Econ 580
Lecture Notes 16

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Paper: Krugman and Venables's "Globalization and the Inequality of Nations" - QJE 1995

Consider first a single economy with labor as the single factor, supplied inelastically in equantity L, two sectors - agriculture and manufacturing, CD preferences with share γ to manufacturing, manufacturing produced from a continuum of intermediate goods through CES with e.s. $\sigma > 1$, where each intermediate good is produced with a fixed cost F and a marginal cost c in terms of a "composite input" whose unit cost/price is η, so that

$$TC(x) = \eta\,(F + cx)$$

Assume first that the composite input is "produced" one-to-one from labor, so that $\eta = w$. What is the equilibrium?

Choosing agriculture as the numeraire, then the price of each intermediate good is $p = c/(1 - 1/\sigma) \equiv \theta$, and

$$\begin{aligned} P_M^{1-\sigma} &= np^{1-\sigma} \\ &\implies P_M = n^{1/(1-\sigma)}p = n^{1/(1-\sigma)}\theta \end{aligned}$$

The zero profit condition is

$$\left(\frac{1}{1-1/\sigma}-1\right)cx-F = 0$$
$$\implies x=(\sigma-1)F/c$$

Choosing units appropriately, then the ZPC is $x=1$.

Total expenditure on manuacturing is $E=\gamma L$, hence demand for each intermediate good is

$$x = p^{-\sigma}P_M^{\sigma-1}E=E/pn$$
$$\implies x=x(n)\equiv\frac{\gamma L}{\theta n}$$

The pricing condition, $p=\theta$, and the ZPC, $x=\gamma L/\theta n$, yield the equilibrium level of n, n^*.

Under "naive dynamics" this equilibrium is stable: $n>n^*$ implies $x(n)<1$, negative profits, and $n\downarrow$, whereas $n<n^*$ implies positive profits and $n\uparrow$.

International trade among equal sized economies ($L_S = L_N$) with no trade costs for final goods and infinite trade costs for intermediate goods. What happens? How do the equilibrium wages depend on γ?

Now imagine that the "composite input" is produced from labor and the manufactured good with a CD technology with labor share $1 - \mu$. Formally,

$$TC(x) = w^{1-\mu} P_M^{\mu} (F + cx)$$

The previous case entails $\mu = 0$. What happens with $\mu > 0$?

With $(\sigma - 1)F/c \equiv 1$ it is still the case that the ZPC entails $x = 1$.

It is also still true that $x = E/pn$ but now $E \neq \gamma L$. Instead, we have

$$E = \gamma L + \mu x p n$$

and

$$(1 - \gamma) L = L - L_M$$

and

$$(1 - \mu) x n p = L_M$$

Hence

$$E = \gamma L + \frac{\mu \gamma L}{1 - \mu} = \frac{\gamma L}{1 - \mu}$$

Plugging above we now have

$$x = \frac{1}{pn} \frac{\gamma L}{1 - \mu}$$

So the ZPC is now

$$np = \frac{\gamma L}{1 - \mu}$$

The pricing condition now is

$$\begin{aligned} p &= \theta w^{1-\mu} P_M^{\mu} = \theta \left(n^{1/(1-\sigma)} p \right)^{\mu} \\ &\implies p = \theta^{\frac{1}{1-\mu}} n^{-\frac{\mu}{1-\mu}\frac{1}{\sigma-1}} \end{aligned}$$

Which condition is steeper?

$$\frac{dp}{dn} \mid \ _{ZPC} = -\frac{p}{n}$$
$$\frac{dp}{dn} \mid \ _{PP} = -\frac{\mu}{1-\mu}\frac{1}{\sigma-1}\frac{p}{n}$$

ZPC is steeper than PP iff

$$\begin{aligned} \frac{\mu}{1-\mu}\frac{1}{\sigma-1} &< 1 \\ &\iff \mu < \frac{\sigma-1}{\sigma} \end{aligned}$$

Why do we need low μ for stability? Why is it that the threshold for μ is given by $(\sigma - 1)/\sigma$.

