

## Preferred citation style

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Axhausen, K.W. (2005) Activity spaces, biographies, social networks and their welfare gains and externalities: Some hypothesis and empirical results, PROCESSUS Colloquium, Toronto, June 2005.

# Activity spaces, biographies, social networks and their welfare gains and externalities: Some hypothesis and empirical results

KW Axhausen

IVT

ETH

Zürich

March 2005

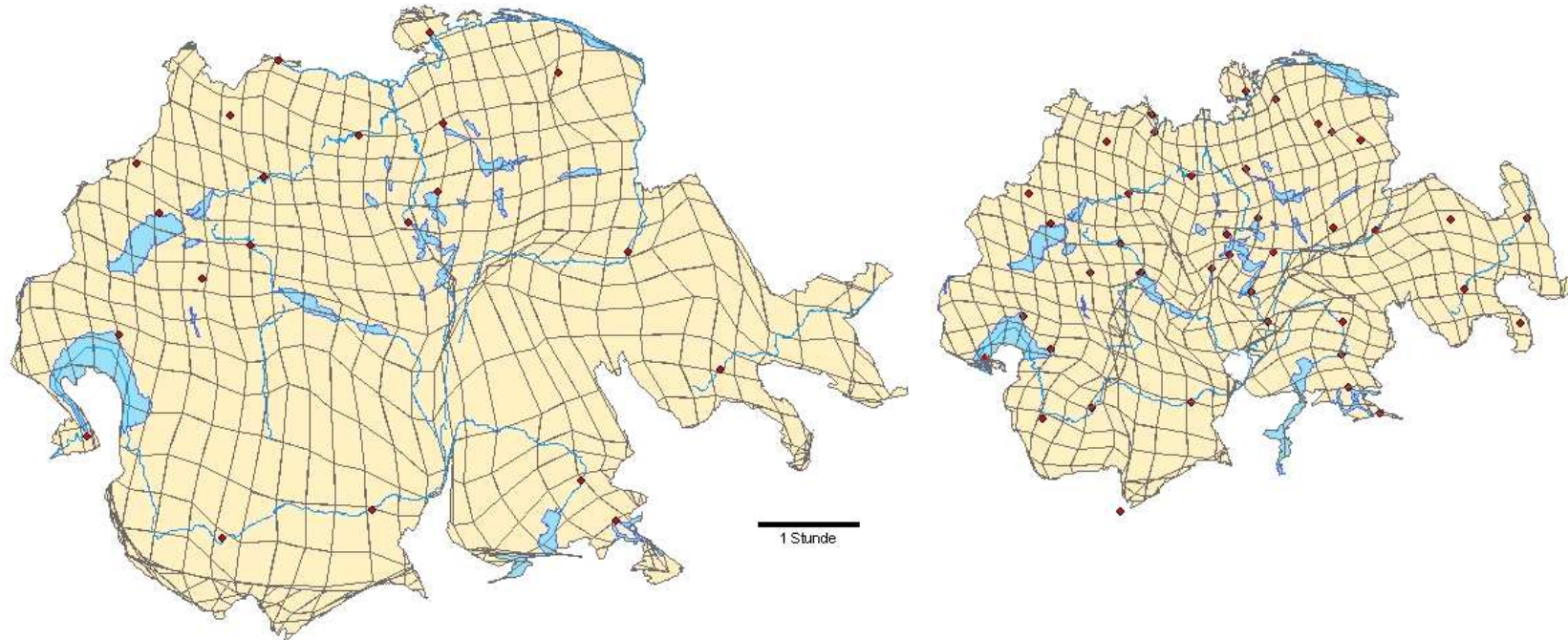
 Institut für Verkehrsplanung und Transportsysteme  
Institute for Transport Planning and Systems

**ETH**

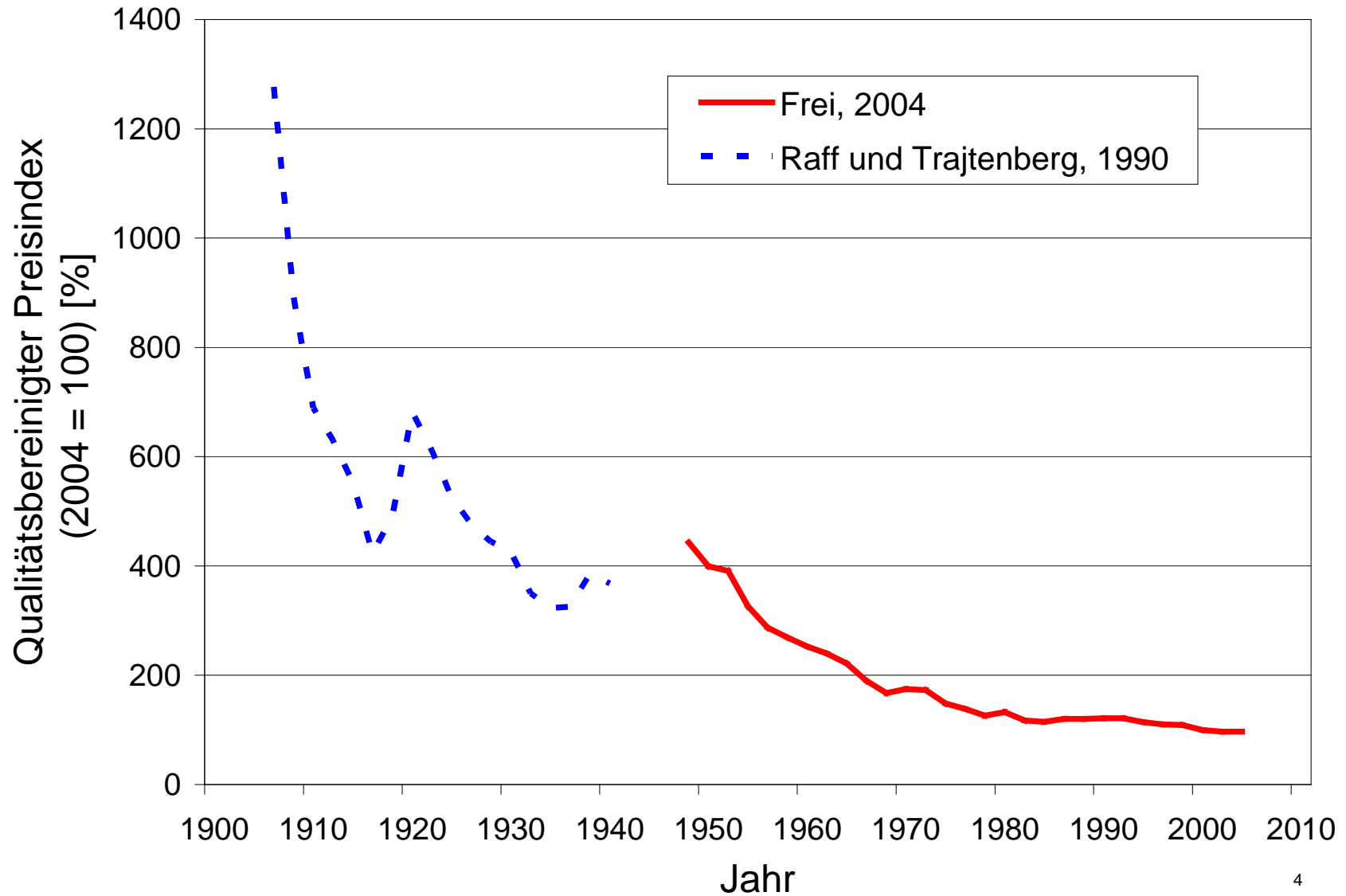
Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

