

Macro II/Aussenwirtschaft

Lecture Slides No 9

Gerald Willmann
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New trade theory

- dating from late 1970s early 1980s
- increasing returns to scale
- monopolistic competition
- much better at explaining North-North trade
- whereas old theories explained North-South trade

Intra-industry vs inter-industry trade

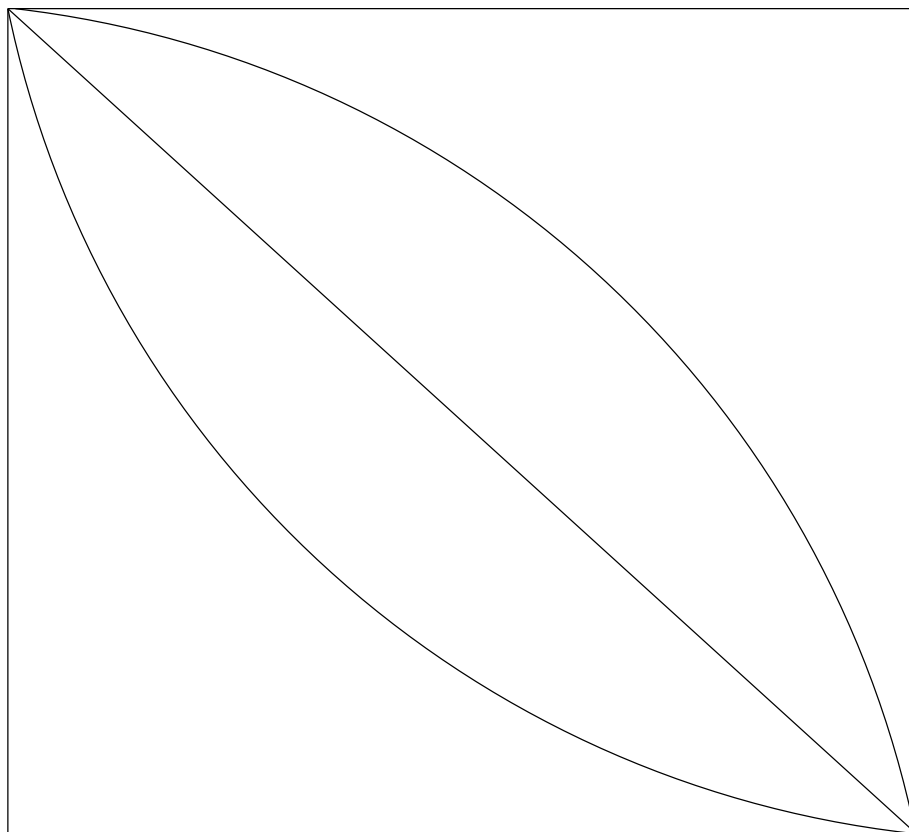
- North-North (little South-South) is intra-industry, trade in both directions within the same industry
- North-South is trade in opposite directions across different industries
- one can measure the degree of intra-industry trade
- use the Grubel-Lloyd index: $1 - \frac{|X_i - M_i|}{X_i + M_i}$
- ranges from zero (no intra-industry trade) to one

Some Data on International Trade in Armenia in 2013 (in mln USD)				
Codes	Article	Exports	Imports	Grubel–Lloyd Index
0207	Poultry	0.1	48	0.01
0302	Fish (fresh or frozen)	17	0.1	0.01
2402	Cigars and cigarettes	68	61	0.95
2523	Cement	12	0.6	0.10
2603	Copper ore	280	0.0	0.00
2710	Oil and oil products	0.0	342	0.00
2716	Electricity	79	4	0.09
3923	Plastic boxes and wraps	6	9	0.76
6203	Men's clothing	10	9	0.97
6802	Monumental or building stone	7	8	0.92
6908	Ceramic paving and tiles	0.0	17	0.00
7010	Glass bottles and jars	17	15	0.94
7102	Diamonds	88	116	0.86
8703	Automobile	4	254	0.03
9403	Furniture	0.1	19	0.01

