Medieval Population Dynamics to 1500

Part C: the major population changes and demographic trends from 1250 to ca. 1520

| 3. 25 September 2013 **Epstein**, ch. 6, 8 **Brady**, ch. 1 (De Vries) **Cipolla**, chs.1-3; 5; **Davis,** ch. 6; **Musgrave**, ch. 2 **ET 1**	2	**Population Changes: a Survey** (1) A Malthusian Crisis, 1290-1340? The Great Famine of 1315-22; (2) the Black Death (from 1348), Bubonic Plagues, and Late-Medieval Demographic Crises (3) Demographic and Economic Recovery, to 1520

European Population, 1000 - 1300

- (1) **From the 'Birth of Europe' in the 10th century, Europe's population more than doubled:** from about 40 million to at least 80 million – and perhaps to as much as 100 million, by 1300

- (2) **Since Europe was then very much underpopulated,** such demographic growth was entirely positive: Law of Eventually Diminishing Returns

- (3) **Era of the 'Commercial Revolution',** in which all sectors of the economy, led by commerce, expanded -- with **significant urbanization and rising real incomes.**

Demographic Crises, 1300 – 1500

- **From some time in the early 14ᵗʰ century, Europe's population not only ceased to grow**, but may have begun its long two-century downswing

- **Evidence of early 14ᵗʰ century decline**

- (i) **Tuscany (Italy)**: best documented – 30% -40% population decline before the Black Death

- (ii) **Normandy** (NW France)

- (iii) **Provence** (SE France)

- (iv) **Essex,** in East Anglia (eastern England)

The Population of Europe

1300 - 1800, in millions
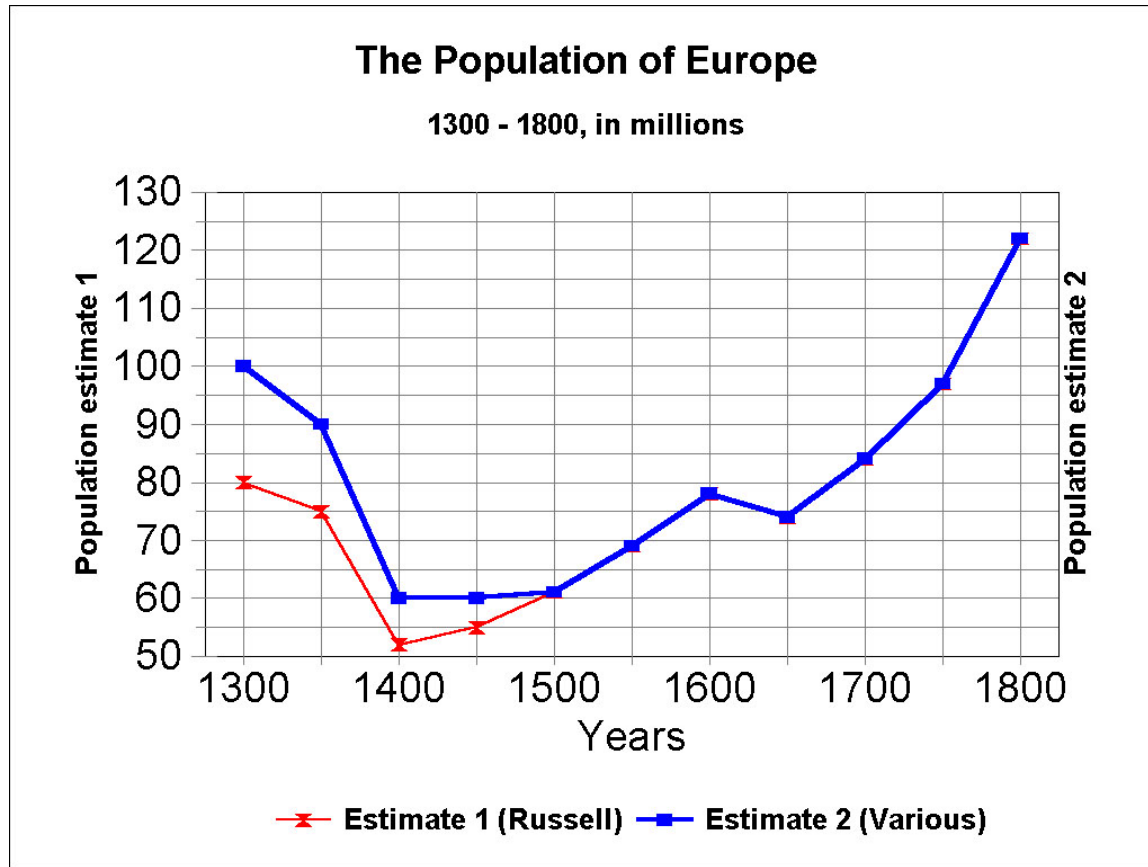
The Estimated Populations of Later Medieval and Early Modern Europe

Estimates by J. C. Russell (red) and Jan de Vries (blue)

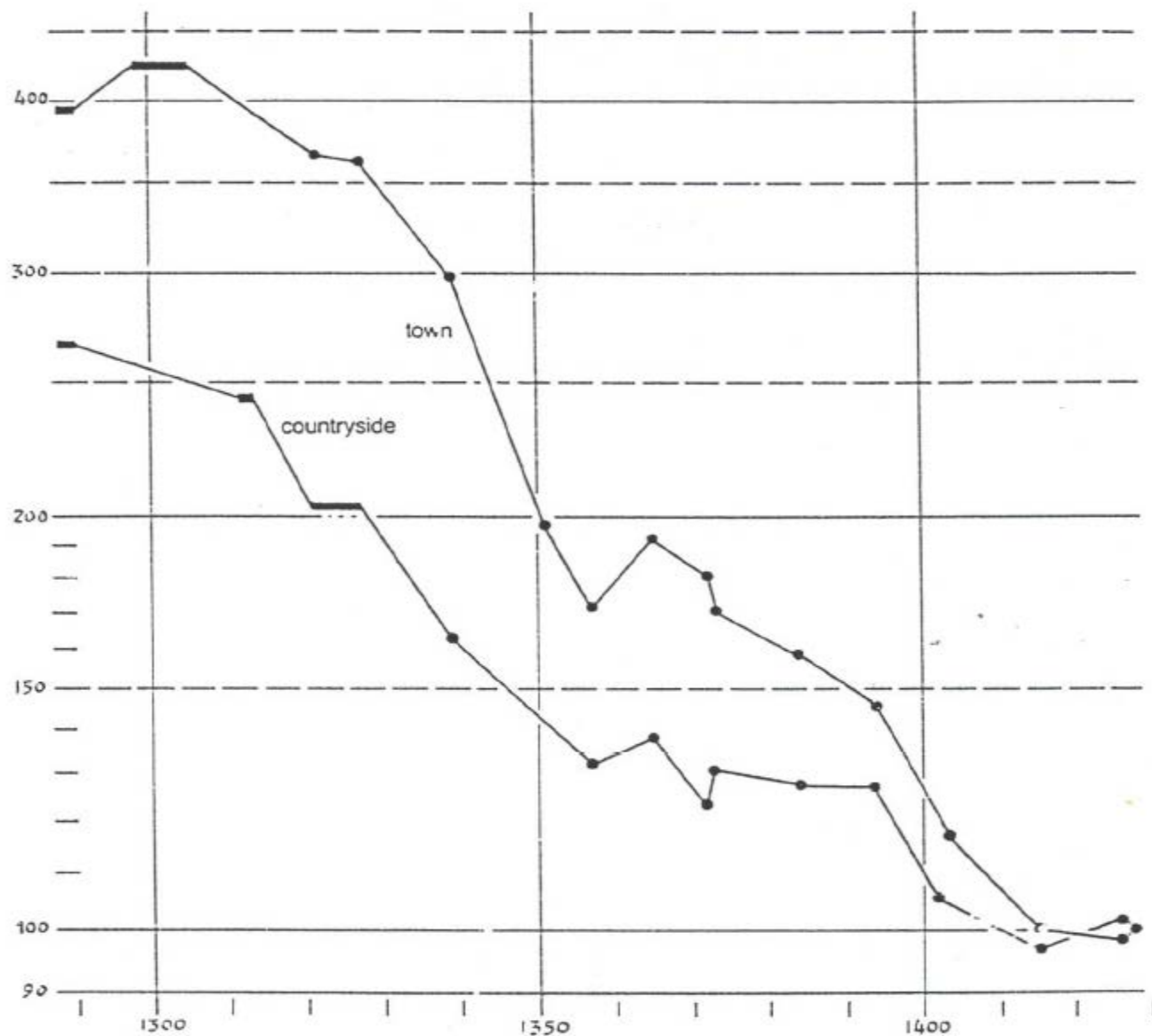Fig. 3.1. Population Movements at Prato (ca. 1290–1427)