# Time-scaled “road”-Switzerland (1950 and 2000)

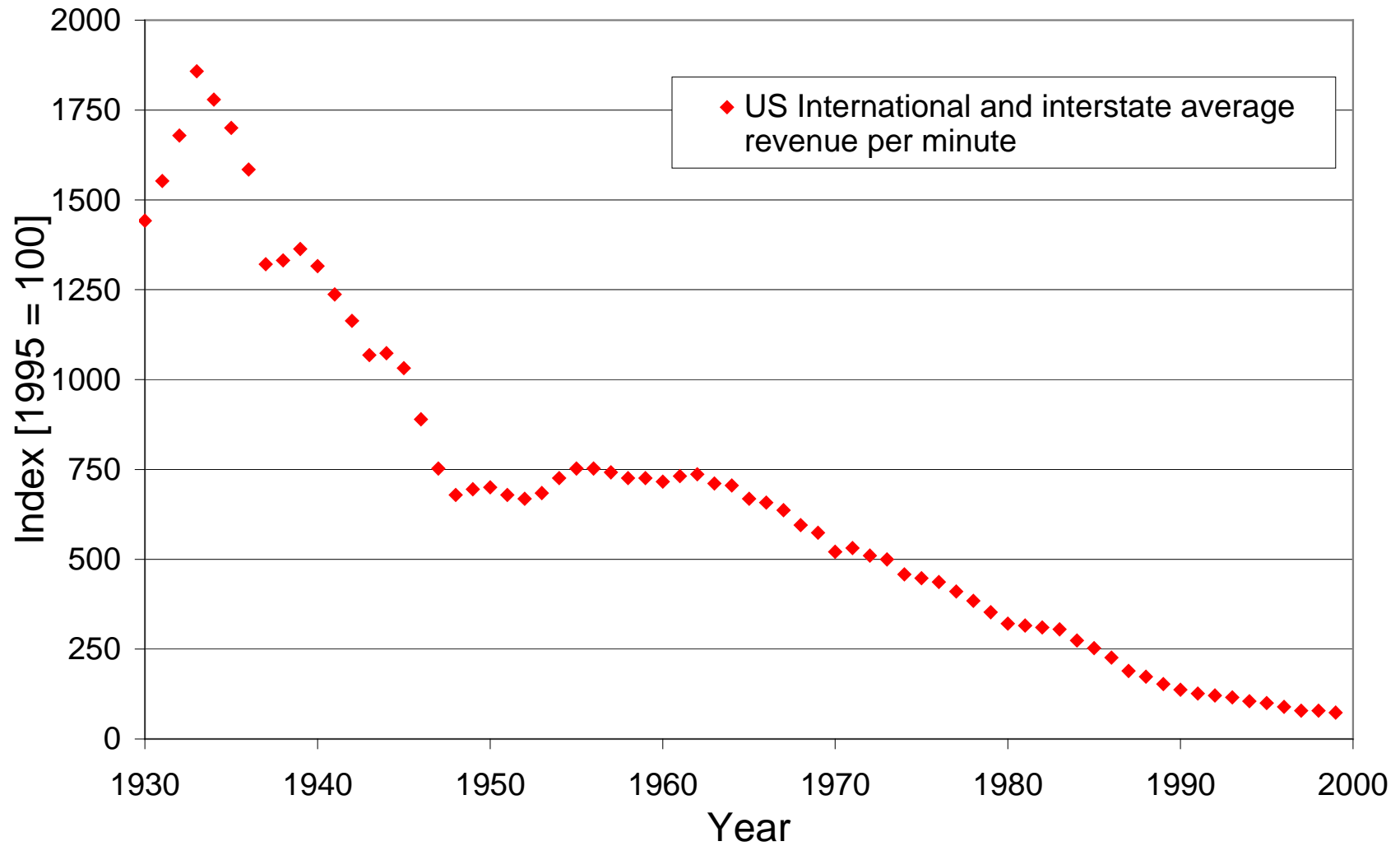
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# Markets: Price deflation for cars



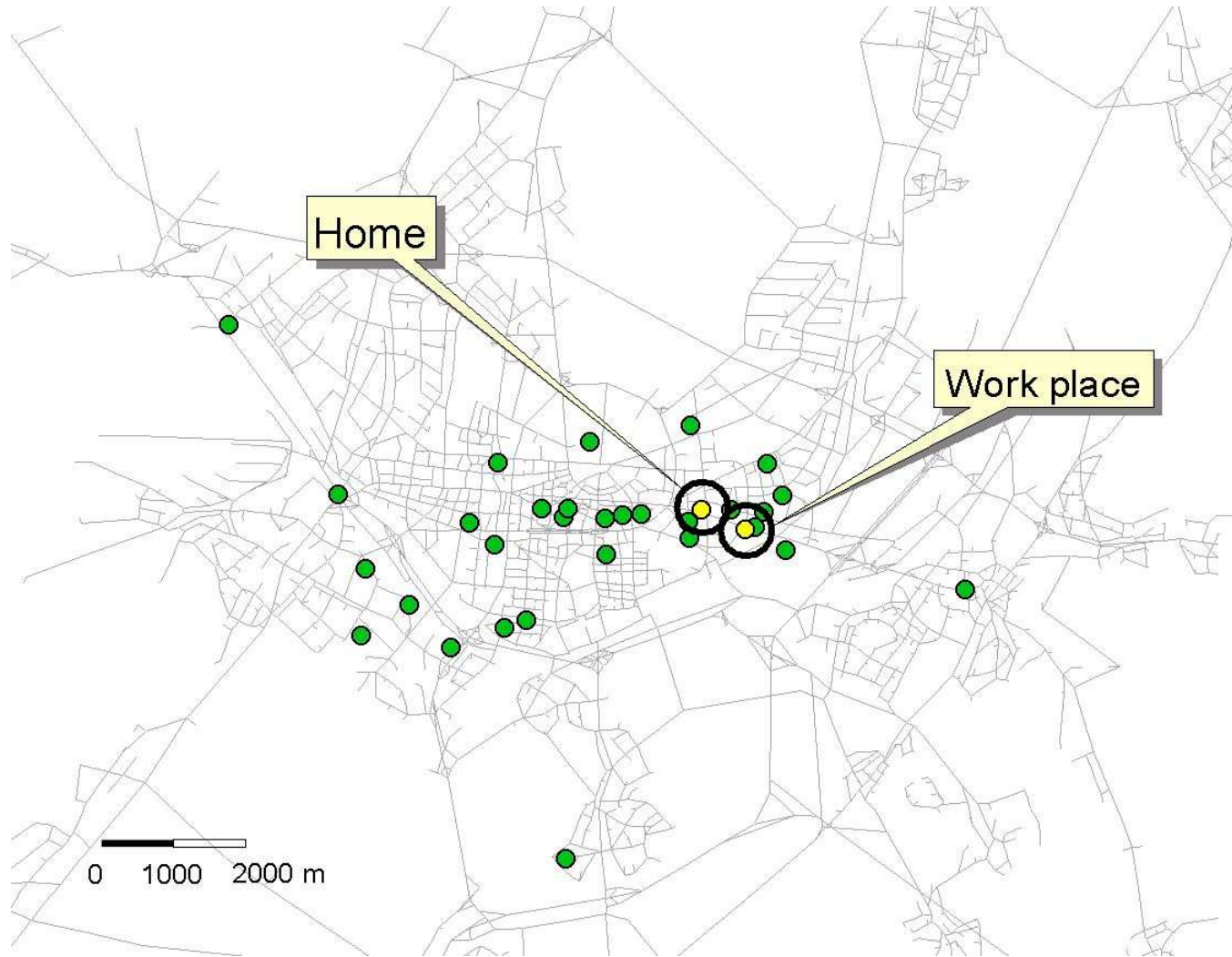
# Markets: Price deflation for telecommunication



