

# Preferred citation style

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Axhausen, K.W. (2007) Social network geographies: Expected dynamics and empirical results, *Cosmobilities Network Meeting 2007: Mobilities, space, and inequality*, Basle, September 2007.

# Social network geographies: Expected dynamics and empirical results

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Swiss Federal Institute of Technology Zurich

# Acknowledgments

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## Collaborators:

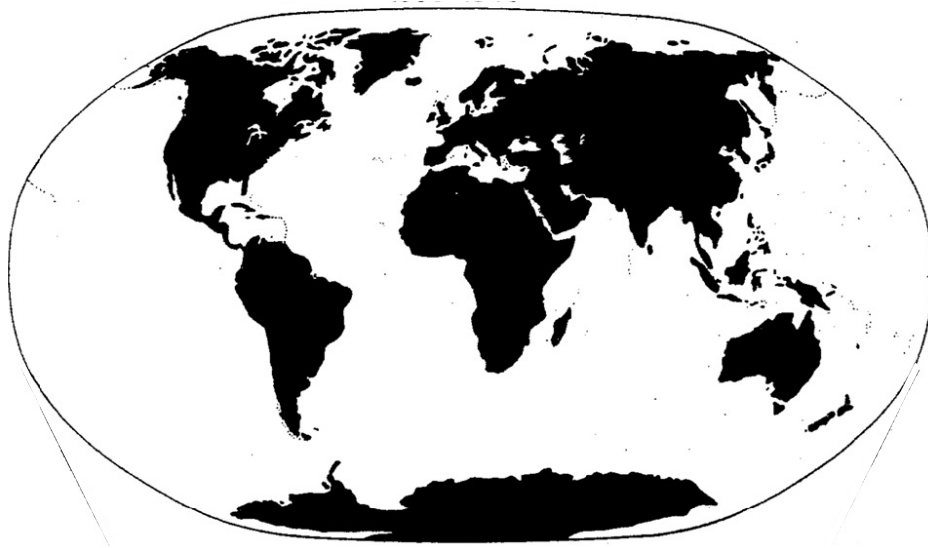
- Andreas Frei, ETH Zürich
- Timo Ohnmacht, HSW Luzern
  
- Jonas Larsen and John Urry, Lancaster University

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- BBW, Bern
- ifmo, Berlin
  
- UK Department for Transport, London

# A shrinking world

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Coach and sailing boat until 1840



