The impact of Temporary Events on Spatial Concentration of Population:

Evidence from a large-scale resettlement

Aki Kangasharju

GOVERNMENT INSTITUTE FOR ECONOMIC RESEARCH (VATT)

Is the current regional structure in Greenland the only 'sustainable'?

- Can temporary events (policy interventions) have permanent effects?
  - If no, the current structure is the only sustainable without permanent interventions
  - If yes, there is room for regional policy objectives

- Economic theory provides three alternatives
  - Fundamentals
  - Random growth
  - Increasing returns to scale and/or externatilities

- Large temporary shocks may reveal existence of multiple equilibria
  - A test for the 'Fundamentals'-story against the alternatives (done here)
  - can also be used to distinguish between the 'Random growth' and 'Increasing returns' – stories (not done yet)

- The evidence is scarce and mixed
  - Therefore a Finnish study
  - Also our "experiment" has promising features from a researcher's point of view

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A short review 1

Japan and Vietnam

- Davis and Weinstein (2002)
  - Allied bombings in the WWII affected the relative city sizes for less than 20 years in Japan

- Davis and Weinstein (2004)
  - Even specific industies mainly relocated back to their original sites in Japan

- Miguel and Roland (2005)
  - US bombings had only temporary effects on the relative city sizes in Vietnam

=> One Equilibrium (Fundamentals)

A short review 2

Germany

- Brakman et al. (2004)
  - Allied bombings in the WWII had only temporary effects on relative city sizes in West-Germany (but permanent effects in the East)
- Bosker et al. (2006 and 2007)
  - Allied bombings had permanent effects on the relative city sizes in West-Germany

- Bosker's analysis is more advanced than that of Brakman's
- Japan is a montanious country with few alternatives for good locations

=>Multiple equilibria? (Random growth / IRS)

