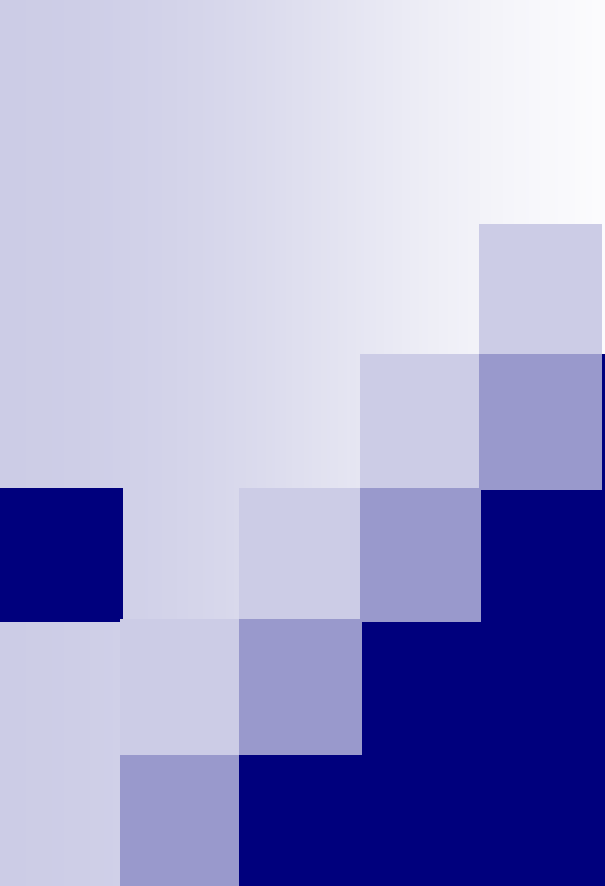




EE451

Chapter 5: Alternative Theories of Trade

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Alternative Theories

- The Imitation Lag and Product Cycle (Posner, 1961)
- The Linder Theory
- Increasing Returns with Monopolistic Competition (Krugman, 1979)
- External Economies of Scale
- Intra-Industry Trade

