



# Agglomeration and welfare

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# [ „New economic geography“ ]

- „Positive“ model:
  - Derivation of geographical equilibrium structures
- Increasing returns to scale + transportation costs + factor mobility
  - Endogenous emergence of a centre-periphery-structure in a model with two regions that are ex-ante identical.

# [ „New economic geography“ ]

- Normative issue:  
What are the welfare implications of these equilibria?
- NEG: Imperfect competition  
→ First theorem of welfare economics not always valid!

# [ Regional policy ]

- Second most important policy area in the EU (~30 billion Euro p.a.)
- Goal of EU regional policy:  
Reduction of agglomeration
- Not a policy of income redistribution, but rather: policy that aims at influencing the spatial resource allocation

# [ Regional policy ]

„Durch die explizite Nennung des Ziels der Verringerung der Unterschiede im Entwicklungsstand in Bezug auf die wirtschaftliche Entwicklung wird implizit gefordert, dass die EU-Politik und insbesondere die Kohäsionspolitik die Faktorausstattung und die Ressourcenallokation beeinflussen sollen, um dadurch das wirtschaftliche Wachstum zu fördern. [...] Es geht weniger darum, den Verbrauch direkt zu erhöhen oder das Einkommen umzuverteilen.“

**(Second Cohesion Report of the EU Commission, 2001)**

# [ Regional policy ]

- When is regional policy justified from an efficiency point of view?
  - Decentralized market allocations must exhibit „over-agglomeration“.
- What is „over-agglomeration“?
  - markets generate more spatial inequality than a „benevolent social planner“

# [ Regional policy ]

- With „over-agglomeration“:  
Justification for EU regional policy
- With optimal or „under-agglomeration“  
compensating income transfers,  
but no reason to influence spatial  
resource allocation

# [ NEG and normative analysis ]

- Problem: Most models can only be solved numerically.
- Normative analysis based on analytically tractable NEG models:
  - Ottaviano/Thisse, JPubEcon, 2002
  - Ottaviano/Tabuchi/Thisse, IER, 2002
  - Pflüger/Suedekum, IZA, 2004



# [ NEG-Modell ]

- Two ex-ante identical regions
- Two sectors: „Industry“ (M) and „agriculture“ (A)
- Two types of individuals
  - unskilled (regionally immobile, sectorally mobile), L
  - skilled (only in M-sector, regionally mobile), K
- Immobile housing stock (H)
- H and L distributed evenly across the two regions

# [ NEG model ]

- A-sector:  
CRS, perfect competition, free tradability.  
1 unit labour = 1 product unit
  - M-sector: Dixit-Stiglitz  
variety of differentiated products; one product per firm  
IRS + monopolistic competition + interregional  
transportation costs.
- One skilled worker per firm as fixed cost;  
constant marginal costs (unskilled only)

# [ Demand ]

Utility function

$$U = \alpha \ln X + \beta \ln H + A$$

$$X = \left( \int_{i=0}^N x_i^{\frac{\sigma-1}{\sigma}} di + \int_{j=N}^{N^*} x_j^{\frac{\sigma-1}{\sigma}} dj \right)^{\frac{\sigma}{\sigma-1}}$$

# [ Equilibrium structure ]

Decision problem for skilled workers:

Agglomeration in one region, or remaining in the symmetrical initial situation?

Agglomeration versus dispersion forces

# [ Equilibrium structure ]

Agglomeration forces:

- Market size effects:
  - higher nominal wages +
  - lower price index for M-goods

Dispersion forces:

- Stronger product and factor market competition with regional concentration
  - downward pressure on nominal wages
- Higher housing prices

