Long-Term Effects of Equal Sharing: Evidence from Historical Inheritance Rules for Land

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Introduction

- Long-standing debate regarding consequences of wealth inequality for economic outcomes (e.g., Becker and Tomes ’79, Galor and Zeira ’93, Banerjee and Newman ’93, Dell ’10)
- This paper: analyze sharp geographic variation in historical inheritance rules for land in Germany:
  - Unequal sharing (Anerbenrecht): primogeniture or ultimogeniture (oldest or youngest son inherits farm)
  - Equal sharing (Realteilung): equal sharing of parental farm land

→ What are the economic effects of equal sharing on economic outcomes and their distribution?
Ferdinand von Weckherlin, finance minister in Württemberg, argued in 1825 that Württemberg’s economic strength was:

- ”Württemberg is not distinguished by the existence of individual large factories. But all of Württemberg is a factory, a Manufactory. No matter where one looks, one finds everywhere industrious artisans, highly skilled manufacturers and thoughtful merchants. That is the character of industry in this land.”

- ”Supported by their small farms ... they are at least able to salvage a meager existence until luck or genius brings to them better times.”
Historical Inheritance Rules in the German Empire

**Unequal sharing area**
Mecklenburg-Vorpommern

**Equal sharing area**
Rheinland-Pfalz
This Paper

▶ Leverage spatial discontinuities in prevalence of inheritance norms (equal vs. unequal sharing)

▶ Broad geographic variation and more local spatial RD Design (Dell 2010)
  ▶ Find that other fundamental drivers of growth (geography, soil quality, etc.) are smooth at the boundary

▶ Historic data to study outcomes and mechanisms during the transition from an agrarian to an industrial economy

▶ Modern data to study long-run effects of equal sharing
More landholding equality in equal sharing areas.

During transition from agrarian to industrial economy, farmers in equal sharing areas increasingly engaged in innovative, highly-specialized industrial by-employment and, ultimately, became entrepreneurs.

Higher GDP pc, higher education, higher labor productivity, more creative industry in equal sharing areas today.

Substantial capital accumulation over time results in higher top incomes (from business), higher income concentration and higher top wealth in equal sharing areas today.
Outline

Institutional Setting: Geography and Origins of Inheritance Rules in Germany

Empirical Strategy and Data

Effects of Equal Sharing
   19th century
   Modern outcomes
   Mechanisms

Conclusion
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Institutional Setting: Historical Inheritance Rules

Historically, two different inheritance rules for land predominant across German regions

- **Equal sharing**
  - Partible inheritance
  - Land split equally among all children
  - Developed into customary law that land has to be divided equally among all children
  - Abolished in 1933 by Nazi *Reichserbhofgesetz*

- **Unequal sharing**
  - Land considered “indivisible” or entailed
  - Decrees or writs prohibit division of land or farms
  - Primogeniture or ultimogeniture
  - No side payments to other children
Historical Inheritance Rules in the German Empire
Institutional Setting: Geography of Inheritance Rules

- Rules or customs date back to pre-industrial times
- Variation is fine-grained and varies sharply geographically
  - Crosses religious, linguistic, political boundaries
- We draw on first comprehensive survey conducted by economist Max Sering in late 19th century
  - Survey of local courts, parishes in Prussia
  - Digitize Sering data and complement with information from von Miaskowski, Fick (Bavaria), Krafft (Württemberg), Hartke and Westermann
What caused variation in inheritance rule across places?