Source: RA Customs Service and own calculations for GLI

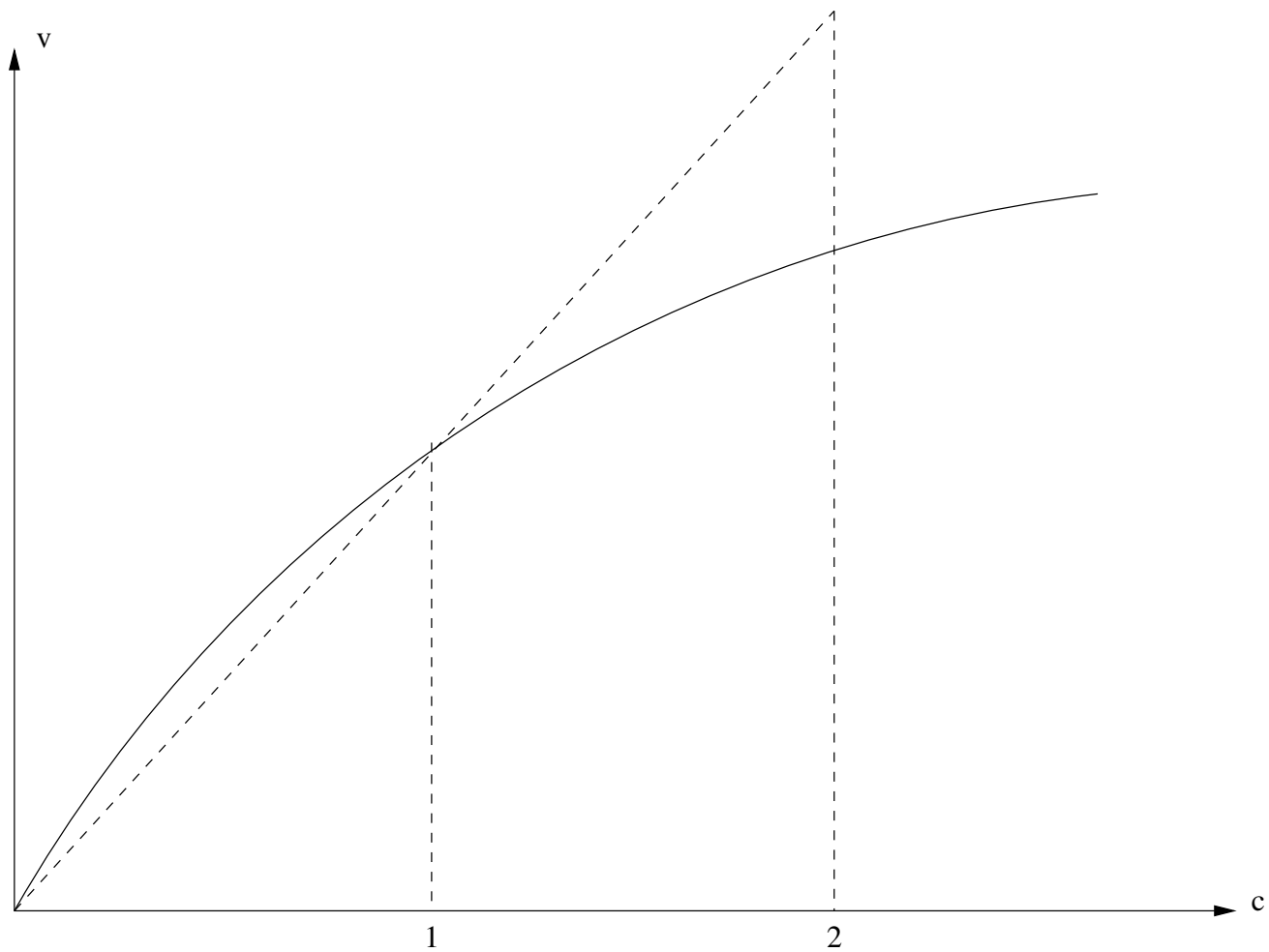
Monopolistic competition trade model

- due to Krugman (JIE 79)
- Dixit-Stiglitz demand side
- with lots of symmetry
- monopolistically competitive industry
- firms producing differentiated varieties
- small monopolists in their respective niches
- show that identical countries will trade