Krugman's (1991) model
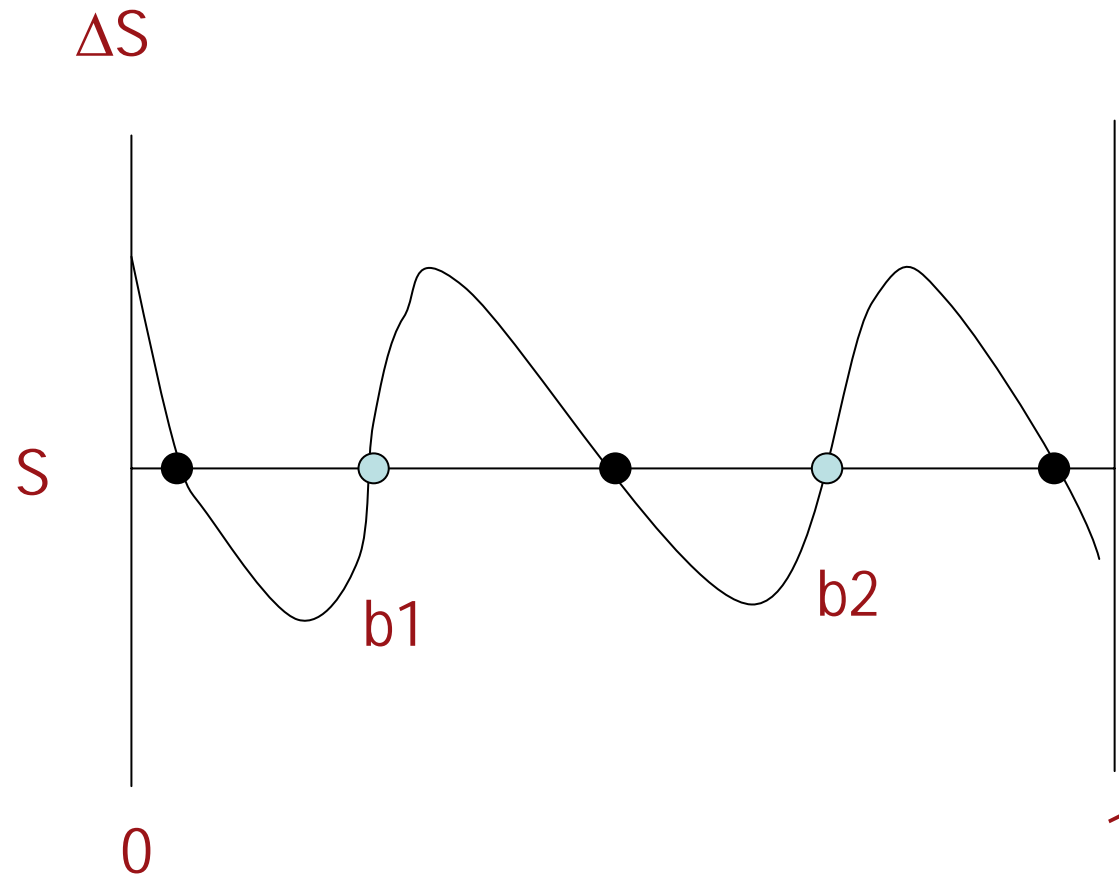
the Finnish case

- Regional development in rural Finland after the resettlement of Karelian farmers at the end of WWII
- Total number of evacuees was 430 000 (11 % of the Finnish population)
  - Most of them Karelians
  - Most of them farmers (more than 50 % of Karelians and Finns were farmers)
- Finland is a sparcely populated country
