Origins of Europe North-South Divide: Demographic shocks, institutions and wage divergence in early modern Europe

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Objective

• Aim: investigate the reasons of the early modern divergence in real wages across northern and southern European regions;

• Why is the divergence relevant?
  
  • According to several authors, e.g. Allen (2009), the divergence was at the origin of the heterogeneous industrialization in Europe (northern advantage vs. southern backwardness);

  • Carlin (2010) and Boltho (2010): the importance of the past for the persistence of divergence in the current Euro-zone;

• In this work
  
  • Main result: a divide across regions in the way in which wages responded to population changes in late medieval and early modern times;

  • An hypothesis: the role of pre-demo shocks labor institutions;
Outline

- The divergence in economic history
- Wage determination in late medieval Europe
- Empirical analysis
- Some historical evidence
- Conclusions
The North-South real wages divergence in recent economic history literature

- Allen (2001): a wage divergence between northern cities (e.g., Amsterdam, Antwerp, London) and southern ones (e.g. Krakow, Vienna, Valencia and Florence), before the Industrial Revolution.

- Pamuk (2007): the 1348 Black Death at the origin of the divergence:
  - Dramatic decline in population and shock in labor supply;
  - Increase in land-to-labor ratio;
  - Rise in real wages (14th-15th centuries);
  - Diverging as population restored (16th century)
The North-South real wages divergence in recent economic history literature/2

- Allen (2001) dataset: daily wages of skilled and unskilled labourers in the building sector;

- Some adjustments:
  

  - Only the unskilled workers (results for skilled are less clear)

  - Series for Amsterdam is anticipated to 1344 (in Allen (2001) it was starting in 1500)

  - Series for Florence is corrected;

  - Data in silver grams, deflated by a CPI (at purchasing power parity);
The North-South real wages divergence in recent economic history literature

Real wages (in silver grams)

Amsterdam - Florence
London - Strasbourg
Antwerp - Paris

Northern cities
Southern cities
Late medieval demographic changes

- Mid 14th - end 15th centuries: a long wave of population decline

- 1347- 1348: the Black Death, bubonic plague arriving in Europe from Asia (Crimea) and hitting almost all European regions in the following 3 years:

<table>
<thead>
<tr>
<th>Region</th>
<th>Estimated death rate (1347-1350)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>60-65%</td>
</tr>
<tr>
<td>Italy</td>
<td>50-60%</td>
</tr>
<tr>
<td>France</td>
<td>60%</td>
</tr>
<tr>
<td>Low countries</td>
<td>45-50%</td>
</tr>
<tr>
<td>England</td>
<td>60-65%</td>
</tr>
</tbody>
</table>

Source: Benedictow (2004)
Late medieval demographic changes/2

- Slow process of population recovery

- Some of the main epidemics that hit European region in the subsequent two centuries

<table>
<thead>
<tr>
<th>Region</th>
<th>Main Epidemics in the following 150 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>1428, 1439, 1450, 1459, 1466, 1469, 1509</td>
</tr>
<tr>
<td>Italy</td>
<td>1360, 1387, 1408, 1411, 1414, 1417, less frequent plagues until the big one of 1629</td>
</tr>
<tr>
<td>France</td>
<td>1466 (40,000 inhabitants died in Paris), 1565</td>
</tr>
<tr>
<td>Low countries</td>
<td>1360, 1368, 1382, 1400, 1409, 1420, 1450, 1456, 1466, 1481, 1487, 1492, 1572</td>
</tr>
<tr>
<td>England</td>
<td>1361, 1369, 1375, 1379-1383, 1390-91, 1399-1400, 1405, 1420, 1433, 1480, 1499, 1563 (20,000 inhabitants died in London)</td>
</tr>
</tbody>
</table>

Source: See Fochesato (2014)
The North-South real wages divergence
Existing explanations

Why did the divergence occur? Some explanations

  - The role of persistent high death rates and technological improvement;
  - Limit: high death rates also in the south;

- **Institutional**: Acemoglu, Johnson and Robinson (2005), North and Weingast (1989);
  - Atlantic trade, constitutionalism, institutions fostering growth
  - Limit: not similar development of regions with similar endowments (Germany), why did good institutions emerge in some places and in others not?

- **Technological**: Allen (2003)
  - Limit: why England?