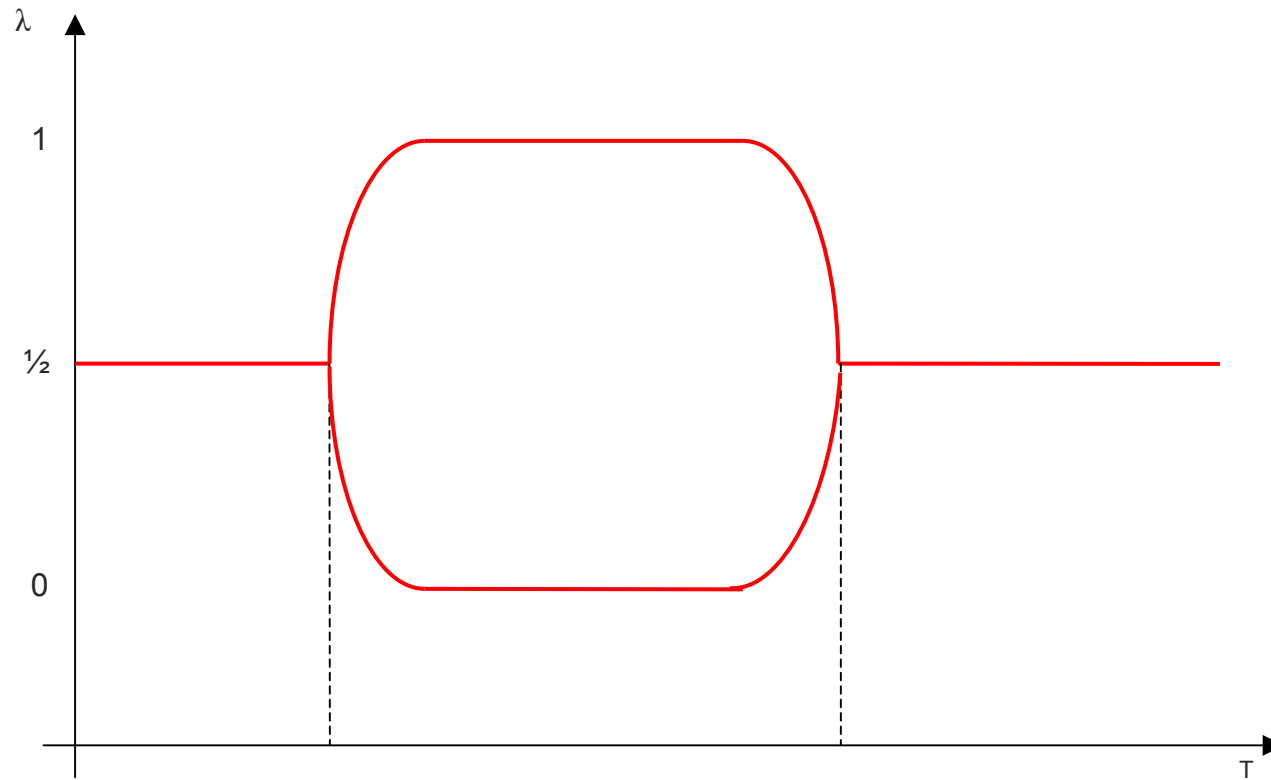
# [ Equilibrium structure ]

Agglomeration forces  $>$  Dispersion forces:  
Centre-periphery-structure.  
Skilled workers concentrate in on region.