Nach FCC (2001)

# Example of a local activity space

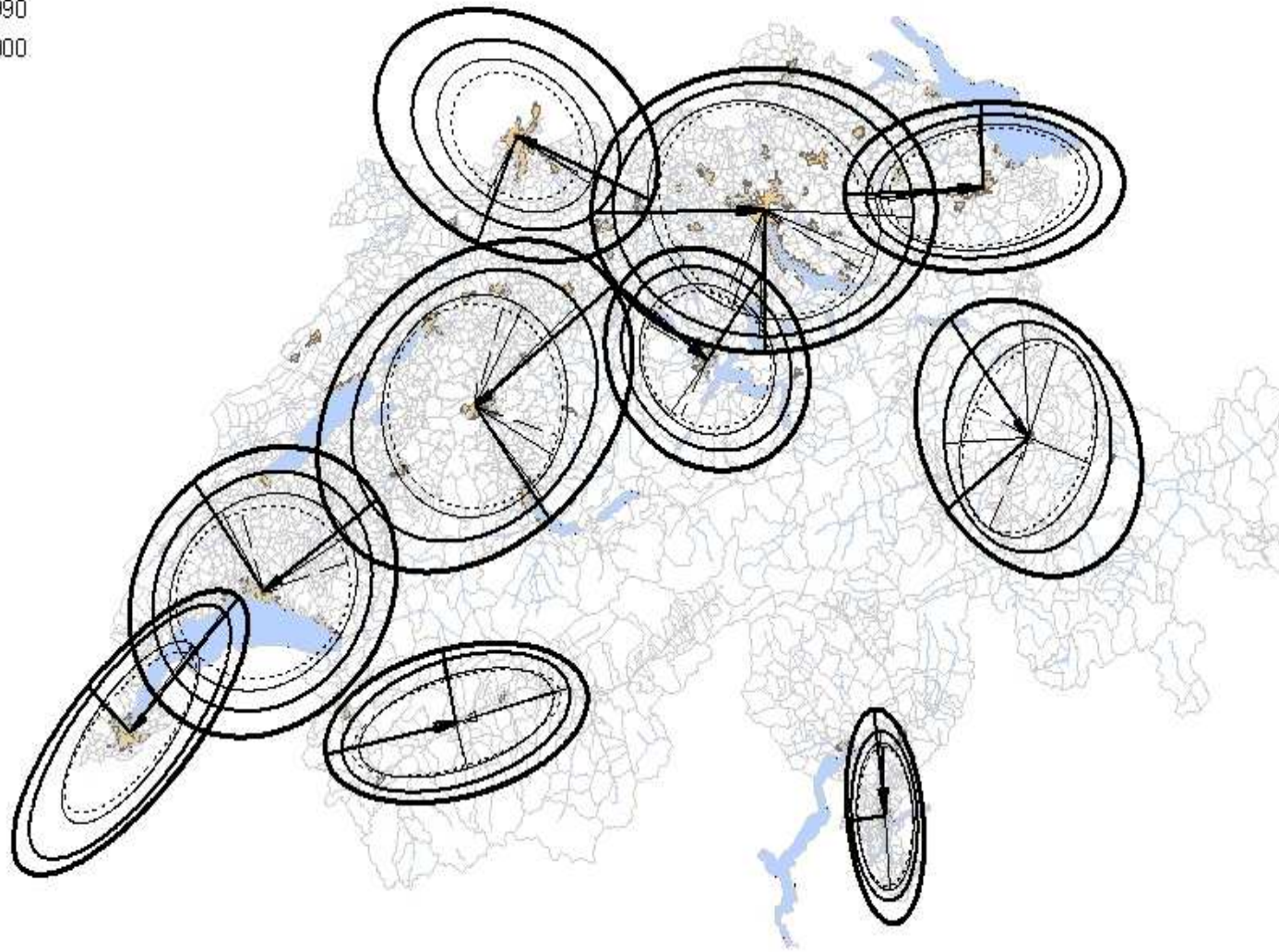
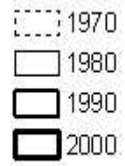
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Female, 24  
Full time  
Single  
216 trips / 6  
weeks

# Example: Commuter sheds of the 10 largest Swiss towns

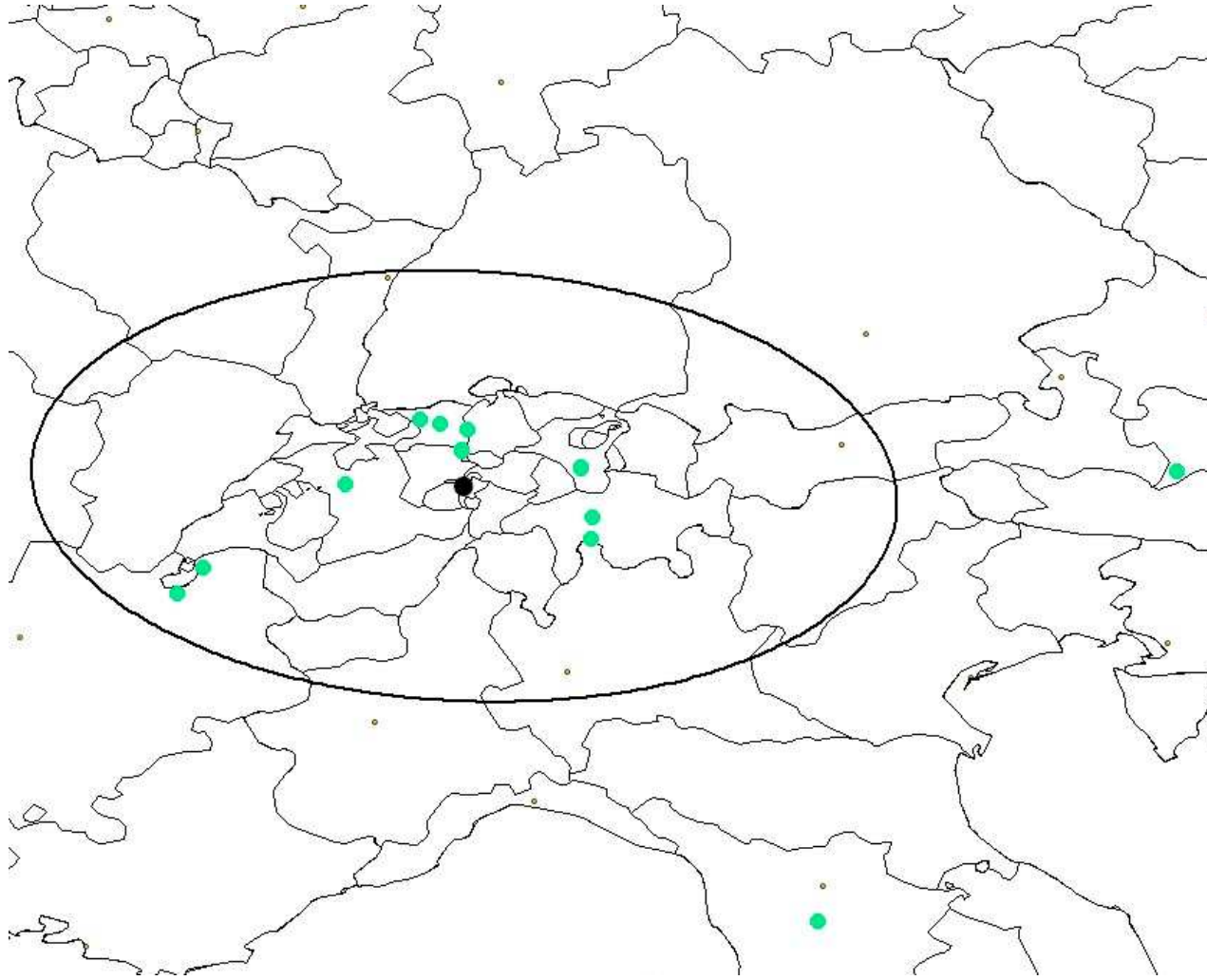
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# Example of a social network geography

