"Local dominance was complete, for, in the course of time, the Junker had become not only an exacting landlord, hereditary serf master, vigorous entrepreneur, assiduous estate manager, and nonprofessional trader, but also the local church patron, police chief, prosecutor, and judge. [...] Many of these experts in local tyranny were experienced in whipping the backs, hitting the faces and breaking the bones of ‘disrespectful’ and ‘disobedient’ peasant serfs."

German historian Hans Rosenberg commenting on Prussian miniature autocracies as quoted in Clark (2006, p. 162)
Labor coercion and trade

"The majority of labor transactions throughout much of history and a significant fraction of such transactions in many developing countries today are 'coercive'" Acemoglu and Wolitzky (2011, p.555)

- Today, c. 25 million people are in forced labor without the option to quit, many of them producing for international markets (International Labour Organization, 2017)
- Research on distributional consequences of trade, e.g.:
  - Wage-setting in multinational’s sweatshop following international scrutiny (Harrison and Scorse, 2010)
  - How fair trade labelling initiatives may lead to better terms for producers (Dragusanu et al., 2014)
- However, existing trade-inequality research assumes that workers voluntarily agree to the terms of employment
Examples of present-day labor coercion related to trade

(a) Enserfement of c. 1 million Uzbek citizens to pick cotton for export

(b) Labor conditions and passport confiscation of guest workers in Qatar

- Usually national services (civil or military) benefiting the public are not considered coercion
- Qatar example involves mobility bans that also frequently occur in history, e.g. as part of serfdom
This paper

- This paper studies the setting with the firmest qualitative (but no quantitative) evidence that trade drove labor coercion:

  **The Second Serfdom and concurrent grain exports (1579-1856)**

- The *export hypothesis* was first formulated by Polish historians more than 60 years ago and posits that opportunities to export grain incentivized landowners to coerce labor (Malowist, 1958)
- The hypothesis is mentioned as a driver of the Second Serfdom in most of the literature but remains untested (e.g. Moon, 2001; Stanziani, 2009; Cerman, 2012; Eddie, 2013)

- I use novel trade and de-jure and de-facto unfree labor data
  - De-jure unfree labor: all countries around the Baltic Sea
  - De-facto unfree labor: Denmark, Estonia, Prussia, Southern Sweden & Russia

- My paper also offers a first open-economy model of labor coercion
Research Questions

1. Endogenous Institutions
On the country level, do the East’s grain export booms occur before and during *de-jure* reforms that limit peasant freedom?

2. Blessing of Bad Geography
On the sub-national level, can a locality’s *de-facto* extent of unfree labor be related to its potential to export grain to the West that is determined by its access to ports and ports’ export volume?
Figure 2: Distribution of large estates and grain exports in Prussia, 1849

Source: Share large estates (>50 hectare): Prussian census (Becker et al., 2014), Exports: Author’s calculations based on Sound Toll
Related literature

- **Causes of serfdom:** high land-labor ratios (Domar, 1970), limited outside options (Brenner, 1976; Acemoglu and Wolitzky, 2011), ideology (Finley, 1980; Oudin-Bastide and Steiner, 2015)

- Disagrees with 'Sugar story'? (Engerman and Sokoloff, 1997)

- **Consequences of serfdom:** for Russia (e.g. Buggle and Nafziger, 2016; Markevich and Zhuravskaya, 2018)

- **World system theory:** Wallerstein’s (2011) inspired by Malowist

- **Blessing of bad geography:** difficult-to-traverse geography may limit negative foreign influence (Nunn and Puga, 2012)

- **Endogenous institutions and trade:** e.g. Acemoglu et al. (2005); Greif (2006); Puga and Trefler (2014)

- **Early-modern trade statistics** particularly rare and often ToT for peripheries (e.g. Williamson, 2008)

- **Export hypothesis elsewhere?** American South during slavery (Wright, 1975), Chile’s grain export boom in 1850-70 (Bauer, 1975)
Chronology of the wider project

2015: One slide on Sound Toll’s self-declaration tax in undergraduate Public Economics lecture

2017: Started cleaning the Sound Toll data
Poster presentation on the Hansa in San Jose

2018: Presentation U. Groningen
Research stay with Hansischen Geschichtsverein in Lübeck and archives (incl. in Poland)
Readings on Polish history

2019: Funding Fonds Sarah Andrieux
Presented at U. Helsinki → Estonia data
Research stay at U. Lund (planned)
Archives Estonia (planned)
## Contributions - Data

**Data sets:**

<table>
<thead>
<tr>
<th>Data set</th>
<th>New data</th>
<th>Newly related to trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound Toll records (for all $t$ and for grains)</td>
<td>✓</td>
<td>NA</td>
</tr>
<tr>
<td>Grain prices in the West</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>De-jure unfree labor reform dates</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>De-facto unfree labor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark estates</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Estonian HHs (outside of genealogy)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Prussian counties</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Scanian villages</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Russian counties</td>
<td>✗</td>
<td>✓</td>
</tr>
</tbody>
</table>
Outline

1. Introduction
2. Historical background
3. Model
4. Data
5. Methodology & Findings
6. Conclusion
7. PhD proposal
Introduction

Historical background

Model

Data

Methodology & Findings

Conclusion

PhD proposal

Commercial revolution - changing ports

Figure 3: Grain exports (tons) to the West based on Sound Toll.

