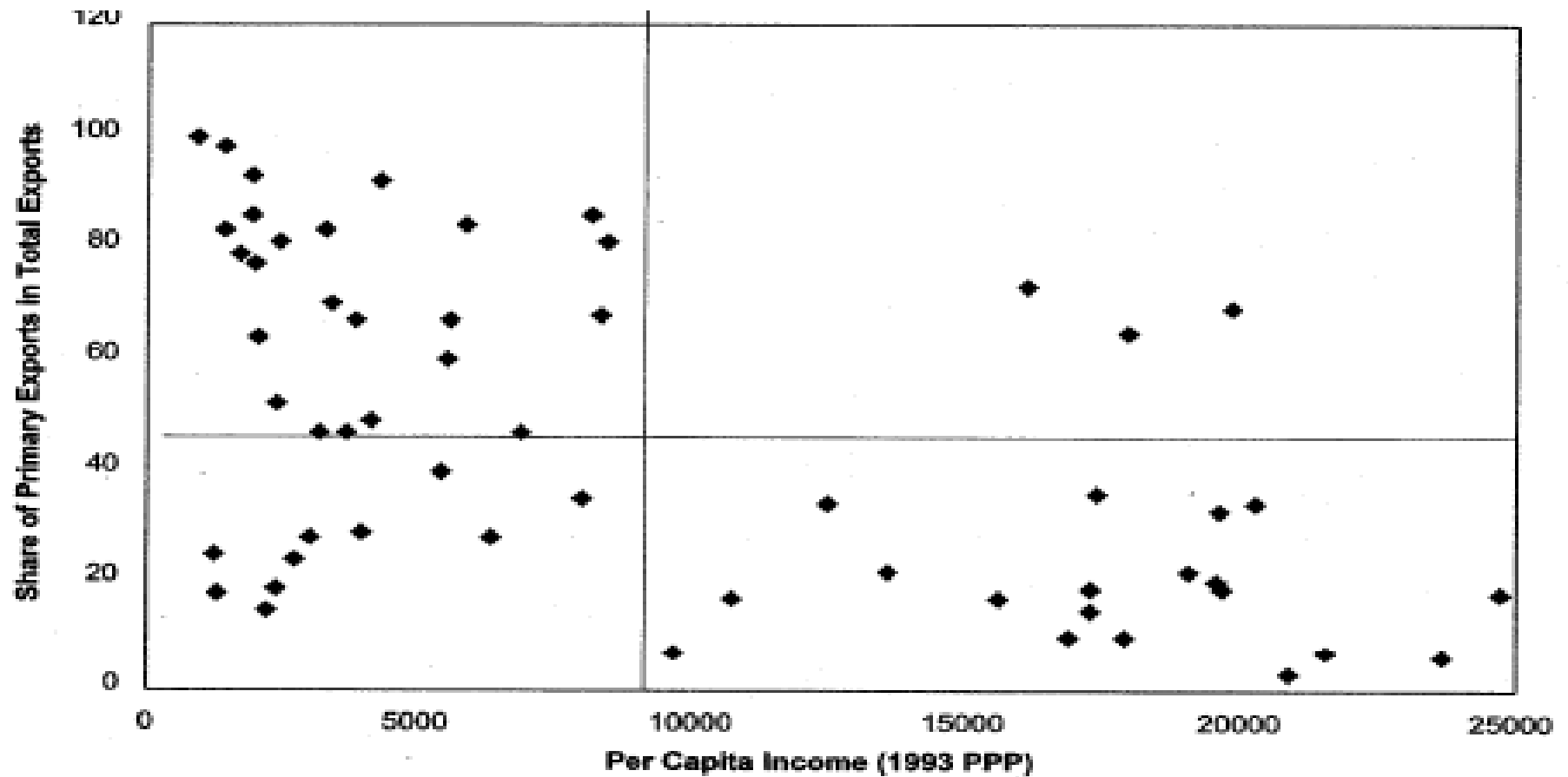


Figure 16.1. *Share of primary exports in total exports. Source: World Development Report (World Bank [1995]).*