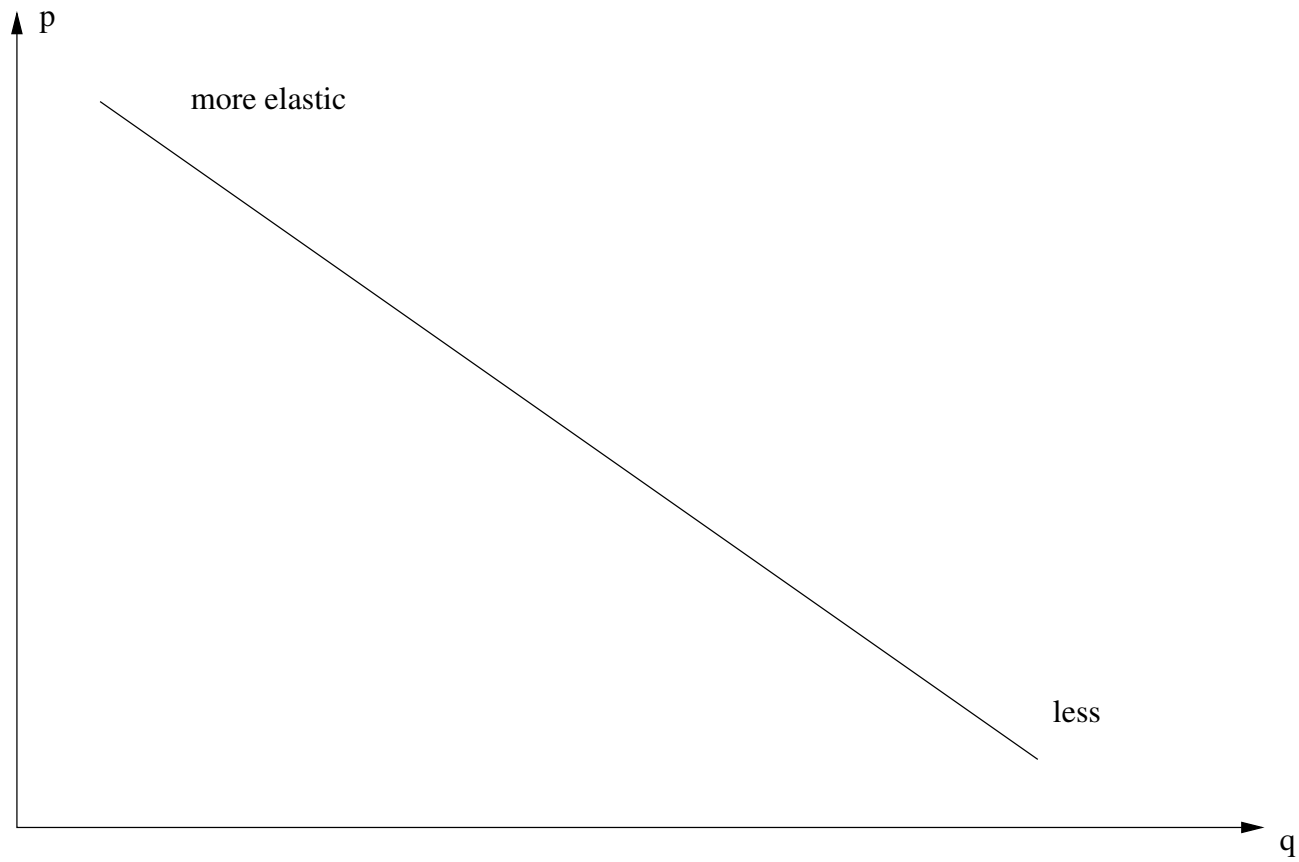
Model setup

- start with demand side
- need demand elasticity to determine pricing behavior of firms
- $U = \sum_{i=1}^N v(c_i)$ with $v' > 0$ and $v'' < 0$
- love of variety
- budget constraint: $w = \sum p_i c_i$
- $\max U$ s.t. BC gives $v'(c_i) = \lambda p_i$



