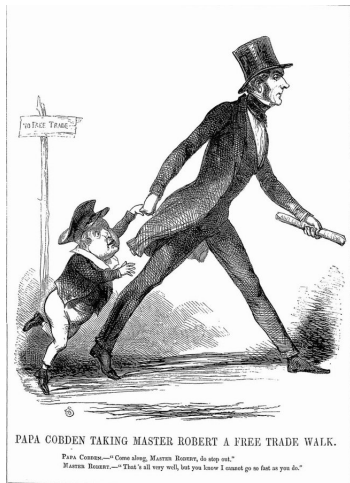


# The Distributional Consequences of Trade: Evidence from the Repeal of the Corn Laws

*Stephan Heblich, Stephen J. Redding and Yanos Zylberberg*



## Motivation

- Resurgence of interest in the distributional consequences of trade
  - China shock: Autor, Dorn & Hanson (2013, 2016, 2020)

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- Research on the Corn Laws has traditionally emphasized economy-wide distributional effects across **factors** or **industries**
  - Heckscher-Ohlin and Specific-Factors models
  - Urban workers / manufacturers versus rural aristocracy
- We provide evidence on distributional consequences across different **geographical areas** within England and Wales
  - New, spatially-disaggregated data on population, employment and land values for around 11,000 parishes from 1801-1911
  - Exogenous trade exposure measure based on agroclimatic conditions
  - Quantitative spatial model to evaluate the impact of this trade shock on industrialization, urbanization and income distribution

## Main Findings

- Key advantage of empirical setting is the difference in agroclimatic conditions between Western and Eastern parts of England and Wales
  - Warm ocean current of North Atlantic Drift and prevailing SW winds
  - Western areas have greater cloud cover, more precipitation and lower average temperatures, and also more mountainous
  - **Western grazing** (pastoral) and **Eastern corn** (arable) locations
  - Exogenous **exposure measure** based on **agroclimatic suitability for wheat**

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- Substantial estimated treatment effects of the grain invasion following the Repeal of the Corn Laws for high-wheat suitability regions
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  - Poverty (poor law data)
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  - Rateable values (value of land and buildings)
- Consistent with historical narrative of “great agricultural depression” concentrated in corn-growing regions



## Related Literature

- **Local labor market effects of international trade shocks**
  - Topalova (2010), Autor, Dorn & Hanson (2013, 2016, 2020), Autor et al. (2014), Kovak (2013), Kovak & Dix-Carneiro (2015), Feenstra (2019), Eriksson et al. (2020)
- **Distributional consequences of international trade**
  - Stolper & Samuelson (1941), Jones (1971), Mussa (1974)
- **Urbanization and structural transformation**
  - Matsuyama (1992), Uy, Yi & Zhang (2013), Bustos, Caprettini & Ponticelli (2016, 2020), Fajgelbaum & Redding (2018), Eckert & Peters (2018)
- **Quantitative spatial models**
  - Redding & Sturm (2008), Allen & Arkolakis (2014), Redding (2016), Ramondo, Rodríguez-Clare & Saborío-Rodríguez (2016), Redding & Rossi-Hansberg (2017), Desmet, Nagy & Rossi-Hansberg (2018), Caliendo, Parro, Rossi-Hansberg & Sarte (2018), Galle, Rodríguez-Clare & Yi (2018), Allen & Donaldson (2018), Monte, Redding & Rossi-Hansberg (2018), Fajgelbaum & Redding (2018), Caliendo, Parro & Dvorkin (2019), Fajgelbaum, Morales, Suárez Serrato & Zidar (2019)
- **Economic history of the corn laws, agricultural depression, industrial revolution, and decline of aristocracy in 19th-century Britain**
  - Graham (1892), Nicholson (1904), Barnes (1930), Irwin (1989), Williamson (1990), O'Rourke (1997), Taylor (1999), Clark (2002), Schonhardt-Bailey (2006), Sharp (2009), Cannadine (2019), Caprettini & Voth (2019), Irwin & Chepeliev (2020)

# Outline

- Historical Background
- Data
- Reduced-form Evidence
- Theoretical Model
- Quantitative Evidence

## Historical Background

- Origins of the corn laws date back to laws of 1463 and 1670
  - Sliding scale of import duties that were part of regulations to stabilize the price of bread as the main source of sustenance
  - Initially, mostly self-sufficient in wheat and suspended in scarcity