Agglomeration forces  $<$  Dispersion forces:  
Symmetrical equilibrium remains

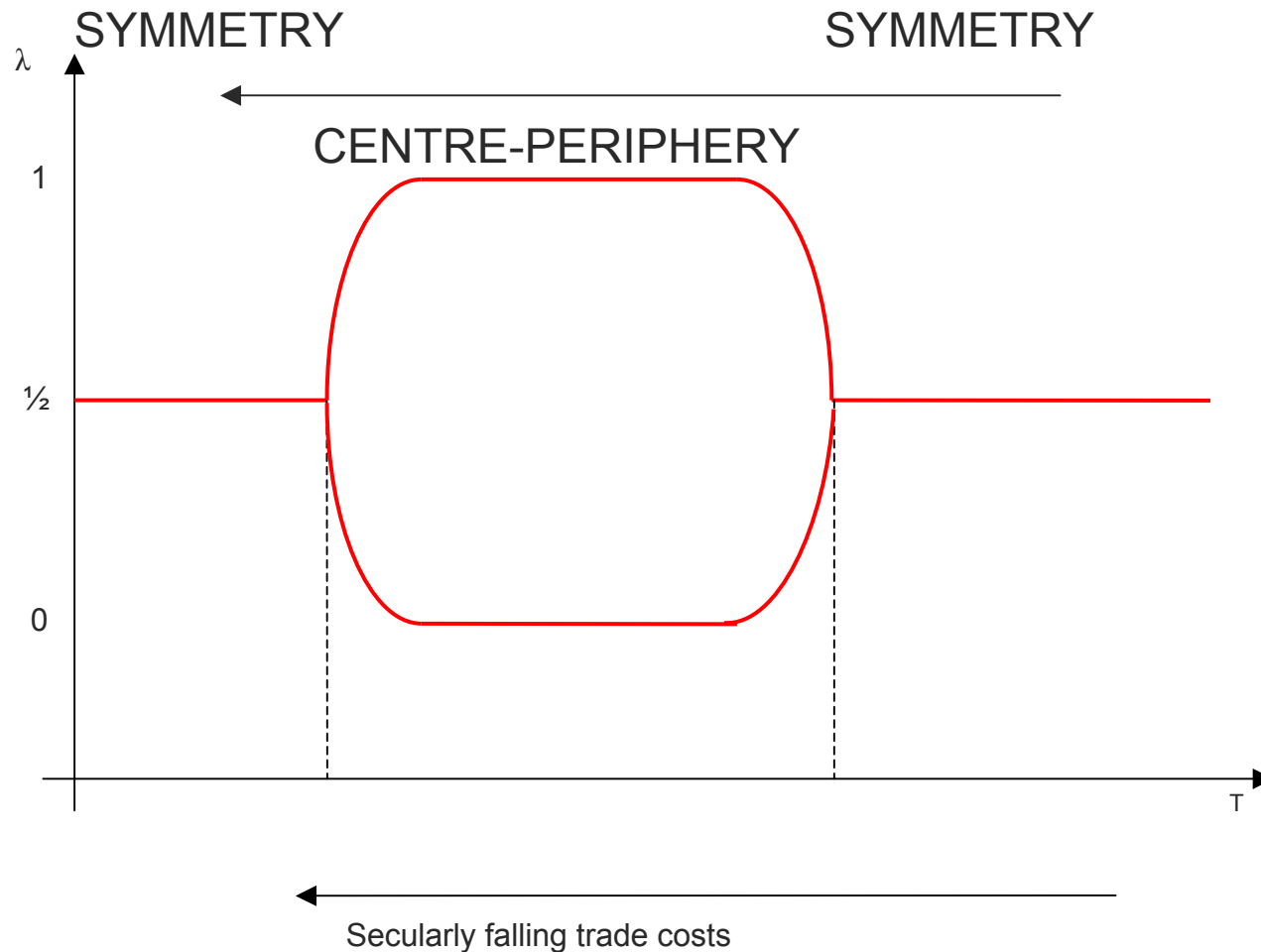
Critical determinant:  
**Transportation costs**