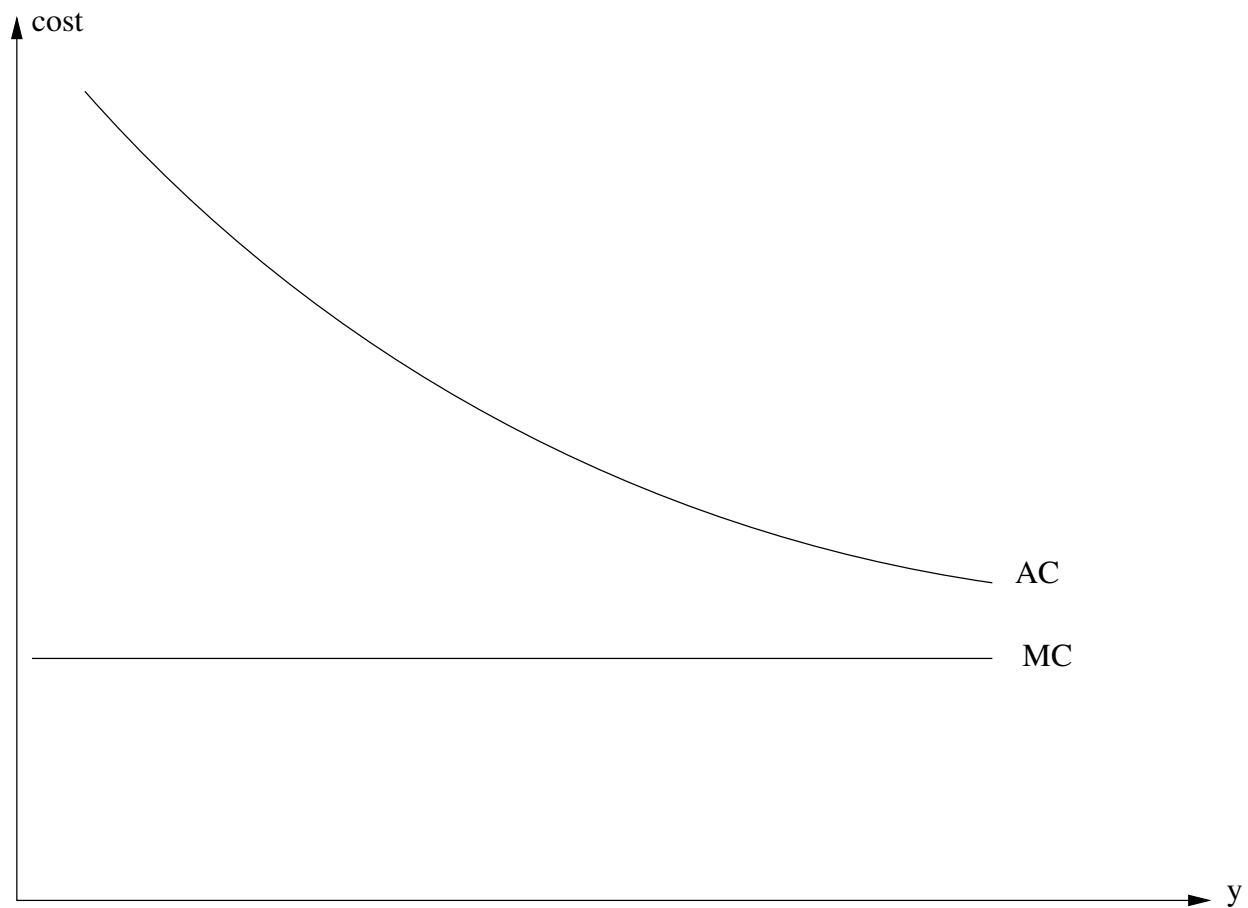
Solving for price elasticity

- totally differentiate first order condition
- $v''dc = dp_i\lambda$
- $d\lambda$ zero if infinitely many varieties
- $\frac{dc}{dp} = \frac{\lambda}{v''}$
- $\eta_i = -\frac{dc_i}{dp_i} \frac{p_i}{c_i} = -\frac{\lambda}{v''} \frac{v'(c)}{\lambda} \frac{1}{c_i} = -\frac{v'}{v''c_i} > 0$
- assumption that $d\eta/dc < 0$
- less convex than CES (AER 80 version has CES)



Production side

- (inverse) production fct: $L_i = \alpha + \beta y_i$
- simple form of IRS, fixed cost in terms of α
- average cost $AC = \frac{wL_i}{y_i} = \frac{w\alpha}{y_i} + w\beta$
- marginal cost $MC = w\beta$
- average cost converges down to constant marginal cost, as fixed cost is spread across more and more units