- *Trade Patterns (back to Todaro table)*
 - North-north (within this intra-industry >25%)
 - *North-south*

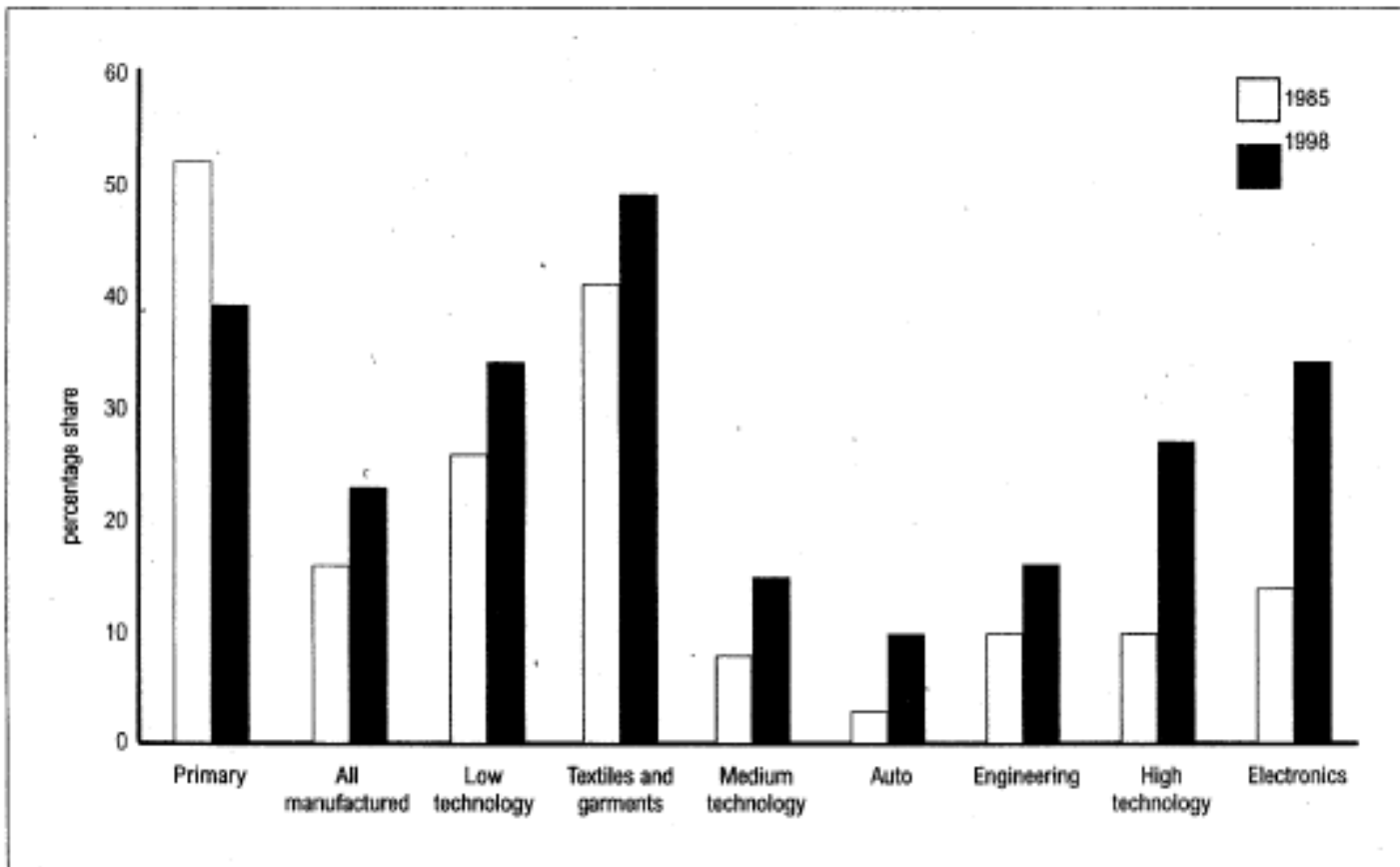


Figure 1.5
Share of developing countries in world exports: selected product groups (1985 and 1998)