Population of Florence (Tuscany)

Date	Estimated Urban Population
1300	120,000
1349	36,000?
1352	41, 600
1390	60,000
1427	37,144
1459	37,369
1469	40,332
1488	42,000
1526 (plague year)	70,000

GRAPH 1: THE POPULATION OF THE PISTOIESE COUNTRYSIDE, ca. 1244-1427

LOST TO FLORENCE, 1329

30,000

20,000

10,000

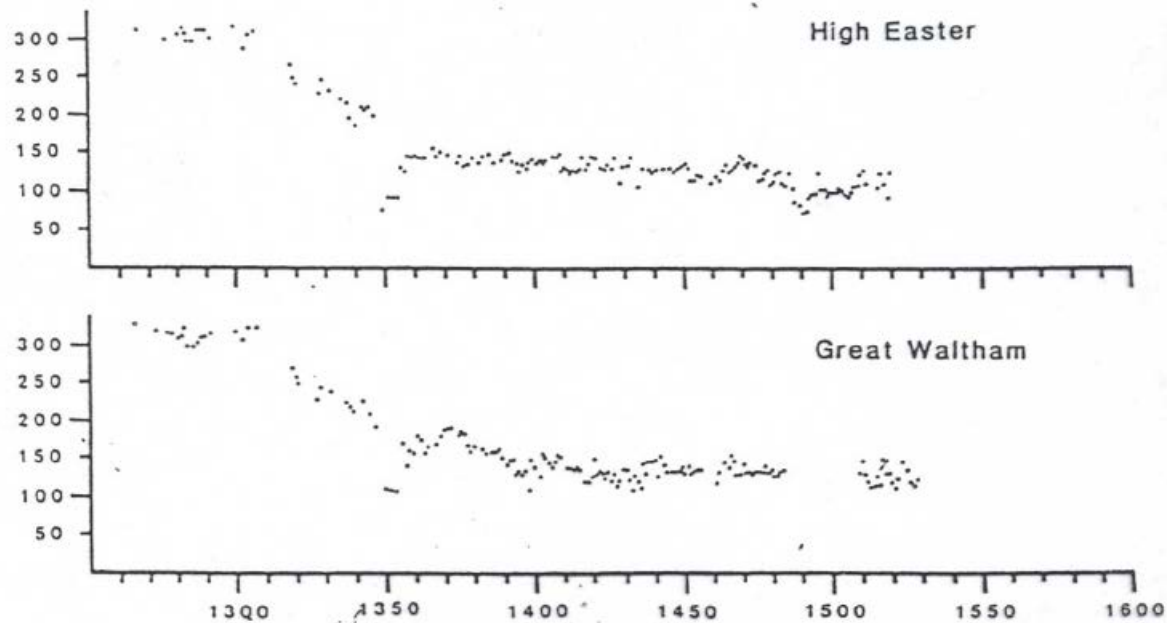ca. 1244   1344   1383   1392   1401   1404   1427
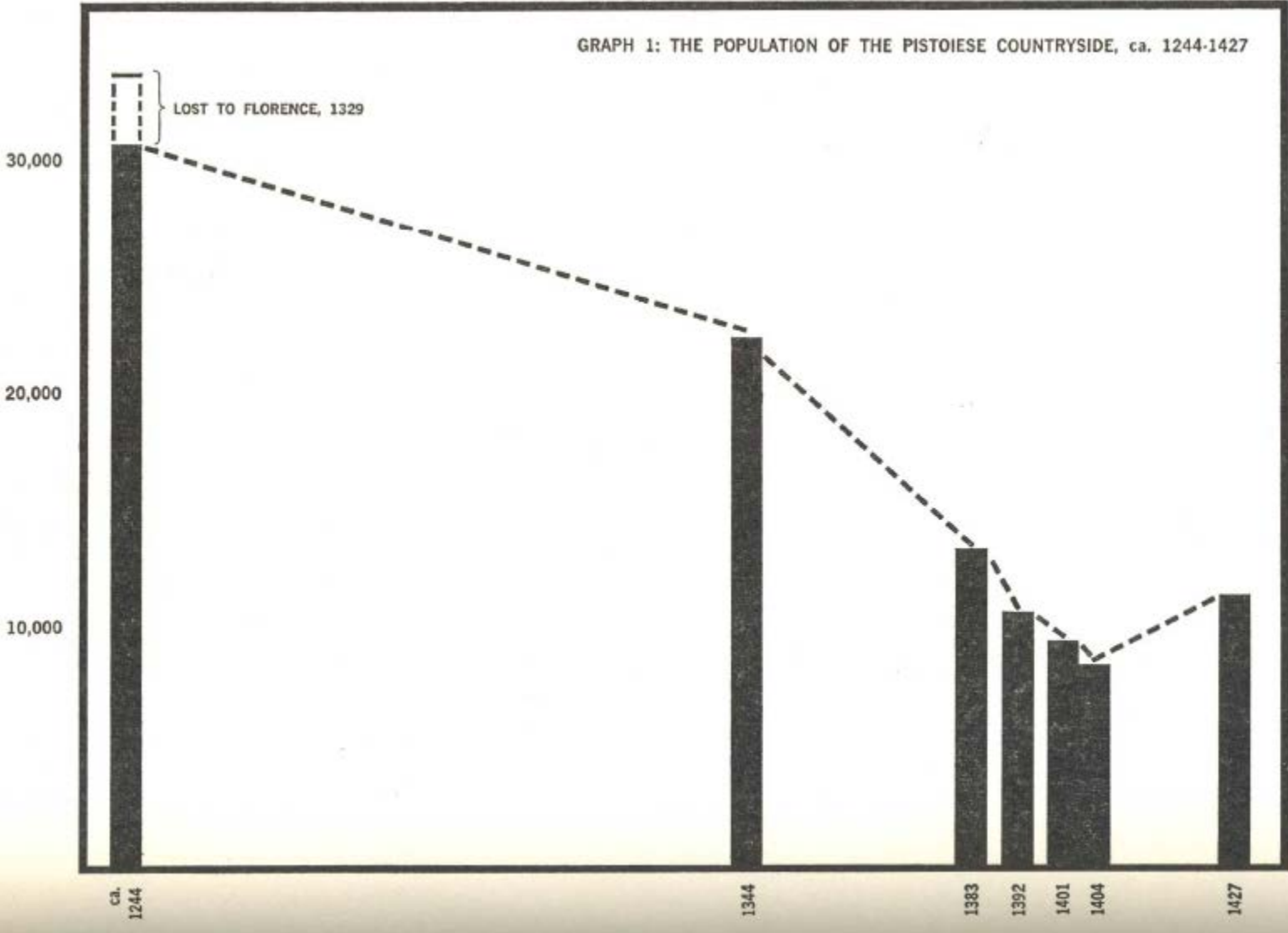
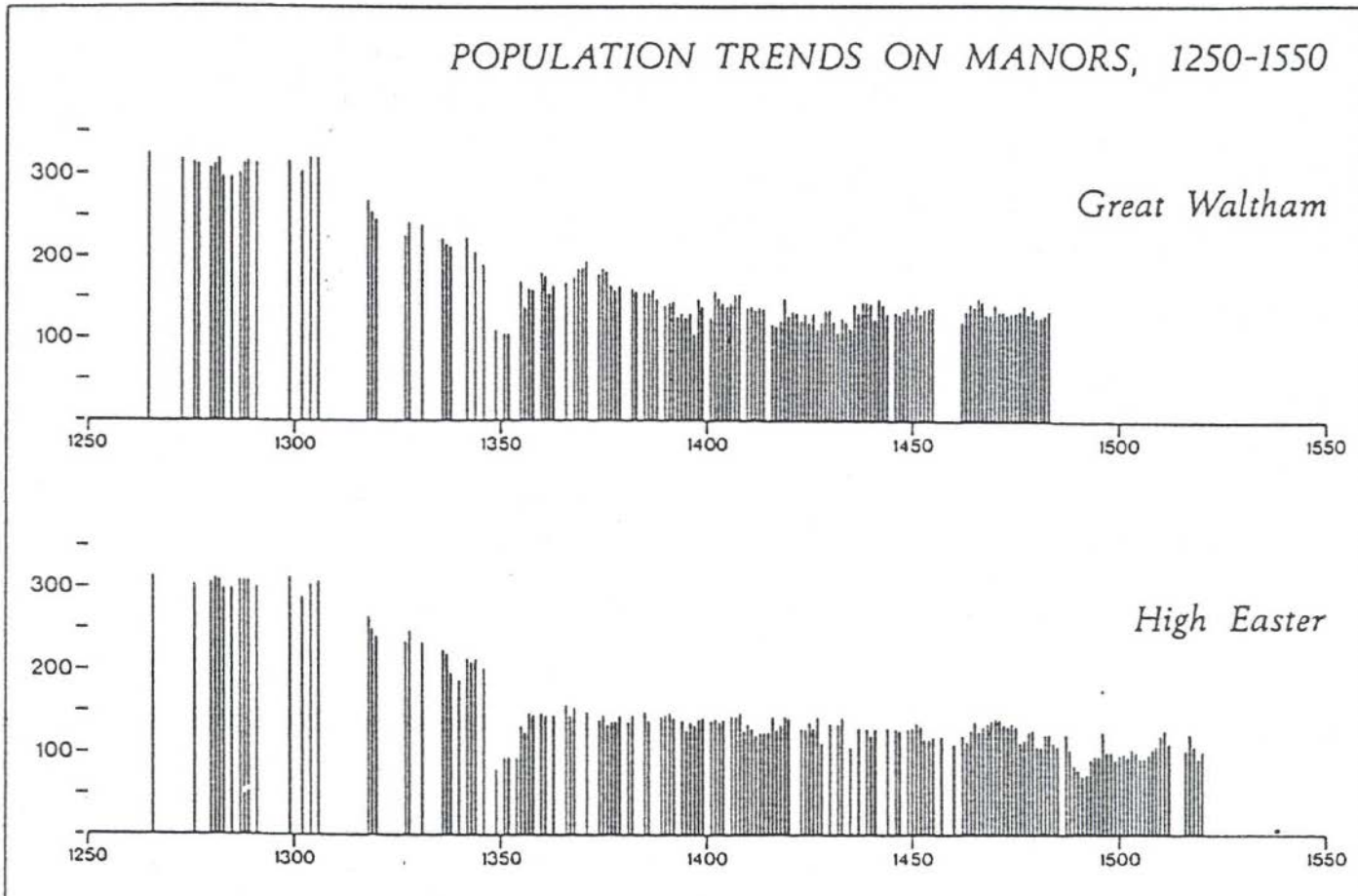# Evidence of pre-Plague population decline in 14ᵗʰ century ESSEX