  - Room for alternative locations
- Rural areas
  - Role of increasing returns and externalities smaller in agriculture relative to manufacturing.
- A positive shock
  - No proxies for reconstruction subsidies
  - No reconstruction or going back to old places

Per capita GDP (PPP) by region in Europe, 1960, EU15=100
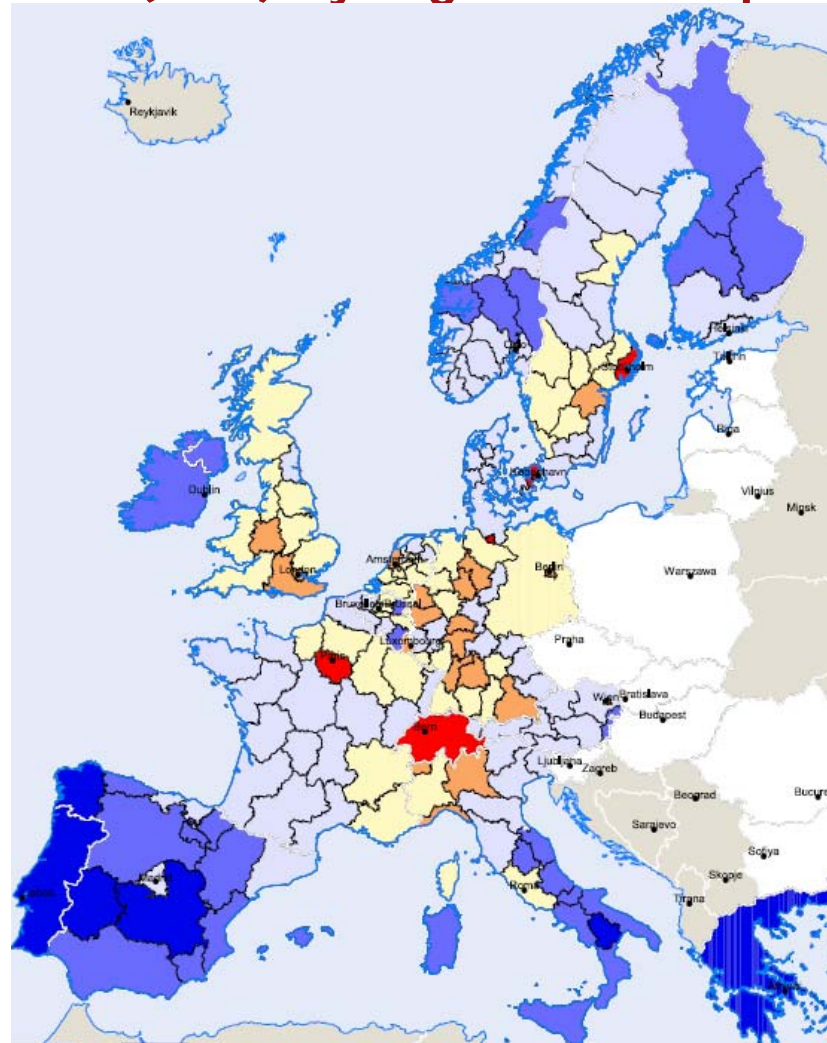
Ceded areas 1944
(and per capita income, 1938)