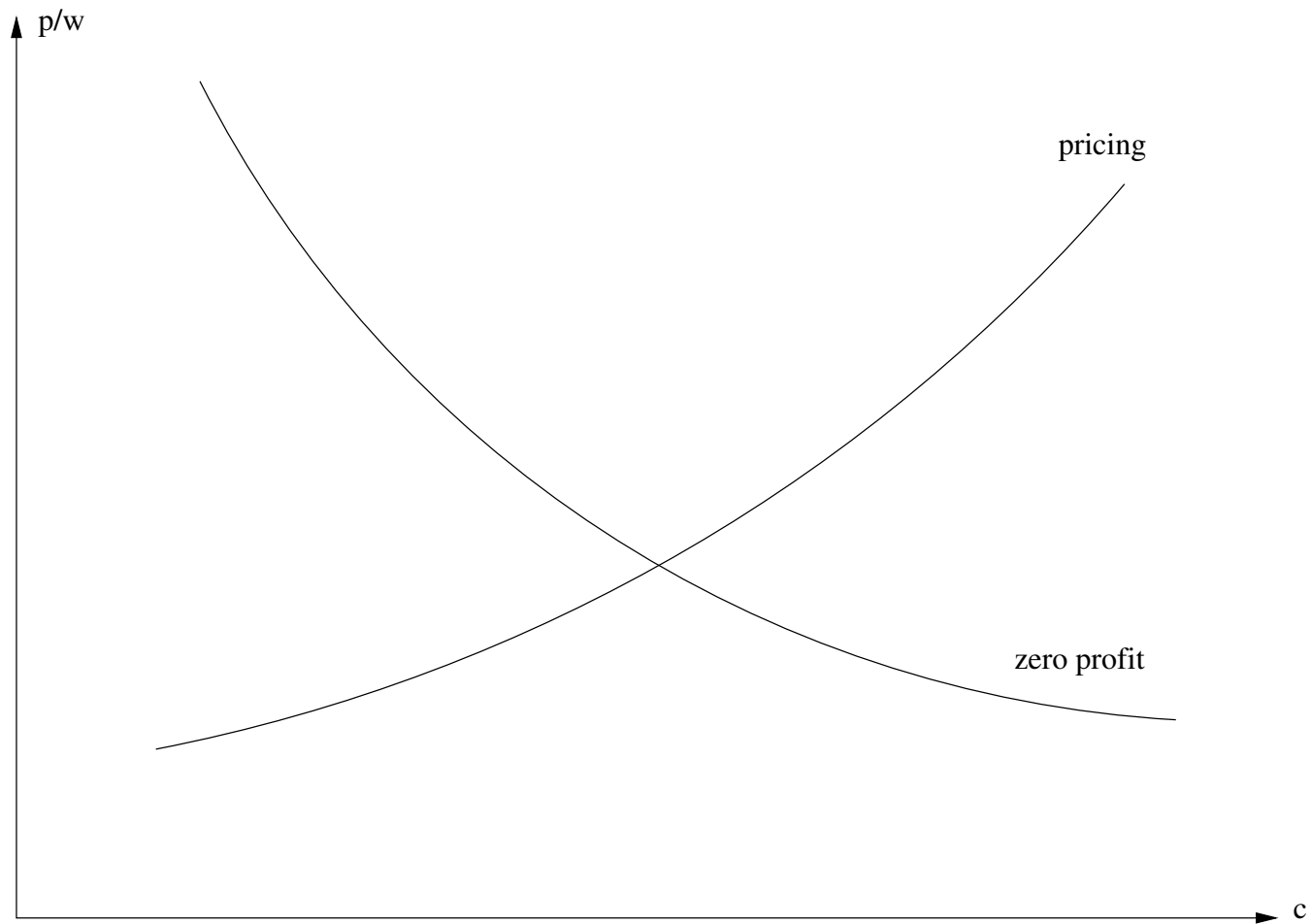


Monopolistic competition

- profit maximization implies $MR = MC$
- $\max \pi = p_i y_i - w(\alpha + \beta y_i)$
- FOC: $p_i + \frac{dp_i}{dy_i} y_i = w\beta$
- $p_i \left(1 - \frac{1}{-\frac{dy_i}{dp_i} \frac{p_i}{y_i}} \right) = w\beta$
- or $\frac{p}{w} = \beta \frac{\eta}{\eta - 1}$
- mark-up monopoly pricing

Free entry

- free entry implies zero profit in long term equilibrium
- zero profit: $AC = p = \frac{w\alpha}{y_i} + w\beta$
- or $\frac{p}{w} = \frac{\alpha}{y_i} + \beta = \frac{\alpha}{Lc} + \beta$
- we now have two equations in two unknowns p/w and c
- solve conceptionally in a diagram