Notes: Top 20 exporting cities named in each panel. Cities not represented by a dot did not export grain. Inland dots represent the few instances when Sound Toll mentions region in stead of origin city.
Grain shipments by destination - first Dutch then British

Figure 4: Tons of grain shipments by destination, 1579-1856

Notes: Sound Toll records only systematically show destination post 1660. During peak year (1847), assuming a Nordic consumption basket, exports could have fed >6 million individuals or twice the Netherlands at the time.

- Exports are highly correlated with wars (-), tariffs (-), and prices in the West (+)
Second Serfdom - spatially and temporally varied

Figure 5: De-jure unfree labor in Baltic Sea region

Notes: Compiled by author from secondary sources. Bars show period of legality of the most common types of labor coercion.
De-facto unfree labor case studies

**Denmark:** Following Great Northern War, agricultural prices drop during 1720s and rural exodus. Agricultural board mandates serfdom (stavnsbåndet) between 1733-88 bans mobility of farm hands (diff-diff non-farm hands).

**Estonia:** Colonized by German knights since 1200s who owned virtually all land despite changing rulers (Danish, Polish, Russia, and Swedish) and are known for their harsh treatment of natives. Compare Boers in Southern Africa and Malaysian Chinese.

**Prussia:** Junker-led labor coercion and exports East of the Elbe. Following Napoleonic wars (1807), slow improvements of peasant freedoms, particularly after 1821 Ordinance.

**Scania:** No serfdom, but corvée. Ceded to Sweden in 1658; enacted export ban until the 1720s; then land market deregulation: peasants allowed to buy crown (and later manorial) land they tilled, but corvée still unregulated.
Open-economy labor coercion model

- Outside-option models predict less coercion in proximity to ports (e.g. Acemoglu and Wolitzky, 2011) contrary to what I observe.
- Unlike Acemoglu and Wolitzky (2011), I take prices as exogenous (based on domestic & foreign demand) due to the high levels of market integration (e.g. Jacks, 2004; Olsson, 2006).

Figure 6: Visualization of my model
Figure 7: Example of a ship and its shipments recorded in the Sound Toll

Notes: Example of the entry of a ship on 18.4.1711 whose captain resides in Hoorn (the Netherlands). All shipments originate in Danzig and are bound for Amsterdam. A last is approximately equal to 1.8 tons. Source: Sonttolregisters-1750238 (film), 632752 (record id).
Sound Toll Records (2/2)

- Tax collected by Danish Crown at Elsinore on shipment level:
  - origin, destination, tax amount & domicile of captain
  - >5 million observations
- Self-reported value with Crown’s right-to-buy as truth-telling mechanism
- Fraud limited and mainly in luxury goods (Degn, 2018)
- Digitized in the Netherlands: www.soundtoll.nl
- Further standardizing:
  - value in silver
  - identify type of good
  - units to metric

Tax collected by Danish Crown at Elsinore on shipment level:
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  - value in silver
  - identify type of good
  - units to metric
Unfree labor

- **Danish estates (1706-1801)**
  - *Prices and Wages in Danish Estate Accounts* (Andersen and Pedersen, 2004)
  - Wages of different occupations
  - Grain sales of estates

- **Estonian estates (1732, potentially more t)**
  - Novel, full-universe dataset from Estonian National Archives
  - Corvée days by HH
  - Various controls

- **Prussian counties (1816, 1849, 1858):**
  - Share of large estates is good proxy for intensity of serfdom (e.g. Cinnirella and Hornung, 2016)
  - Census data available in multiple years

- **Scanian villages (1702-1856):**
  - Comparable outcome variable can be constructed from 'tenth surveys' compiled by Olsson et al. (2017)
Figure 8: Example of a Wackenbuch in 1732

Notes: Figure shows a full Wackenbuch of Moisakül estate. The book shows for each household the name of the head, a breakdown of its members, the allotted land and other wealth. On the rights the dues are detailed, including corvée, in-kind, and monetary payments. Source: EAA.854.7.101
De-jure findings - prices in the West

Figure 9: Prices in the West and de-jure coercion (constant borders), 1579-1856

Notes: This figure combines the price index of grains we construct and de-jure unfree labor reform data for all countries and investigates their relationship. The index is constructed from prices of different types of grains in the West based on long-run series. The prices of grain types contribute to the index based on the grain type’s share in Baltic grain exports. Thus, multiplying it by the export tonnage leads the total value of Baltic exports (in grams of silver).
De-jure findings - export

Figure 10: Tons exported and de-jure coercion (constant borders), 1579-1856
**De-jure findings - Mecklenburg**

![Figure 11](image)

**Figure 11:** Grain exports and unfree labor in Mecklenburg, 1579-1856

This figure presents the specific example for Mecklenburg, for which unfree labor reforms are well documented. Figure is based on Sound Toll (exports), our de-jure reform data, and the price index we construct. Dark shaded years are those with wars involving Mecklenburg based on Brecke (1999), which could be potential omitted variables, but they do not coincide with de-jure reforms. Ports with grain exports attributed to Mecklenburg include: Kirchdorff, Mecklenburg, Rostock, Schwerin, Warnemünde, Wismar.
Methodology micro (de-facto)

- Use standardized ExportPotential index as single, interpretable variable of interest
- Similar to Kopsidis and Wolf’s (2012) Prussian county market potential index (that uses city population instead of exports)

1. Sum port’s $p$ exports in $t$ over $\tau$ years: $\sum_{t-\tau}^{t} GrainExports_{pt}$
2. Divide by distance between county/village/estate ($c$) and port
3. Sum over all ports ($P$)

$$ExportPotential_{ct} = \sum_{p} \frac{\sum_{t-\tau}^{t} GrainExports_{pt}}{Distance_{cp}}$$