Petsamo

Salla

Karelia

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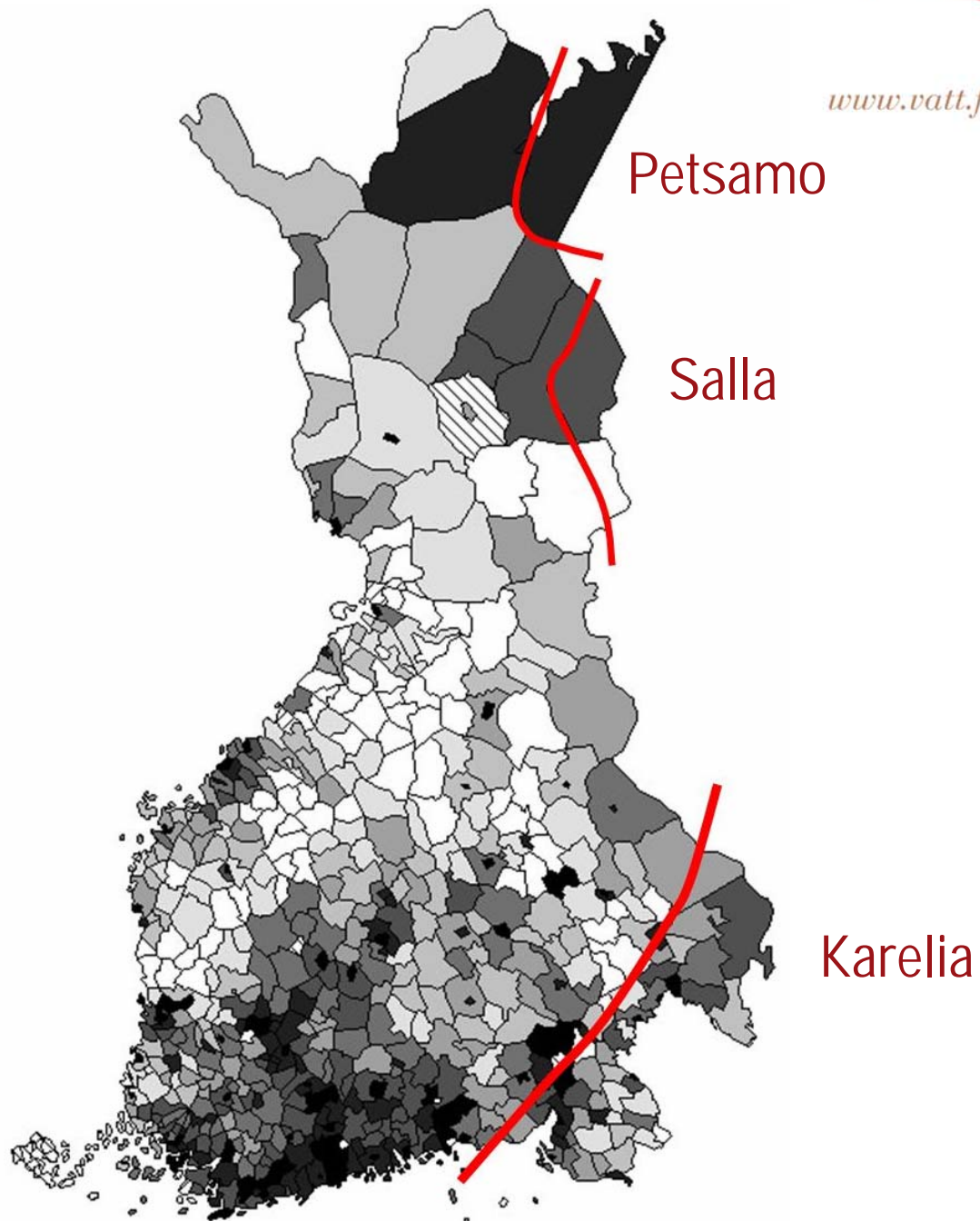
Resettlement Plan