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- **Repeal of Corn Laws 1846** by Robert Peel to stem political discontent
- Following **American Civil War of 1861-65**, new transport technologies of steamship and railroad led to new-world “**grain invasion**”
  - Repeal ensured that British markets remain open
  - “**Great agricultural depression**” after 1870



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## Data

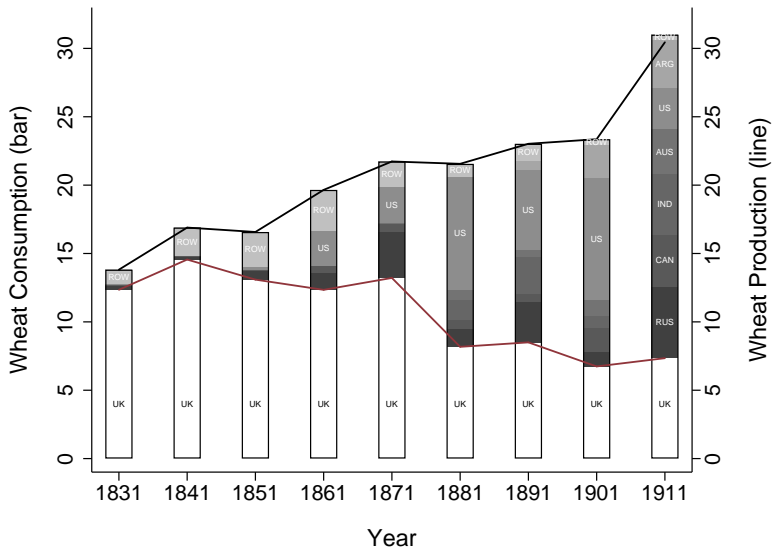
- Parish-level Population Census data for England and Wales
  - Around 11,000 parishes, aggregated into poor law unions and counties
  - Population by residence from 1801-1911
  - Employment by occupation from 1851 onwards
- Individual-level population census data
  - Name match individuals across population census waves (migration)
  - Data for 1851, 1861 and census decades from 1881-1901
- Rateable value data
  - Rateable value data by parish from 1815-1896
  - Market rental value of land and buildings after deducting expenses for repair and maintenance
- Domestic prices, import values and quantities of wheat
- Global Agro-Ecological Zones (GAEZ) crop suitability, endowments of other natural resources (e.g. coal and iron), urban & rural status etc

# Outline

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# Corn Laws & Grain Invasion

## UK Consumption, Production and Imports of Wheat

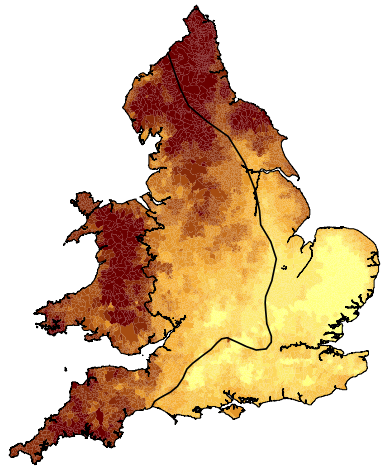


# Wheat Suitability

## Wheat Suitability

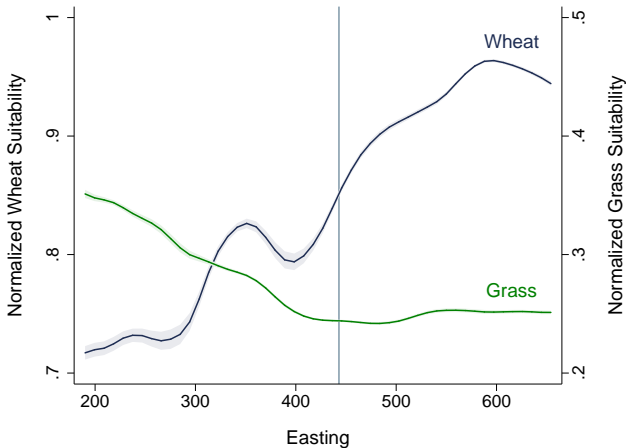


(a) Caird (1852)



(b) Wheat Suitability (UN GAEZ)