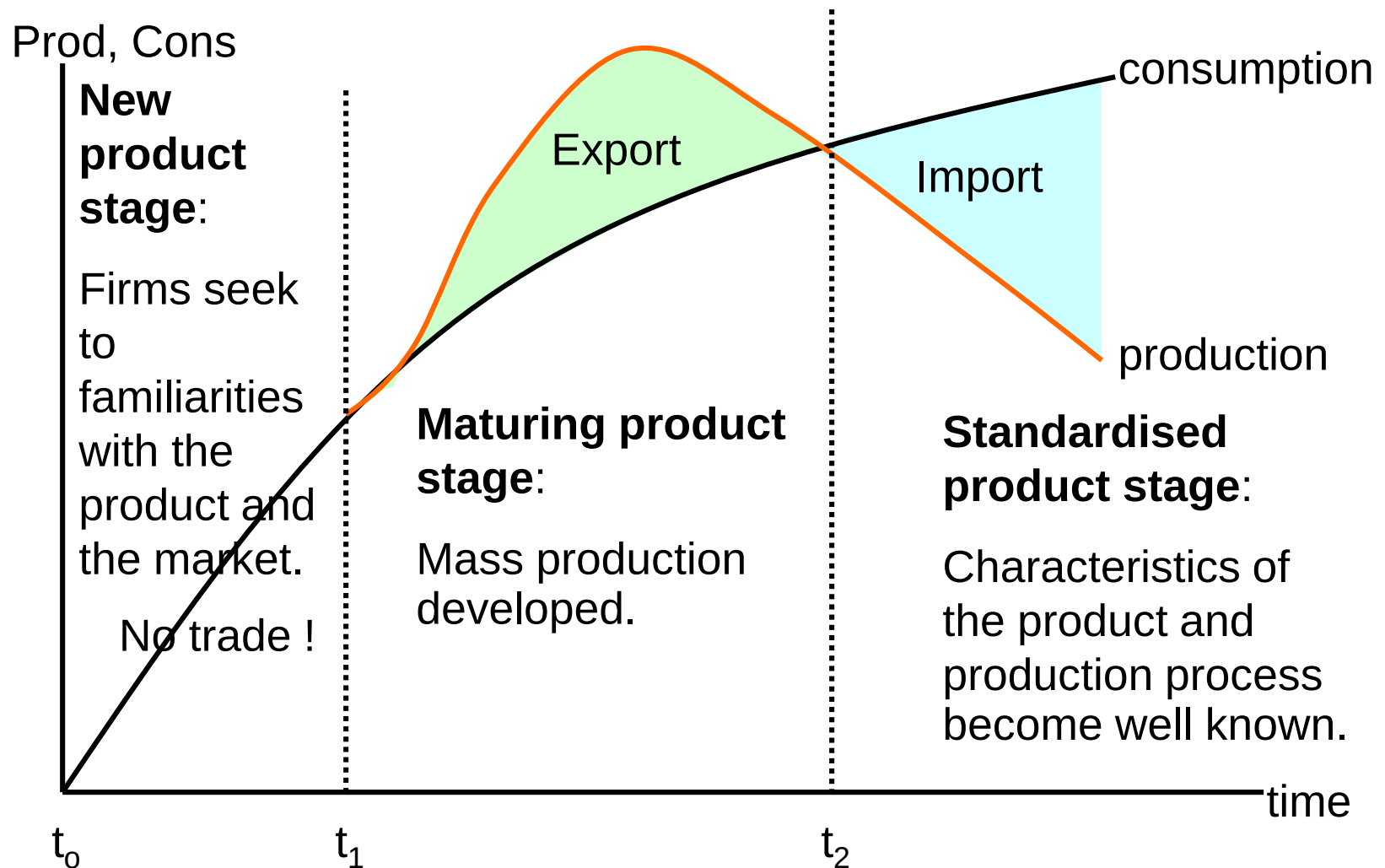
Product Cycle Theory

- Make use of the sequence of innovation and imitation.
- Assumes
 - the same technology is NOT always available in all countries
 - there is a delay in the transmission or diffusion of technology from one country to another.
- Imitation lag: the length of time that elapses between the product's introduction in country I and the appearance of the version produced by firms in country II.
 - Learning period (acquiring technology and know-how in order to produce the product) plus Time to purchase inputs, install equipments, process the inputs and bring the finished product to market.
- Demand lag: the length of time between the product's appearance in country I and its acceptance by consumers in country II as a good substitute for the products currently consumed.

Product Cycle Theory

- Net lag = imitation lag – demand lag
- 3 stages of product life
 - New
 - Maturing
 - Standardised.
- In fact, it postulates a DYNAMIC comparative advantage because the country source of exports would shift throughout the life cycle of the product.

