

Exogenous regional productivity asymmetries in a core-periphery model

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- ▶ The industrial productivity is different between regions but equal within regions
- ▶ Entrepreneurs may decide where to locate their industrial firms
- ▶ The industrial good may be (costly) traded between regions

Therefore, how do exogenous regional asymmetries in firms' productivity affect the spatial distribution of economic activity and the agents' welfare?

- ▶ Footloose entrepreneur model with quasi-linear log utility and two regions (Gaspar et al., 2018; Pflüger, 2004)
 - Region i has $L/2$ unskilled workers that are immobile between regions
 - Region i has H_i skilled workers that are mobile between regions
 - The agricultural good is produced under perfect competition and is freely traded
 - The industrial good is produced under monopolistic competition and is traded with iceberg transportation costs (τ)
 - $\phi = \tau^{1-\sigma} \in (0, 1]$ represents the freeness of trade between the regions
 - Migration decisions are governed by the replicator dynamics (Sandholm, 2010; Taylor & Jonker, 1978),

$$\dot{h} = h(1-h)[V_1(h, \epsilon) - V_2(h, \epsilon)]$$

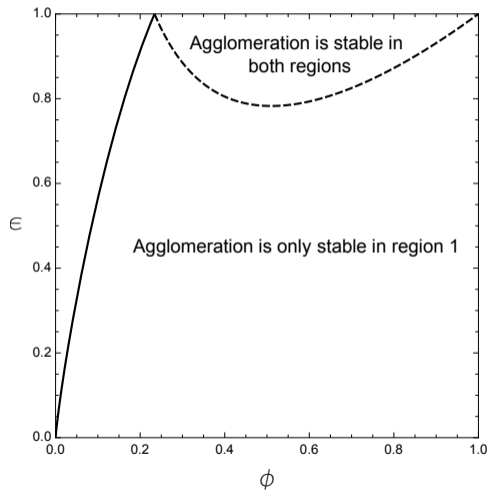
Productivity problem

- ▶ The productivity level in region i is ϵ_i
- ▶ The input requirement of skilled labour in region i is α/ϵ_i
- ▶ Firms do not incur any costs related to the regional productivity level

- ▶ To simplify our analysis, without loss of generalisation, we define
 - The productivity level in region 1 equal to $\epsilon_1 = 1$
 - The productivity level in region 2 equal to $\epsilon_2 = \epsilon \in (0, 1)$

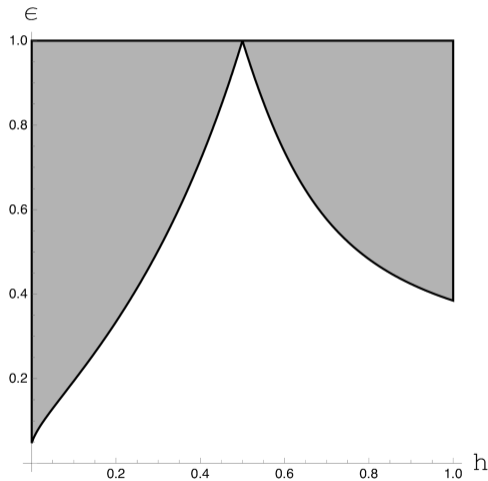
Long-run equilibrium

Agglomerations

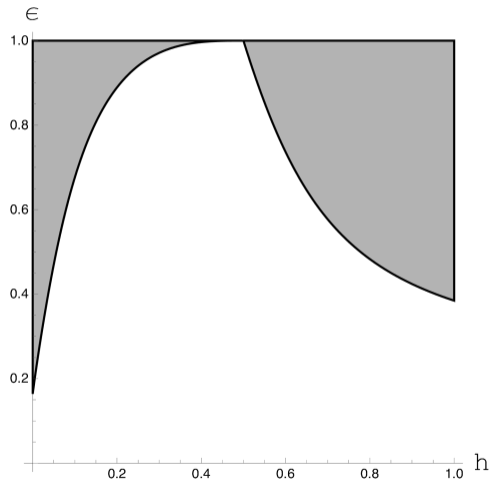


Long-run equilibrium

Interior equilibria ($\phi = 0.2$)



