Econ720 - TA Session 11

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Logic of "Knowledge Spillovers and Scale Effects"

Further Discussion on Variety Expansion Model

Discussion-1. R&D Sector

- Current assumption is "R&D sector only uses final goods to innovate"
- Relax this assumption by assuming "R&D sector also uses labor"

Problem!!

There is no sustained growth (P4)

How to fix?

Introduce knowledge spillovers: $\dot{N}_t = \eta N_t L_{Rt}$ (P5-10)

Logic of "Knowledge Spillovers and Scale Effects"

Discussion-1. R&D Sector

- New assumption about R&D sector
- Knowledge spillovers

$\rightarrow$ Sustained growth!

BUT...

New problem: scale effect (P10)

$$g(C) = g(Y) = g(N) = \frac{(1-\beta)\eta L - \rho}{1-\beta+\theta}$$

Logic of "Knowledge Spillovers and Scale Effects"

Discussion-1. R&D Sector

How to get rid of scale effects?

Modify the model by

$$\dot{N}_t = \eta N_t^{\phi} L_{Rt}$$

Does this modification help? Kind of...

$$g(N) = \frac{n}{1-\phi}$$

Scale effects still exist... (P11-13)

Another approach: Young, 1998 (P14)

Logic of "Knowledge Spillovers and Scale Effects"

Discussion-2. Intermediates Sector (P16-32)

- In the current model, the intermediates sector problem is a static one.
- What if the intermediates are durable? (P18)

Key:

Intermediates sector problem becomes dynamic!! (P24)