- Outcomes ($Y$): wages, corvée days, land inequality
- $X$: vector of controls (e.g. land-labor ratio)
- $\alpha_t$ and $\sigma_c$ are year and county/village fixed effects

$$Y_{ct} = \beta_0 + \beta_1 ExportPotential_{ct} + \beta'_2 X_{ct} + \alpha_t + \sigma_c + \epsilon_{ct}$$
Figure 12: Denmark estate and export port location, 1706-1801

Notes: Figure shows the location of the 12 estates in the sample and the tons of grain shipped (sum of the 1705-1801 period in the Sound Toll) from ports in the surrounding. Missing port observations are ports that did not export grains in the considered period but at some earlier or later point.
Denmark - diff-diff: farm-hand vs. rest, pre-post serfdom

Figure 13: Denmark wages (farm hand vs. rest) and exports, 1706-1801

Notes: Vertical lines show introduction and abolition of serfdom. Tons of grain are aggregated from all ports shown in Figure on previous slide. Real wage is nominal wage for both farm hands and other workers deflated using average grain prices of the grain sales of all estates.

- Observe sharp pre-post 1733 farm-rest wage differential
Figure 14: Estonia estate, corvée, and export port location, 1732

Notes: Figures shows the location of estates and in which quantile of weekly corvée days per person (summing days with and without own draught animal) by parish. Missing observations are parishes in Estonia, but outside of those in sample. The location of grain export ports and how many tons they exported to the West during the last 10 years is also shown. The vast majority of exports appear to be concentrated in Tallinn in the north and not in the other port cities of Pärnau more south or Narva in the very north-east at the border with the Russian heartland.
### Table 1: Results Estonia, 1732

<table>
<thead>
<tr>
<th></th>
<th>Without draught animal</th>
<th>With draught animal</th>
<th>With and without draught animal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>Distance to Tallinn (in km)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>–0.015***</td>
<td>–0.032***</td>
<td>–0.005***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.003)</td>
<td>(0.0004)</td>
</tr>
<tr>
<td><strong>Distance to Pärnau (in km)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.011***</td>
<td>0.024***</td>
<td>0.008***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.002)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td><strong>Used land (in 12,5 ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.291***</td>
<td>4.084***</td>
<td>2.689***</td>
</tr>
<tr>
<td></td>
<td>(0.325)</td>
<td>(0.824)</td>
<td>(0.104)</td>
</tr>
<tr>
<td><strong>Unused land (in 12,5 ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>–0.049</td>
<td>–0.532</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>(0.196)</td>
<td>(0.413)</td>
<td>(0.065)</td>
</tr>
<tr>
<td><strong># HH member</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.158***</td>
<td>0.119*</td>
<td>0.115***</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.066)</td>
<td>(0.009)</td>
</tr>
<tr>
<td><strong># horses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.339***</td>
<td>0.747***</td>
<td>0.064***</td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.137)</td>
<td>(0.020)</td>
</tr>
<tr>
<td><strong>Forested land (in 12,5 ha)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>–1.141***</td>
<td>–0.658</td>
<td>0.929***</td>
</tr>
<tr>
<td></td>
<td>(0.287)</td>
<td>(2.147)</td>
<td>(0.091)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>4,955</td>
<td>1,868</td>
<td>6,154</td>
</tr>
<tr>
<td><strong>Adjusted R²</strong></td>
<td>0.248</td>
<td>0.388</td>
<td>0.473</td>
</tr>
</tbody>
</table>

**Additional controls:**

- Type of manor: Y Y Y Y Y Y
- Farm animals: Y Y Y Y Y Y
- Other dues: Y Y Y Y Y Y
- Potential yield: Y Y Y Y Y Y
- Drought intensity: Y Y Y Y Y Y

**Notes:** Cross-section of Northern Estonian households as recorded in the *Wackenbuch* of their manor. Type of manor distinguishes between church, knight and state manors. Multiply the coefficients by 1440, the number of minutes per day, to convert them to the change in corvée minutes per household per week. 1 km closer to Tallinn, ceteris paribus, implies 21 min more corvée per week (Column 1). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Table 2: Results Prussia, 1816, 1849, 1858

<table>
<thead>
<tr>
<th></th>
<th>% large estates (standardized)</th>
<th>% emancipated serfs (standardized)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>ExportPotential</td>
<td>0.175***</td>
<td>0.169***</td>
</tr>
<tr>
<td>(standardized)</td>
<td>(0.0455)</td>
<td>(0.0508)</td>
</tr>
<tr>
<td></td>
<td>0.166***</td>
<td>0.147**</td>
</tr>
<tr>
<td>(standardized)</td>
<td>(0.0609)</td>
<td>(0.0636)</td>
</tr>
<tr>
<td>Primary school</td>
<td>-0.661</td>
<td>2.749***</td>
</tr>
<tr>
<td>enrollment</td>
<td>(0.411)</td>
<td>(0.579)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.484***</td>
<td>0.468***</td>
</tr>
<tr>
<td>(standardized)</td>
<td>(0.0780)</td>
<td>(0.0894)</td>
</tr>
<tr>
<td></td>
<td>0.467***</td>
<td>-0.111</td>
</tr>
<tr>
<td>(standardized)</td>
<td>(0.0533)</td>
<td>(1.674)</td>
</tr>
<tr>
<td>Observations</td>
<td>453</td>
<td>453</td>
</tr>
<tr>
<td># counties</td>
<td>151</td>
<td>151</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.037</td>
<td>0.180</td>
</tr>
<tr>
<td>Controls</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Year FE</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>County FE</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