Steam ship and locomotive, 1840 - 1930

Propeller aircraft, 1930-1950

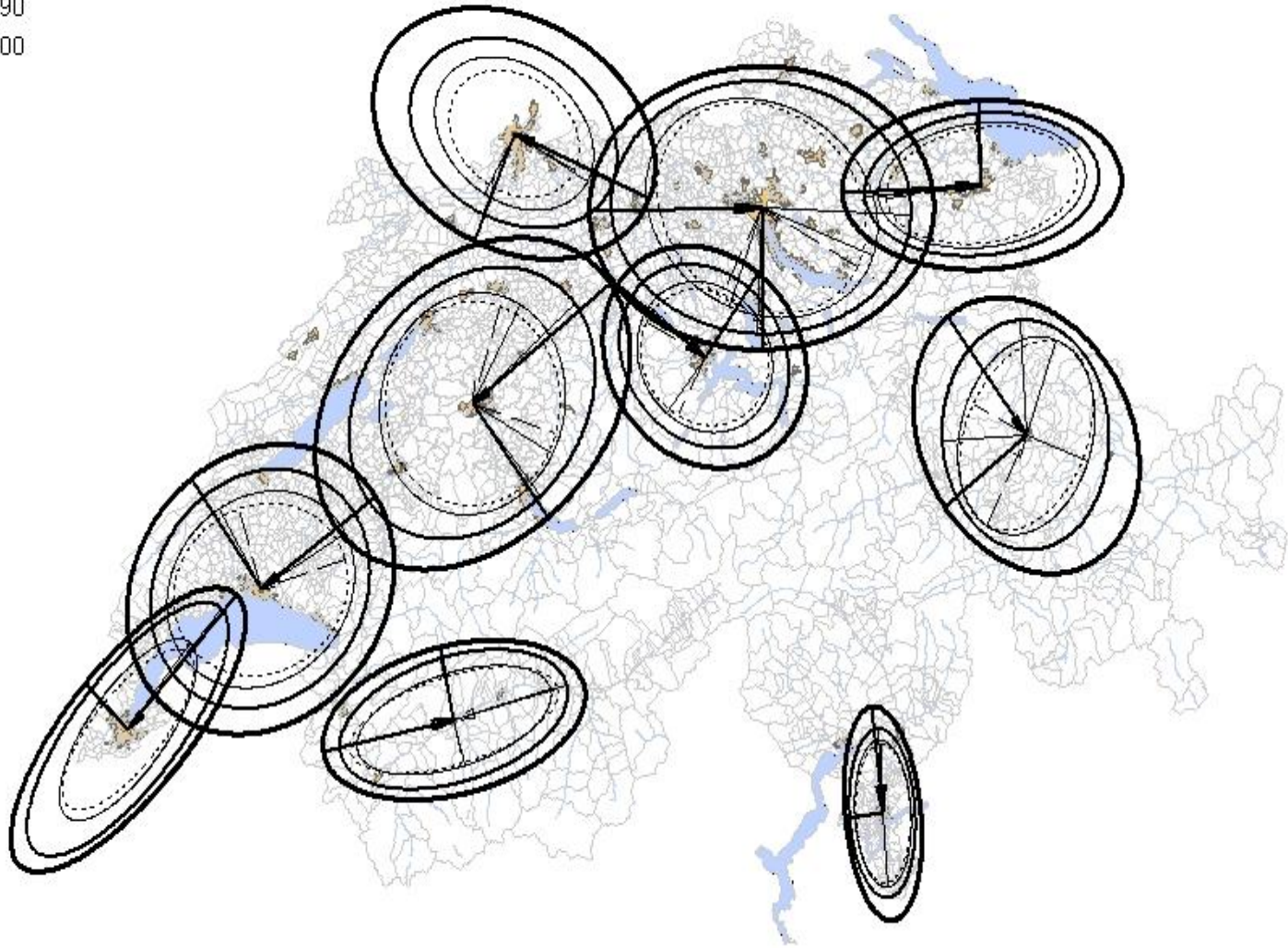


Jets, from 1950



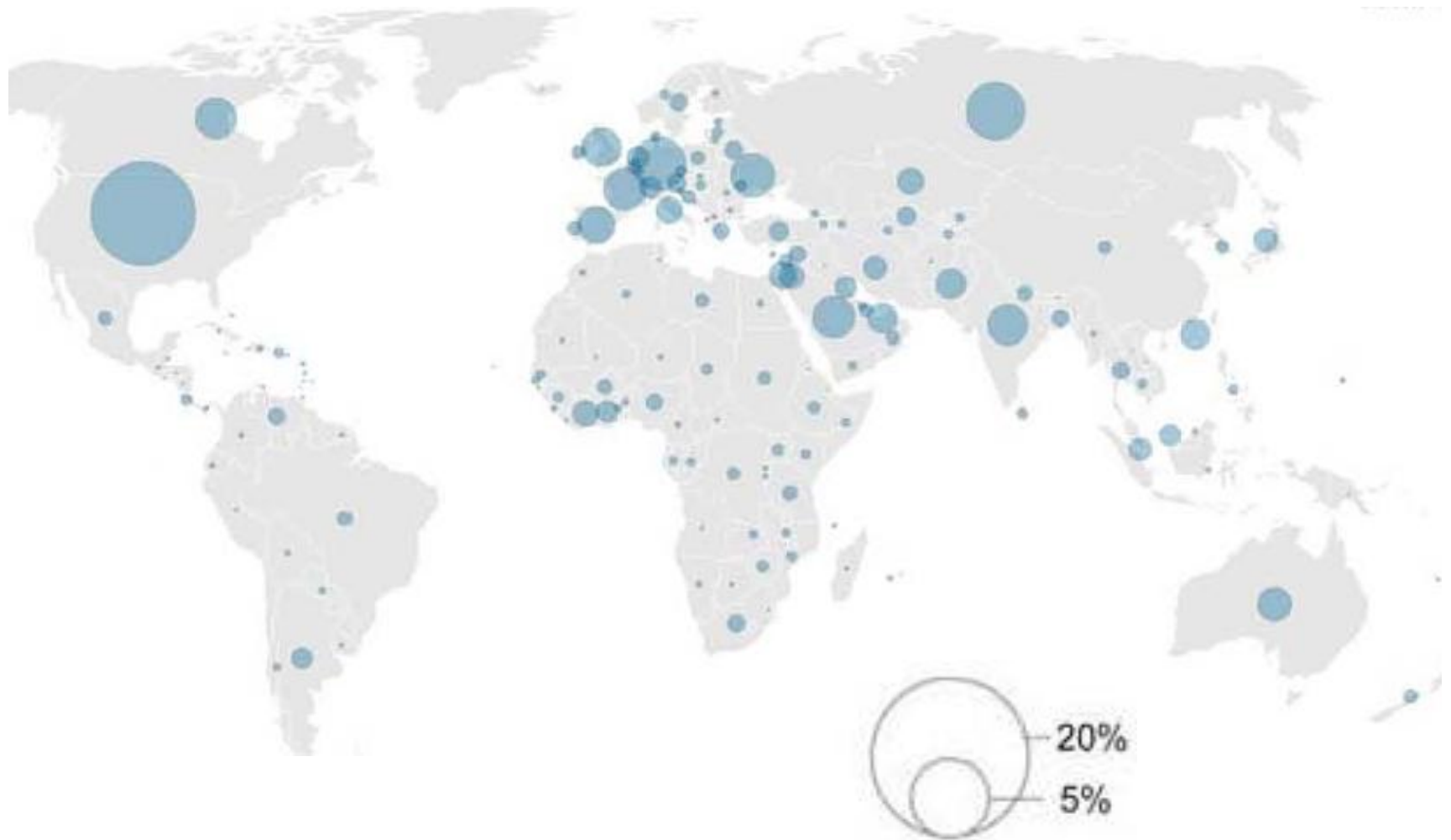
# In-commuter sheds of the ten largest Swiss towns