Source: Lall 2001a

- Evolving pattern of N-S trade away from primary commodities (Oxfam table 1.5)



Explaining N-S Trade

- *First focus on classic N-S trade idea of comparative advantage & trade as improved technology*
 - Ricardian (2 countries, 2 goods, 1 factor of production, labor) 2x2x1 [Appleyard 27-38]
 - Heckscher-Ohlin (2 countries, 2 goods, 2 factors: labor and capital) 2x2x2 [Appleyard 85-99]



2x2x1 Trade Model

- Countries: North and South
- Goods (and technologies)
 - Automobiles
 - In North takes 10 units of labor to make 1 auto
 - In South, takes 40 units of labor
 - Cotton
 - In North, takes 15 units of labor
 - In South, takes 20 units



Production (Autos & Cotton)

Labor Costs	<i>North</i>	<i>South</i>
<i>Autos</i>	10 labor units	40 labor units
<i>Cotton</i>	15 labor units	20 labor units

- What are 'absolute advantages' in production?
- Factor Endowments
 - North has 600 units of labor $\rightarrow 10a + 15c = 600$
 - South has 600 units of labor $\rightarrow 40a + 20c = 600$



Endless Possibilities...

Feasible combinations for North given tech and 600 laborers

Autos	60	30	15	0
Gigasacks of Cotton	0	20	30	40

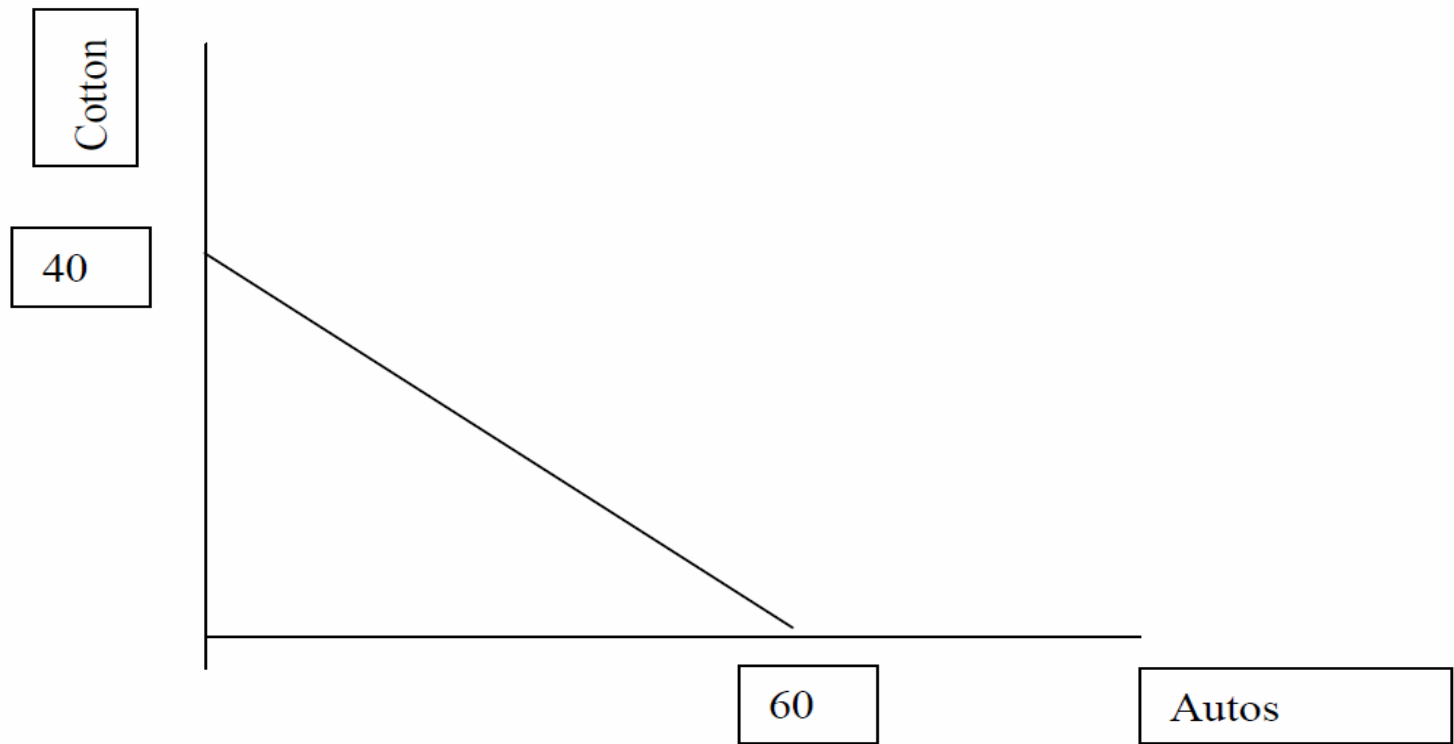
Feasible combinations for South given tech and 600 laborers