► No clear consensus among historians (Rösener '12)

► Sphere of influence of Roman vs. Germanic law? Dismissed (Rouette, '03)

► Frankish Law: Lex Salica (507) enacted by Merovingian king Clovis I prescribes equal sharing of assets among male offspring

  ► In contrast: Sachsenspiegel (1220) prescribes indivisibility of farms

► Features of terrain: ruggedness limits returns to farm scale
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Empirical strategy

We estimate the following model:

\[ Y_{cs} = \alpha + \gamma \cdot \text{Equal Division}_c + X'_{cs} \beta \ldots + f(\text{Geographic Location}_c) + \phi_s + \epsilon_{cs}. \]  

(1)

- **Outcome** \( Y_{cs} \) for county \( c \) in state \( s \)
- **Coefficient of interest**: \( \gamma \)
- **Rich set of control variables**:
  - Protestantism, legal environment (dummies for Preußisches Landrecht, etc.), Hanseatic League, elevation, soil quality, temperature and precipitation
  - State fixed effects
- **Estimation**:
  1. OLS
Empirical strategy

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- **Estimation**:
  1. OLS
  2. Regression Discontinuity Design (following Dell '10)
     - Flexible geographic controls (latitude/longitude)
     - Sample restricted to districts adjacent to opposite inheritance regime
Spatial Discontinuity Model: Border Sample
Empirical strategy

- Key regressor: EqualSharing index either 0 (Anerbenrecht) or 1 (Realteilung)
- Unit of analysis: district (Kreise)
- Standard errors clustered at the Regierungsbezirk level
Identification assumption: Predicted equal division
Identification assumption: Predicted GDP per capita

![Graph showing the relationship between predicted GDP per capita and distance to inheritance border in km. The graph plots predicted GDP per capita (logs) on the y-axis and distance to inheritance border in km on the x-axis. Two datasets are shown: unequal division (blue dots) and equal division (green crosses). The graph includes a reference line for comparison.](chart.png)
Data Sources

- Prevalence of inheritance rules: Sering, von Miaskowski, Fick, Krafft Hartke and Westermann
- Historical data on inequality, development: ifo Prussian Economic History Database (iPEHD, Becker et al. ’12), Reichsstatistik 1895 and 1907, Ziblatt (’12), conscript data from Baten (1845), county-level income tax records
- Modern outcomes: Volkszählungen (1925 onward), INKAR data (’14), county-level income tax and wealth tax records
- Additional data sources:
  - Bairoch et al. (’88)
  - Geographic data (terrain, soil quality, etc.): ESDB, Fastenmayer (’09)
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Equal Sharing $\Rightarrow$ Less Land-Holding Inequality (19th c.)

Landholding inequality in 1895

- Average farm size
- % of farms 20-100 ha
- % of farms 5-20 ha
- % of farms 2-5 ha
- Landholding Gini coefficient

Equal sharing effect in standard deviations

Basic sample
Border sample
95% CI
No Detectable Differences in Income Inequality

Income inequality in 1895 and 1907

Equal sharing effect in standard deviations

- Basic sample
- Border sample
- 95% CI
Today: Equal Sharing Areas Feature Higher Incomes

Income in 2014

Equal sharing effect in standard deviations

GDP per capita (logs)
Median income (logs)
Tax income (logs)
Household income per capita (logs)

Basic sample
Border sample
95% CI
...Higher Top Income and Top Wealth,

Top incomes in 2014 and top wealth in 1995

Equal sharing effect in standard deviations

- Millionaires pc
- Wealth taxpayers pc
- Top 1% income share
- Top 10% income share
- Top 10% mean income (logs)

Basic sample
Border sample
95% CI
More Human Capital and Higher Labor Productivity

Education and labor productivity 2014

Equal sharing effect in standard deviations

Basic sample | Border sample

95% CI
No Differences in Other Drivers of Growth

- **Similar agricultural productivity** caloric output per hectare before 1500 (Galor and Özak, 2016); grain yields in Prussia 1878

- **Similar population density** urban population data since 1500 (Bairoch et al., 1988), population density in Prussia 1816 and in German Empire 1895

- **No significant differences in early industrialization, income and wages** factories, mills and looms in 1821, employment in manufacturing in 1882, income and county taxes 1878, daily wages 1892

- **Similar human capital** literacy rates in Prussia 1871, school density and pupils in Prussia 1816 and 1886
Potential mechanisms

