

Does public spending level mortality inequalities? – Findings from East Germany after unification

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Motivation

- ▶ In the literature: social inequalities are a major cause for mortality differentials.
- ▶ The larger socioeconomic inequality the wider life expectancy differentials.
- ▶ Mortality differentials should narrow if social inequalities diminish among or within countries.



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- ▶ Mortality differentials should narrow if social inequalities diminish among or within countries.
- ▶ Can public policy contribute to a leveling of mortality differentials?



The German reunification - a natural experiment

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The German reunification - a natural experiment

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- ▶ **What did the reunification mean for the East?**
 - ▶ Introduction of the West German social security system including access to modern health care.

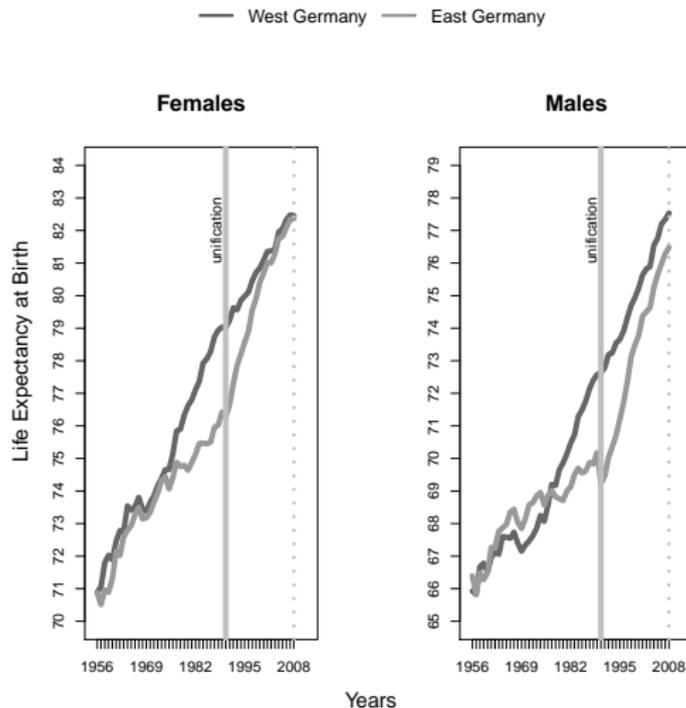


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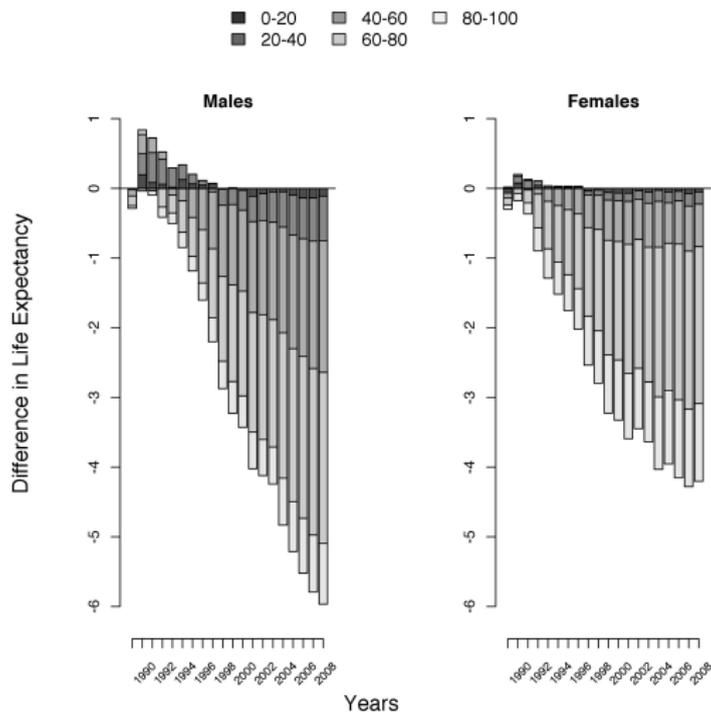
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 - ▶ Introduction of the West German social security system including access to modern health care.
 - ▶ Increase in relative and nominal income due to introduction of West German Mark at a highly beneficial exchange rate of 1:1.