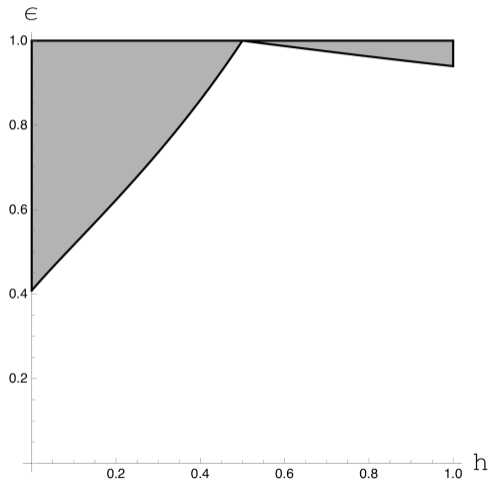
(a) Existence



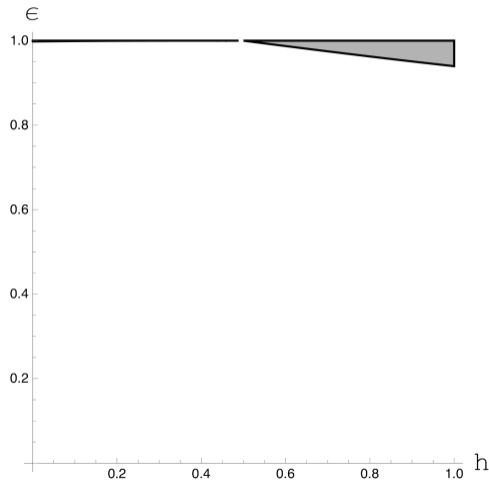
(b) Stability

Long-run equilibrium

Interior equilibria ($\phi = 0.7$)