Comparative statics: under stability, an increase in L leads to an increase in n and a decline in p.

Different scenarios:

(A) As above, consider international trade among equal sized economies with no trade costs for final goods and infinite trade costs for intermediate goods. Same implications as above.

From now on, assume that the composite manufacturing good is non-tradable.

(B) Imagine no trade costs for intermediate goods. The no geography and real wages would be equalized across countries.

(C) Now imagine a trade cost $\tau > 1$ for intermediate goods, but with $\mu = 0$. This is the world of the "Home Market Effect" where large country specializes in differentiated goods produced with increasing returns to scale even if it doesn't have any intrinsic comparative advantage in these goods. But KV assume that $L_S = L_N$, so this is ruled out.

(D) With $\mu > 1$ and $\tau > 1$. The story is as follows: starting from the symmetric equilibrium where no inter-industry trade (only intra-industry trade), imagine that $n_N \uparrow$. Besides usual channel (1) through which n affects profitability ($n \uparrow$, $P_M \downarrow$, profits decrease) there are two additional channels that depend on trade:

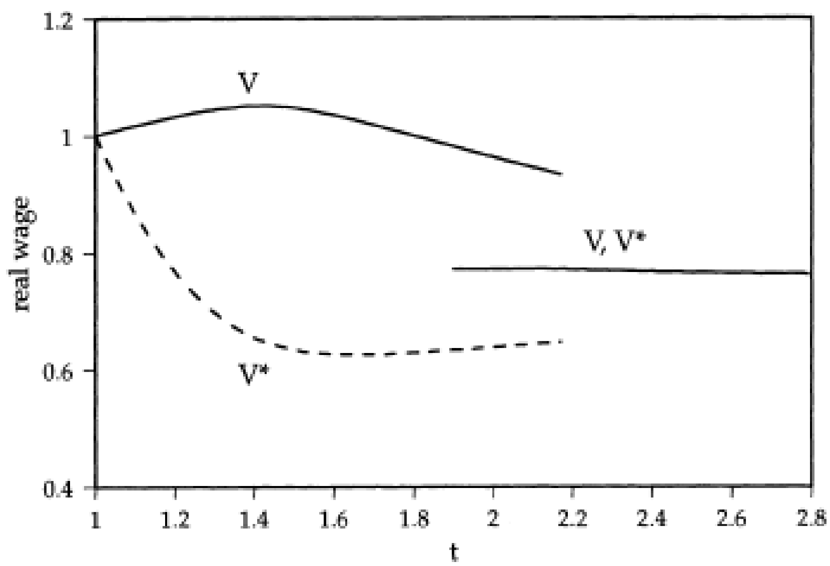
(2)The decline in P_M decreases each intermediate good producers' cost -> a forward linkage effect.

(3) An increase in n increases total expenditure on manufactured goods in the North -> a backward linkage effect.

If τ is very high then these effects are small, just like in the closed economy. The condition $\mu < (\sigma - 1)/\sigma$ ensures that (2) and (3) are weaker than (1) in that case. Continue to assume this.

As τ falls, (2) and (3) get larger because manufacturing sector in North becomes more competitive than in South and starts exporting, thus strengthening the effects.

This allows a "cluster" to form in the North. This is how this model captures the "core-periphery" idea. If North produces only manufacturing then $w_N > w_S = 1$.



We need τ to fall enough that

$$\tau^{\sigma-1} < \left(\frac{1+\mu}{1-\mu}\right)\left(\frac{\sigma(1+\mu)-1}{\sigma(1-\mu)-1}\right)$$

If τ is close to 1 (but higher) then always core-periphery equilibrium, but real wage gap is minimal. If $\gamma \leq 1/2$ then clustering but North not completely specialized and $w_N = w_S = 1$. But if $\gamma > 1/2$ then $w_N > w_S = 1$.