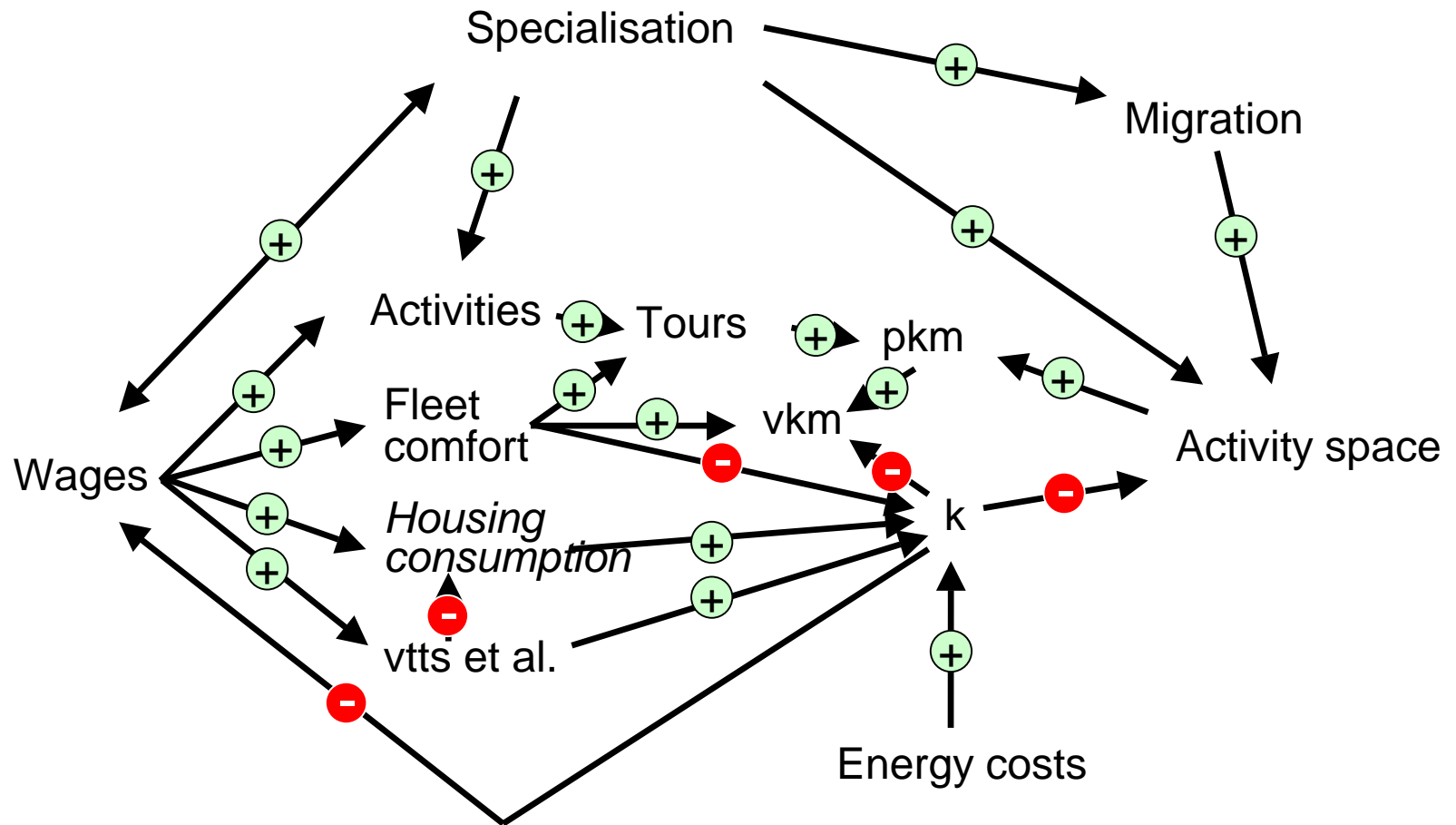
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Female, 28,  
4 moves,  
Public  
transport user



# Size of activity spaces: A hypothesis

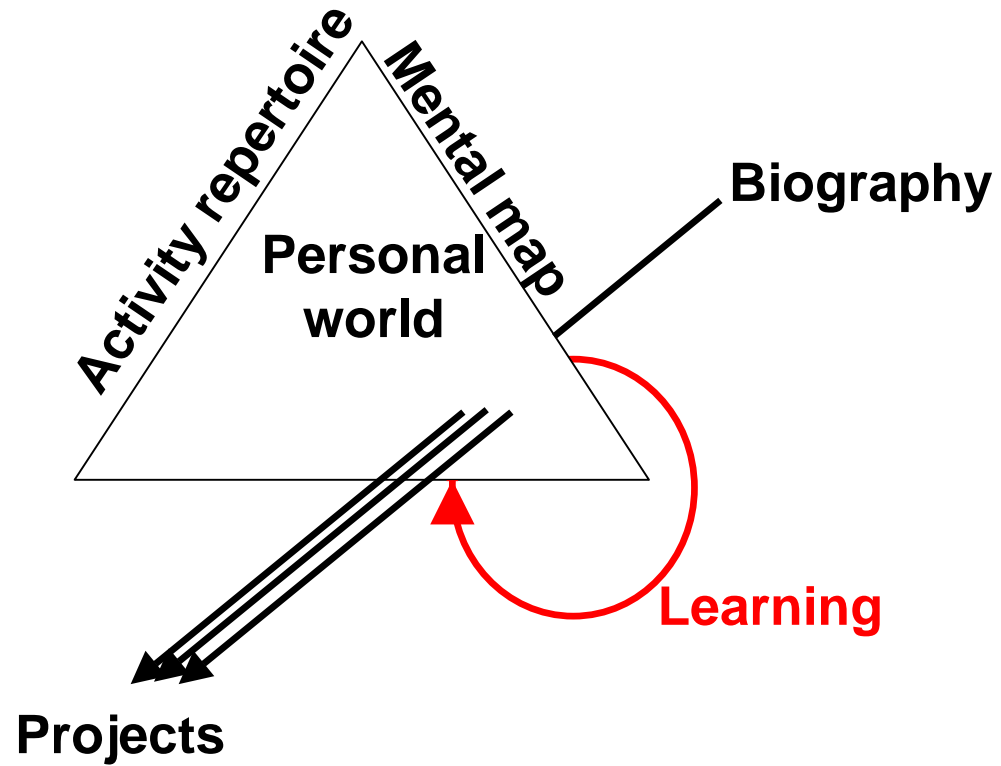


⊕ Elasticity > 0  
 ⊖ Elasticity < 0

k: personal short term generalised costs of travel

# Impact of biographies: Hypotheses

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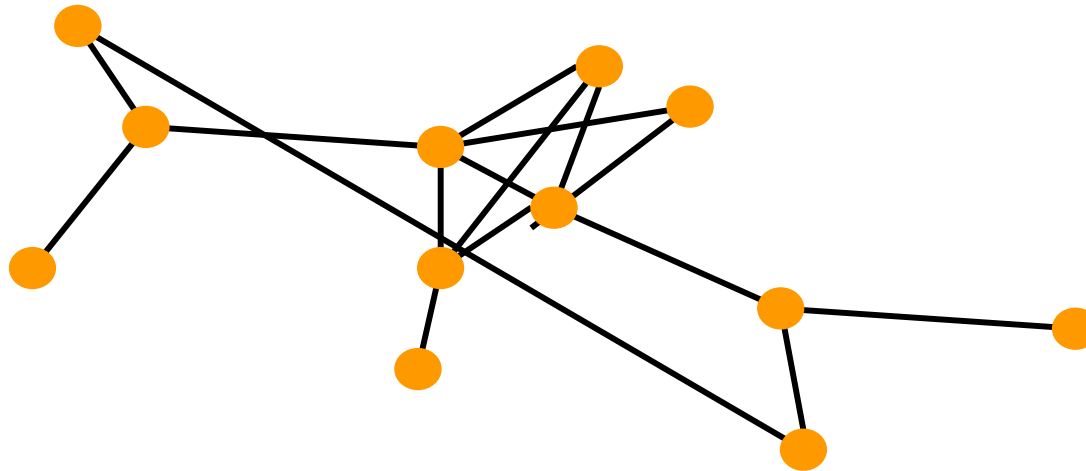