Notes: Panel of East-Elbian Prussian counties (1800 constant borders) in 1816, 1849, and, 1858 (Columns 1-4) and cross-section of share of manumitted serfs (Column 5). Grundsteuerreinertrag proxies for agricultural productivity. Further controls include % protestant, % urban, % industrial, % agricultural, child dependency ratio, population density, school density, % first language not German. Time invariant controls include soil conditions and river access. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Scanian villages

Figure 15: Scania villages and export port location, 1702-1856

Notes: Figures shows the villages in Scania and the location of export ports and how much they exported across the entire period. Grey shaded dots represent ports that exported prior to 1702, but not in 1702-1856.
Figure 16: Landownership by mantal and grain exports, 1702-1856

Notes: Constructed from the Historical Database of Scanian Agriculture (Olsson et al., 2017) and the Sound Toll.

Further descriptive statistics
## Scania, 1702-1856 - Share of large estates

<table>
<thead>
<tr>
<th>Table 3: Results Scania share of large estates, 1702-1856</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village’s share of large estates</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>ExportPotential</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Grain production (in stooks)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td># plots of land</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(2)</td>
</tr>
<tr>
<td>ExportPotential</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Grain production (in stooks)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td># plots of land</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(3)</td>
</tr>
<tr>
<td>ExportPotential</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Grain production (in stooks)</td>
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<td></td>
</tr>
<tr>
<td># plots of land</td>
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<td></td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Observations</td>
</tr>
<tr>
<td>Number of villages</td>
</tr>
<tr>
<td>R-squared</td>
</tr>
<tr>
<td>Village FE</td>
</tr>
<tr>
<td>Year FE</td>
</tr>
</tbody>
</table>

Notes: Mean and s.d. of ExportPotential are 1.3 and 5.9, respectively. Panel of Scanian villages observed, at most, annually from 1702 to 1856. Dependent variable is the share of large land plots in a village. Crown lands are excluded. Grain production include amount of grains produced (rye, barley, oats, wheat, buckwheat, and mixed) in stooks. # plots of land gives the number of land plots in a village, which would increase if existing plots were partitioned. Robust standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.
## Table 4: Results Scania peasant landowners, 1702-1856

<table>
<thead>
<tr>
<th></th>
<th>Peasant owns land? [0/1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) OLS</td>
</tr>
<tr>
<td>ExportPotential</td>
<td>0.00120**</td>
</tr>
<tr>
<td></td>
<td>(0.000590)</td>
</tr>
<tr>
<td>Grain produced</td>
<td>-0.000630</td>
</tr>
<tr>
<td>(in stooks)</td>
<td>(0.000529)</td>
</tr>
<tr>
<td>Cultivator changed?</td>
<td>-0.00102</td>
</tr>
<tr>
<td>[0/1]</td>
<td>(0.00128)</td>
</tr>
<tr>
<td>Cultivator widowed?</td>
<td>0.0103</td>
</tr>
<tr>
<td>[0/1]</td>
<td>(0.00755)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.461***</td>
</tr>
<tr>
<td></td>
<td>(0.0364)</td>
</tr>
<tr>
<td>Observations</td>
<td>59,716</td>
</tr>
<tr>
<td>Number of plots</td>
<td>1,963</td>
</tr>
<tr>
<td>Land plot FE</td>
<td>N</td>
</tr>
<tr>
<td>Year FE</td>
<td>N</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Notes: Mean and s.d. of ExportPotential are 1.5 and 5.6, respectively. Panel of Scanian land plots observed, at most, annually from 1702 to 1856. Dependent variable is binary indicator whether peasant owns land (skatte), or whether land is manorial. Crown lands are excluded. Grain produced include amount of grains produced (rye, barley, oats, wheat, buckwheat, and mixed) in stooks. Note that since we use land plot fixed effects, probit results are not bound by 0 and 1. Village-level cluster robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Conclusion

- Evidence *for* export hypothesis on de-jure coercion around the Baltic Sea and on de-facto coercion in Estonia and Prussia
  - Worker’s (real) wages appear to rise with trade - even under serfdom - in Denmark
  - Internal migration appears to dominate any export hypothesis in the Russian heartland
- Evidence *against* export hypothesis in Scania where concurrent opening of land market to peasants supposedly allowed them to benefit from trade despite unregulated dues
  - This is an understudied consequence of wealth policies
- Eastern European coastal cities not only appear to provide few outside options, but also foster coercion through grain exports
  - Future labor-coercion models may take this into account
Trade, Inequality and Social Conflict

Tom Raster
PhD Proposal
Paris School of Economics

June 13, 2019
How does trade create or re-inforce within- and between-country inequalities and how do these translate into social conflict?

Specific projects:

1. Extensions Master Thesis
2. The Slow Emancipation of Peasants and the Rise of Socialism in Prussia
3. Participation and Trade during the Hansa
4. Import Substitution in the European East
5. Terms of Trade Compared to Trade Volumes
Engerman and Sokoloff (1997) hold that **economies of scale** foster coercion

- Test this by grain type with Scania land plot and corvée data

**Export hypothesis on manorial land in Scania?**
Estate-level corvée data Scania – More corvée with better export potential like in Estonia?