Slopes

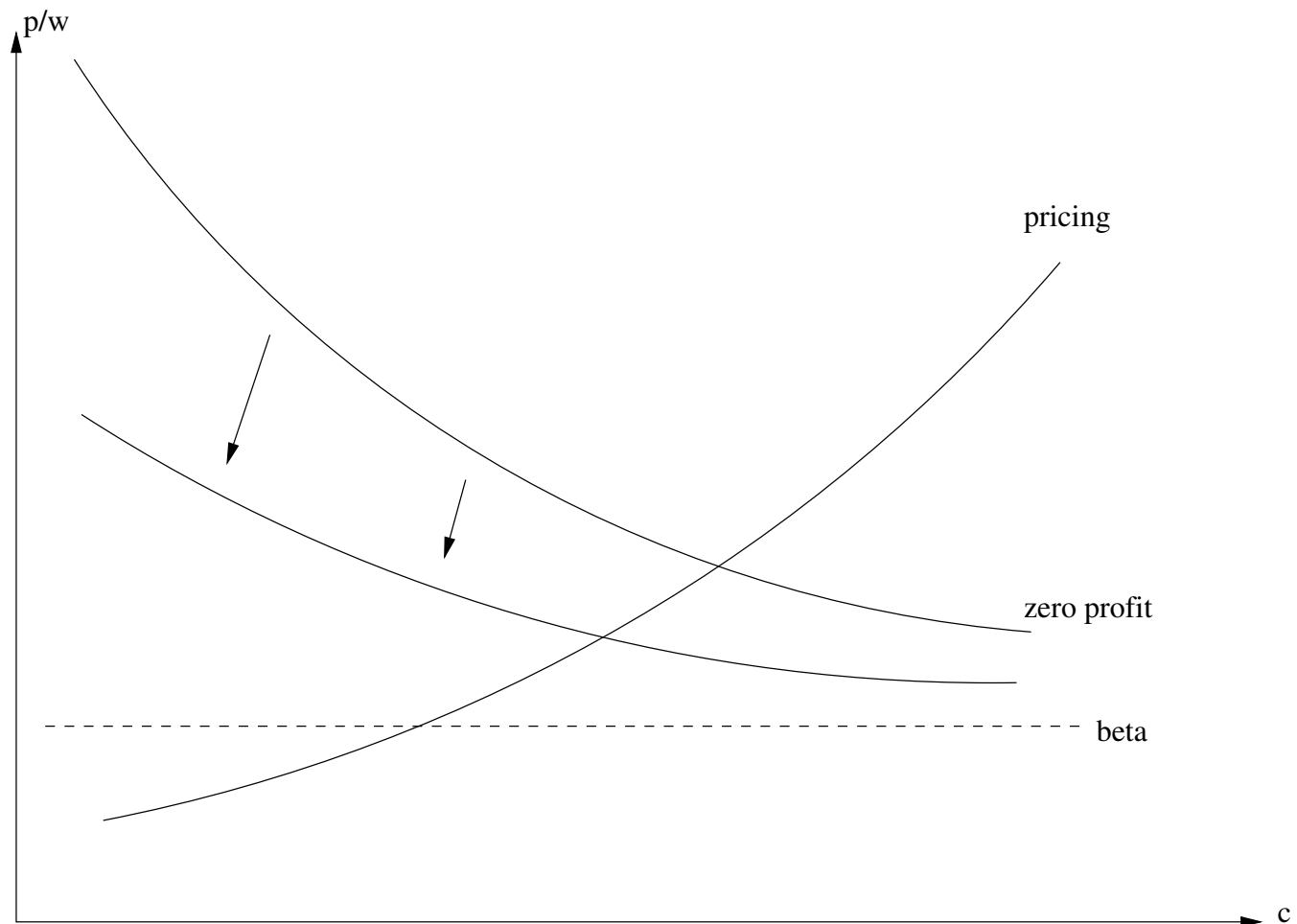
- downward slope of zero profit is clear
- fixed cost spread across more units
- $\frac{p}{w} = fct(c) = \beta\eta(\eta - 1)^{-1}$
- $\frac{d(p/w)}{dc} = (\beta(\eta - 1)^{-1} + \beta\eta(-1)(\eta - 1)^{-2})\frac{d\eta}{dc}$
- (negative + negative) × negative gives positive
- higher demand → lower elasticity → higher mark-up

Determine number of firms

- use resource constraint
- $L = \sum L_i = \sum (\alpha + \beta y_i) = N(\alpha + \beta y)$
- so $L = N(\alpha + \beta Lc)$
- or $N = \frac{1}{\alpha/L + \beta c}$
- quantity c (from the diagram) determines N

Trade

- let's use the model
- how to model trade?
- consider (identical) 2nd country with $L^* = L$
- allow the 2 to trade freely (can also do more than 2)
- analyze integrated world market
- well, we have of done that already
- simply take model with $\tilde{L} = 2L$



Effects of trade

- per capital consumption of each variety lower
- real wage increases/real price falls
- number of varieties (available to consumers) increases
- two sources of gains from trade: real income and variety
- output per firm $y_i = Lc_i$ increases,
as L has doubled and c fallen by less than half
- lower N per country (average)
- scale and selection effect

Time dimension

- suppose liberalization/market integration happens overnight
- economy takes time to adjust, especially number of firms
- so in short term we have too many firms
- who viciously compete down the price and make losses
- only over time will some firms leave the market
- and number of competitors reaches new equilibrium level
- example of airline liberalization

Number of firms/varieties

- each firm produces more
- but number of firms/varieties globally decreases
- example: from 2×10 to 16
- one is tempted to conclude 8 per country
- but model silent on this - firms are identical
- incentive to use subsidies to keep your firms alive
- and let adjustment play out in the other country

- only works if other country doesn't react
- subsidies could be discontinued once adjustment (in other country) has taken place