# Definition of a social network

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The topology of a social network describes

- Which person/firm (node) is linked to which other persons/firms
- By contacts (links) of a certain quality (impedance or cost)



Closeness  $\sim 1/\text{Impedance}$

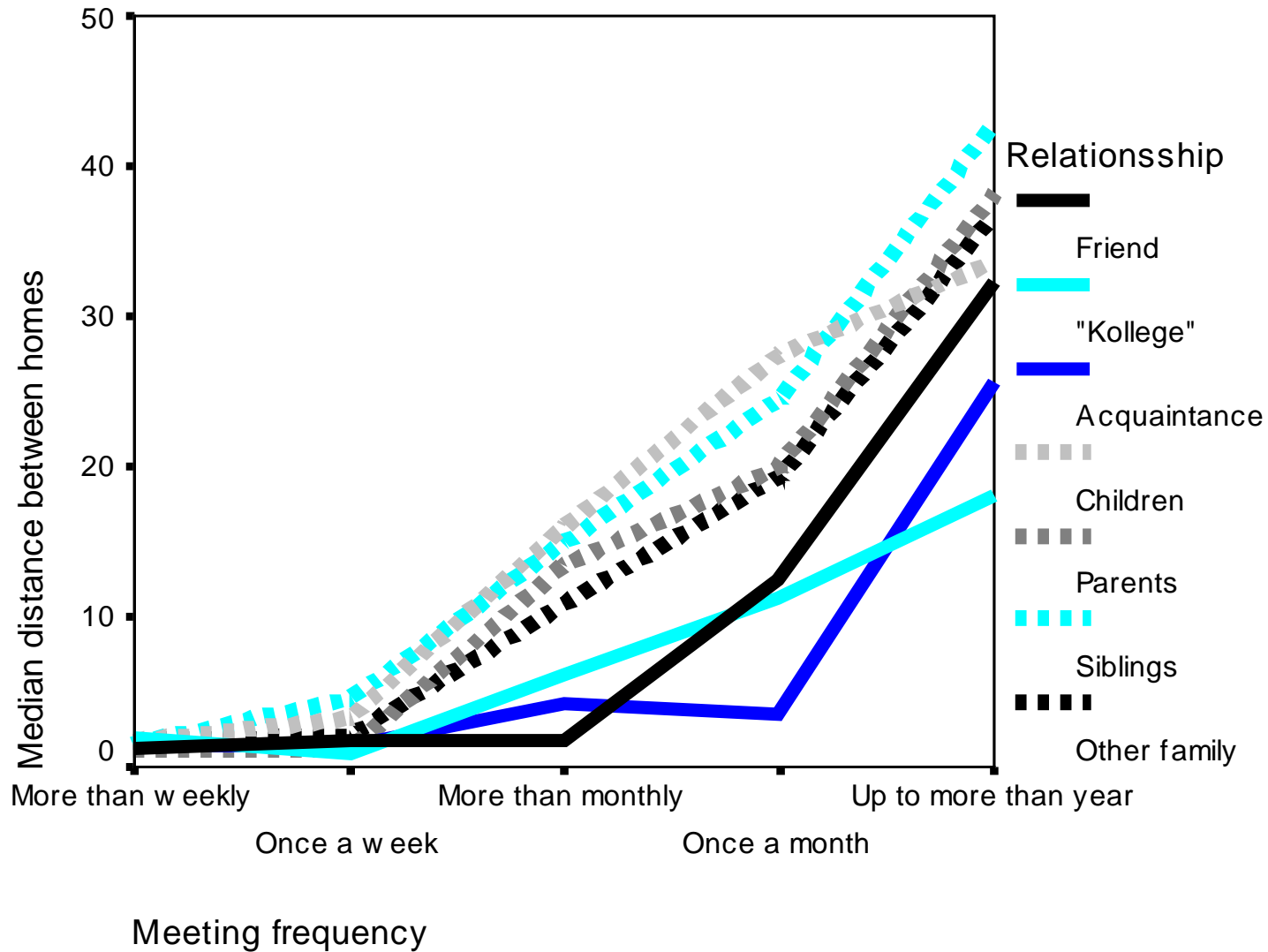
# Travel and social networks

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Maintenance of the network requires:

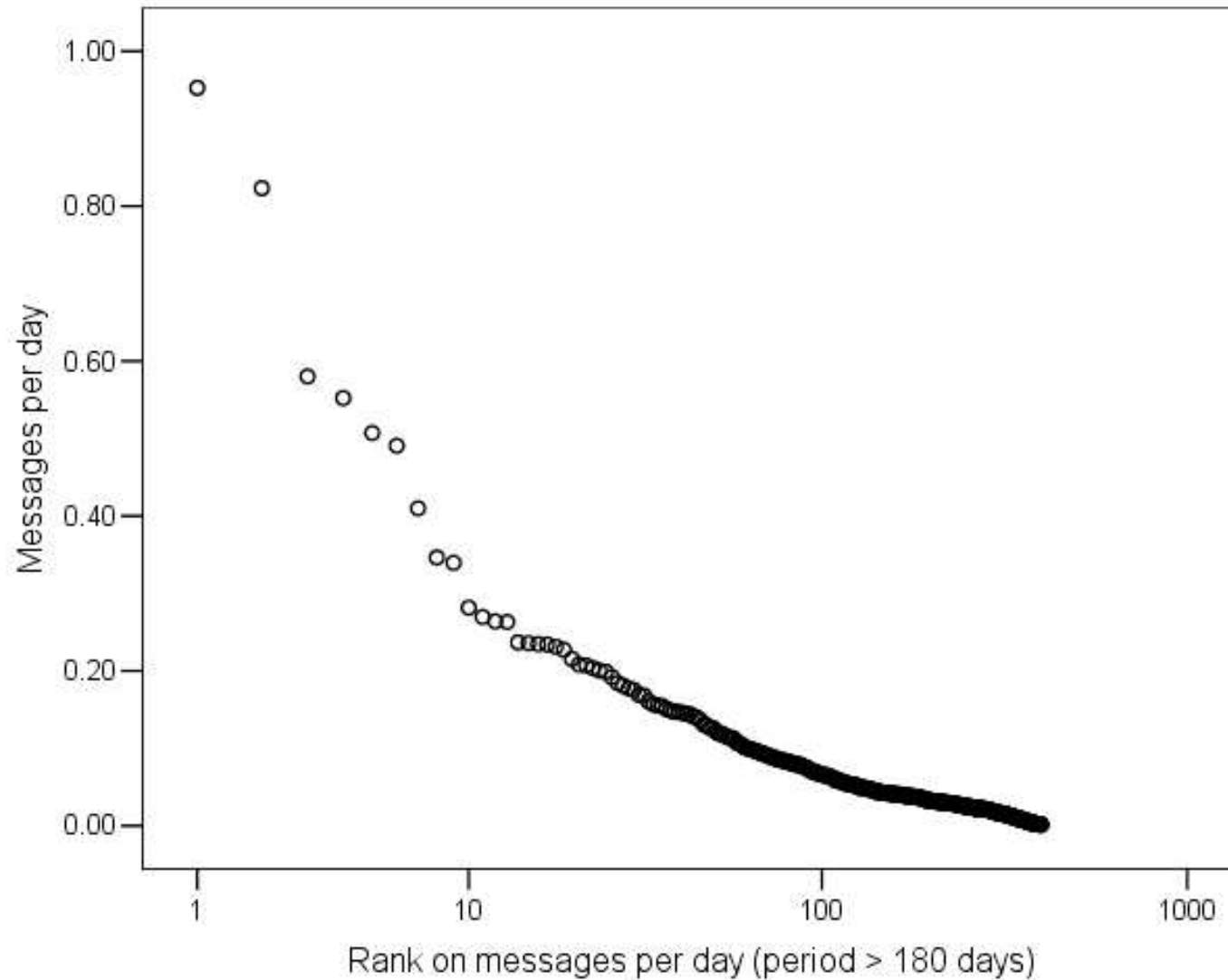
- Face to face contacts
- Balanced by other forms of contacts
- Travel ~ Physical spread of the contacts
- Trade-off between loosing contacts and “social” capital and investing in new contacts closer to home