Autos	15	10	5	0
Gigasacks of Cotton	0	10	20	30

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$$\text{North: } 10a + 15c = 600$$

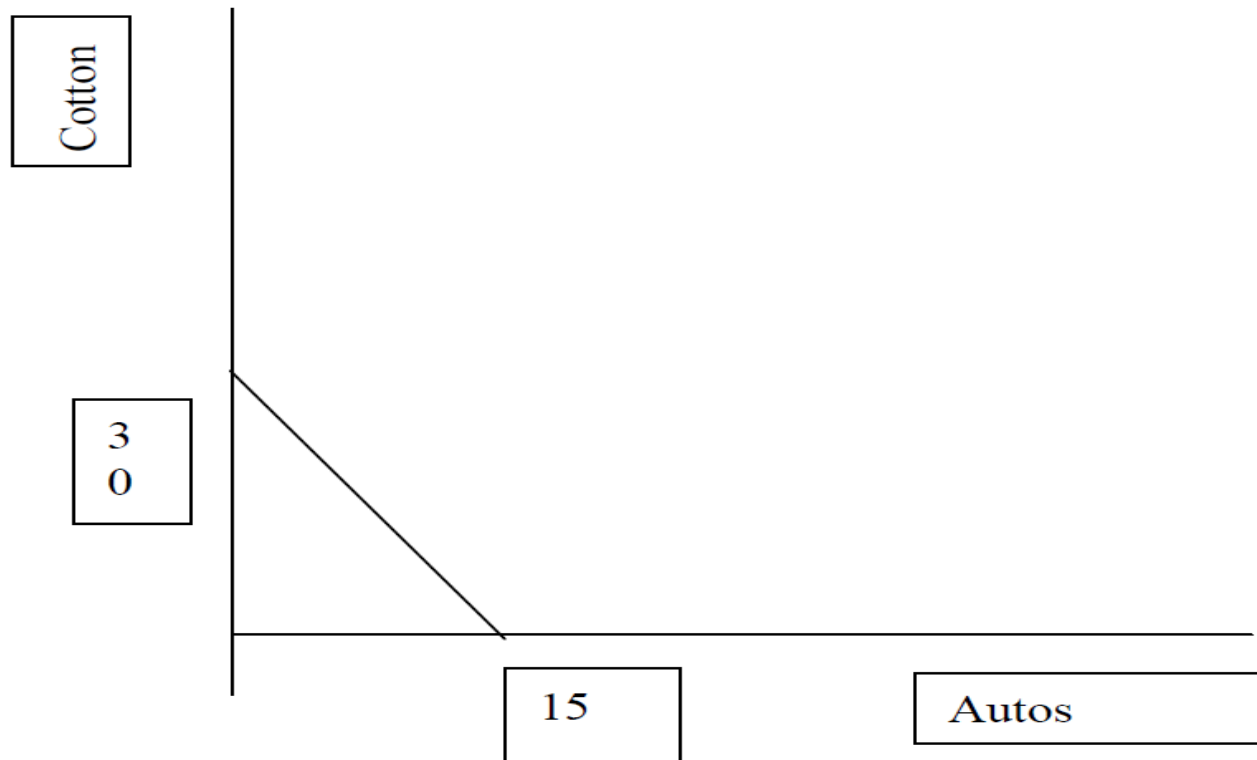
$$\text{South: } 40a + 20c = 600$$



- In north: $c=40-(2/3)a$, where c is the cotton that can be produced when a autos are produced

● ● ● | North: $10a + 15c = 600$

South: $40a + 20c = 600$



○ In the south, $c=30-2a$



Real Economic Prices

- How much cotton does one auto cost in North (i.e., how much cotton must they give up to get one more auto)? $2/3$ gigasack of cotton / auto
- How much cotton does one auto cost in South (i.e., how much cotton must they give up to get one more auto)? 2 gigasacks / auto
- Note that these costs are simply given by slope of production possibilities curve—steeper slope, more cotton given up to get another auto—i.e., more expensive autos are in real terms.
- So where are autos most expensive? (Think opportunity cost).



Autarchy and Prices

- CLAIM: Under autarchy in north, the price of autos relative to the price of a gigasack of cotton has to be in ratio $10:15=2/3$, for example \$1000 for an auto and \$1500 for a gigasack of cotton.
- If autos sell at a relative price $> 2/3$ (say \$5000 per auto and \$1000 per cotton, a relative price of 5) then all northern firms will want to make autos and big profits. Every 15 units of labor employed will yield them revenues of \$7500 ($=1.5 \text{ autos} * \5000), while same 15 units of labor allocated to cotton will yield them only \$1000 (1 gigasack * \$1000).



Autarchy and Prices Cont'd

- If autos sell at a relative price $> 2/3$, no cotton will get produced. Consumers demanding cotton will drive the price of cotton up until we get back to the $2/3$ relative price ratio.
- Similarly, if autos sell for a relative price $< 2/3$ (say \$500 for an auto and \$1000 for cotton), only cotton will get produced as profit making producers rush to make profits producing cotton (or avoid big losses making autos).
- **CONCLUSION:** the price of a gigasack of cotton has to be in ratio $10:15=2/3$