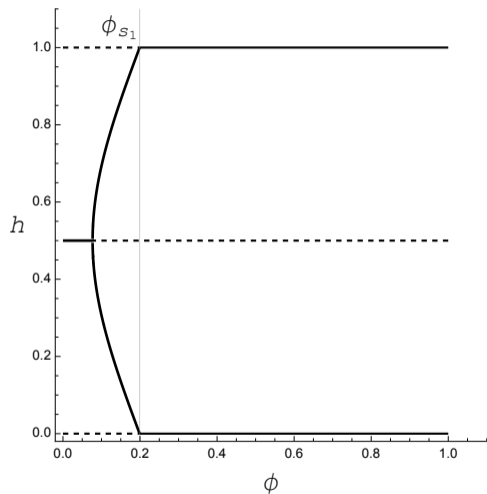


(a) Existence

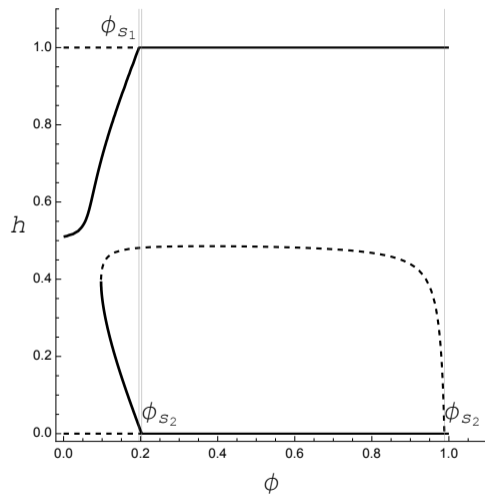


(b) Stability

Migration dynamics

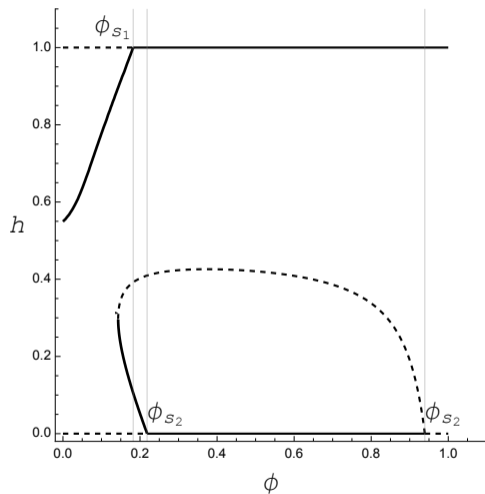


(a) $\epsilon = 1$

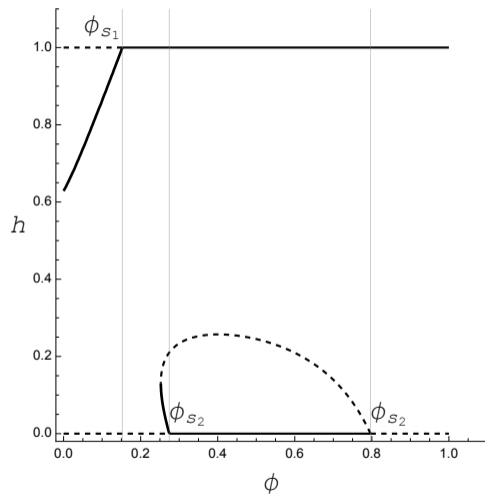


(b) $\epsilon = 0.99$

Migration dynamics

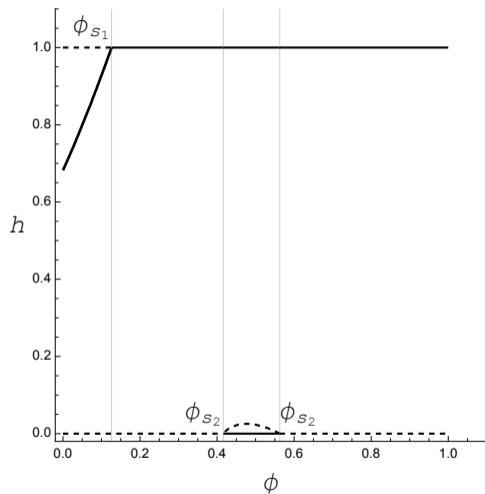


(c) $\epsilon = 0.95$

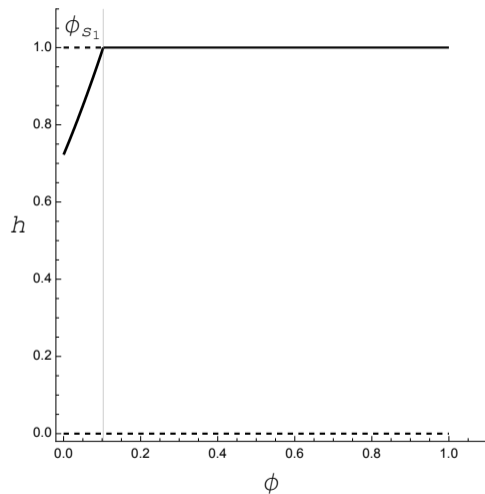


(d) $\epsilon = 0.85$

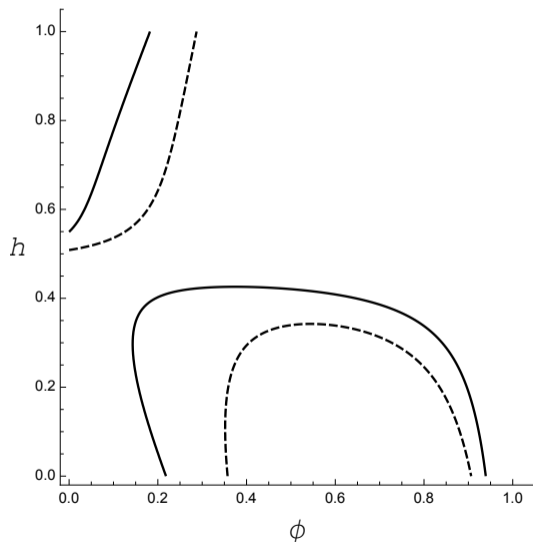
Migration dynamics



(c) $\epsilon = 0.75$



(d) $\epsilon = 0.65$



Sum up

- ▶ Wages in the most productive region increase
- ▶ Wages in the least productive region decrease
- ▶ Prices decrease in both regions
- ▶ Symmetric dispersion is no longer an equilibrium

Proposition 3

When the productivity gap between the regions is too big, the mobile agents will always choose to be agglomerated in one of the regions.

Proposition 9

Unskilled workers can never attain maximum welfare.

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