# Contact costs: Distance and meeting frequency



# Contact frequencies: E-Mail messages to kwa

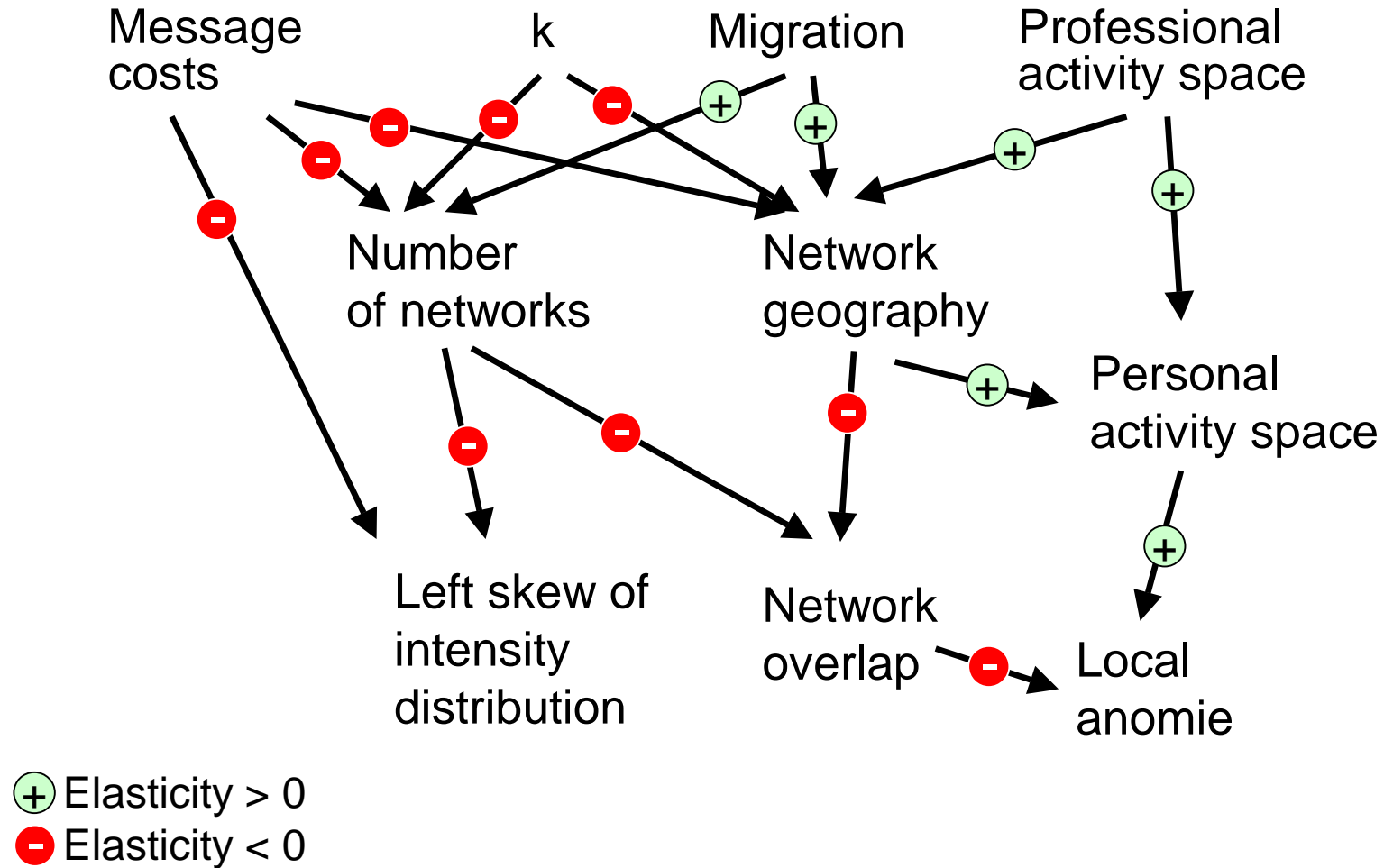
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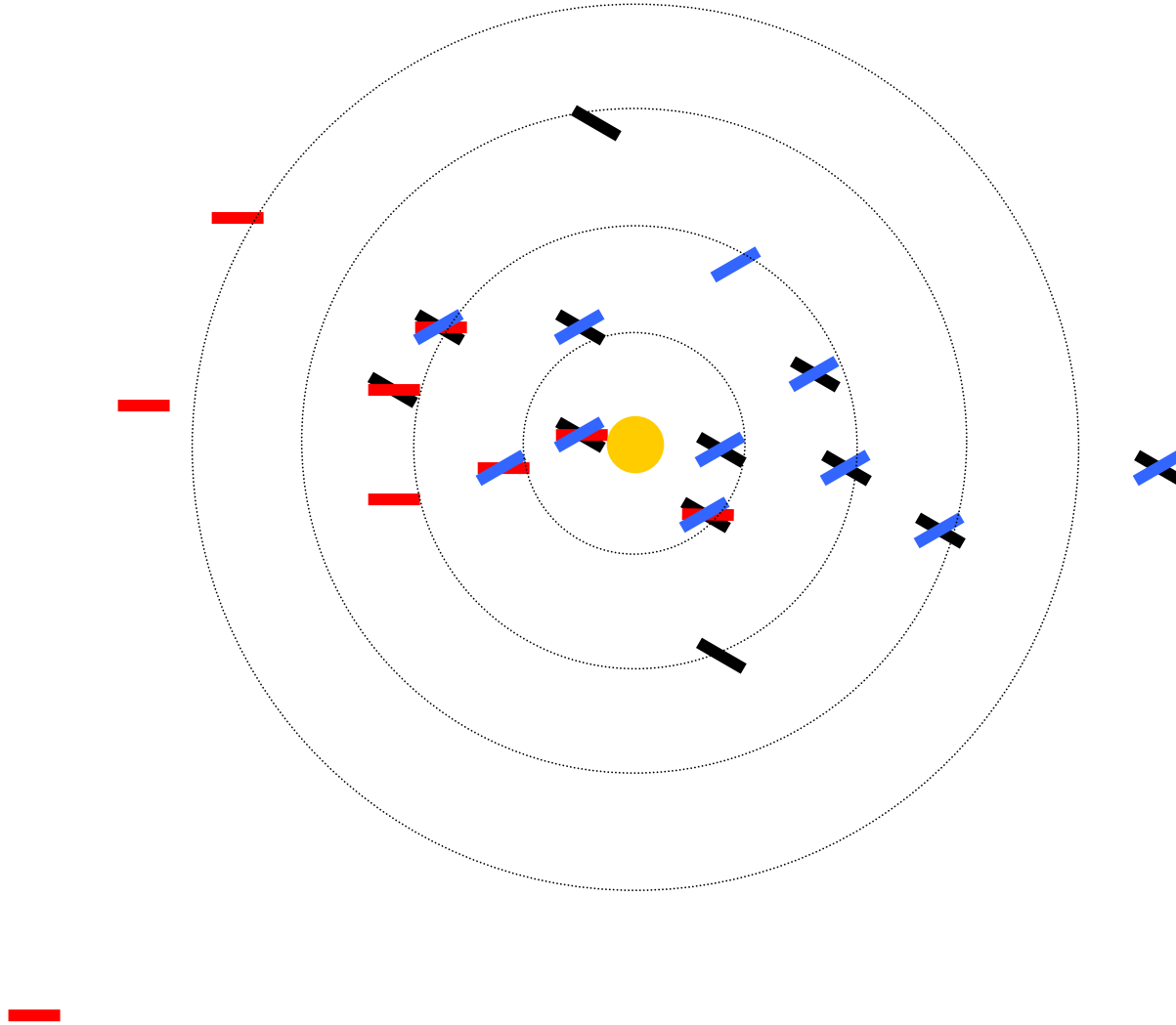
# Hypotheses