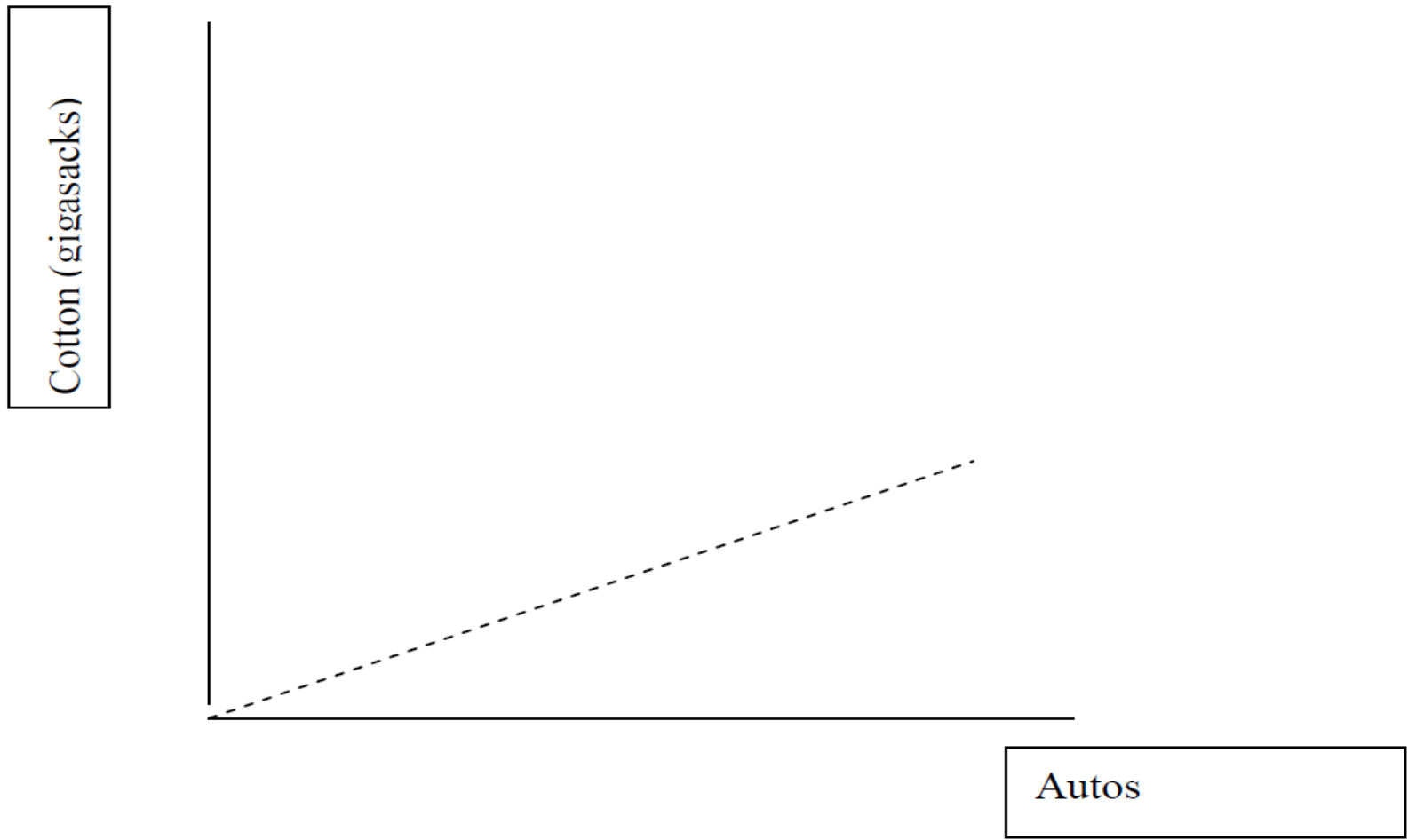


Autarchy and Prices Cont'd

- **By a similar logic, in south, prices have to be in a relative price ratio of 40:20 or 2.**
- **Notice we have only talked about the production side and prices. No prediction as yet about what each country will produce. How to get such a prediction?**