- Summarizing
  - Pure economic forces: failing to explain alone the divergent path
  - Pure institutional explanations: not capturing the reasons for the adoption of certain organizations in certain regions;
Wage determination in late medieval Europe

- How was wage determined in the late medieval European cities?
  - Skilled workers
    - Wage contracted by guilds;
    - Usually employed on a monthly basis;
  - Unskilled workers
    - Wage contracted directly with the master and paid on a daily basis;
    - Employment instability:
      - hired day by day
      - returning to their countryside farm to cultivate land in periods of unemployment;
Wage determination in late medieval Europe/2

- A possible representation of the of urban wage determination in late medieval economies:
  - Arthur Lewis (1954), in a two-sector developing economy:

  “[...] men will not leave the family farm to seek the employment if the wage is worth less than they would be able to consume if they remained at home”
  
  (Lewis, 1954, p.149)

- Wage in the rural sector as fallback position for the unskilled workers: does this idea reflect late medieval economies?
  - Labor supply competition between unskilled urban workers and agricultural ones;
  - Skilled workers protected by guilds and not affected by the migration of rural labor force;
  - Rural workers moving from the countryside to the city searching for more than their agricultural income;

- In equilibrium: urban wage > rural wage, historically consistent?
  - Repaying some experience of the unskilled already working in the city;
  - Some indirect positive effect of guilds’ bargaining activity;
Wage determination in late medieval rural sector

- Van Bath (1963): the income was the average agricultural product (a farmer cultivating a piece of land with his family members);

- However, persistence in late Middle Ages of natural (or feudal) economy institutions:
  - Corvée: lords giving land to farmers but requiring some portion of unpaid work on the seigniorial land;
  - Tithes: the tenth part of the product should have been given to the lords (in early Middle Age it was the share of the bishop);
  - The Taille: direct arbitrary imposition on peasants;
  - Several other rents and customs arbitrarily required to workers;
  
- Farmers did not fully enjoy the average product;

- Heterogenous degree of diffusion of such institutions in late medieval Europe;
Wage determination in late medieval Europe

- A different effect of shocks in labor force on the rural and urban wages depending on the degree of persistence of natural economy (feudal) institutions:

  - If **strong feudal pressure on rural incomes**
    - Wages immediately rising because of labor shortage but as long as population restored they returned to their pre shock levels
      - Either because the product was not used to invest in productivity (not rising rural incomes);
      - Or because of weak bargaining power of workers;
    - Urban wages first increasing (short term) and then declining (long run);

  - If **weak feudal pressure on rural incomes**
    - Wages immediately increasing and then likely to remain high
      - Either because part of the additional income was not lost in rents and invested in some labor saving improvement;
      - Or because of the high bargaining power of the workers;

- Then, if a divergence existed
  - It could have been motivated by different pre-demo shocks institutions
  - Resulting in a distinctive long run wage response to population changes
Testing the long-run relationship between population and wages

- I test the second implication: the different long run wage response to population changes

- Data used
  - Wages
  - Population:
    - Collected from different sources (primary and secondary)
      - Fiscal sources;
      - Death and birth rates (Funerals and baptisms)
      - Series built with the method of inverse projection (compared with data points from fiscal sources);
    - Urban population: including those living in the near countryside;
    - Regional population: including those living in the most historically representative regional area (at current boundaries):
      - Antwerp (Brabant), Amsterdam (Holland), Florence (Tuscany), London (England), Paris (France), Strasbourg (France), Valencia (Kingdom of Valencia)
  - The model is estimated on urban and regional population: allowing for different degrees of labor mobility;
Testing the long-run relationship between population and wages

- Can 14th-19th centuries population size be used as a proxy for labor force? Relevant changes in age structure?
  - The estimated age structure of European society at the eve of the Black Death (my computation from Coale and Demeny (1983) data):
    - 0-14: 43%
    - 15-49: 48%
    - 50+: 9%
  - The impact of the plague
    - By social class
      - Mortality among zero wealth owners was around 5-6% higher than mortality among better off social classes
    - By gender and age group
      - Slightly higher mortality among women and children, but not clear
The long run effects of the late medieval population decline on age structure

Northern Italy (1650-1890)

Working-age population (around 50%)

England (1540-1880)

Source: See Galloway (1994)
Testing the long-run relationship between population and wages