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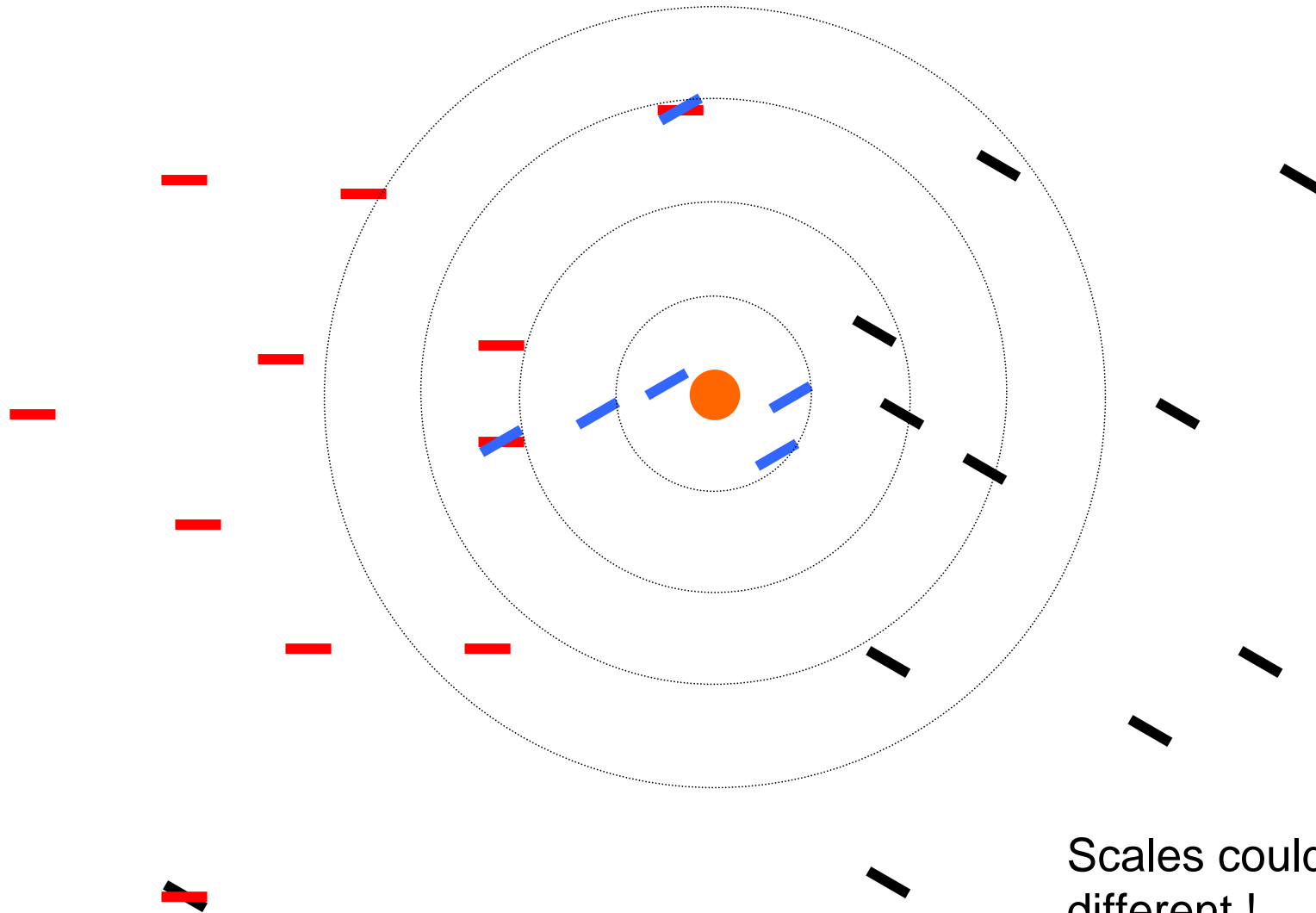
# Expected impacts: Spare versus dense networks

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# Expected impacts: Spare versus dense networks

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Scales could be different !

## Expected impacts: Improved welfare

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The social networks should be more homogeneous and therefore more productive for their members

But, the selectivity excludes the „less attractive“ persons who are disadvantaged through a reduced ability to travel or a reduced ability to participate in activities

But, the dependence on commercial or state-provided services for “care” increases

# Research issues

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- Measurement of the activity spaces (geographies, markets)
- Estimate of historical activity spaces ...
  
- Taste differences in network form and geography
- Social/cultural preferences for network form and geography
  
- Stability of the geographies under pressure
- Elasticities to policy (or environmental) change
- Time until trend change