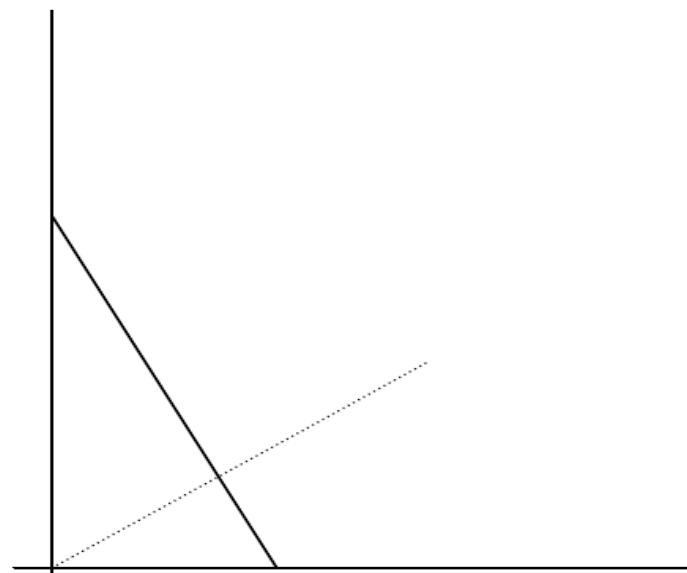
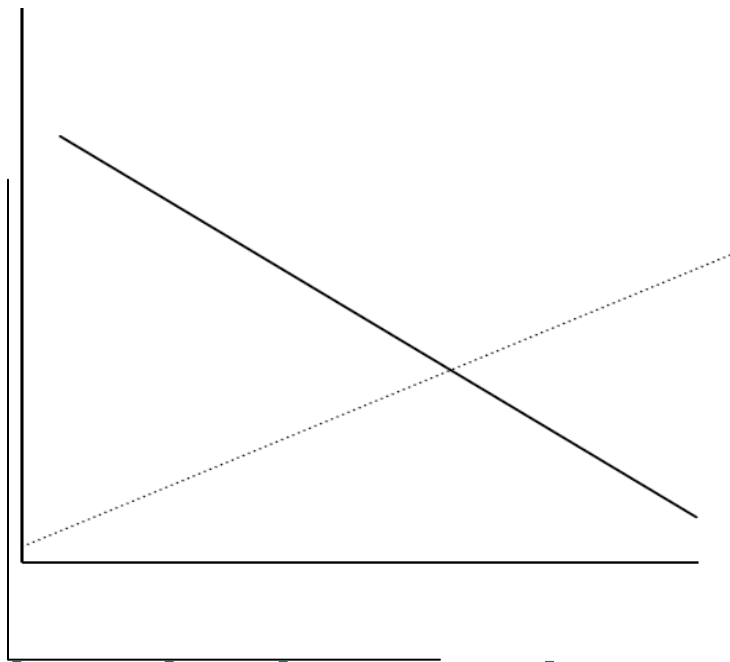


'Rigid Preferences' 1:2 ratio (cotton:autos)





'Rigid Preferences' 1:2 ratio (cotton:autos)



Note that in autarchy:

north will produce AND consume ~34 autos and ~17 cotton;

south will produce AND consume 12 autos and 6 cotton

(Check it: Use $10a + 15c = 600$ and $a/c=2$)



	North	South
Autarchy		
Relative Price (autos/cotton)	$2/3$	2
Consumption Ratio (autos/cotton)	$1/2$	$1/2$
Auto Prod'n	34	12
Auto Cons	34	12
Net Exports	0	0
Cotton Prod'n	17	6
Cotton Consumption	17	6
Relative Wage or living standard (north to south)	~3:1	



Is globalization polarizing?

- Between countries (north-south) i.e. (rich-poor)
 - Convergence of all countries to same wealth
 - Or Permanent divergence between countries
- Within countries
 - Inequality
 - Poverty



Trade as a sources of growth and convergence

- Trade understood as a technological option – that is a way of transforming objects/endowments into material standard of living
- What can trade (and later, growth) theory tell us about polarization?



Effects of PPP measurement

	<i>US, 2004</i>	<i>China, 2004</i>
<i>GDP at market Exchange Rate</i>	41,400	1938
<i>GDP using \$PPP (year 1993)</i>	39,820	5890

- PPP tends to raise estimate of income for poorer countries (i.e. \$ value of haircut > \$ cost in Yen)
- Lower estimate of income for higher countries (3 Euro=\$5 Beer worth \$3 in US)