**Exogenous transport cost shifter** to improve identification

- E.g. railroads in Prussia starting in 1840 (Hornung, 2015)

Extend Estonia HH data to more t

- How are **dues converted** between corvée, in-kind and monetary?
- How do are **dues adjusted** during crop failures and international price busts?
- Eddie’s (2013) Freedom’s Price: Do landowners provide ‘**insurance**’ in exchange for dues (Konservation)?
- Link to modern development literature
The Slow Emancipation of Peasants and the Rise of Socialism in Prussia

- Slow phasing out of serfdom (1821–) and rise of socialism despite bans (1869–)
- How do enduring inequalities (Sonderweg) interact with this emerging ideology based on solidarity?
- Local variations in the extent of emancipation can be exploited and linked to electoral outcomes
- Consequences of serfdom are well documented for Russia (e.g. Buggle and Nafziger, 2016; Markevich and Zhuravskaya, 2018), but Prussia is set apart by its democratization and data abundance (e.g. Dell, 2005)
Figure 17: Share of emancipated peasants in 1848

Notes: Manumissions compiled from Meitzen (1869). Numerator is number settled emancipation cases of those who previously had lifetime duties and from the Dissolution Ordinance of 1821 to 1848 has redeemed them (Dienst- und Agabenpflichtige, welche abgelöst haben). Denominator is population eligible for such emissions, i.e. the rural population, recorded in the 1849 census, that had strong enough tenure rights (spannfähige bäuerliche Nahrungen) (Meitzen, 1869, p.307). Sound Toll trade during 5 prior years.
Figure 18: Constituencies’ winning party in North German Confederation election, 1867. Source: Maximilian Dörrbecke

- Turnout 65% in 236 Prussian constituencies
- Men aged $\geq 25$ not receiving welfare allowed to vote ($\approx 19.4\%$ of population, 53% aged $\geq 25$ among males, 50% male)
- Following elections: 1871, 1874, 1877, 1878, 1881, 1884...
Introduction

Historical background

Model

Data

Methodology & Findings

Conclusion

PhD proposal

Participation and Trade during the Hansa

- Ongoing debate whether merchant guilds rely predominantly on formal rules (Edwards and Ogilvie, 2012) or multilateral reputation mechanisms (Greif, 2012)
- Studying a guild - the Hansa - that has not been quantitatively researched before may provide new insights on institutions

The Hansa:
- Was a trade alliance between cities rather than merchants
  - max. 200 members, e.g. Hamburg, Lübeck, Danzig, and Riga
- Conducted much of the trade in the North and Baltic Sea from 1358 to 1669
- Has been compared to the European Union and modern trade agreements (e.g. Fink, 2012)
- Held Hansa Diets that reveal membership and influence
- Viner’s (1950) trade diversion framework can be applied
- Sound Toll reveals origin and destination city and if ships sails for Hansa since this requires Hansa city as captain’s domicile
Sources: Diet meeting in 1609, EXT HANS 204
Import Substitution in the European East

- Present-day developing world is concerned with import substitution - evidence from history?
- Eastern Europe predominantly exported primary products and, in return, it imported manufactured goods, such as textiles, from the West.
- Did this trade stifle the East's own industrial development? Or did it encourage it through providing opportunities to copy and learn?
- Did coercion limit the availability of labor for the industrial sector and curb its development?

Data:

- Sound Toll reveals penetration of industrial imports of sub-national entities
- Prussian and Swedish censuses provide proxies for industrialization
Figure 19: Share of workers employed in manufacturing in 1849

Notes: Taken from Becker et al. (2009) and originally based on Prussian census.
Terms of trade informs many studies (e.g. Jacks, 2004; Williamson, 2008; Frankema et al., 2018), but it may be an imprecise proxy for market integration, especially when:

- inflation is volatile
- currencies are debased
- product quality is varied

Sound Toll is a single source that reveals the actual extent of trade that can be compared to ToT.

Supply shocks that falsely suggest ToT-based market integration can be controlled for using grid-cell tree ring growth data.

Findings may caution against relying on ToT in certain circumstances.


References II


References


Prices in the West and exports from the East (1/2)

Figure 20: Grain-type-weighted price index, prices, and grain exports, 1579-1856

Notes: Figure shows the movement of prices of different grains (price index in first panel) and their exports. Choice of price series based on longest available series. Prices of rye (Arnhem) from Allen (2008) and prices of barley, wheat and oats (England) from Clark (2004). No long price series for buckwheat (which is not frequently exported) appears to exist. Price index calculated as weighted average of grain prices, with weights proportional to grain types share in number of shipments.
Table 5: Correlation grain-type-weighted price index, prices, and grain exports, 1579-1856

<table>
<thead>
<tr>
<th></th>
<th>Price Index</th>
<th>Barley</th>
<th>Oat</th>
<th>Rye</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of grain shipments</td>
<td>0.5063557</td>
<td>0.622435</td>
<td>0.620387</td>
<td>0.126017</td>
<td>0.4451744</td>
</tr>
<tr>
<td>Tons of grain shipments</td>
<td>0.495561</td>
<td>0.5938744</td>
<td>0.580603</td>
<td>0.127821</td>
<td>0.4729609</td>
</tr>
<tr>
<td>Amount tax on grain shipments</td>
<td>0.5360389</td>
<td>0.6007349</td>
<td>0.541273</td>
<td>0.26655</td>
<td>0.5560674</td>
</tr>
</tbody>
</table>