- Non-stationarity and cointegration problems
  - ADF and KPSS tests, all the series are I(1)
  - Cointegration: ADF test on residuals, Phillips Ouliaris test and Johansen test
    - All the pairs of wages and population used are cointegrated;
    - There is a single cointegrating vector for each pair;
  - Pesaran and Shin (1999), an ADL model estimated with OLS gives
    - Consistent results for short run effect
    - Super consistent results for long run effect (valid inference with standard distribution);
    - Same results as a corresponding error-correcting model;
- The method here
  - Estimate an ADL and compute the long run effect of population on wages
Testing the long-run relationship between population and wages/6

The ADL model

\[
\ln(w_{it}) = b_0 + b_1 \ln(w_{i,t-1}) + \sum_{j=1}^{n} b_{j+1} \ln(\text{pop}_{i,t-j}) + e_t
\]

- With \( i \) the city object of the estimation, \( w \) real salaries of unskilled workers regressed on one-year lag of real wages, and \( t-n \) optimal lags of regional or city population \((c,r)\), set through the Akaike method;

- **Long run** response of wages to population

\[
\eta = \frac{\sum_{i=1}^{n} b_{i+1}}{1 - b_1}
\]
Testing the long-run relationship between population and wages.

Long Run Population Effect

Urban Population  Regional Population

London  Amsterdam  Antwerp  Paris  Valencia  Strasbourg  Florence
• The “Southern” response of wages to population

  • Paris, Strasbourg, Florence and Valencia

  • All coefficients significantly different from zero at 99% confidence interval;

  • Large average coefficients (-0.83 urban, -0.99 regional) and significantly different from zero;

• The “Northern” response of wages to population

  • London, Amsterdam and Antwerp

  • Small average coefficients (-0.02 urban, -0.12 regional) and not significantly different from zero;

• In both cases the means of the two groups are different at 95% significance
The Dynamic OLS model, Stock and Watson (1993)

- When only one cointegrating vector and $I(1)$ series;

- Simply regress the dependent at time $t$ on the regressors at time $t$ plus leads and lags of first difference of the regressors and a constant (estimate with OLS)

\[ \ln(w_{it}) = b_0 + b_1 \ln(pop_{i,t-1}) + \sum_{j=-3}^{j=3} b_j \Delta \ln(pop_{i,t-j}) + e_t \]

- with

- $j$, the number of leads and lags of one difference of population

- $b_1$ the long run coefficient;

- Number of lags and leads equal to 3 (following Stock and Watson);
Testing the long-run relationship between population and wages

Long Run Population Effect

- Urban Population
- Regional Population

London Amsterdam Antwerp Paris Valencia Strasbourg Florence
Testing the long-run relationship between population and wages

- Results confirm findings of the ADL
  - Southern type response
    - Paris, Florence, Strasbourg, Valencia, all coefficients are significant;
    - All coefficients are significantly different from zero;
    - Large average coefficient (urban -0.87, regional -0.90) and significantly different from zero;
  - Northern type response
    - London, Amsterdam, Antwerp;
    - Small average coefficients and not significantly different from zero (urban -0.009, regional -0.12);
  - the two groups are statistically different at 95% confidence interval;
• What would happen to wages series if there would be a permanent shock in population?

• Using impulse response function to test the effect of a negative permanent demographic shock;

• Estimated from a cointegrated VAR model (Johansen, 1996)

• Caveat:
  • not exactly what really happened, shocks were not permanent, but eventually confirming the long run relationship between wages and population;
Testing the long-run relationship between population and wages

Urban population

Amsterdam

Antwerp

London

Paris

Florence

Strasbourg

Valencia
Testing the long-run relationship between population and wages

Regional population

- Amsterdam
- Antwerp
- London
- Paris
- Florence
- Strasbourg
- Valencia
The history of pre and post plague European rural institutions

• Central Italy
  
  • Urban sector
    
    • Autonomous small city-states with large trade and banking relationships and sophisticated forms of political and social organization;
  
  • Rural sector
    
    • Land ownership mainly based on large manors;
    
    • Persistence of feudal working relationships (limited workers mobility and land expropriation);
    
    • Increasing use of sharecropping in the land given to peasants;
    
    • Strict political control of city-states favoring large ownerships and landlords’ interests;
The effects of demographic shock on rural labor markets:

- The rise in real wages due to labor scarcity, immediately limited by attempts of the city-states to control it,

  - e.g. The rural policies of Florence at the end of the 14th century
    - Favoring the adoption of sharecropping;
      - Giving immediate incentives to farmers accepting it (fiscal reductions);
      - Giving advantages to landlords;
      - Maintaining the fiscal capacity of the agricultural sector;

- In the long run…
  - General impoverishment of rural society;
  - Extension of large manors and sharecropping;
The history of pre and post plague European rural institutions/3

Paris and the Île-de-France, Source: Bloch (1931), Brenner (1976)

• Before the Black Death
  • Almost exclusive control of justice by the seigniorial sector;
  • Introduction and diffusion of new forms of charges (tithe and taille);
  • Both free men and serfs linked to the lord rather than to land: agreements among lords to not accept serfs escaped from other lords.

• The effects of the Black Death
  • An immediate rise in real wages
  • Decline in rural production due to recurring crises (Hundred Years’ War)
  • Fragmentation of rural ownership and emergence of the small property
  • Monarchy substituting to the lords in extracting surplus from peasants via taxation.
The history of pre and post plague European rural institutions

- Other Central and Southern European regions

- The Kingdom of Valencia in the late Middle Ages
  
  - Before the plague
    
    - *Jurisdicció Alfonsina* (1329): The Crown gave to the aristocracy full jurisdictional power on rural workers
  
  - After the plague
    
    - The King favored small land concentration but also reinforced the seigniorial sector (4/5 of the whole cultivated land in 1490);

- The region of Alsace
  
  - Being ruled by the Habsburg until the end of the 16th century;
  
  - Before the plague the process of land reclamation reinforced feudal privileges of the lords
The history of pre and post plague European rural institutions/5

• The peculiar changes in pre-plague England:

  • 12th-13th century, Postan (1973): the increase in the number of free-holders in rural areas:
    • Progressively immune from landlords’ arbitrary impositions;
    • Increasing economic position of peasants;

• English rural society at the eve of the Black Death, Campbell, (2000):
  • Lesser significance of the seigniorial sector with respect to the peasants’ one;
  • Seigniorial sector characterized more by hired than customary employment;
  • Low investments in agricultural sector (extensification rather than intensification);
The impact of Black Death on the English rural economy:

- The decrease in prices and rise in real wages favoring small-size tenants rather than large owners;

- Central state failing to control increase in rural wages (1381 Peasants’ revolt);

In the long run

- Even if unimpressive productive gains (see Clark, (2007))…

- …Change in the structure of rural economy
  - Small landownership
  - Decline of the seigniorial sector;
The history of pre and post plague European rural institutions/7

The Netherlands, Source: Bavel and Zanden (2004)

- Before the Black Death
  - Weak feudal relationships (loose feudal customs and control on peasants’ mobility)
  - Near absence of manorialism, large degree of peasants’ freedom (2/3 were owner occupier);
  - Use of capital intensive technologies;

- The effects of the Black Death
  - Short run
    - Rise in real wages;
    - Rapid emergence of rural non agricultural activities;
  - Long run
    - Growing urban investors, accumulation: towards land ownership concentration;
    - Extensive diffusion of wage labor (early industrialization).
Conclusion

• Two main preliminary conclusions

• Northern regions’ exceptionality: detaching wages from population before the industrial revolution,
  • North long run elasticity close to zero;
  • South long run elasticity close to -1;

• The theoretical framework and the historical section suggests that it could have been caused by the different combination of pre-plague institutions governing rural labor markets and the effects of the plague with
  • Southern regions: strong natural economy rural institutions, negative relationship between labor force and real wages
  • Northern regions: weaker natural economy rural institutions favoring, when shock in labor supply
    • England: increased bargaining power of peasants
    • Low countries: use of resources for investments in productivity and diversification;
Next steps

- Series on wages in European cities (e.g. Paris)

- Incorporating human capital data: to understand the difference between skilled and unskilled trends;

- Why different pre-plague rural institutions in different European areas? Investigating the process of weakening or reinforcing of feudalism in late medieval Europe;

- Extending the analysis to medieval Eastern Europe, why these regions returned to serfdom after the demographic shock?

- The ‘little’ divergence in Europe and Asia and the ‘great’ divergence
Thank you