522   L. R. POOS

Figure 2(a). *Males Aged Twelve and Older, Essex Communities, 1250-1600*

Population Trends on Essex Manors

POPULATION TRENDS ON MANORS, 1250-1550

ENGLISH POPULATION ESTIMATES
1088 - 1523: in Millions
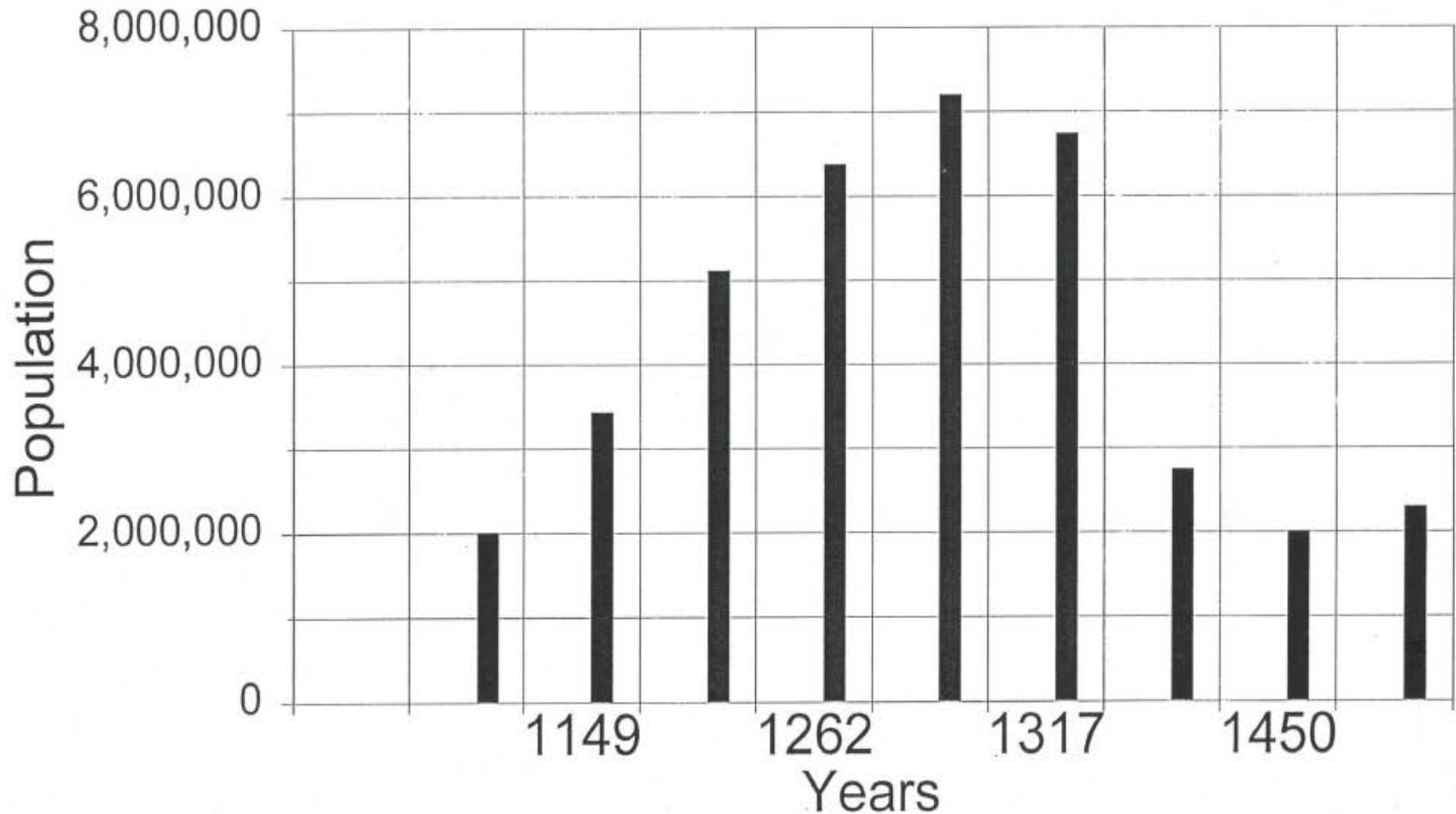
The Great Famine: Malthusian Crisis?

- (1) **The 'Great Famine' of 1315-22**
- (if we include the sheep murrain and cattle plagues) was the first a very major demographic catastrophe
- (2) **Michael Postan**: implied that the roots of this catastrophe was a Malthusian crisis of extensive overpopulation:
- (3) **But no real evidence supports this thesis** – certainly not in the data for real wages

Postan's Malthusian Thesis

- **Implied Malthusian explanation for the Great Famine (1355-22)**

- *But after a time the marginal character of marginal lands was bound to assert itself, and the honeymoon of high yields was succeeded by long periods of reckoning, when the poorer lands, no longer new, punished the men who tilled them with failing crops and with murrain [disease] of sheep and cattle.*

- *In these conditions a fortuitous combination of adverse events, such as the succession of bad seasons in the second decade of the fourteenth century, was sufficient to reverse the entire trend of agricultural production and to send the population figures tumbling down.*