## Average Wheat Suitability

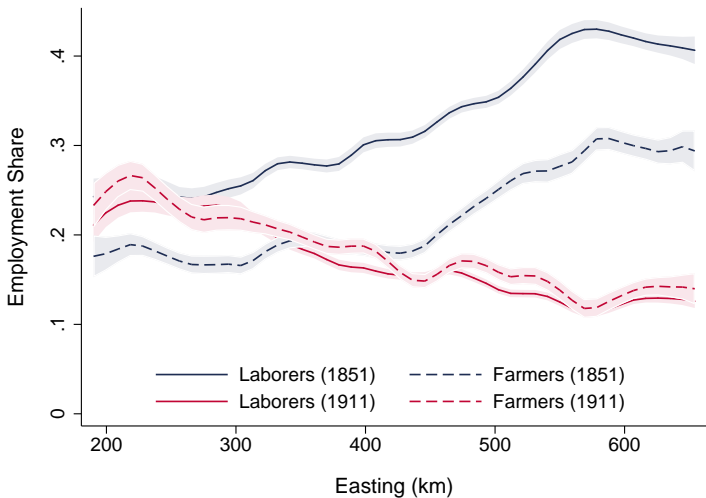


- Eastings of British National Grid (London Guildhall: 532)
- Vertical line: Avg. easting of Caird line separating grazing and corn counties

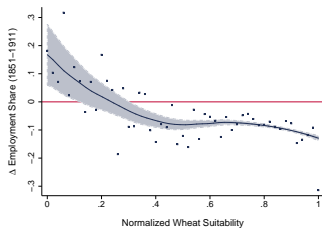


# Structural Transformation

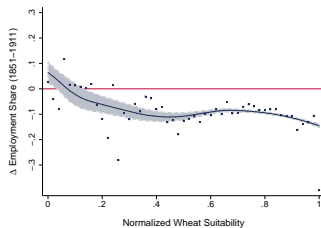
## Laborers and Farmers 1851 & 1911



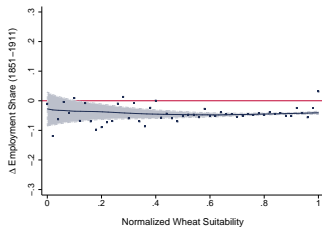
# Change in Employment Shares



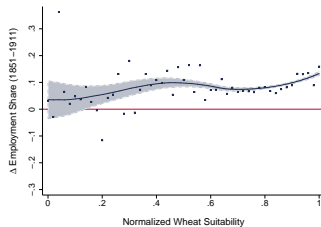
(a) Agriculture



(b) Agricultural Laborers



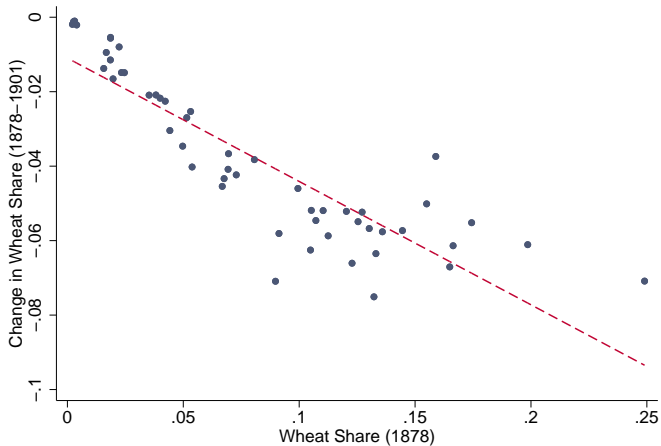
(c) Manufacturing



(d) Services

## Arable Land Reallocation Away from Wheat

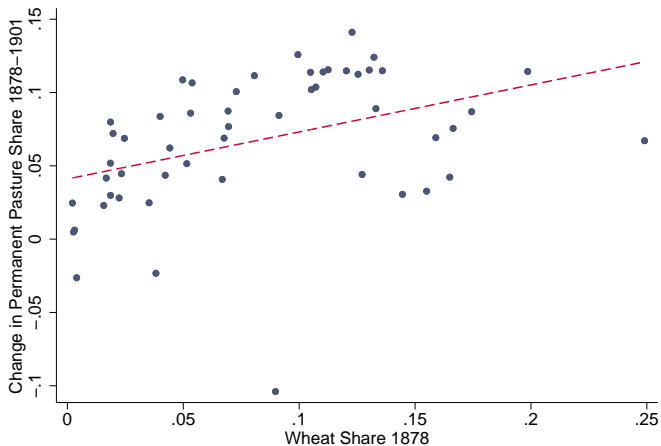
- County data from the agricultural census from the 1870s onwards



Note: Slope coefficient:  $-0.3312$ ; standard error:  $0.0327$ ; R-squared:  $0.7679$ .