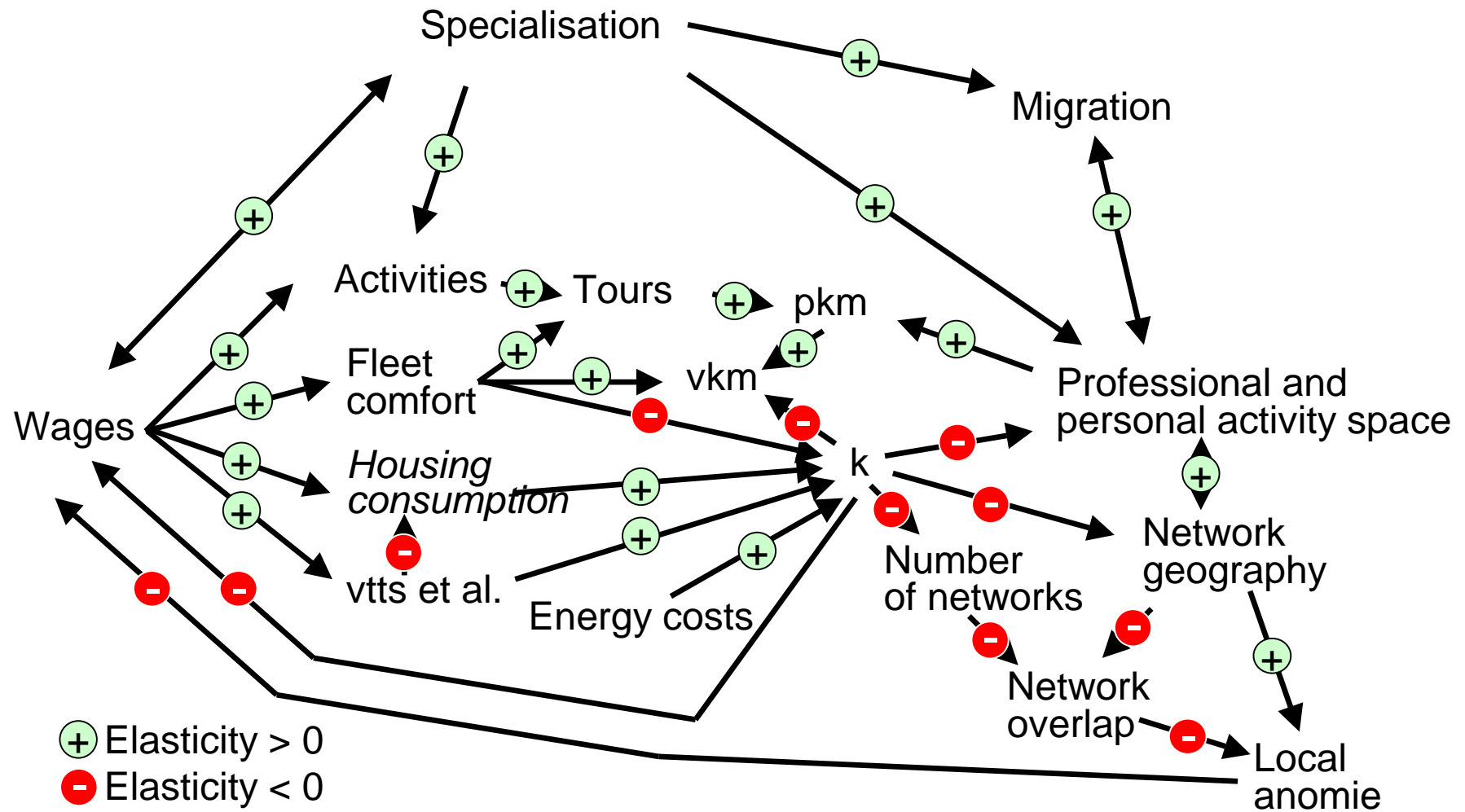
# Policy questions

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- Is „happiness“ still growing ?
- How large are the social externalities ?
- How stable is the overall system under pressure ?



# The hypotheses summarized



# Literature and references

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# Social networks: Hypotheses

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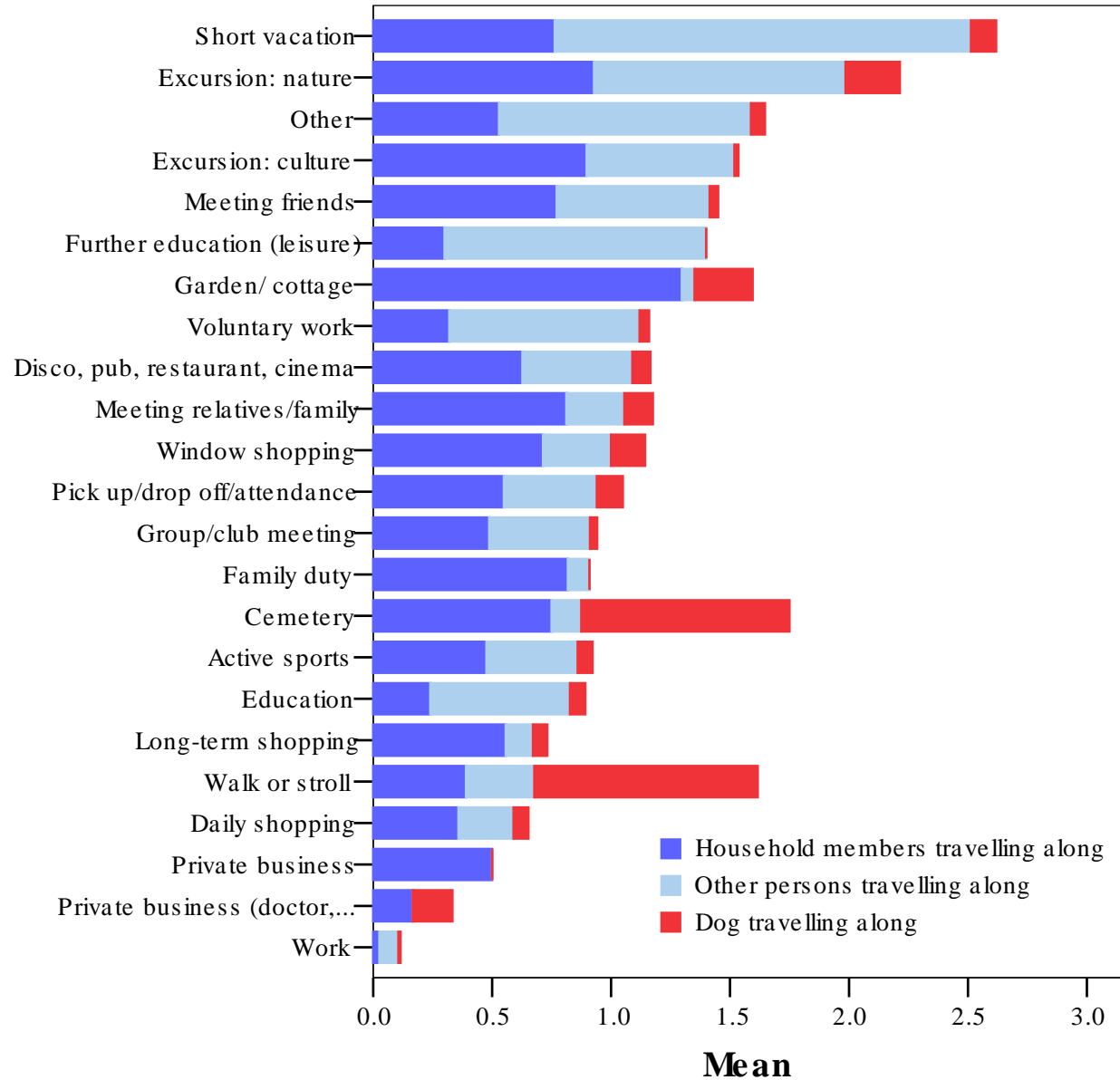
- [1] The size of the social network geography is inversely proportional to the generalised costs of travel and communication
- [2] The number of contacts individuals maintain is inversely proportional to the generalised costs of travel and communication
- [3] The probability of being linked to a member of one's network through multiple networks increases with the spatial density of one's contacts
- [4] The distribution of effort on non-household members will become more left skewed as the spatial social network tightness decreases
- [5] The knowledge about the contacts of contacts in a social network is proportional to the generalised costs of travel and communication

## Social networks: Hypotheses (2)

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- [6] The activity space of an individual is proportional to its social network geography
- [7a] The size of the local activity space of an individual stabilises after an initial exploration.
- [7b] The size of the total activity space will grow in line with the growth of social network geographies.
- [8] The reliance on commercial or publicly funded personal services increases proportionally with the geography of social networks
- [9] The welfare of the individuals should increase inversely proportional to the generalised costs of travel

# Share of joint travel (2003 Thurgau)





# Contact frequencies: E-Mail messages to kwa

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