Life expectancy and unification



Mortality improvements by age group



Research Question

Which impact did public spending have on the mortality convergence and how elastic is mortality to public spending?

- ▶ variety of factors changed after unification (pollution, life style factors etc.)
- ▶ but limitation on public expenditures for pensions and health care (Diehl 2004)



Data and Methodology

Data

- ▶ National Transfer Accounts for East and West Germany.
- ▶ Causes of Death Statistics Germany.



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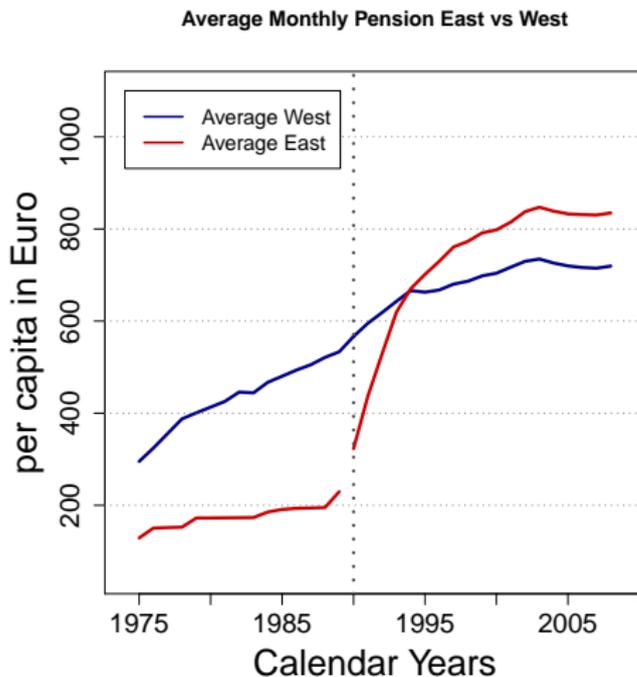
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Modeling the impact of public spending on mortality

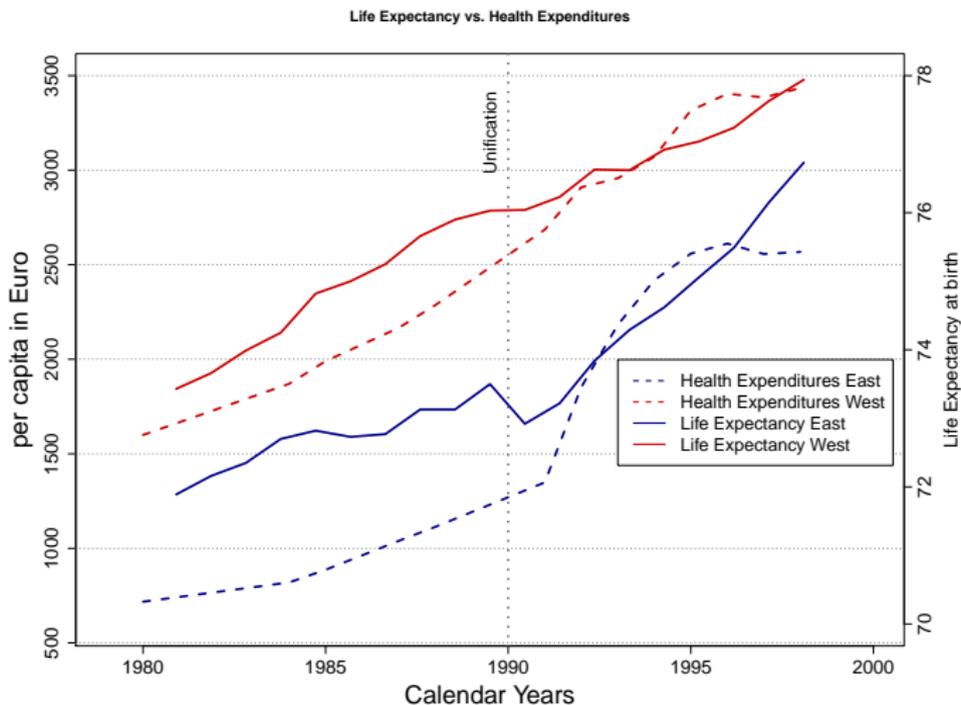
- ▶ Difference-in-difference estimation to estimate the elasticity of mortality to public spending
- ▶ Generalized linear model with Poisson-distributed mortality hazard to quantify the impact of different categories of public spending