Notes: Table shows correlation between price (index) by grain type and their exports.
Grain exports by origin
Grain exports by captain domicile

![Grain exports by captain domicile graph](image-url)
Grain exports by grain type

- Barley
- Buckwheat
- Mixed
- Oat
- Rye
- Wheat

Year range: 1580-1840

Number of shipments

Rolling 5y average of total
The Export Hypothesis in the Russian Heartland

Figure 21: Share of serfs in Russia, 1745, 1782, 1835, 1858

Notes: Based on Russian censuses spreadsheets and shapefiles taken from Kessler and Markevich (2015). Shares are out of total population and plotted based on quartile in each panel. The shown panels represent the 4 earliest Russian censuses. Missing values stem from either territories not belonging to the Russian Empire at the time or those not captured by the census. In the case of Estonian and Livonia (present-day Latvia), their abolition of serfdom (in 1816 and 1819, respectively) explains why they are missing in the 1835 and 1858 census.
Figure 22: Russia’s Baltic and Black Sea grain exports by grain type, 1812-56

*Notes:* St. Petersburg exports based on Sound Toll, implying that they might be understated since they do not include intra-Baltic trade. Odessa export data obtained from the Black Sea Project, see https://cities.blacksea.gr/en/odessa/5-7/.
Table 6: Estonia findings excluding distance to Pärnau, 1732

<table>
<thead>
<tr>
<th>Without draught animal</th>
<th>HH’s corvée days per week</th>
<th>With draught animal</th>
<th>With and without draught animal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Distance to Tallinn (in km)</td>
<td>-0.005***</td>
<td>-0.006***</td>
<td>-0.003***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.0002)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.141***</td>
<td>-0.658</td>
<td>0.929***</td>
</tr>
<tr>
<td></td>
<td>(0.287)</td>
<td>(2.147)</td>
<td>(0.091)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,955</td>
<td>1,868</td>
<td>6,154</td>
</tr>
<tr>
<td>R²</td>
<td>0.233</td>
<td>0.354</td>
<td>0.421</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.230</td>
<td>0.349</td>
<td>0.420</td>
</tr>
</tbody>
</table>

**Additional controls:**
- Type of manor: Y Y Y Y Y Y
- Farm animals: Y Y Y Y Y Y
- Other dues: Y Y Y Y Y Y
- Potential yield: Y Y Y Y Y Y
- Drought intensity: Y Y Y Y Y Y
- Forested land: N Y N Y N Y

**Notes:** Cross-section of Northern Estonian households as recorded in the *Wackenbuch* of their manor. Type of manor distinguishes between church, knight and state manors. Multiply the coefficients by 1440, the number of minutes per day, to convert them to the change in corvée minutes per household per week. 1 km closer to Tallinn, ceteris paribus, implies 21 min more corvée per week (Column 1). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Estonia - Further Descriptive Statistics

Table 7: Descriptive statistics for key variables in the *Wackenbücher*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Pctl(25)</th>
<th>Pctl(75)</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to Tallinn</td>
<td>32,508</td>
<td>120.492</td>
<td>71.817</td>
<td>3.985</td>
<td>59.693</td>
<td>156.329</td>
<td>198.483</td>
</tr>
<tr>
<td># corvée days/week per HH member with draught animal</td>
<td>12,150</td>
<td>0.963</td>
<td>0.491</td>
<td>0.125</td>
<td>0.667</td>
<td>1.000</td>
<td>6.000</td>
</tr>
<tr>
<td># corvée days/week per HH member without draught animal</td>
<td>10,634</td>
<td>0.964</td>
<td>0.863</td>
<td>0.000</td>
<td>0.500</td>
<td>1.000</td>
<td>18.000</td>
</tr>
<tr>
<td># able-bodied adult men</td>
<td>21,060</td>
<td>1.476</td>
<td>0.656</td>
<td>0.000</td>
<td>1.000</td>
<td>2.000</td>
<td>5.000</td>
</tr>
<tr>
<td># able-bodied adult women</td>
<td>19,788</td>
<td>1.396</td>
<td>0.612</td>
<td>1.000</td>
<td>1.000</td>
<td>2.000</td>
<td>8.000</td>
</tr>
<tr>
<td># total HH member</td>
<td>24,884</td>
<td>3.207</td>
<td>1.471</td>
<td>1.000</td>
<td>2.000</td>
<td>4.000</td>
<td>21.000</td>
</tr>
<tr>
<td>Used land</td>
<td>32,608</td>
<td>0.137</td>
<td>0.218</td>
<td>0.000</td>
<td>0.000</td>
<td>0.2</td>
<td>14</td>
</tr>
<tr>
<td>Unused land</td>
<td>32,608</td>
<td>0.145</td>
<td>0.573</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>15</td>
</tr>
<tr>
<td># horses</td>
<td>14,669</td>
<td>1.431</td>
<td>0.608</td>
<td>1.000</td>
<td>1.000</td>
<td>2.000</td>
<td>5.000</td>
</tr>
<tr>
<td># cows</td>
<td>16,414</td>
<td>1.901</td>
<td>0.929</td>
<td>1.000</td>
<td>1.000</td>
<td>2.000</td>
<td>12.000</td>
</tr>
<tr>
<td># sheep</td>
<td>9,808</td>
<td>0.640</td>
<td>0.297</td>
<td>0.000</td>
<td>0.500</td>
<td>1.000</td>
<td>4.000</td>
</tr>
<tr>
<td># chicken</td>
<td>7,108</td>
<td>1.591</td>
<td>0.982</td>
<td>0.000</td>
<td>1.000</td>
<td>2.000</td>
<td>8.000</td>
</tr>
</tbody>
</table>
Denmark (1/3)