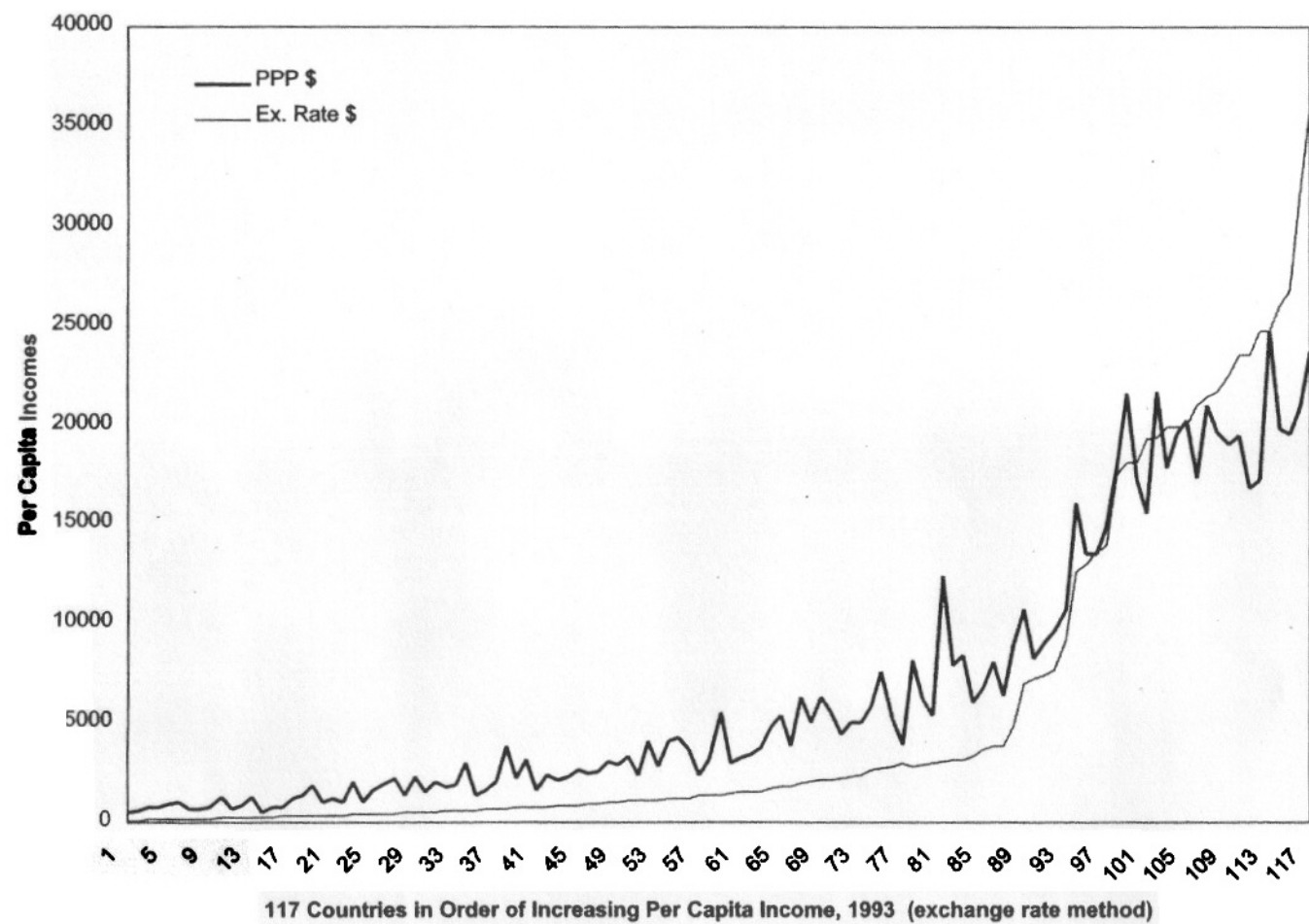


Figure 2.3. PPP versus exchange rate measures of GDP for ninety-four countries, 1993. Source: World Development Report (World Bank [1995]).