- 1970
- 1980
- 1990
- 2000

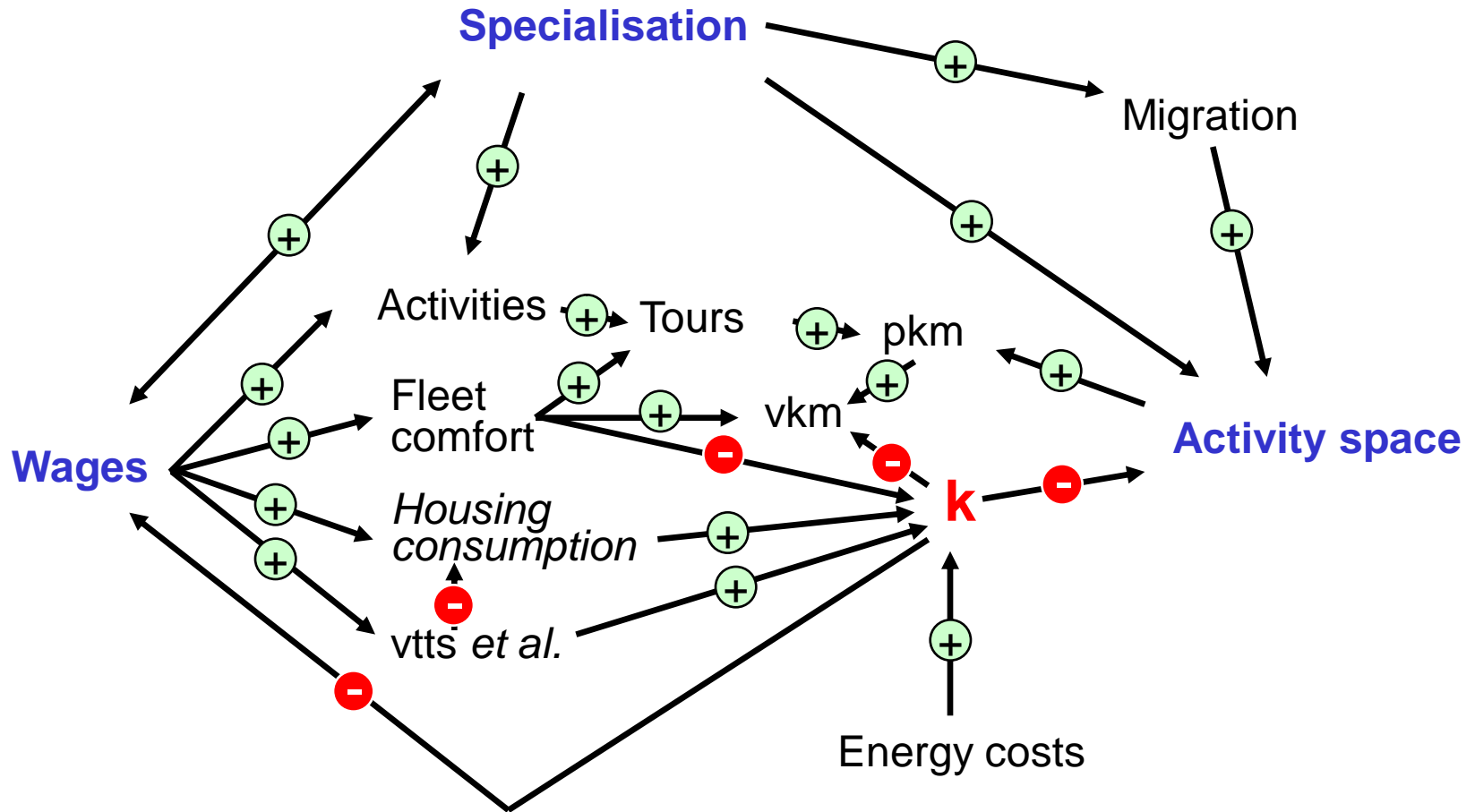


# Worldwide flows: 2005 Share of world's migrants

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# Activity spaces inc. network geographies: A hypothesis



⊕ Elasticity > 0  
 ⊖ Elasticity < 0

k: personal short term generalised costs of travel

# Travel and social networks

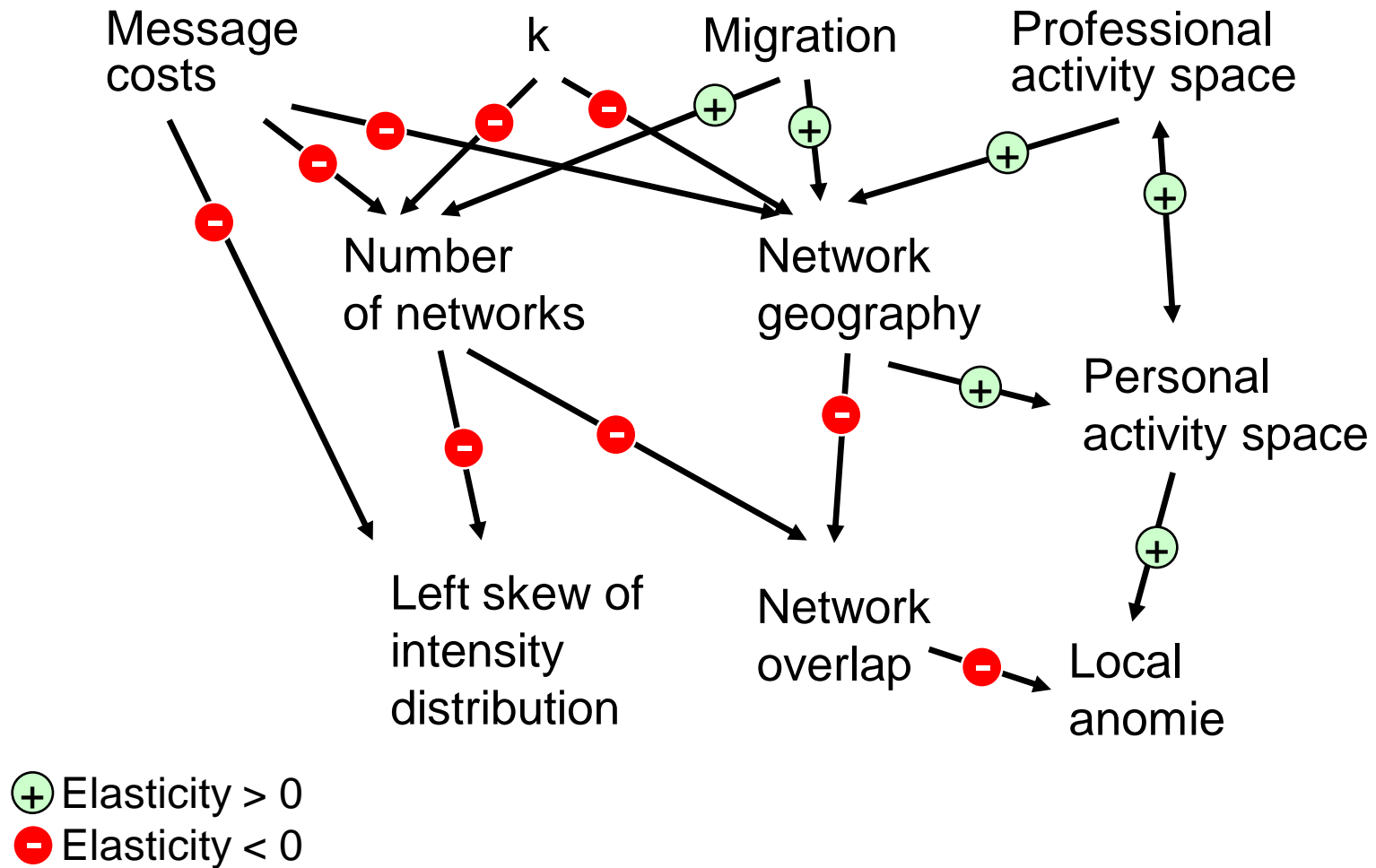
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Maintenance of the networks requires:

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



# Hypotheses



# First set of research issues

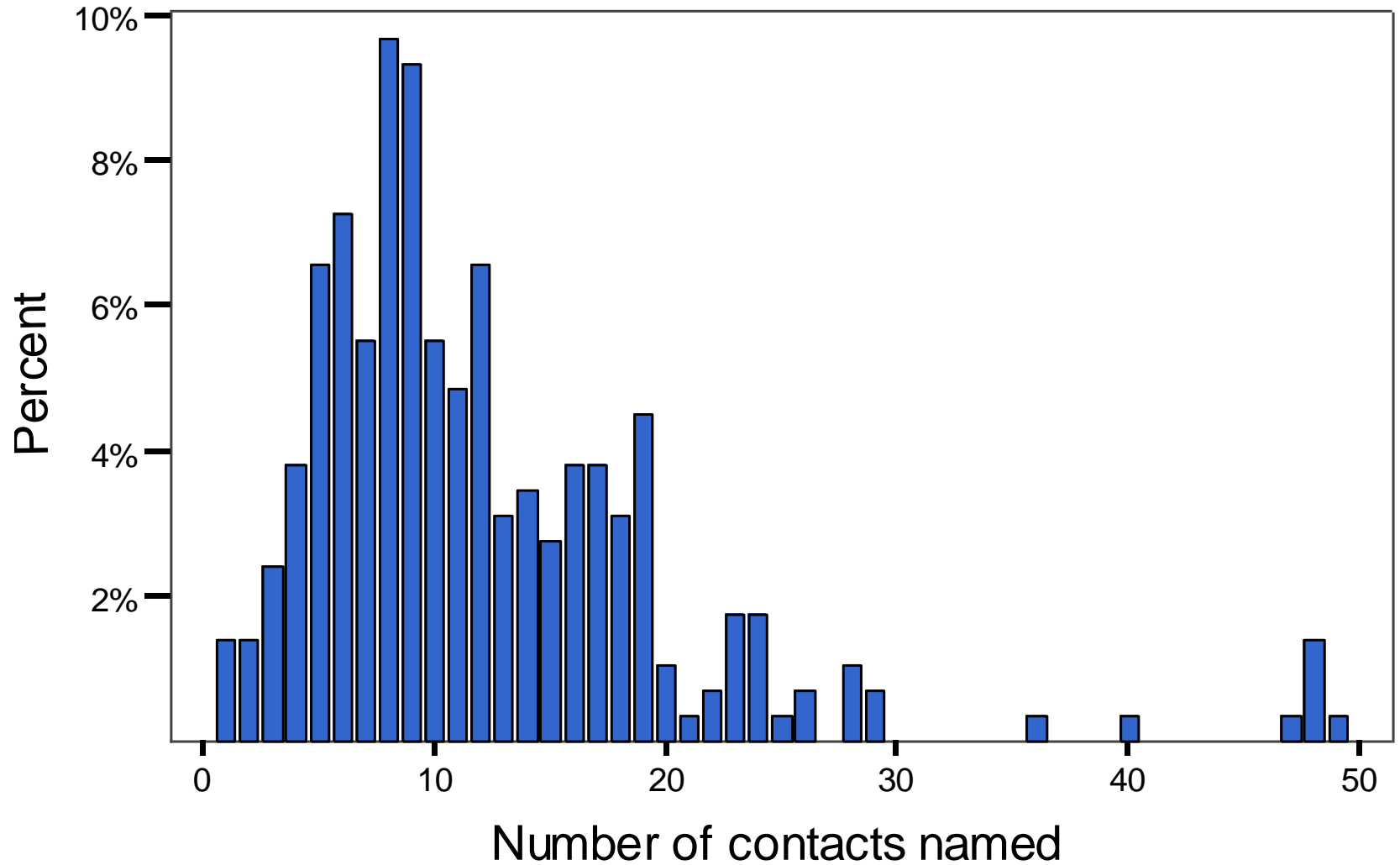
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## Benchmarking the current state:

- Numbers of contacts
- Distance distributions
- Geographies
- Frequency and mode of contact
  
- Productivity
- Levels of local anomie
- Levels of local trust
- Level of place attachment