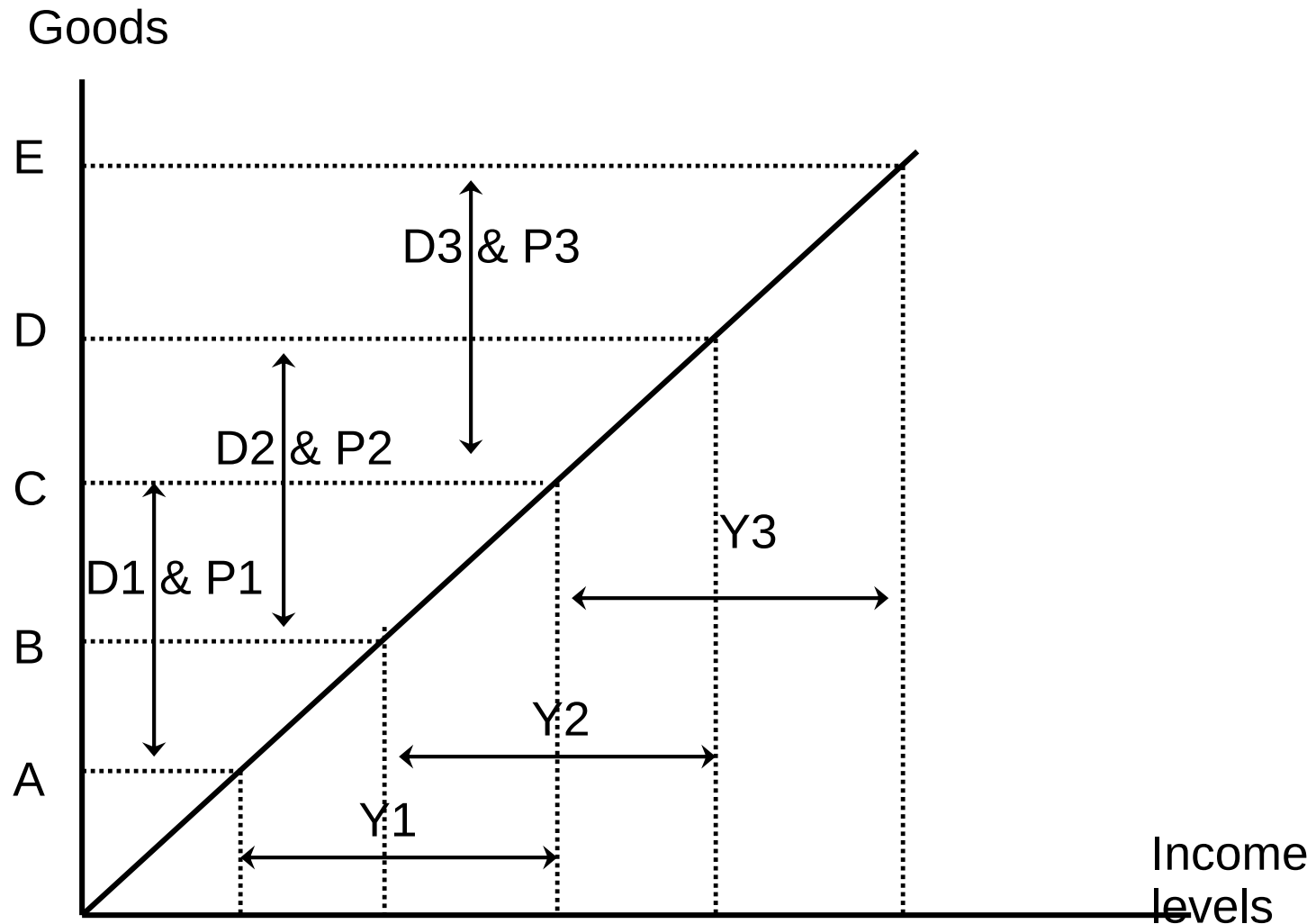
Product Cycle Theory



The Linder Theory (1961)

- H-O: supply-oriented
- L-T: demand-oriented
 - Tastes of consumers are conditioned strongly by their income levels
 - The per capita income level of a country will yield a particular pattern of tastes.
- Overlapping Demand

The Linder Theory (1961)



The Linder Model

- International trade in manufactured goods is more intense between countries with similar per capital levels than between countries with dissimilar per capita income levels.
- This conclusion is consistent with aspects of the product cycle theory.
- But did not identify the direction in which any given good would flow.

Increasing Returns to Scale

- Reasons for IRS (or economies of scale)
 - Indivisibilities of resources
 - Division of labour
 - specialisation
 - Once-and-for-all inputs (such as designing of an automobile and the proofreading of a book need no increase at all as output expands.)
- Internal economies, whereby growth of an individual firm causes cost reductions → downward sloping AC
- External economies, pertaining to the *industry level* → downward shift of the AC

Increasing Returns to Scale

- Assume two countries experiencing **external** economies of scale, making reduction in the cost when an industry grows → PPF is convex
- Implication to market structure → capable of capturing the majority of the entire market → oligopoly/monopoly



Implication to PPF & gains from trade



Monopolistic Competition

- Krugman model: internal EOS
- Differentiated products
 - Combined with IRS can easily explain intra-industry trade.
- Implications to gains from trade
 - Consumers gain access to greater variety.
 - Unit costs and price decline.
- Then the gains from trade are normally larger under monopolistic competition.