## Arable Land Reallocation to Permanent Pasture

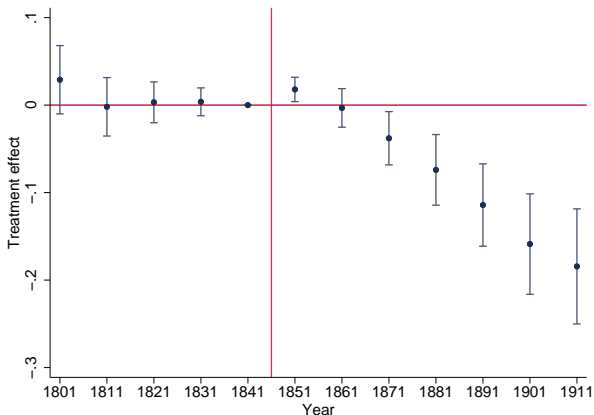
- County data from the agricultural census from the 1870s onwards



Note: Slope coefficient: 0.3208; standard error: 0.0922; R-squared: 0.1620.

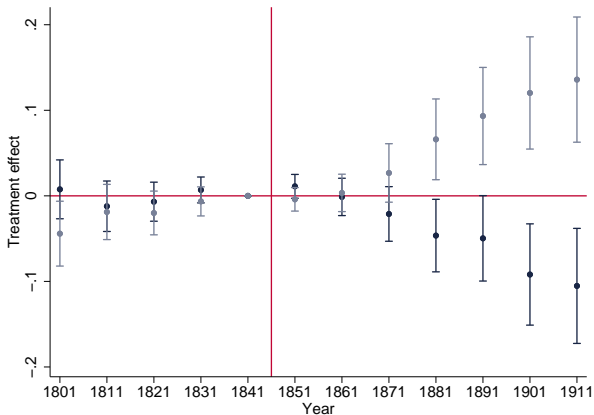
# Event-Study Specifications

## Log Population



- Event-study specification with parish and year fixed effects
- Coefficients on **above-median wheat suitability** interacted with year
- Controls for parish characteristics interacted with year: distance to London / Manchester / other cities, proximity to coal, urban, Wales

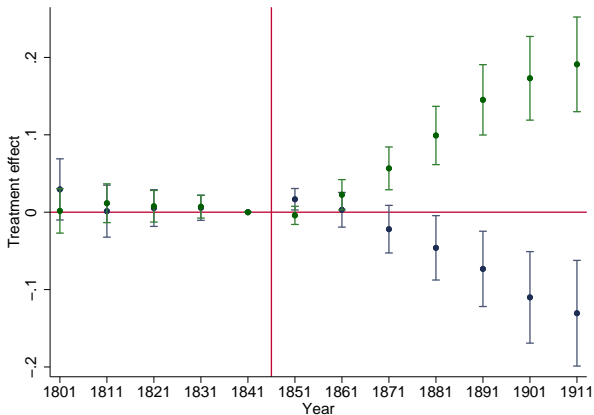
## Log Population (Terciles)



- Event-study specification with parish and year fixed effects
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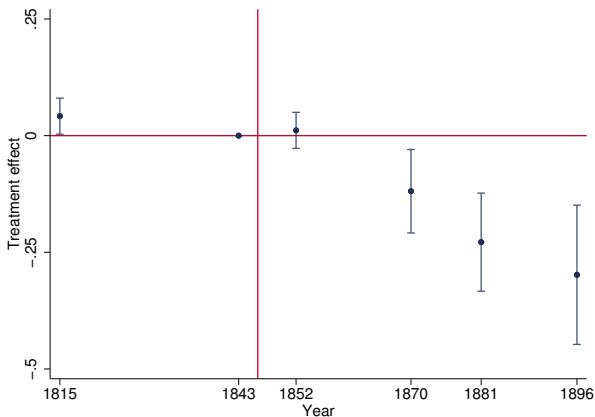