The Great Famine & Climate

- **The Great Famine was instead the product of exogenous forces**, with very adverse changes in the climate, and weather conditions: according to most historians
- **too dry in the Mediterranean and too wet in northern Europe**: ruining grain harvests in both
- **Lack of good fodder crops** may have contributed to livestock diseases (cattle rinderpest, sheep murrains)
- **But were the human mortalities – up to 15% -- aggravated by Malthusian conditions??**
- **Warfare from the 1290s:** a major factor aggravating demographic decline in **In southern France and Italy:**
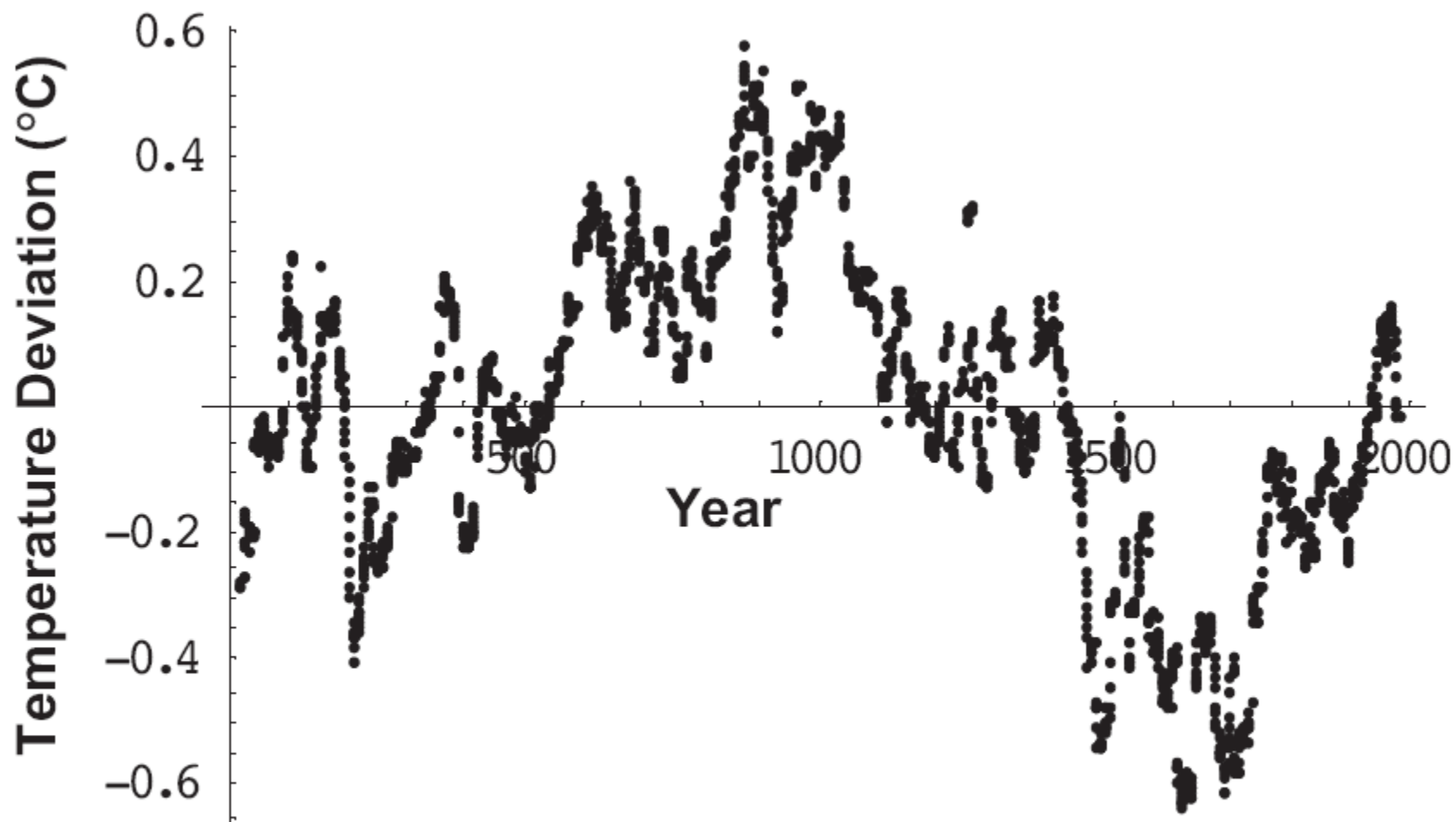
Figure 1. Mean of temperature data for 18 series.

The Black Death: to 1500

- **The Black Death, beginning in 1347-48** (already examined) was certainly a far greater demographic catastrophe
- **This, and successor plagues, into the 15th century, may have wiped out over 40% of western Europe's population**
- **Indeed, the death toll from even the first** visitation may have been up to 60%
- **Plague returned in the 1360s, 1390s, 1420s-30s,** each time with lower death tolls,
- affecting more the very young and very old

England's Population, 1300 – 1520

- **By the late 1370s, England's population had fallen to about 2.25 million,** from a minimum estimate of 4.50 million in 1300

- **Its population would not rise above that level, on a sustained basis, until the 1520s:** when it was 2.25 – 2.50 million (England & Wales)

- **See the following graph and table**: on both mortality and fertility, in terms of male replacement rates (the latter from Philip Slavin):
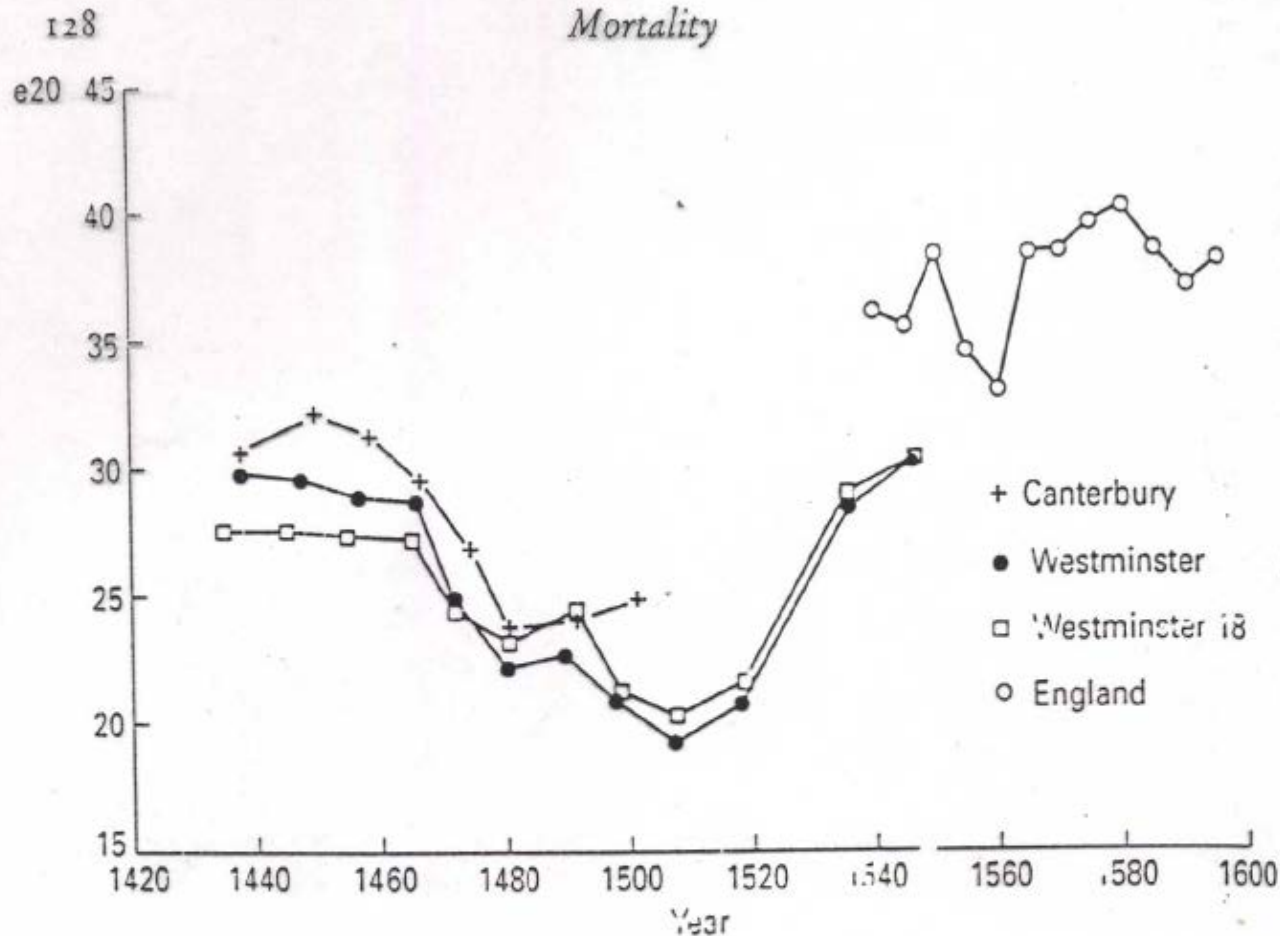
FIG. IV.3. Life-Expectancy at Age 20

Key
+   Canterbury: the estimates for Christ Church Canterbury (Hatcher, 'Mortality in the fifteenth century', table 2).

●   Westminster: the estimates for Westminster Abbey, assuming 21 as the age at profession 1395–1469 and 18 as the age 1470–1529.

□   Westminster 18: the estimates for Westminster Abbey, assuming 18 as the age at profession 1395–1529.

○   England: period estimates by back-projection from 1871, communicated by the Cambridge Group for the History of Population and Social Structure.