# [ Equilibrium structure ]



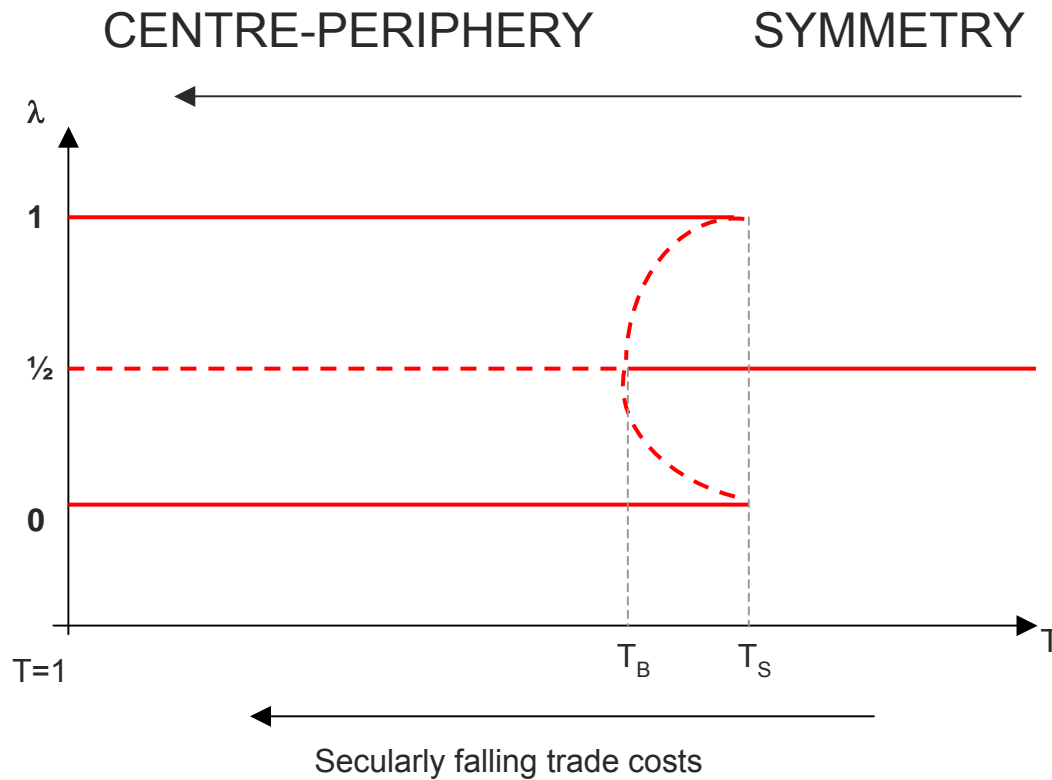
← Secularly falling trade costs

# [ Equilibrium structure ]

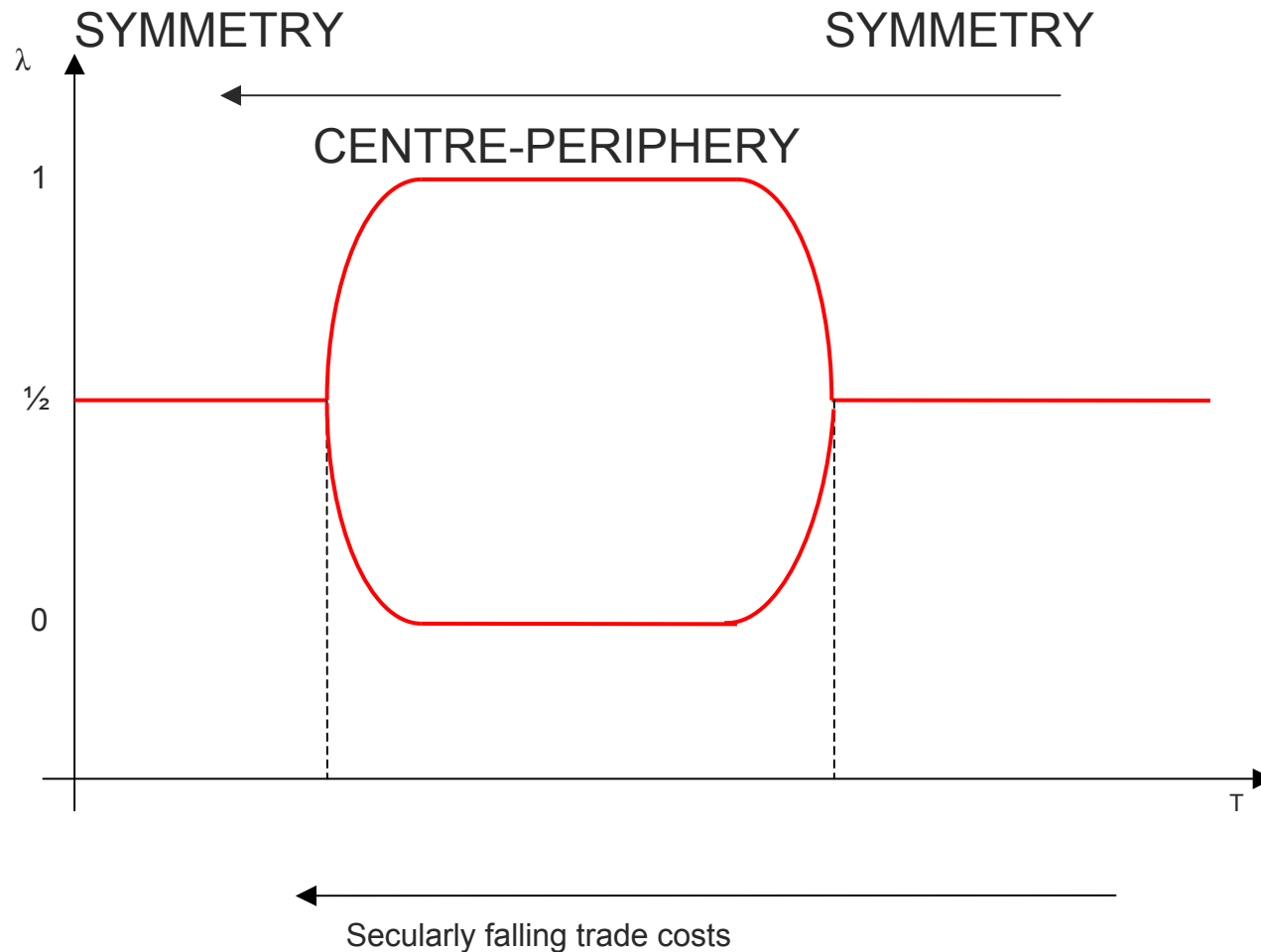




# For comparison: Krugman (1991)



# [ Pflueger/Suedekum (2004) ]



# [ Equilibrium versus optimum ]

- Is the equilibrium allocation always identical with the optimal (planner-)allocation?

# Equilibrium versus optimum

- Is the equilibrium allocation always identical with the optimal (planner-)allocation?

→ NO!

Mobile skilled workers neglect the impact of their location decision on the welfare level of the immobile unskilled workers!  
(transmission mechanism: market prices)

A planner would take these effects into account.

# [ Planner allocation ]

- Planner chooses  $\lambda$  such that:

$$\Omega(\lambda) = \sum_{i \in \{A, A^*, K\}} V_i(p, Y_i) \rightarrow \text{Max!}$$

- „utilitarian social welfare function“

# [ Planner allocation ]

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- Who benefits from agglomeration?
  - mobile skilled workers
  - immobile unskilled in the centre

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- Who loses from agglomeration?
  - immobile unskilled in the periphery

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- Planner: Balancing of the effects!