Product Differentiation in Automobiles

■ Variety of Car Models

- BMW 3-series/ 5-series/ 7-series/ M5/ M6/ X3/ X5/Z4
- Toyota 4Runner/ Avalon/ Camry/ Camry Solara/ Corolla/ FJ Cruiser/ Highlander/ Highlander Hybrid/ Land Cruiser/ Matrix/ Prius/ RAV4/ Sequoia/ Sienna/ Tacoma/ Tundra/ Yaris
- Audi A3/ A4/ A6/ A8/ Q7/ RS4/ S4/ S6/ S8/ TT
- etc.
- See more on www.autoweb.com

Krugman Model (1979)

■ Basic features:

□ Economies of scale

- Assume labour be the only factor of production
- Scale economies are incorporated in the equation of labour requirement: $L = a + bQ$

□ Monopolistic competition

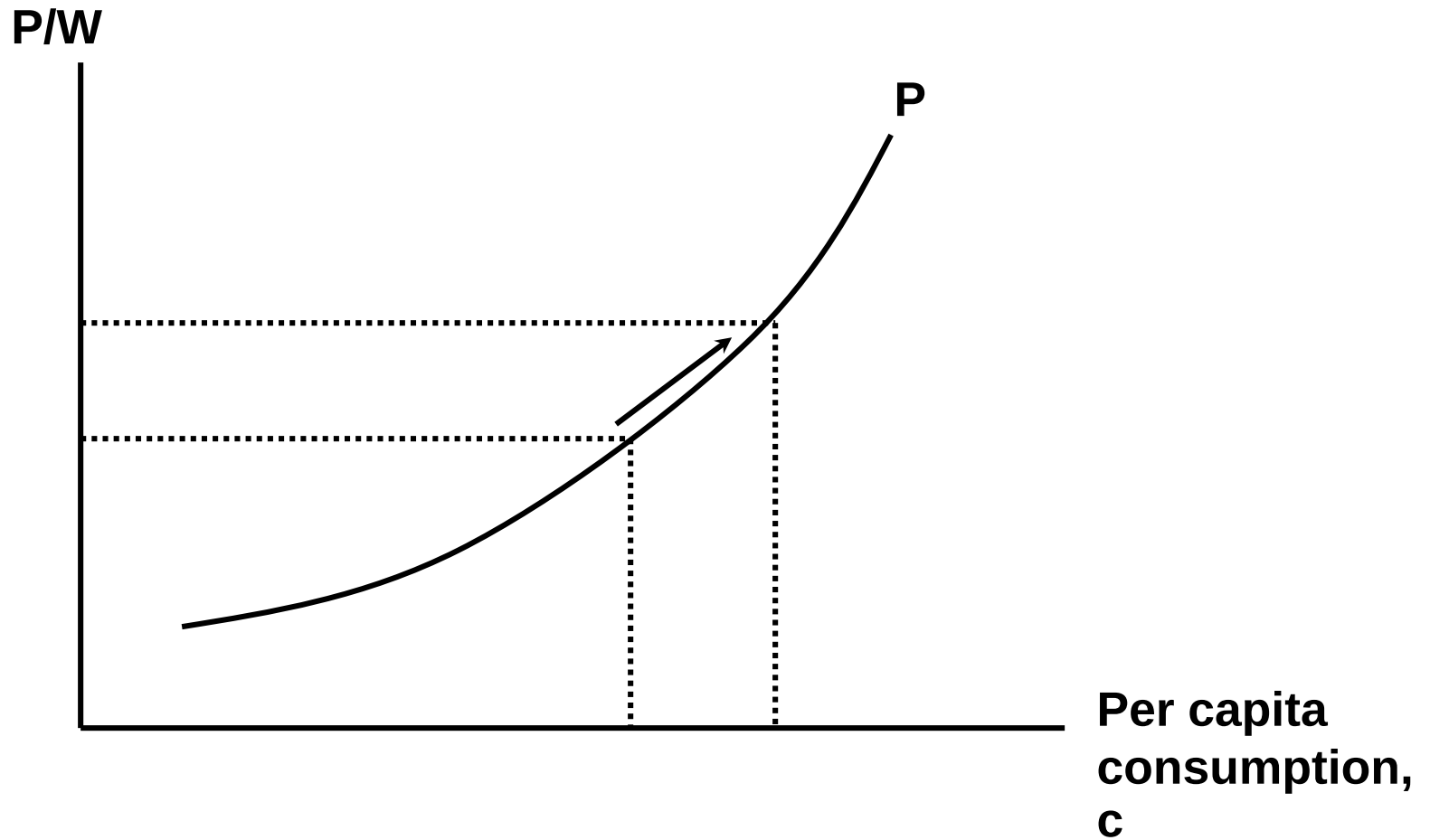
- Recall
$$P = MR \left[\frac{\varepsilon_d}{\varepsilon_d + 1} \right]$$