Mortality and Fertility Problems

- **the adverse consequences of all mortality factors (including other diseases: typhus, dysentery, pneumonia, leprosy)**

- **also affected fertility:**

- **either through sterility, amennorhea**, or other modes of curbing birth rates (or live births)

Replacement Rates: England, 1270-1400 (as sampled from Halesowen, Worcestershire)

Decade	Male Replacement Rates
1270-82	1.281
1293-99	1.352
1300-9	1.269
1310-9	0.971
1320-9	1.072
1330-9	1.209
1340-8	1.010
1350-9	0.611
1360-9	0.828
1370-9	0.620
1380-9	0.480
1390-9	0.909

Warfare and Demographic Decline I

- **Europe experienced warfare, from the 1290s**
- **and not just from the era of the Hundred Years War (1337-1453)**: more widespread, more destructive, more economically disruptive, throughout the entire continent and Mediterranean
- than any since wars of 9th- 10th centuries
- **The warfare of the 14th & 15th centuries** also bred anarchy, piracy, and local civil wars

1 Viking, Magyar and Saracen Invasions

areas of Viking activity:

— boundary of Christian west on the eve of invasions
→ Saracen attacks
▦ areas most affected by Saracen raiders
→ route of great Magyar invasion of 937
▦ main areas devastated by Magyars

▦ Danish
▦ Norwegian
▦ Swedish
→ Viking routes
• Viking bases

ICELAND

to Greenland 984

c.870

Faroe Is.

Atlantic
Ocean

Shetland Is.

Orkney Is.

NORWEGIANS

SCANDINAVIA

SWEDES

Starsya Ladoga

Novgorod

Hebrides

North
Sea

Baltic
Sea

DANES

KIEVAN
RUSSIA

Iona
Derry
Dunbarton
Bangor
Lindisfarne 793

Kiev

IRELAND
Clonmacnoise
Kells
Armagh
Clonfert
Clonard
Limerick
Dublin 841
York
Lincoln
Nottingham
Leicester
Stamford
Derby

Cork
Waterford
WALES
Watling Dyke

WESSEX
London
Canterbury
Winchester
Quentovic
Ghent
Bremen
Hamburg 845

Rouen 841
Arras
Cambrai
Bologne
Aachen
Uprestad 834
Prüm

Nantes 799
Chartres
Paris
Laon
Rheims
Trier

Noirmoutier
Angers
Orléans
Tours

Poitiers
FRANCE
(GAUL)
Lechfeld (955)

MAGYARS

Angoulême
Bordeaux
Périgueux

Valence
Pavia

Santiago de
Compostela 968

Toulouse
Nîmes
Arles
Luna

Pisa
Black
Sea

Fraxinetum 890-973

Corsica

EMIRATE OF

CORDOBA

Roma 936

Constantinople

BYZANTINE

Balearic Is.

Karmona (Córdoba)

Sardinia
1015

Bari 841-871

Taranto 840-880
Otranto
Santa Severina
c.840-885

EMPIRE

Seville 844

Sicily
(occupied 827)

SARACENS
Tunis

Kairouan

Mediterranean Sea

EUROPE
About 1360

MILES 0   50   100   200   300

—— Boundary of Holy Roman Empire
– – – Boundary of France

FAEROES

NORWAY

SWEDEN

Abo

Bergen

SHETLAND ISLANDS

ORKNEY ISLANDS

Oslo

Upsala

Stockholm

HEBRIDES

North Sea

DENMARK

Colmar

Wisby

Riga

Königsberg

SCOTLAND   Aberdeen

Bannockburn

Edinburgh

Berwick

Copenhagen

Stralsund

Danzig

Vilna

IRELAND

Carlisle

Lübeck

Hamburg

POMERANIA

Gnesen

Bielystok

Armagh

Naddick

Dublin

York

Lincoln

Chester

Norwich

HOLLAND

Bremen

Magdeburg

BRANDENBURG

Posen

TEUTONIC KNIGHTS

POLAND

Warsaw

LI

Cork

Wexford

WALES

ENGLAND

London

Bruges

Calais

Ghent

HAINAULT

BRABANT

Cologne

Frankfurt

HOLY

Trier

Mainz

BOHEMIA

Prague

SILESIA

Lublin

Cracow

Atlantic

Ocean

English Channel

Agincourt

Harfleur

Crecy

Rouen

Caen

Reims

Compiegne

Vaucouleurs

LUXEMBURG

LORRAINE

Strassburg

Regensburg

ROMAN

MORAVIA

Krematz

BRITTANY

Rennes

Brittany

Paris

Orleans

FRANCE

Troyes

Dijon

Besancon

Basel

PALATINATE

BAVARIA

Munich

Eger

Pest

MO

Nantes

Chinon

BURGUNDY

SWISS CONFED.

Munich

Salzburg

Vienna

Buda

Bay of Biscay

Loire

Poitiers

Limoges

EMPIRE

AUSTRIA

HUNGARY

Bordeaux

AQUITAINE

Lyon

Constance

LANDS

Arad

Bayonne

Toulouse

Pau

Avignon

DAUPHINY

PROVENCE

Turin

Milan

Ferrara

VISCONTI

Trieste

Venice

REPUBLIC

BOSNIA

Belgrade

WALLA

Santiago

Leon

NAVARRE

Narbonne

Marseille

Genoa

Bologna

OF

Vidin

Bucharest

PORTUGAL

Salamanca

Duero

ARAGON

Saragossa

CORSICA
(To Genoa)

Florence

VENICE

SERBIAN

Nisso

PRINCES

Sofia

BULG

Toledo

CASTILE

Barcelona

Rome

PAPAL STATES

Durazzo

BYZ

Lisbon

Valencia

BALEARIC ISLANDS
(To Aragon)

SARDINIA
(To Aragon)

KINGDOM

OF

PRIN. OF
ALBANIA

Thessalon

Seville

Cordova

Guadalquivir

Naples

NAPLES

Taranto

Cadiz

GRANADA

Granada

Mediterranean

Palermo

Messina

KINGDOM
OF
SICILY

Reggio

DUCHY
ATHENS

Gibraltar

MOSLEM   STATES

Algiers

Tunis

Sea

ACHAIA

MARINIDS

ZIANIDS

HAFSIDS

MALTA

CRETE
(To Venice)

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Copyright by Rand McNally & Company. Made in U.S.A.

Warfare and Demographic Decline II

- **The mortalities, chiefly from**:
- **battle wounds and disease**: the spread of contagious diseases
- **Especially when diseased bodies (humans and animals) were thrown into rivers** and streams, thus polluting the water supplies
- **From the destruction of farmlands and trade routes** that so disrupted food supplies
- → **produce chronic malnutrition**, which in turn reduced resistance to many diseases.

Warfare & Demographic Decline III

- **Warfare (from the 1290s) also led to:**
- **exhorbitant increases in taxes and tolls and drastic coinage debasements**
- **→ major factor in reducing real incomes**
- - see graphs at end of lecture

Why was demographic decline so prolonged: to early 16th century?

- (1) **Had Malthusian pressures been the basic causes**, we would expect that the 14th century losses, in changing land:labour ratios, would have permitted demographic recovery: i.e., rising real incomes should have led to earlier and more productive marriages

- (2) **We also cannot fully rely on continued plagues to explain this mystery**, since all evidence indicates that each successive wave of plague was more localized and less virulent

Why was demographic decline so prolonged: to early 16ᵗʰ century?

- (3) **The combination of plagues (+ other diseases),warfare, anarchy, taxation, malnutrition, etc., and the economic consequences of population decline**
- **may in turn have led to periodic depressions**, which in turn prevented earlier marriages and higher birth rates, for demographic recovery
- (4) **War-torn Burgundian Low Countries** in the 15ᵗʰ century, also plagued with civil wars in the 1480s and early 1490s
- (5) **But possibly demographic recovery had begun earlier, in southern Europe,** and in Italy in particular, from the mid-15ᵗʰ century – see example of Florence

The Low Countries in the Late 15th Cent.