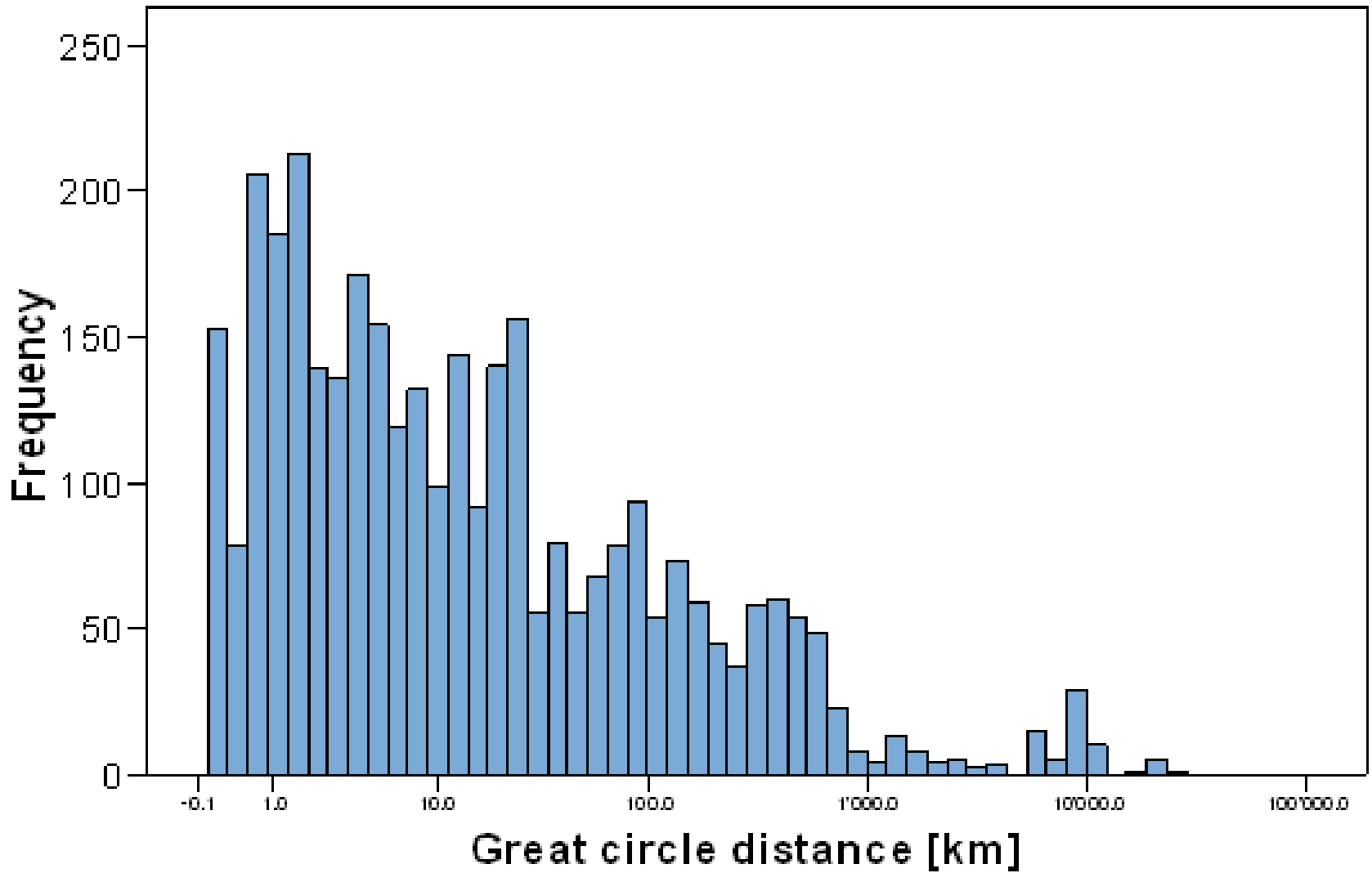
# Number of contacts reported

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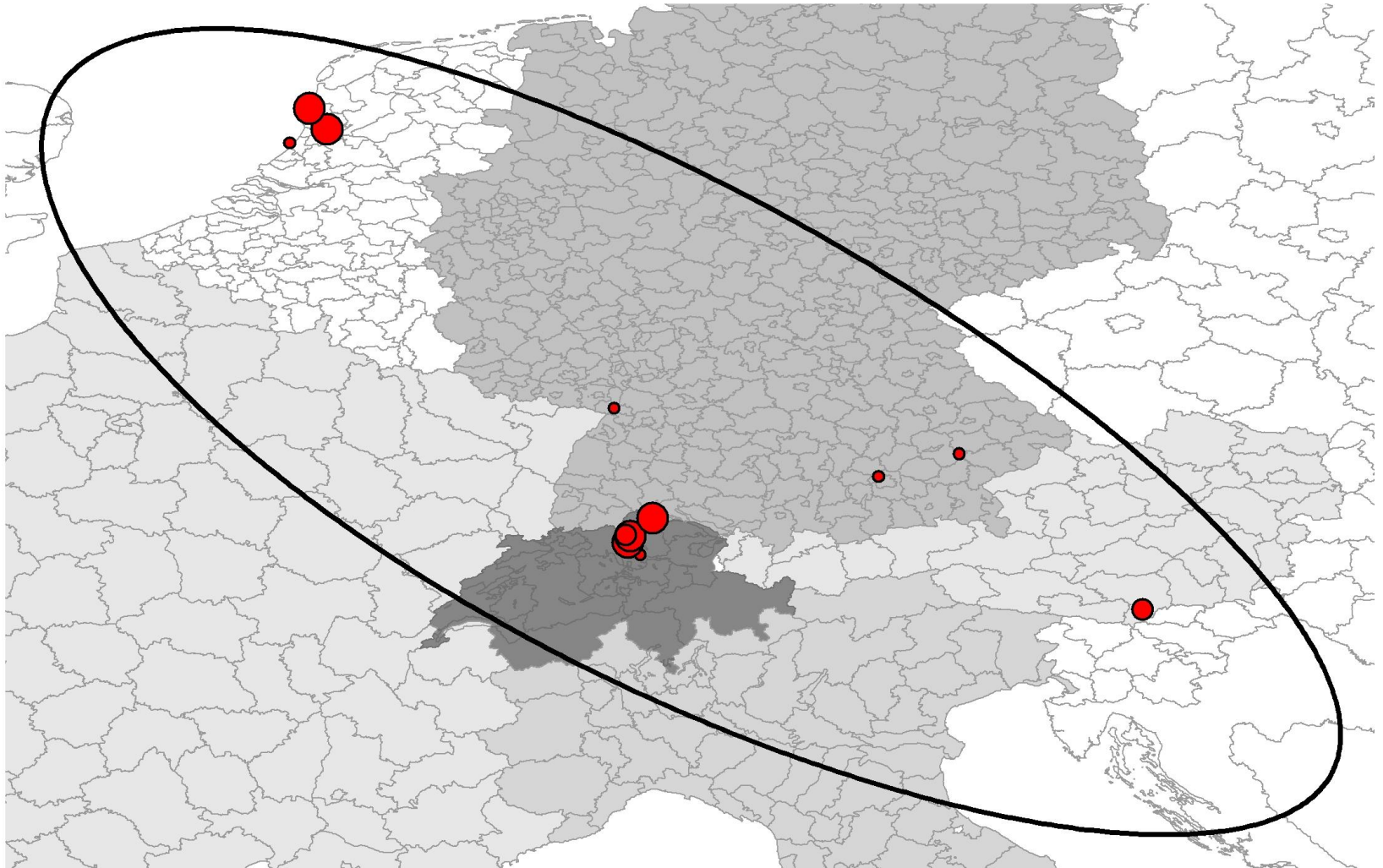
# Distances between home locations