\[
\log(DailyWage)_{iet} = \beta_0 + \beta_1 \text{Serfdom}_t + \beta_2 \text{Farmhand}_{iet} + \beta_3 (\text{Serfdom}_t \times \text{Farmhand}_{iet}) + \\
\beta_4 \text{ExportPotential}_{et} + \beta_5 (\text{ExportPotential}_{et} \times \text{Serfdom}_t) + \\
\beta_6 (\text{ExportPotential}_{et} \times \text{Farmhand}_{iet}) + \\
\beta_7 (\text{ExportPotential}_{et} \times \text{Farmhand}_{iet} \times \text{Serfdom}_t) + \beta'_8 \mathbf{X}_{iet} + \sigma_e + \epsilon_{iet}
\]
Table 8: Results Denmark, 1726-1801

<table>
<thead>
<tr>
<th>Individual’s log(Daily Wage in Skilling)</th>
<th>Jensen et al.’s (2018) approach</th>
<th>Including ExportPotential</th>
<th>Including 3-way interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Serfdom</td>
<td>−0.116***</td>
<td>−0.051***</td>
<td>−0.142***</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>FarmWorker</td>
<td>−0.099***</td>
<td>−0.062***</td>
<td>−0.107***</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.021)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Serfdom × FarmWorker</td>
<td>−0.069**</td>
<td>−0.061**</td>
<td>−0.062**</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.026)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>ExportPotential</td>
<td>−0.029***</td>
<td>−0.027***</td>
<td>−0.029***</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Serfdom × ExportPotential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FarmWorker × ExportPotential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serfdom × FarmWorker × ExportPotential</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GrainSales (tons)</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.00003</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.625***</td>
<td>1.807***</td>
<td>1.640***</td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.045)</td>
<td>(0.046)</td>
</tr>
<tr>
<td>Observations</td>
<td>8,595</td>
<td>8,595</td>
<td>8,595</td>
</tr>
<tr>
<td>Number of estates</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.342</td>
<td>0.467</td>
<td>0.343</td>
</tr>
<tr>
<td>Estate FE</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

Notes: Repeated cross-section of individuals hired by estates to do farm or other work (Andersen and Pedersen, 2004). We control for the worker’s gender, seniority (master, regular worker, or helper), whether the worker is a child, in which season the worker is employed, and the worker’s job category based on the HISCO system. We also control for the island the manor is located on, how many tons of grain the manor sold in a given year net of purchases and a grain price index. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Table 9: Descriptive statistics for key variables for Denmark

<table>
<thead>
<tr>
<th>Statistic</th>
<th>N</th>
<th>Mean</th>
<th>St. Dev.</th>
<th>Min</th>
<th>Pctl(25)</th>
<th>Pctl(75)</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net grain sales of estate (tons)</td>
<td>11,977</td>
<td>22.301</td>
<td>48.495</td>
<td>−100.888</td>
<td>−4.800</td>
<td>52.438</td>
<td>264.913</td>
</tr>
<tr>
<td>% farm worker</td>
<td>12,507</td>
<td>0.103</td>
<td>0.304</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% of observations when serfdom was in place</td>
<td>12,507</td>
<td>0.777</td>
<td>0.416</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>% children</td>
<td>12,507</td>
<td>0.005</td>
<td>0.071</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% male</td>
<td>12,507</td>
<td>0.982</td>
<td>0.133</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>% master</td>
<td>12,507</td>
<td>0.053</td>
<td>0.224</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Mathematical Derivation I

Start by focusing on what sets our model in motion: exogenous changes in domestic ($D_{\text{domestic}}$) and foreign demand ($D_{\text{foreign}}$) that (through a function $f$) drive determine the price $p$ at which grains sell both domestically and internationally:

$$p = f \left[ D_{\text{domestic}} \left( \begin{array}{c} \text{Pop}_{\text{rural}} \text{ (pop)} \\ \text{Pop}_{\text{urban}} \text{ (pop)} \end{array} \right), D_{\text{foreign}} \text{ (pop)} \right] \quad (1)$$

$D_{\text{domestic}}$ depends positively on rural ($\text{Pop}_{\text{rural}}$) and urban population ($\text{Pop}_{\text{urban}}$). $\text{Pop}_{\text{rural}}$ can be used as labor ($L$) in grain production:

$$\text{Pop}_{\text{rural}} = L \quad (2)$$
Mathematical Derivation II

The amount of available land is fixed and set equal to 1, such that the land-labor ratio equals $\frac{1}{L}$. The production function \( g \) determines the produced quantity \( q \) of grain solely depends on \( L \):

\[
q = g(L) = \alpha (L_f + L_c) \quad \text{s.t.} \quad 0 < \alpha < 1, \quad L_f + L_c = L
\]