Life expectancy and public pensions

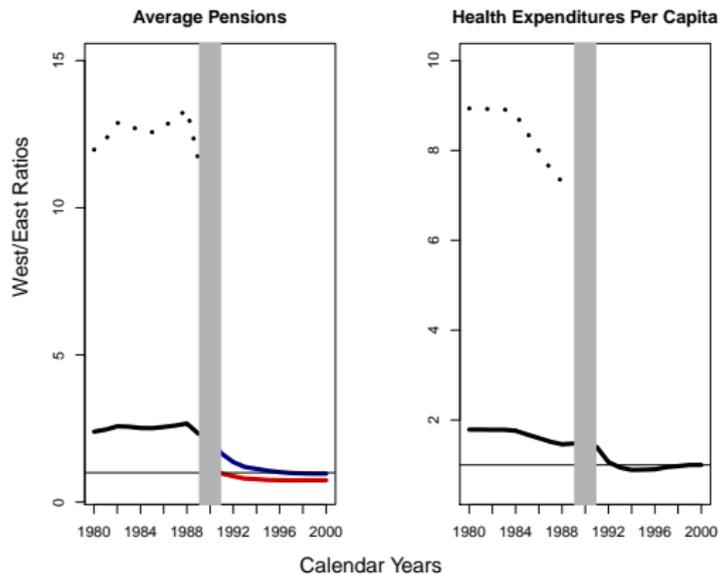


Life expectancy and health expenditures



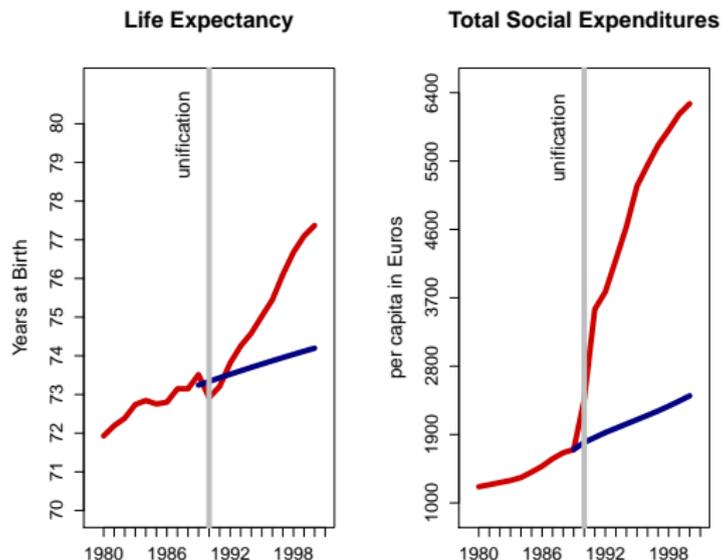
East/West expenditure ratios

— Both Sexes 1:1 — Females
 •• Both Sexes 5:1 — Males



A simple diff-in-diff approach

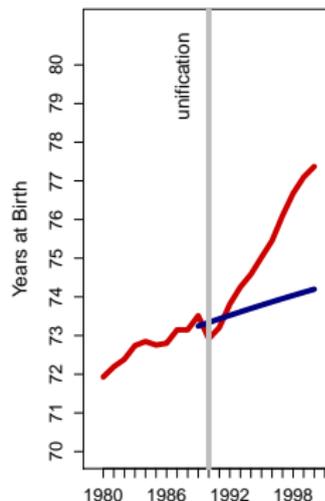
— Without Unification — Unification



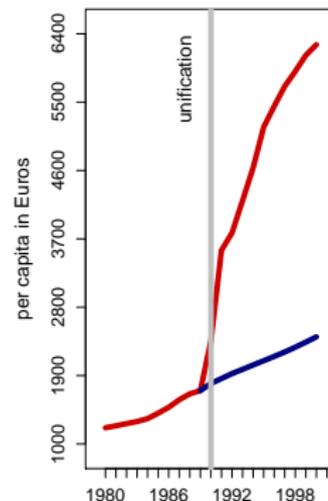
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Life Expectancy