- Cultivated land and land reclamation
- From the state, municipalities, firms, the church, land speculators and landowners not practicing farming
- 90 % of the tilled land was privately owed
- Farms with at least 15 hectares of agricultural land had to provide some land. The larges farms had to yield up to 60 % of their pre-war land area.
- The amount of land available for displaced farmers in a given area:
  - pre-war farm size distribution
  - the amount of land owned by the public sector.
- No Karelians were relocated to Lapland or the Swedish speaking municipalities
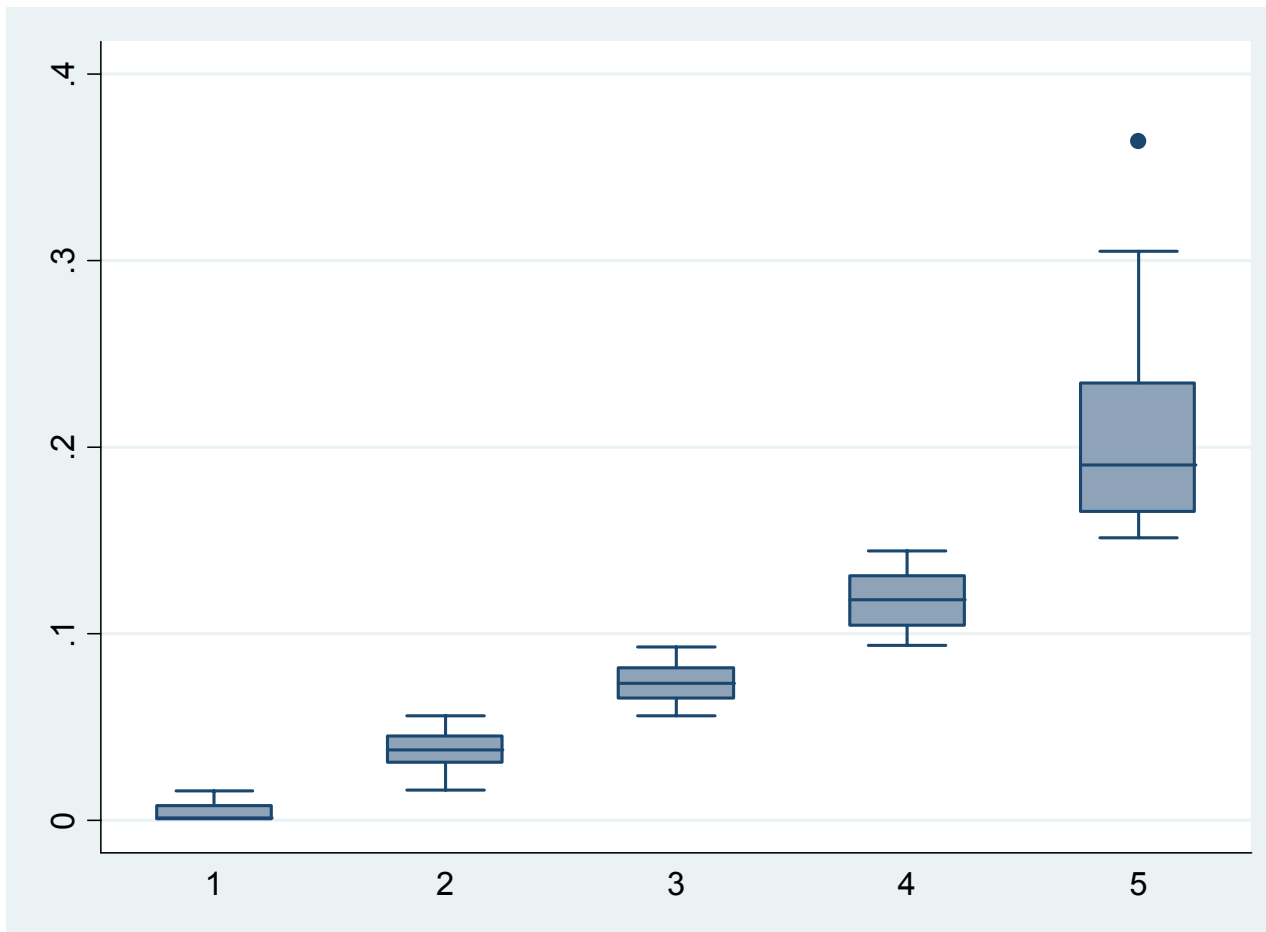
Proportion of all evacuees relative to population in municipality, 1948