- Profit-max condition: $MR = MC$, so
$$P = MC \left[\frac{\varepsilon_d}{\varepsilon_d + 1} \right]$$

Krugman Model (1979)

- Moving along a demand downward to the right, Q increases, and ε_d lowers.
- Thus, the expression $[\varepsilon_d / (\varepsilon_d + 1)]$ increases.
- That is, P/W rises as consumption increases

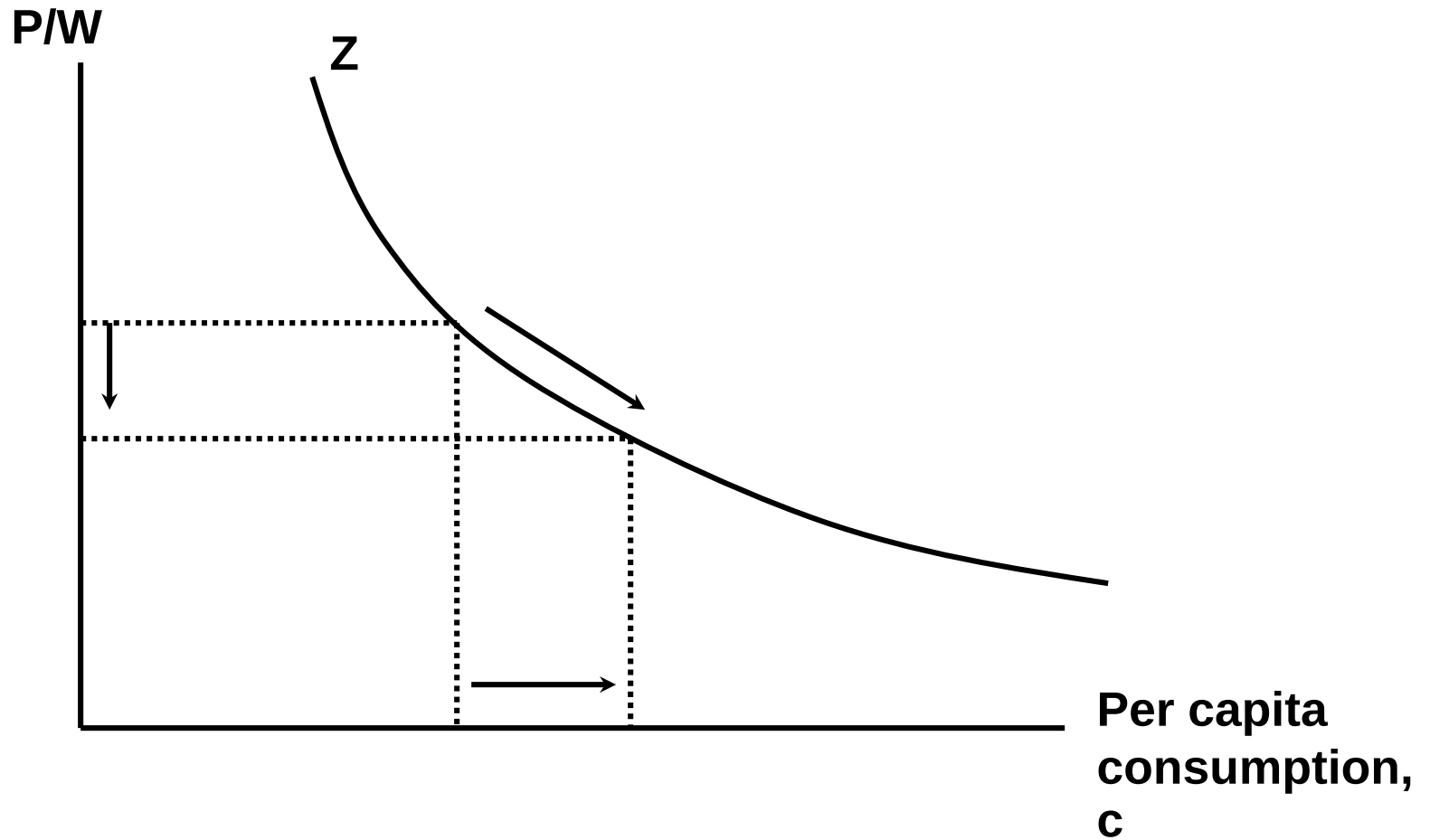
Krugman Model



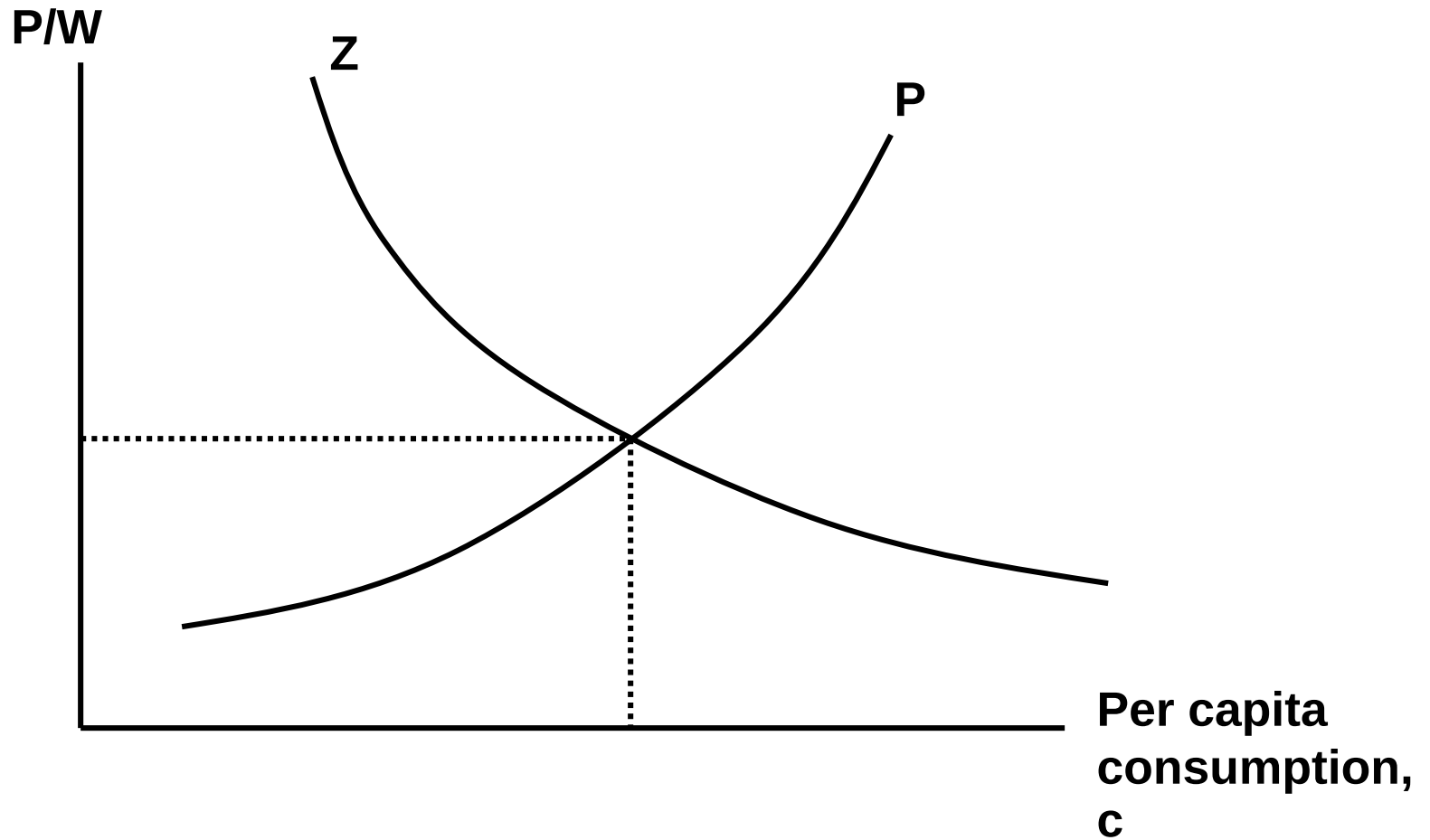
Krugman Model

- Now think about long-run equilibrium:
production takes place where $P = ATC$
- As c increases, AC falls (due to internal EOS)
- Hence, to maintain 'normal' profit, P must be reduced.