Smaller farms with smaller agricultural income in equal sharing areas

- **incentive** for **industrial by-employment** (Herrigel, 2000)
  - with the economy gradually shifting out of agriculture, side-employment turned into entrepreneurship

- **opportunity** to invest in **innovation** (Galor/Zeira 1993, Banerjee/Newman 1993, Ghatak et al., 2002, Galor/Moav 2004)
  - buffer to absorb the potential risks
  - alleviating credit constraints

⇒ combination of incentive and opportunity for entrepreneurship lead to an **earlier industrial take-off**.
Incentive for Industrial By-Employment

- Industrial by-employment as compensatory strategy (Herrigel, 2000)

- Small farms with less than 3 ha too small to nourish a family (Eiler, 1984)
  - equal sharing areas had significantly more farms with less than 2 ha or with 2-5 ha
  - significant effect of farm size and soil quality on (innovative) manufacturing interacting equal sharing with farm size

- Joint production of manufacturing and agricultural products under one roof = widespread phenomenon until the 1950s (Lerner, 1965)
More Innovation from 1877 to 1914

Patents 1877 to 1914

- Patents w/o zero (logs)
- Patents (logs)
- Patents dummy

Equal sharing effect in standard deviations

Basic sample  Border sample

95% CI
Earlier Industrial Take-Off in Equal Sharing Areas I

Sectoral employment 1895 and 1907

Equal sharing effect in standard deviations

Basic sample

Border sample

95% CI
Earlier Industrial Take-Off in Equal Sharing Areas II

Development Industrial/Agricultural Employment 1895-1987

Percent

Agriculture: Unequal Sharing
Agriculture: Equal Sharing
Industry: Unequal Sharing
Industry: Equal Sharing

Year


0 10 20 30 40

95 % CI
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- During transition from agrarian to industrial economy, farmers in equal sharing areas increasingly engaged in innovative, highly-specialized industrial by-employment and, ultimately, became entrepreneurs.

- Today: higher GDP pc, higher education, higher labor productivity, more creative industry in equal sharing areas.

- But higher growth disproportionately benefited top of distribution: higher top incomes (from business), higher top income shares and higher top wealth in equal sharing areas today.
Thank you for your attention!

cbartels@diw.de
Equal division on the composition of income and wealth

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<tbody>
<tr>
<td><strong>Panel A. OLS</strong></td>
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<tr>
<td>equal splitting</td>
<td>40.99*</td>
<td>-4.810</td>
<td>23.31</td>
<td>91.75</td>
<td>54.92</td>
<td>-302.7**</td>
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<td>(21.06)</td>
<td>(9.933)</td>
<td>(27.24)</td>
<td>(58.27)</td>
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<td>(121.5)</td>
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<td><strong>Panel B. With controls</strong></td>
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<td>(10.88)</td>
<td>(9.242)</td>
<td>(12.09)</td>
<td>(25.71)</td>
<td>(100.5)</td>
<td>(126.9)</td>
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<td><strong>Panel C. Distance to border</strong></td>
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<td>(10.62)</td>
<td>(9.730)</td>
<td>(13.64)</td>
<td>(25.22)</td>
<td>(85.35)</td>
<td>(101.2)</td>
<td>(299.1)</td>
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<td>mean outcome</td>
<td>109.0</td>
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<td>441.1</td>
<td>931.0</td>
<td>954.0</td>
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Notes: The table uses county level aggregates from the wealth tax collection in Baden 1908 and Hesse 1907 as well as income tax collection in Baden 1908 and Wurttemberg 1907. Income tax statistics included roughly a third of the population. Real estate includes both land and buildings. Panel A includes longitude, latitude, and state-fixed effects. Panel B additionally includes geographic and cultural controls as specified in summary statistics. Column 3 reduces the sample to counties in 35 km distance to the border of the inheritance rule. Independent cities are excluded. Regressions are weighted by population in 1907. Standard errors clustered on district (Regierungsbezirk) level. * = \( p < 0.1 \), ** = \( p < 0.05 \), *** = \( p < 0.01 \)