Karelian farmers were not resettled in cities or market towns, Lapland or coastal municipalities in Western Finland

Siirtoväen osuus kunnan väestöstä

- 1 = 0-3 %
- 2 = 3-7 %
- 3 = 7-10 %
- 4 = 10-16 %
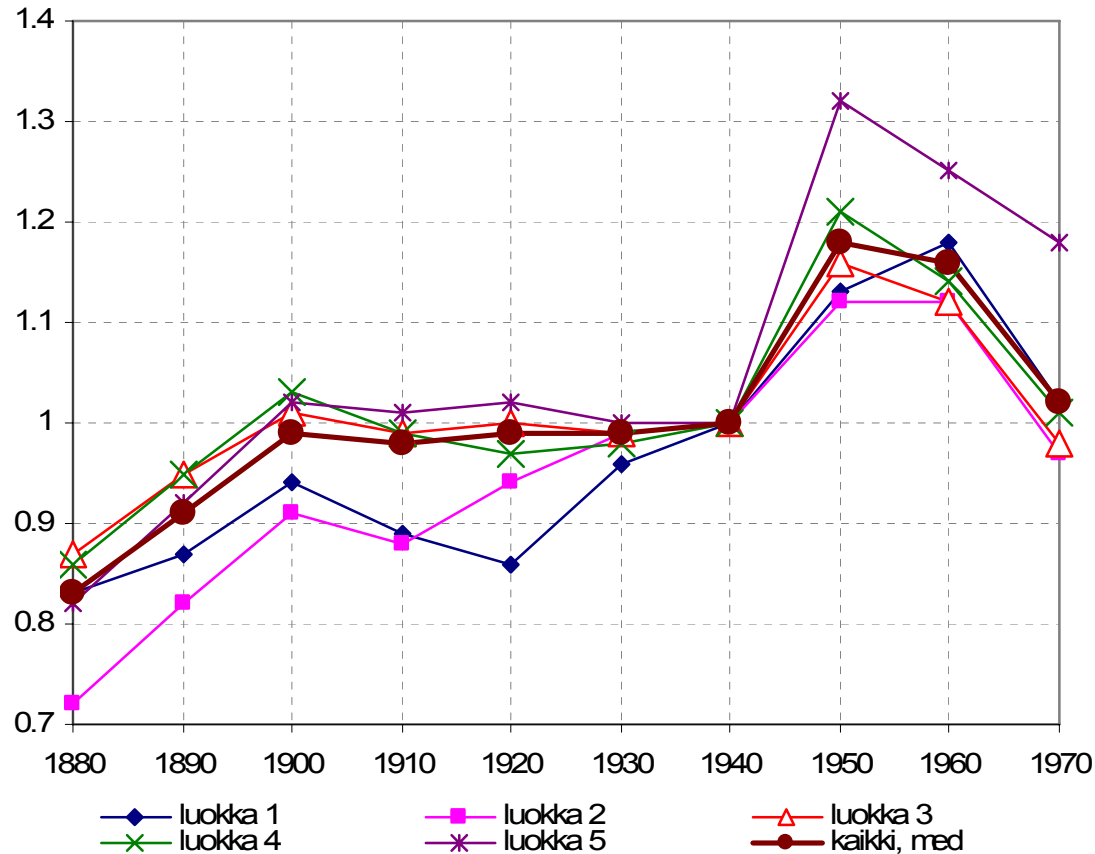- 5 = 16-36 %
- 0 = tuntematon
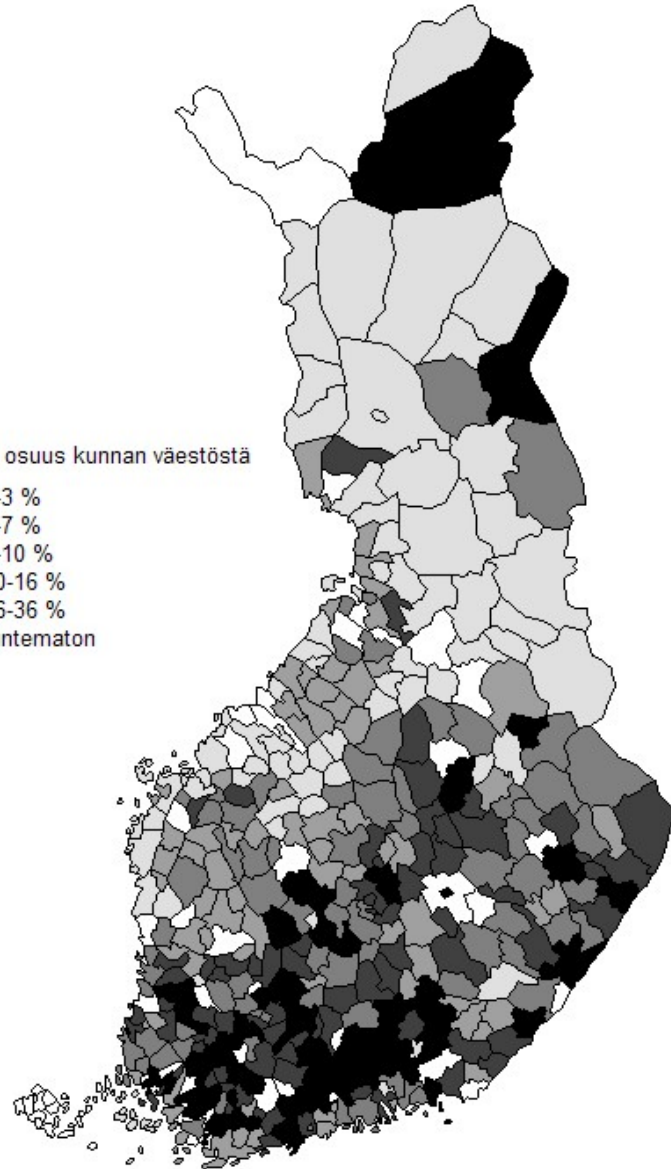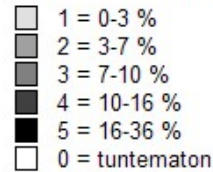
Proportion of all evacuees in five equal sized groups of municipalities, 1948