Population Decline and Poverty in the Duchy of Brabant, 1437 - 1496
Number of Family Hearths (Households) and Percentage of Total Hearths
without Taxable Income ('Poor Hearths'): 1437, 1480, and 1496

| Area of Census	1437: no. of hearths in census	1437: per-cent poor hearths	1480: no. of hearths in census	1480: per-cent poor hearths	1496: no. of hearths in census	1496: no. of poor hearths	Percent Change from 1437 to 1496
Brussels	6,376	10.5	7,414	7.9	5,750	17.1	-9.82%
Antwerp	3,440	13.5	5,450	10.5	6,586	12.5	91.45%
Leuven	3,579	7.6	3,933	18.3	3,069	n.a.	-14.25%
s'Hertogen-bosch	2,883	10.4	2,930	7.9	3,456	n.a.	19.88%
Sub-total Large Towns	16,278	10.5	19,727	14.8	18,861	n.a.	15.87%
Small Towns	14,159	9.2	12,216	28.1	10,600	n.a.	-25.14%
Villages	62,301	29.7	54,540	31.6	45,882	n.a.	-26.35%
Total Duchy	92,738	23.4	86,483	27.3	75,343	n.a.	-18.76%
Percentage Change from 1437			-6.74%		-18.76%		

English Mortalities to 1540
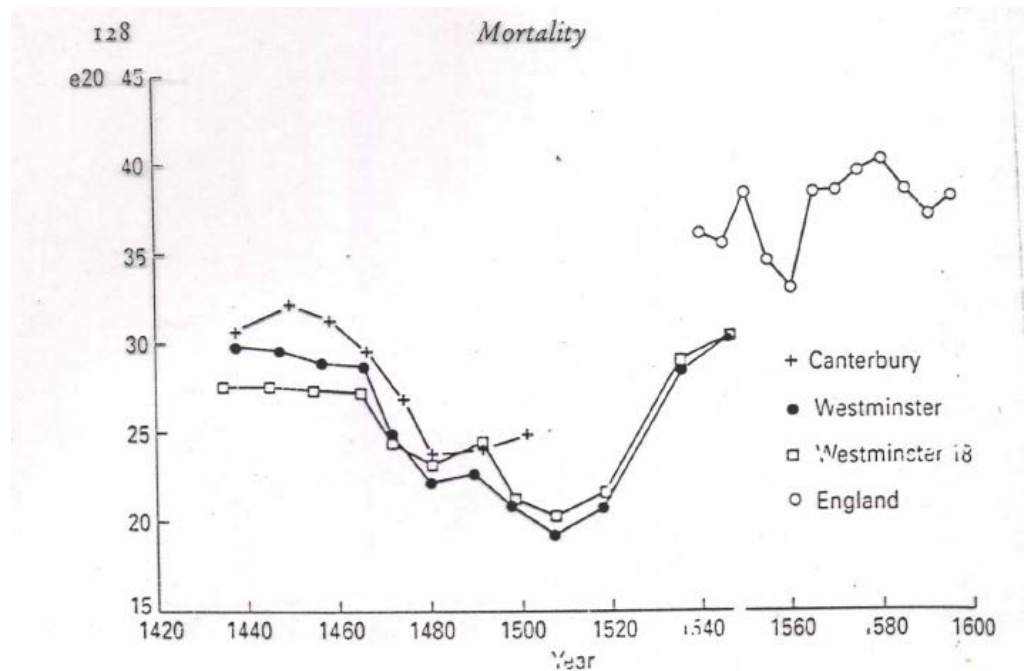
FIG. IV.3. Life-Expectancy at Age 20

Key

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● Westminster the estimates for Westminster Abbey, assuming 21 as the age at profession 1395–1469 and 18 as the age 1470–1529.

□ Westminster 18: the estimates for Westminster Abbey, assuming 18 as the age at profession 1395–1529.

○ England: period estimates by back-projection from 1871, communicated by the Cambridge Group for the History of Population and Social Structure.

Population Distribution in Europe, 1000-1450 (in Millions)

Area	1000 A.D.	1310 A.D.	1450 A.D.
Mediterranean: Greece, Balkans, Italy, Iberia (Spain and Portugal)	17.0 (44%)	25.0 (34%)	19.0 (38%)
West-Central: Low Countries, France, Germany, Scandinavia, British Isles	12 (31%)	35.5 (48%)	22.5 (45%)
Eastern Europe: Russia, Poland- Lithuania, Hungary, Bohemia	9.5 (25%)	13.0 (18%)	9.5 (19%)
TOTALS:	**38.5**	**73.5**	**51.0**

The late-medieval Standard of Living Debate

- **Demography & the Standard of Living Debate:**
- **Did the Black Death and subsequent forces for demographic decline, altering the land:labour ratios, thus lead to rising real incomes –**
- for at least the lower classes of European society (peasants and urban craftsmen?
- **Consequences of warfare, coinage debasements, and taxation in drastically reducing real incomes of the lower social strata: countervailing forces**

# Consequences of Population Decline in the Ricardian Model: I

- (1) **GRAIN PRICES WILL FALL** –
- as higher-cost marginal lands fall out of production and grain is produced on better quality, lower cost lands, with less labour
- (2) **LAND RENTS WILL ALSO FALL**:
- as declining prices reduce the difference between the market price and production costs

Consequences of Population Decline in the Ricardian Model: II

- (3) **REAL WAGES WILL RISE:**

- - as the cost of living falls: with lower priced grains supplied to the market

- as the **marginal productivity of labour rises**

- i.e., since fewer persons (units of labour) are needed to produce a given quantity of grain for the market:

- See **LAW OF DIMINISHING RETURNS**

English Price Indices, 1266-1520

Farinaceous, Meat/Dairy, Industrial

Composite Price Index, 1451-75=100

Quinquennial Means: 1451-75=100

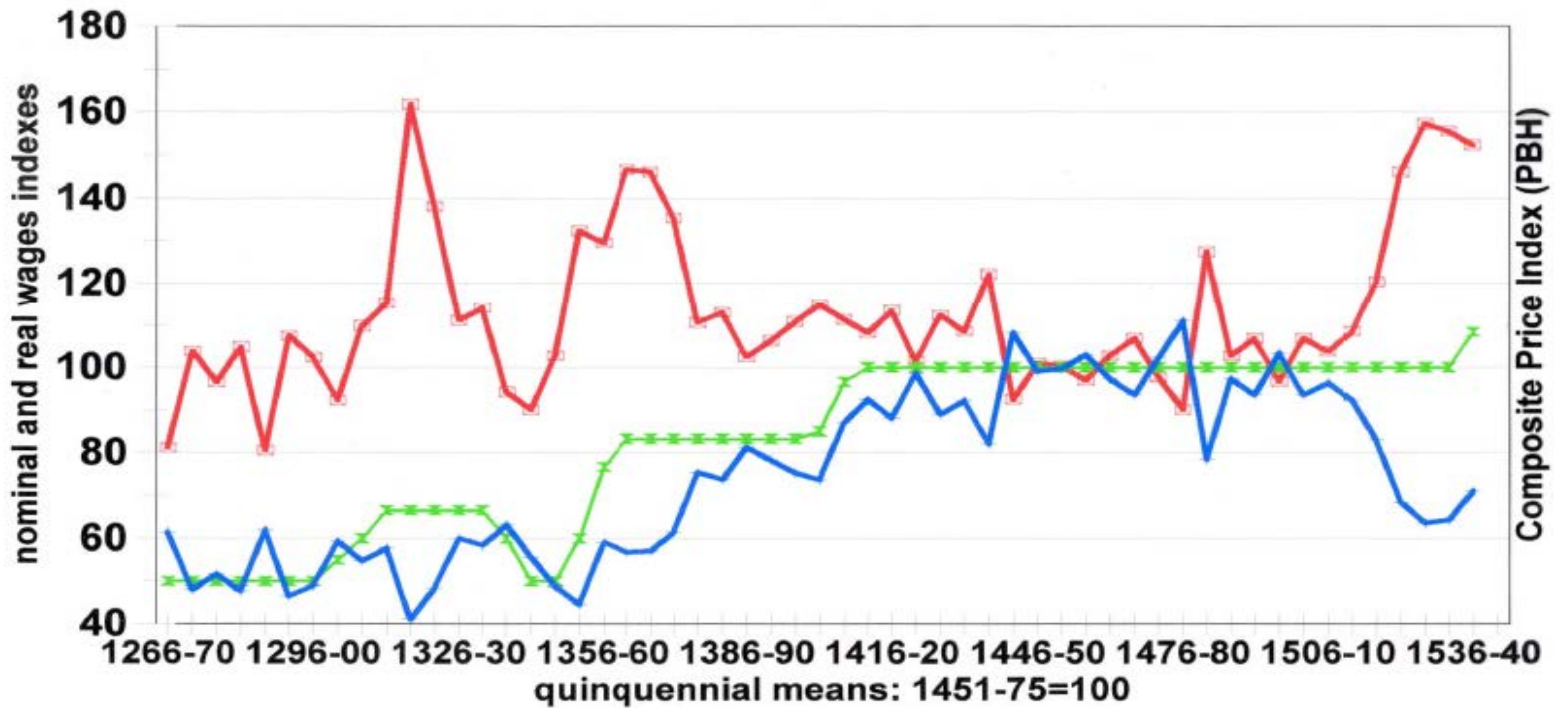Farinaceous, Meat/Dairy, Industrial
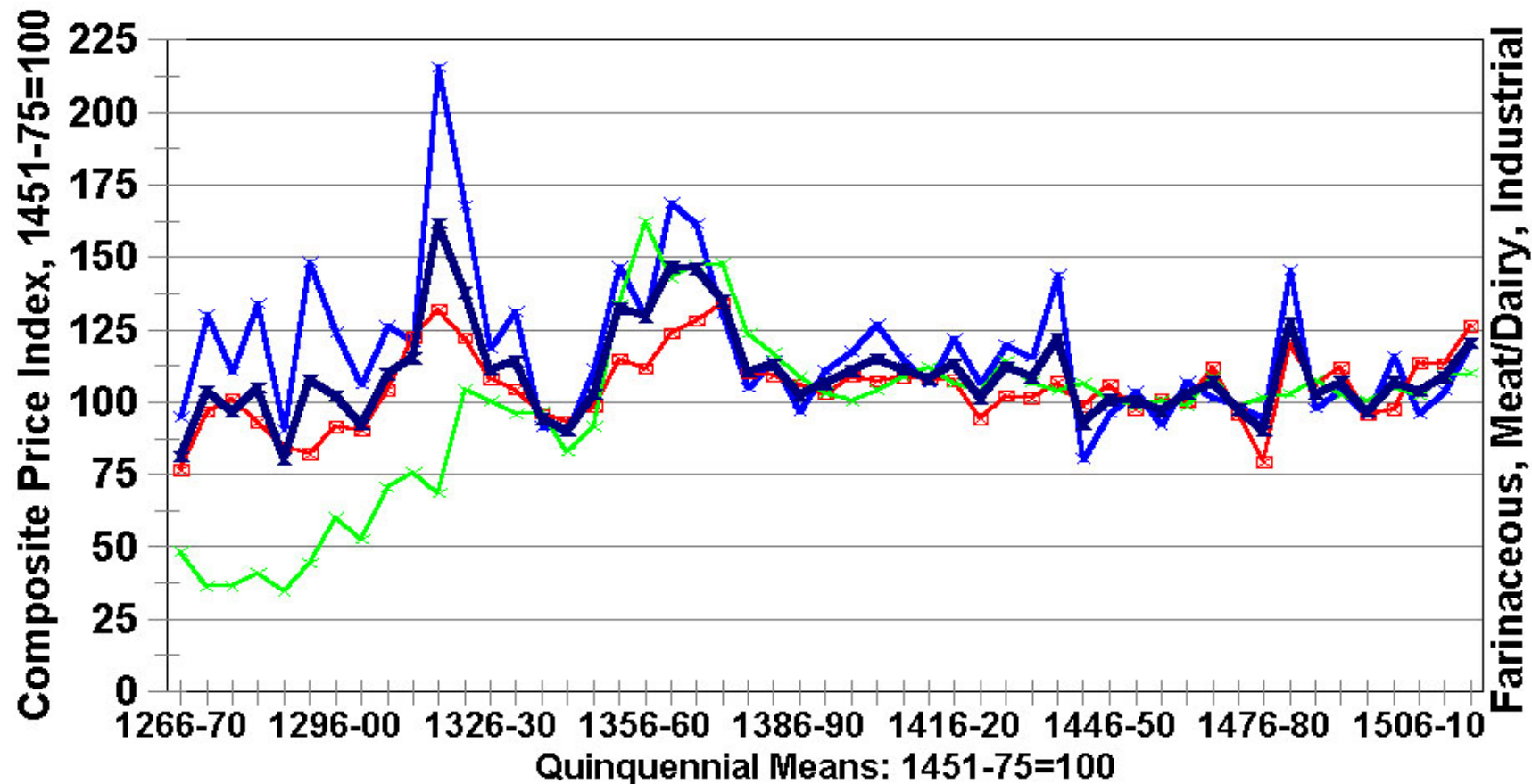
- Farinaceous Index
- Meat/Dairy Index
- Industrial Goods Index
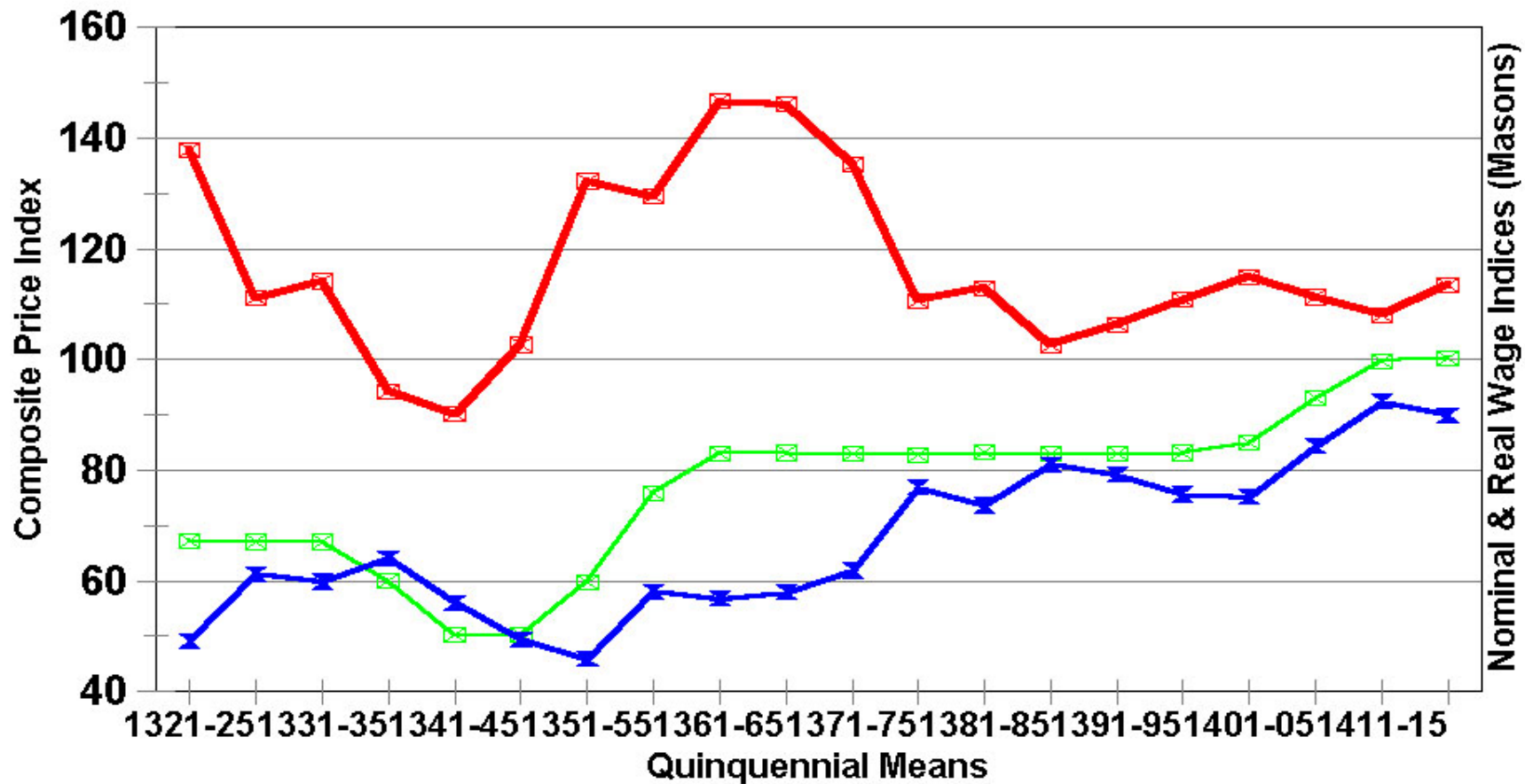- Composite Price Index 1451-75=100

English Builders' Wages, 1266 - 1540
nominal & real wage indexes: 5 yr mean

nominal and real wages indexes

Composite Price Index (PBH)

180
160
140
120
100
80
60
40

1266-70 1296-00 1326-30 1356-60 1386-90 1416-20 1446-50 1476-80 1506-10 1536-40

quinquennial means: 1451-75=100

Composite Price Index (PBH)   nominal wage index (1451-75=6d)

real wage index (1451-75-100)