Krugman Model



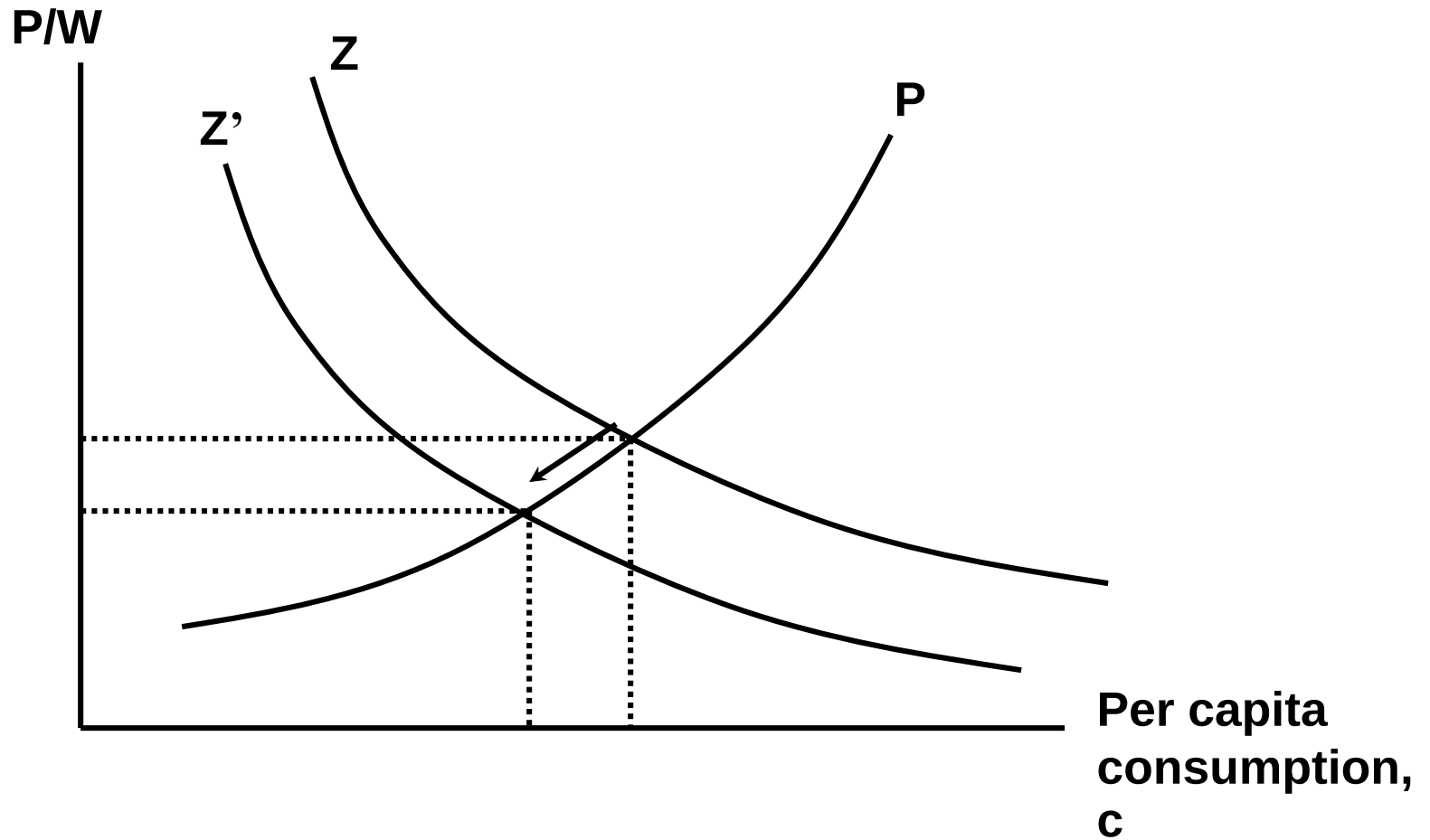
Krugman Model: Equilibrium



When trade is opened

- Market size is enlarged for each representative firm in each industry due to greater number of potential buyers.
- If the firm's total output is held constant, there is less per capita consumption of this firm's product at each P/W than was previously the case. (consumption now spreads to newly available products !)
- Shift Z to the left.

Krugman Model



When trade is opened

- (P/W) falls and c of this firm falls.
- But total consumption of this firm's product increases (due to enhanced market size after trade).
- Then (W/P) increases.
- Trade causes
 - An improvement in real income and a corresponding increase in output of all goods.
 - Consumers now have foreign products available to them as well as home-produced goods. → increased product variety and consumer choice.



When trade is opened

- So this model can explain trade between similar countries, and existence of gains for all consumers.
- Krugman (1983):
 - “factor endowments can determine the broad range of types of goods a country will export and import; but within that broad range, product differentiation and scale economies play a very important role in generating trade and gains from trade”.

Gravity Model

- Predict the volume of trade on a bilateral basis between any two countries which depend on