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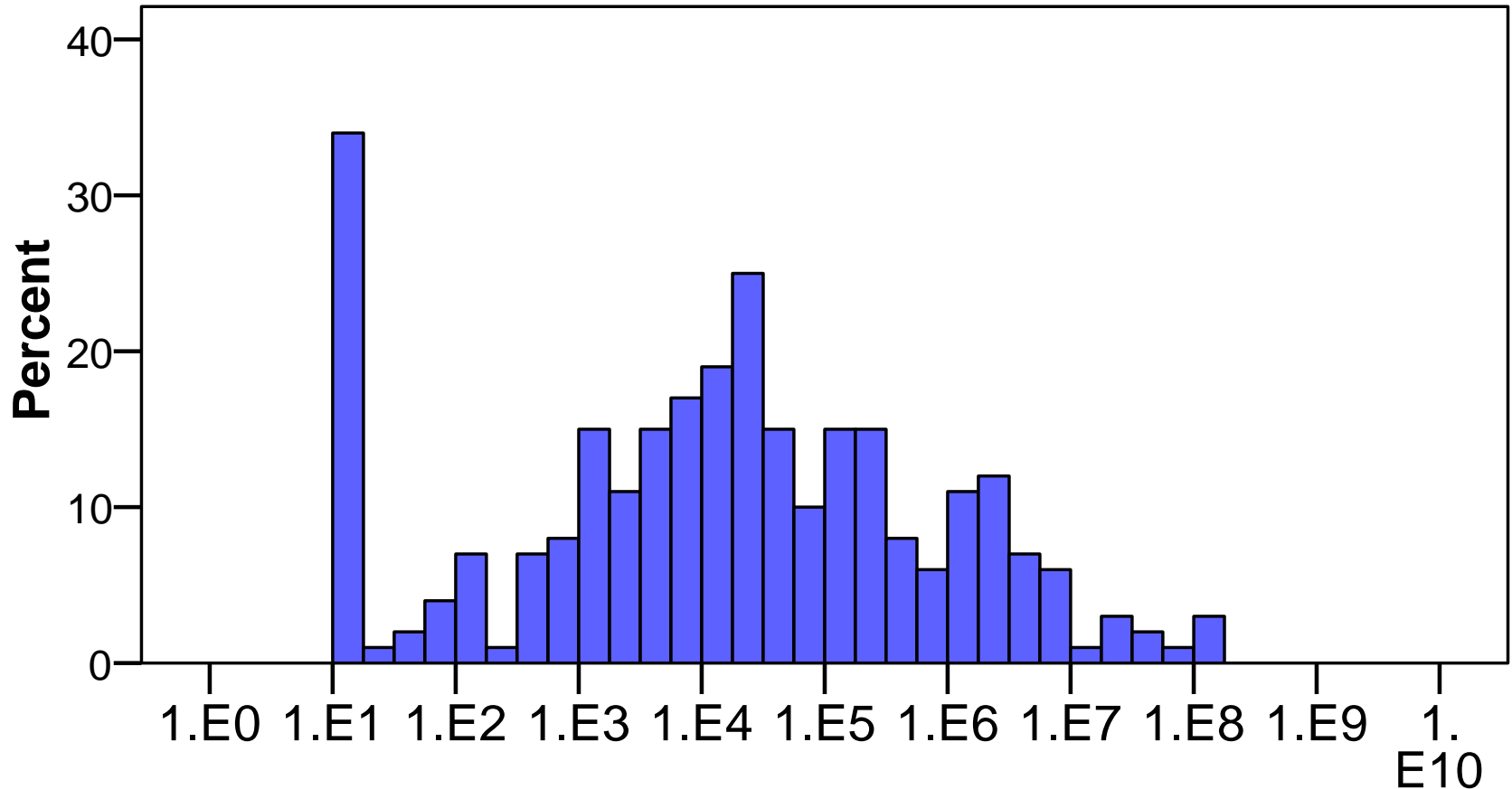
# Example of a social network geography

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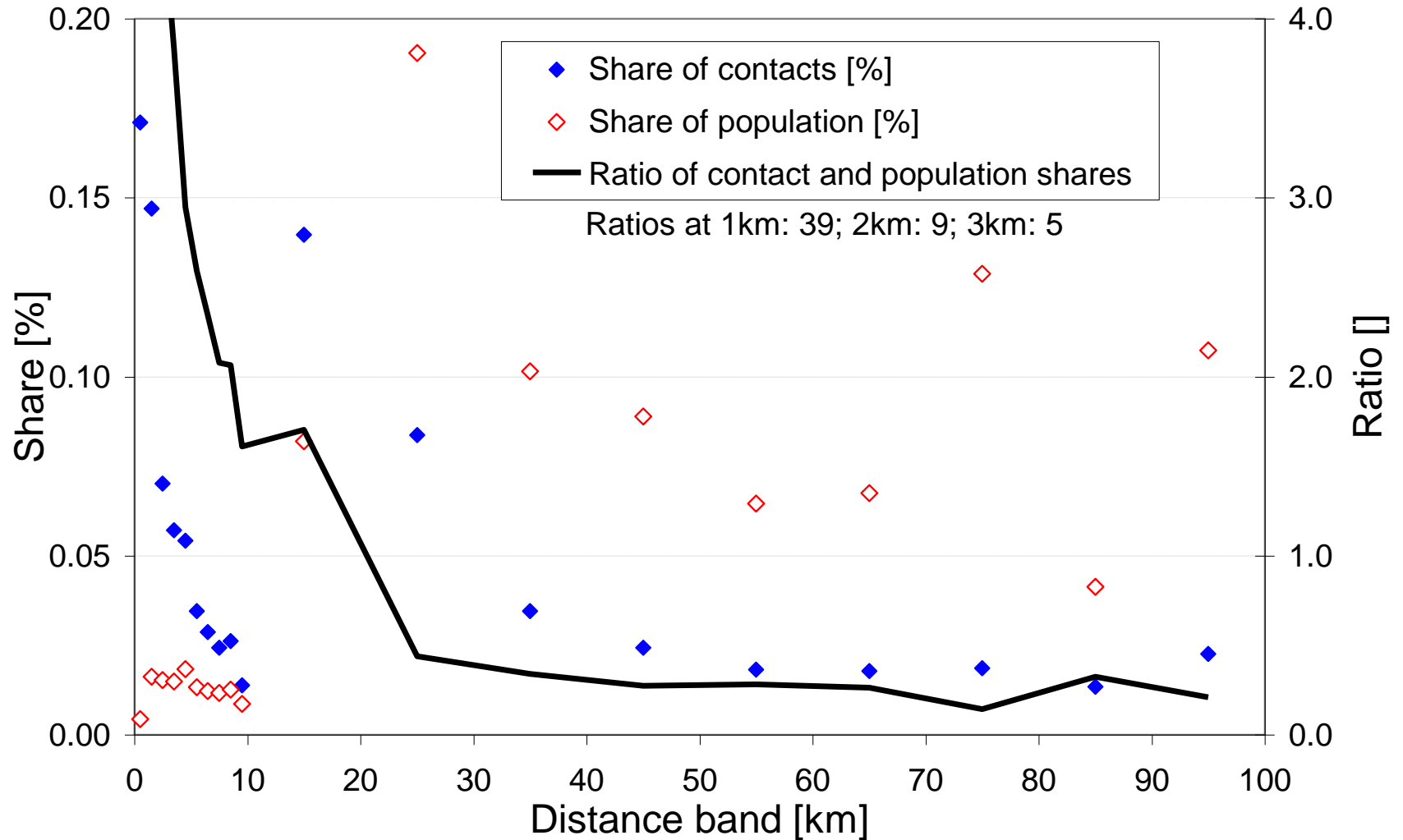
# Size of network geometries