Total Social Expenditures



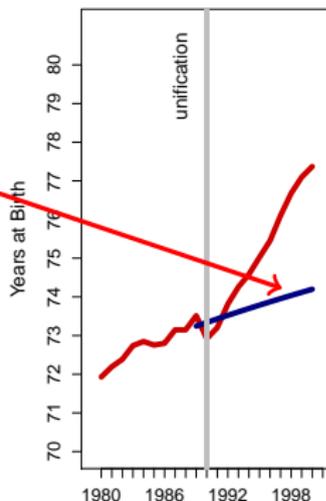
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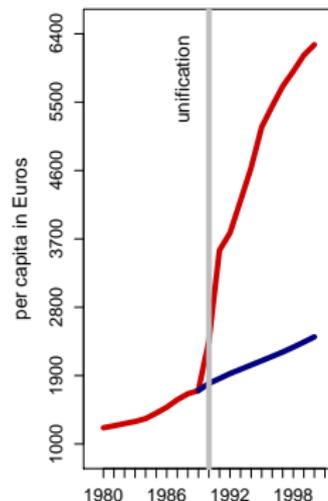
Red: real observed values

Lee-Carter-Forecast

Life Expectancy



Total Social Expenditures



A simple diff-in-diff approach

- ▶ Δ life expectancy: 1.8 years
- ▶ Δ public spending: 4,500 €

1 € invested in pensions or health care yields 3 hours life expectancy per year.



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Other factors changed: pollution, nutrition, health behaviour, life style factors, etc. → GLM for different causes of death.



The regression model

$$\log(mx_{j,t}) = \alpha_{j,t} + \beta X_{j,t} + \varepsilon_{j,t}$$

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	-9.960e+00	9.853e-02	-101.086	< 2e-16 ***
Pensions	-2.698e-02	5.222e-06	-5.166	2.51e-07 ***
Health	-3.728e-02	8.088e-06	-4.610	4.16e-06 ***
Age	1.018e-01	1.263e-03	80.579	< 2e-16 ***
Sex	-3.419e-01	2.555e-02	-13.379	< 2e-16 ***



All-cause mortality

All Cause Mortality

All cause mortality

	Ages above 60 Germany			Ages above 60 East Germany			Ages above 60 West Germany		
	Estimate	Std. Error	P-value	Estimate	Std. Error	P-value	Estimate	Std. Error	P-value
(Intercept)	-1,07E-001	4,23E-002	<2E-016	-1,05E-001	5,07E-002	<2E-016	-1,11E-001	8,22E-002	<2E-016
Pensions	-5,46E-006	1,17E-006	3,26E-006	-1,90E-005	1,76E-006	<2E-016	3,89E-006	1,77E-006	0,02844
Health	-3,50E-005	2,94E-006	<2E-016	-4,95E-005	4,80E-006	<2E-016	-1,81E-005	6,70E-006	0,00692
Age	1,09E-001	4,98E-004	<2E-016	1,08E-001	6,09E-004	<2E-016	1,11E-001	1,12E+000	<2E-016
Region	-1,06E-001	6,40E-003	<2E-016	-	-	-	-	-	-
Sex	-3,47E-001	5,85E-003	<2E-016	-3,10E-001	7,02E-003	<2E-016	-3,67E-001	1,06E-002	<2E-016
Unific	-1,08E-001	9,40E-003	<2E-016	-3,58E-003	1,94E-002	0,854	-1,47E-001	1,19E-002	<2E-016

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Seite 1



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- ▶ **Different CoD:** health care expenditures most beneficial in reducing mortality from infectious diseases, followed by digestive and respiratory diseases. Pensions have greatest effect on mortality from external causes and circulatory diseases.



Conclusion

- ▶ East Germans benefited greatly from increases in public spending.
- ▶ Mortality differentials narrowed as level of disposable income converged and access to modern health was granted.
- ▶ Indication that public spending can help to level mortality differentials via the reduction of social inequalities.



Future Research

- ▶ Include lag variables.
- ▶ Focus on older age groups.
- ▶ Use the German Pension Fund data to investigate if the results hold on the individual level.



- ▶ Thank you for your attention!
- ▶ Comments and Questions are welcome.
- ▶ E-Mail: vogt@demogr.mpg.de