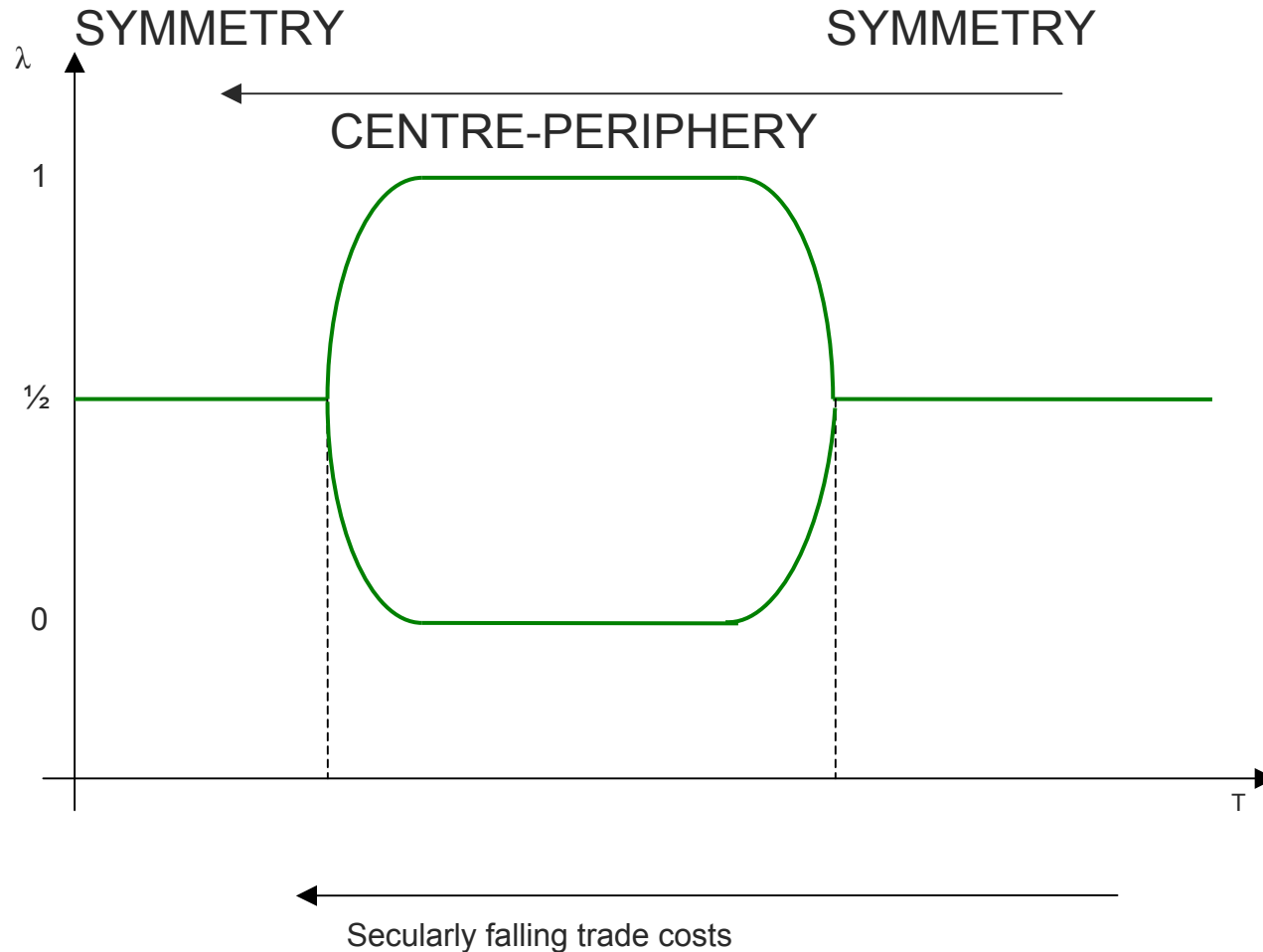


# [ Planner allocation ]

- Who benefits from agglomeration?
  - mobile skilled workers
  - immobile unskilled in the centre
- Who loses from agglomeration?
  - immobile unskilled in the periphery
- Planner: Balancing of the effects!

Critical determinant: level of trade costs!