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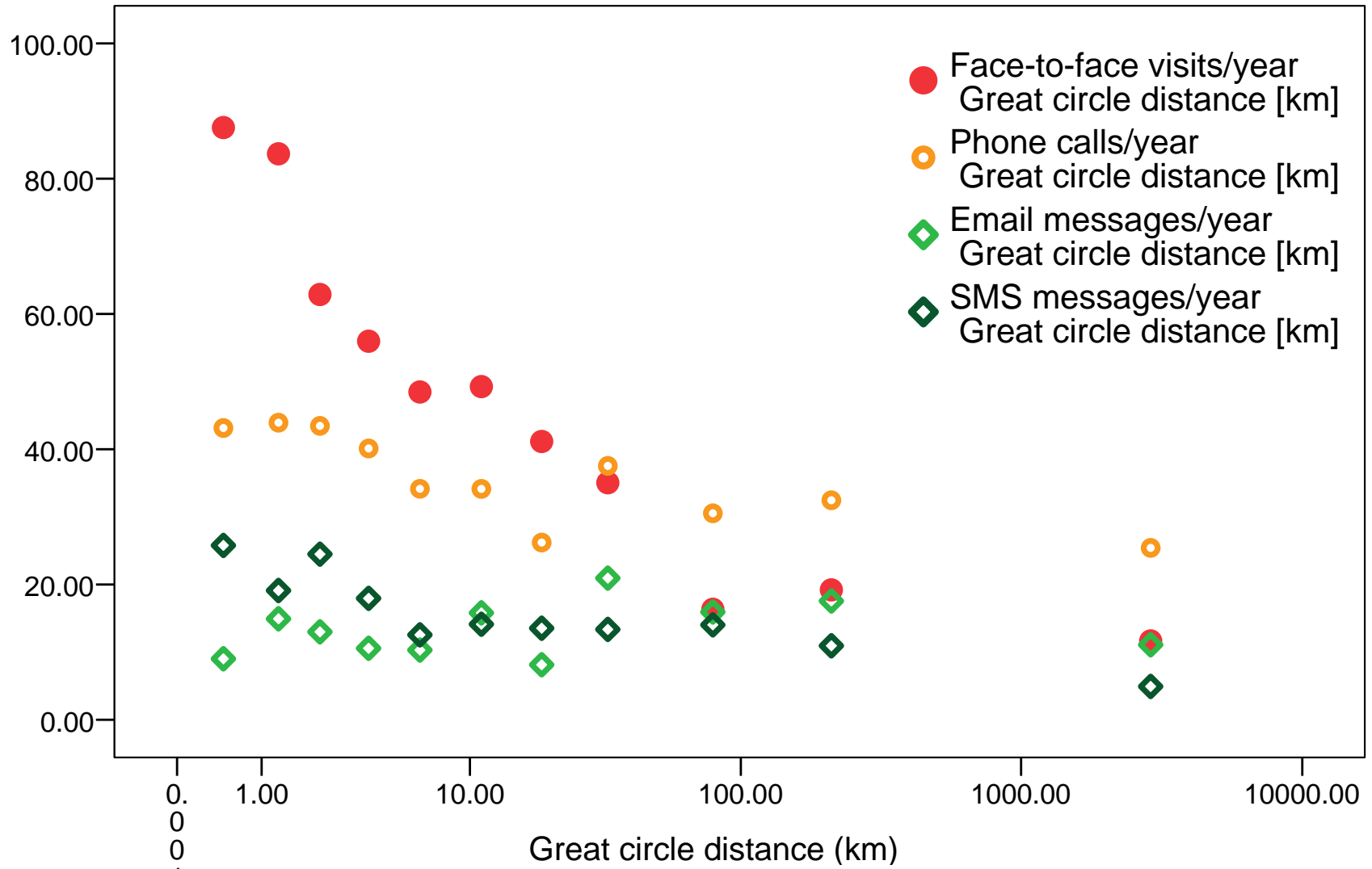