Population index by municipal category, all rural municipalities

Väestöindeksin mediaani, maaseutu

Estimated equation for rural municipalities excluding Lapland and Sweadish speaking areas

$$s_{i1948+t} - s_{i1948} = \alpha \left[s_{i1948} - s_{i1939} \right] + \beta_0 + Z_i \delta + error_i$$

Where

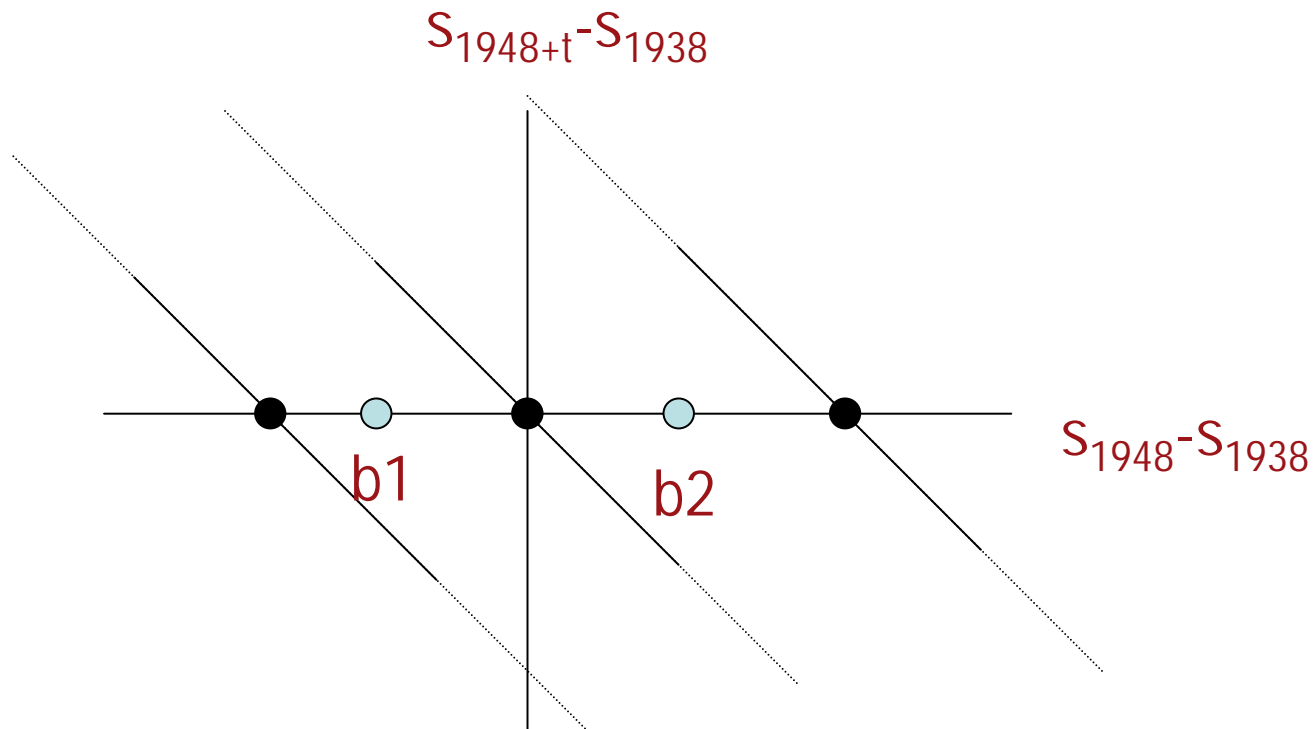s = log of population share

i = municipality

β = a constant

Z = control variables (pre-war characteristics and geographical variables)

Hypotheses

- $\alpha = 0$, random walk, permanent effect
- $\alpha = -1$, full reversion, no effect

$$S_{1948+t} - S_{1938}$$

b1

b2

$$S_{1948} - S_{1938}$$

Z variables

- Pre-war characteristics

    - Change in log population share 1930-1938,

    - pre-war mean per capita taxable income in 1936-1939,

    - share of labour force in agriculture in 1939,

    - share of population in manufacturing in 1939.

- Geographical variables

    - Adjacent neighbor of a city or market town

    - Longitude, latitude, longitude*latitude, distance from Helsinki

Instrument

- One potential instrument: Resettlement Plan
- Two concerns:
  - past shocks: the government may have favoured some areas over the others
  - Future shocks: expectations of the future population growth

- Used instrument: agricultural land available

First stage:
endogenous variable is the war time growth in population share

	(1)	(2)	(3)
Available cultivated land	0.17	0.12	0.21
	(0.03)	(0.03)	(0.04)
Controlling for:			
Pre-War Municipality Characteristic	no	yes	yes
Geography	no	no	yes
Robust F-stat	31.4	13.1	26.6
Partial R^2	0.09	0.05	0.11

Note: First-stage coefficient for the instrument (robust standard errors in parenthesis)

Results

	Dependent variable:				
	Change in log population share between 1948 and				
	1960	1970	1980	1990	2000
Controlling for Pre-War Municipality Characteristics and Geography					
Coefficient α	-0.08	0.20	0.60	0.68	1.03
Robust sd.	(0.19)	(0.31)	(0.47)	(0.55)	(0.63)
H_0: $\alpha = 0$ (random walk)	0.666	0.488	0.158	0.173	0.070
H_0: $\alpha = -1$ (full reversion)	0.001	0.001	0.001	0.002	0.001

Japan, 1948-1960: α=-0.76

Japan, 1948-1965: α=-1.03

West-Germany, 1948-1963: α=-0.53

West-Germany, 1948-1967: α=+0.03

Conclusion

- We strongly reject the hypothesis of reversion to the pre-war distribution.
  - the size distribution of rural municipalities in Finland does not have only one equilibrium.
  - A case for regional policy
  - Random growth or increasing returns?

- Note
  - Rural municipalities (IRS?; technological progress since the wars)
  - Sparcely populated country (room for alternatives)
  - A postitive shock (no going back to old places)

- We also find that municipalities would even have benefited from the resettlement (α tends to grow over time, as in the Japanese case).