## Log Population (Wheat & Grass)



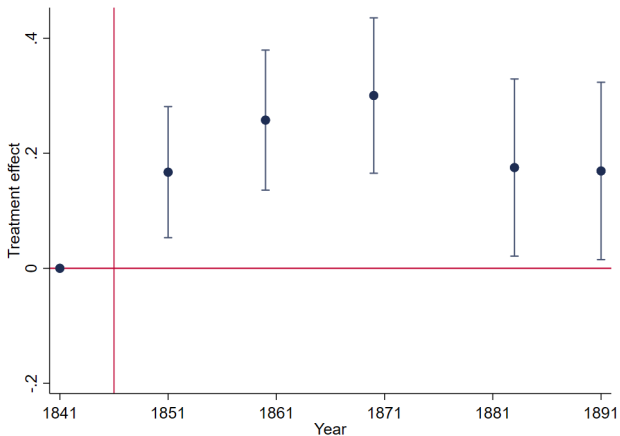
- Event-study specification with parish and year fixed effects
- **Above-median wheat and grass suitability** interacted with year
- Controls for parish characteristics interacted with year: distance to London / Manchester / other cities, proximity to coal, urban, Wales

## Log Rateable Values



- Event-study specification with parish and year fixed effects
- Coefficients on **above-median wheat suitability** interacted with year
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## Log Paupers per Capita

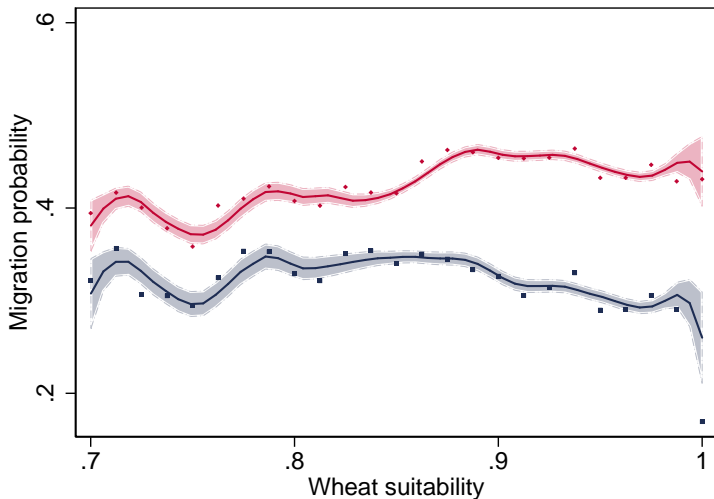


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# Migration

## Individual-Level Data

## Out Migration & Wheat Suitability



- Blue (1851-1861); Red (1861-1881, 1881-1891 and 1891-1901)

# Outline

- Historical Background
- Data
- Reduced-form Evidence
- **Theoretical Model**
- Quantitative Evidence

## Model Outline

- World economy consists of many locations indexed by  $i, n, m \in N$ 
  - Subset of locations are in England & Wales:  $N^E$
  - Subset of locations are foreign countries:  $N^R$
- Two types of agents: workers and landlords
  - Landlords immobile and earn income and consume where born
  - Workers mobile within countries but immobile across countries (can be extended to allow for mobility across countries)
- Each worker can migrate from location  $i$  to  $n$  within a country by incurring a bilateral migration cost
- Economic activity takes place in a number of sectors  $k, j, \ell \in K$ , including agriculture, manufacturing and services
- Locations can differ in amenities, sectoral productivities and bilateral trade and migration costs
- We use the model to examine the impact of an international trade shock that is concentrated in a sector (grain invasion) across locations that differ in sectoral specialization

## Conclusions

- Distributional consequences of trade is one of the central questions in international economics
- Examine one of the most influential historical trade shocks following the 1846 repeal of the Corn Laws in 19th-century Britain
- Traditionally, research on the Corn Laws has emphasized economy-wide distributional effects across factors or industries
  - Heckscher-Ohlin and Specific-Factors models
  - Urban workers / manufacturers versus rural aristocracy
- We provide new evidence on the distributional consequences of the repeal of the Corn Laws across different **geographical areas**
  - New, spatially-disaggregated data on population, employment and land values for around 11,000 parishes in England & Wales from 1801-1911
  - Exogenous trade exposure measure based on agroclimatic conditions
  - Substantial estimated reduced-form treatment effects
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Thank You