**95%-confidence ellipse of the social network geography**

# Ratio of contacts to population



# Interactions by mode and distance between homes





## Second set of research issues

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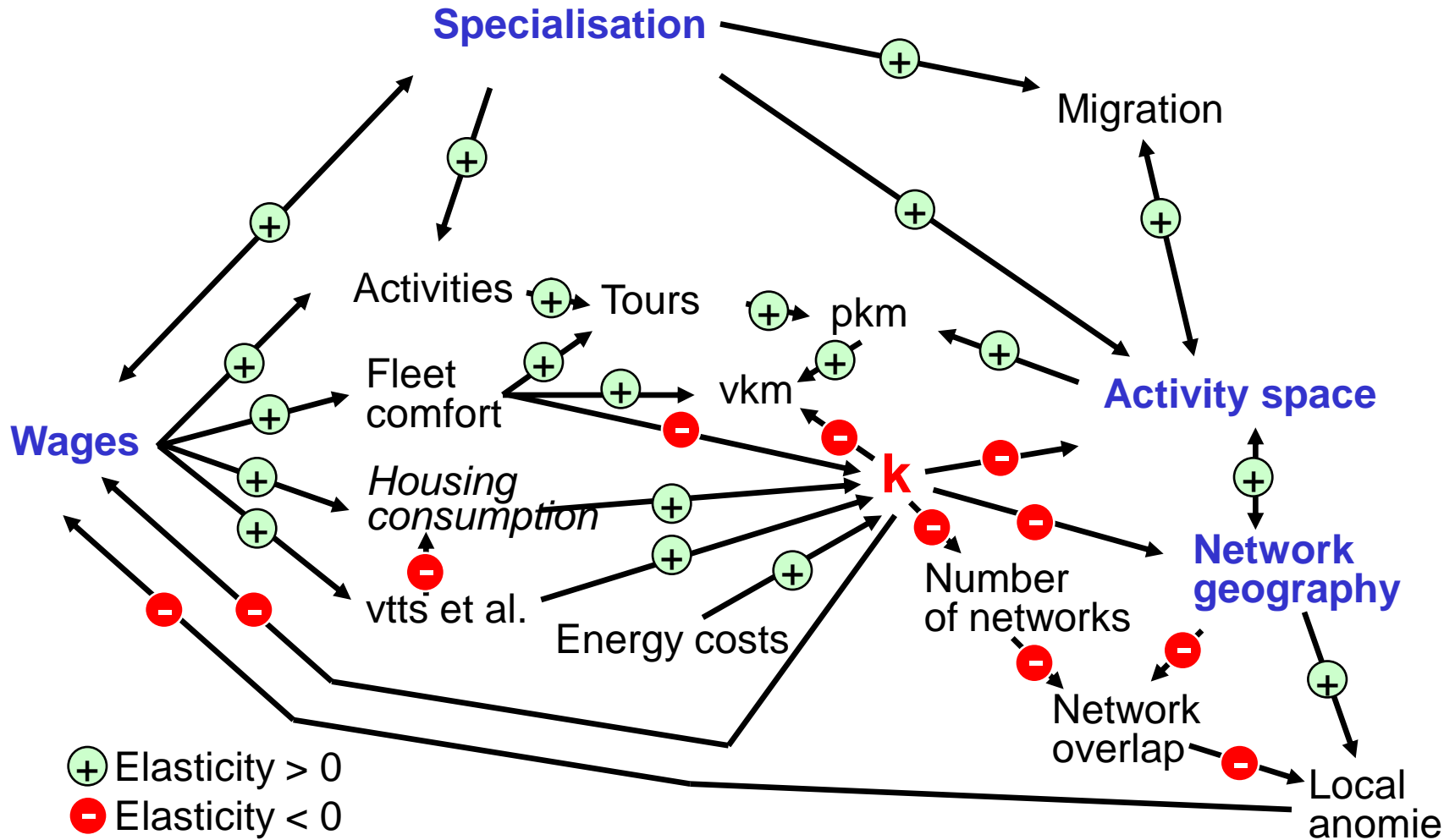
- Reconstruction of historical/prior activity spaces
- Taste differences in network form and geography
- Social/cultural preferences for network form and geography
- Stability of the geographies under pressure
- Elasticities to policy (or environmental) change
- Time until trend change

# Policy questions

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- Is „happiness“ still growing ?
- How large are the social externalities ?
- How stable is the overall system under pressure ?
- How can public policy support a possible need to reconstruct the networks ?

# The hypotheses summarized



For more information see

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[www.ivt.ethz.ch](http://www.ivt.ethz.ch)

# Literature and references

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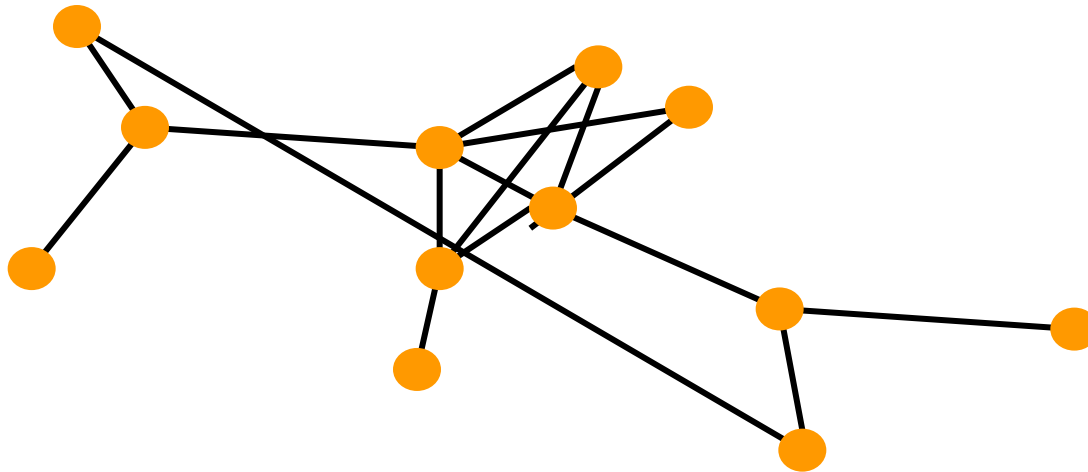
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# Definition of a social network

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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  $\sim 1/\text{Impedance}$

# 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