Labor can either be free \( (L_f) \), in which case it is paid a wage \( w \) based on its marginal productivity, or coerced \( (L_c) \). \( L_f \) and \( L_c \) sum to \( L \), the maximum amount of labor. \( L_f \) can be converted into \( L_c \) and vice-versa. Coerced labor is paid a small subsistence wage \( (\sigma) \) that does not depend on its marginal product. Coercion costs coercion effort \( \chi \) per coerced unit of labor. Free and coerced labor are assumed to be equally productive contributing to output by a factor \( \alpha \). Note that the landowner’s output is always the same as a result. The landowner’s profit \( (\pi) \) maximization writes as follows:
Mathematical Derivation III

\[
\max_{L_f, L_c} \pi = p\alpha(L_f + L_c) - wL_f - (\sigma + \chi)L_c
\]

s.t. \(0 < \sigma < 1,\)
\(0 < \chi < 1,\)
\(w = h(L, p) = h\left(L, f\left(D_{\text{domestic}}(+)\left(\text{Pop}_{\text{rural}}, \text{Pop}_{\text{urban}}\right), D_{\text{foreign}}(+)\right)\right)\)

The landowner can choose how much free and much coerced labor to employ, i.e. can convert free into coerced labor. Given \(\frac{\partial w}{\partial p} > 0,\) the landowner will employ more free labor as long as \(w < \sigma + \chi,\) but will employ more coerced labor as soon as \(w > \sigma + \chi\) in order to avoid paying wages. This consequence of rise in the price (that stems from foreign and domestic demand surges) is the aforementioned direct effect. We now turn to the 2 indirect effects.
Mathematical Derivation IV

The first indirect effect focuses on outside options (proxied by urban population in our model) that increase the cost of coercion ($\chi$) according to a function $i$:

$$\chi = i(Pop_{urban})$$  \hspace{1cm} (5)

Thus, given that an increase in $Pop_{urban}$ not only leads to an rise in $w$ (through $p$), but also and increase in $\chi$, its effects on the equilibrium condition for more coercion ($w > \sigma + \chi$) are ambiguous. A rise in coercion is made even more improbable by the second indirect effect, which dampens wage growth (given $w = h(L, p)$) due to increased abundance of labor following an increase in $Pop_{rural}$. As mentioned before, in our model an increase in $D_{foreign}$ only has a direct effect and, thus, unambiguously increases coercion.
**French Trade**

Figure 23: Value of french grain imports as recorded by local sources and toll on Baltic exports to France, 1750-1825

*Notes: Based on Charles and Daudin (2018) and Sound Toll. All variables are denoted in kg of silver. Note that Sound Toll revenues are not in millions.*
Trade and City growth

Figure 24: Grain exports and growth of selected, German cities, 1200-1856

Notes: Figure shows the population across time of selected cities and the aggregated grain exports of East-Elbian, German cities. We observe a break in population growth for Danzig and Lübeck (and other East-Elbian cities) that is in stark contrast to that of Hamburg (and other West-Elbian cities). Population data transcribed from the commonly-used German city books (Städtebücher) (Kayser, 1939, 1941, 1952, 1954, 1956; Stoob et al., 1995; Engel et al., 2000).
**Prussia 1816**

![Map of Prussia 1816 with data on tons grain exported and percentage of large estates.]

**Figure 25**: Distribution of large estates and grain exports in Prussia, 1849

*Notes*: Share large estates (>50 hectare): Prussian census (Becker et al., 2014), Exports: Author’s calculations based on Sound Toll.
Figure 26: Distribution of large estates and grain exports in Prussia, 1849

Notes: Share large estates (>50 hectare): Prussian census (Becker et al., 2014), Exports: Author’s calculations based on Sound Toll
Figure 27: Distribution of large estates and grain exports in Prussia, 1849

Notes: Manumissions compiled from Meitzen (1869). Numerator is number settled emancipation cases of those who previously had lifetime duties and from the Dissolution Ordinance of 1821 to 1848 has redeemed them (Dienst- und Agabenpflichtige, welche abgelöst haben). Denominator is population eligible for such emissions, i.e. the rural population, recorded in the 1849 census, that had strong enough tenure rights (spannfähige bäuerliche Nahrungen) (Meitzen, 1869, p.307). Sound Toll trade during 5 prior years.
Figure 28: Share of estates’ income from coerced labor versus wage labor and grain exports, 1680-1856

Notes: This figure shows the share of income that a manor declares as having been generated by coerced, that is unpaid, corvée labor. Based on the 9 estates for which this information is provided disaggregated in Olsson (2002). More data will be provided by Mats Olsson in the future that will allow us to assess whether these trends are affected by export potential.
Figure 29: Distribution of mantals by cultivators across all years, 1702-1856

*Notes: Figures shows the distribution of mantals by cultivators. Note that only peasant land and former manorial land is actually owner by the cultivator. The red vertical lines the thresholds that defines large estates.*
Figure 30: landownership and grain exports, 1702-1856

Notes: Constructed from the Historical Database of Scanian Agriculture (Olsson et al., 2017) and the Sound Toll. Note that the used data specifically refers to Scania rather than the whole of Sweden.
Figure 31: Scania (1703-1856): Trade, wages, harvest, GDP, and population

Notes: Figure plots macro statistics specific for Scania to assess the economy-wide effects of trade liberalization and/or land markets. Real and nominal wage data for rural, male, annual workers in Scania taken from Gary (2018) who uses a respectability basket for Malmö to deflate. Production per mantal calculated from our usual Scania data. Population and GDP calculated from Enflo and Missiaia (2018) using the Kristianstads and Malmöhus districts.
Share cultivator (20 most frequently obs. villages)
Share mantal (20 most frequently obs. villages)
Figure 32: Share of peasants with weak tenure rights in 1848

Notes: Numerator is that had no strong enough tenure rights (spannfähige bäuerliche Nahrung) (Meitzen, 1869, p.307) to qualify for manumission. Denominator is rural population recorded in the 1849 census. Sound Toll trade during 5 prior years.