 - National income of two countries (ability to purchase & capacity to produce) or population size (to indicate market size and perhaps economies of scale)
 - Some measure of distance (as a proxy for transportation costs)
 - Variable reflecting an economic integration arrangement between two countries (eg: FTA)

Intra-Industry Trade

- Trade in the same product category.
- Basic reasons for IIT
 - Product differentiation
 - Transport costs
 - Dynamic economics of scale
 - Degree of product aggregation
 - Differing income distributions in countries
 - Differing factor endowments and product variety

Intra-Industry Trade

■ How to measure IIT

$$I = 1 - \frac{\sum |(X_i / X) - (M_i / M)|}{\sum [(X_i / X) + (M_i / M)]}$$

$I = 1$: ‘total’ intra-industry trade → a country’s exports and imports within a given industry are equal.

$I = 0$: a country either exports or imports, not both, according to what comparative advantage model predicts.

Indexes of IIT for US industries, 1993

Power-generating machinery	0.97
Electrical machinery	0.96
Medical and pharmaceutical	0.86
Office machinery	0.81
Telecommunication devices	0.69
Road vehicles	0.65
Clothing and apparel	0.27
footwear	0.00

Manufacturing IIT as % of Total Manufacturing Trade, 1992-2000

	1992-95	1996-00		1992-95	1996-00
Czech	66.3	77.4	NZ	38.4	40.6
Slovak	69.3	76.0	Australia	29.8	29.8
Mexico	74.4	73.4	Norway	37.5	37.1
Hungary	64.3	72.1	Greece	39.5	36.9
US	65.3	68.5	Turkey	36.2	40.0
UK	73.1	73.7	Korea	50.6	57.5
Ireland	57.2	54.6	Japan	40.8	47.6