# [ Planner allocation ]



# [ Equilibrium versus optimum ]

Equilibrium allocation

✓

# [ Equilibrium versus optimum ]

Equilibrium allocation ✓

Planner allocation ✓

# [ Equilibrium versus optimum ]

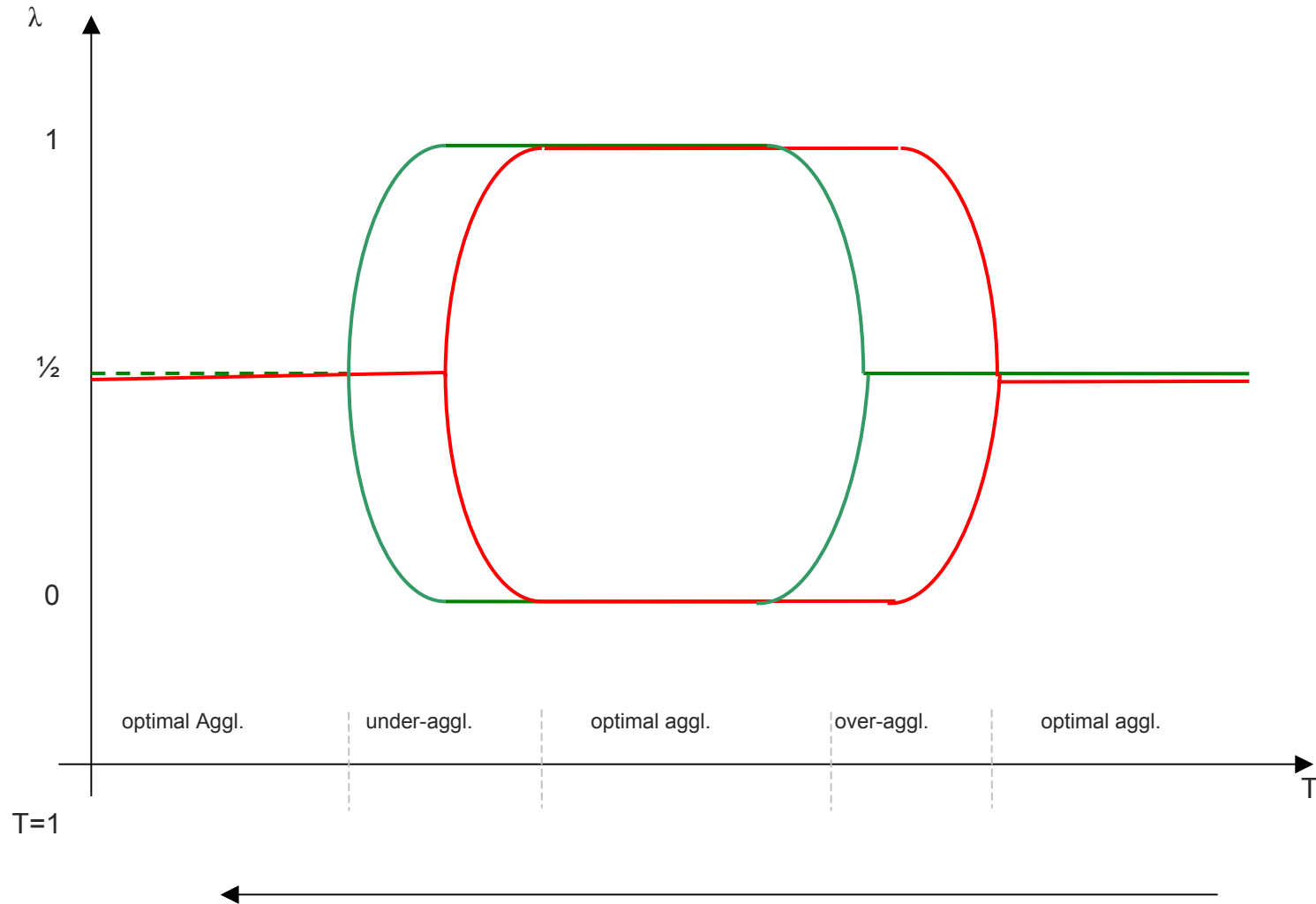
Equilibrium allocation ✓

Planner allocation ✓

Comparison of the two:

Implications for the efficiency reasons for regional policy

# [ Equilibrium versus optimum ]



# Efficiency reasons for regional policy

- Over-agglomeration only in a certain range of trade costs.
- In other ranges:  
Market generates optimal degree, or even „too little“ agglomeration

# [ Policy implications ]

- From an efficiency point of view:  
A more equal spatial resource allocation is by no means **always** justified.



# [ Policy implications ]

- From an efficiency point of view:  
A more equal spatial resource allocation is by no means **always** justified.
- But a policy like this is justified in certain parameter ranges.

# [ Policy implications: Outlook ]

- Problem 1: Do all theoretical models produce the same qualitative results?
- Problem 2: Even if so, in which parameter range are we?