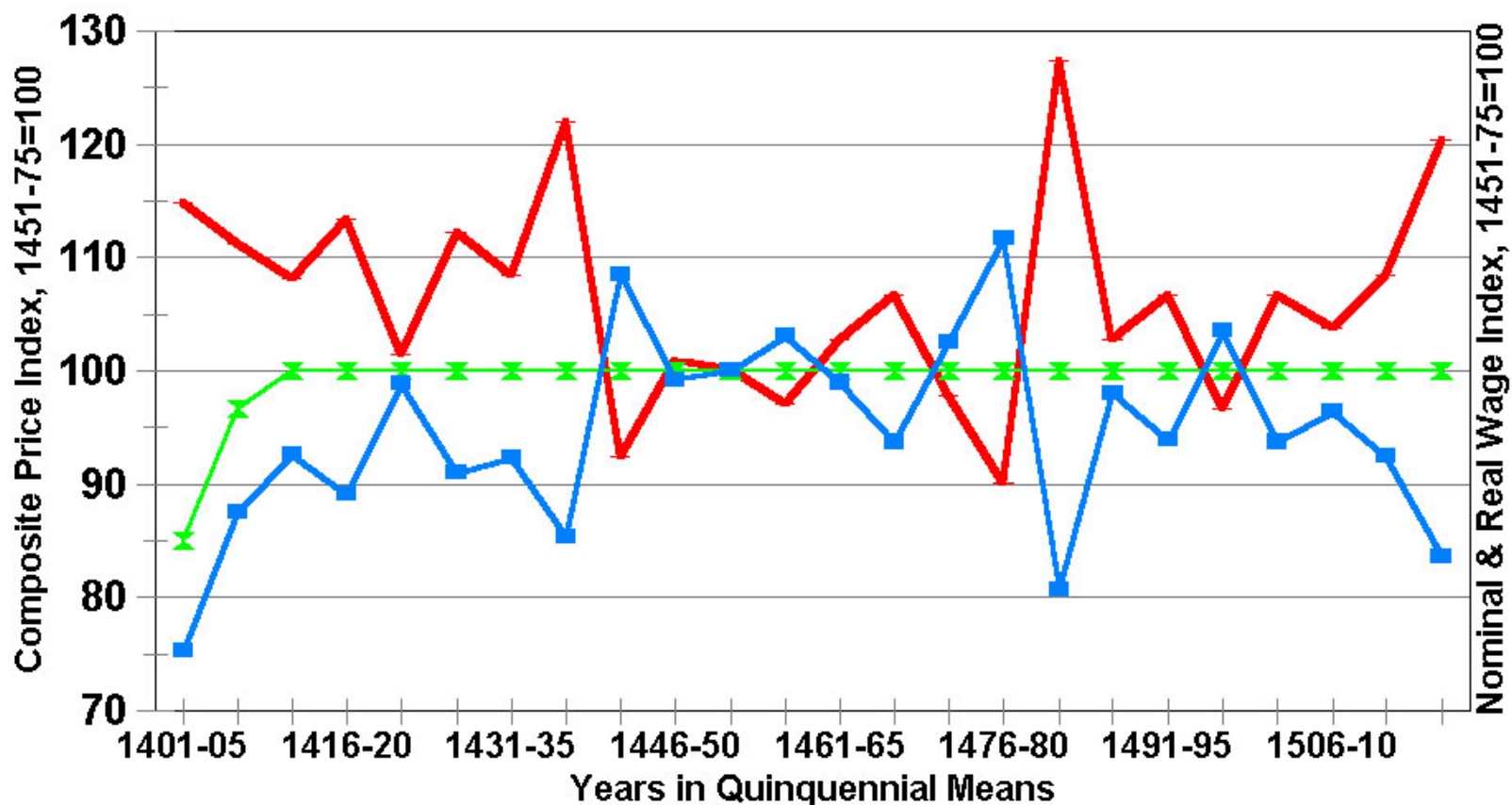**Prices & Wages in England, 1321-1420**

Mean of 1451-75=100

English Price and Wage Indices

Urban Masons:1401-05 to 1516-20

Flemish Commodity Prices, 1346 - 1500
in 5 yr means: 1451-75=100
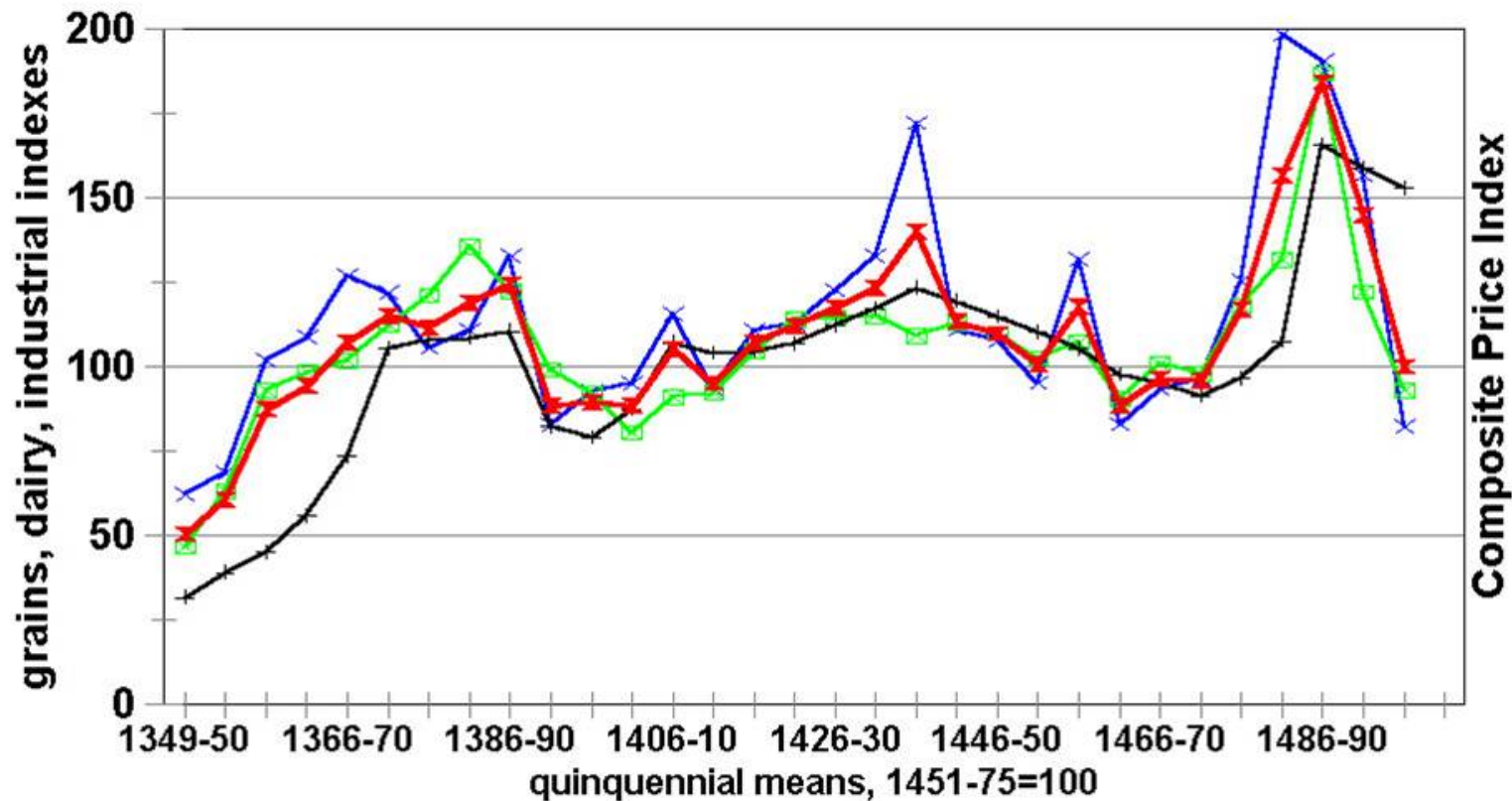
Legend:
- farinaceous index
- dairy products index
- Industrial (textile) index
- Composite Price Index 1451-75=100

x-axis: quinquennial means, 1451-75=100
y-axis (left): grains, dairy, industrial indexes
y-axis (right): Composite Price Index

Flemish Builders' Wages, 1351 - 1500
Nominal & Real Wage Indexes: 5 yr mean

Nominal and Real Wage Indexes (left axis, 40–200)

Composite Price Index (right axis)

x-axis labels: 1351-55, 1371-75, 1391-95, 1496-00, 1431-35, 1451-55, 1471-75, 1491-95

quinquennial means: 1451-75=100

Legend:
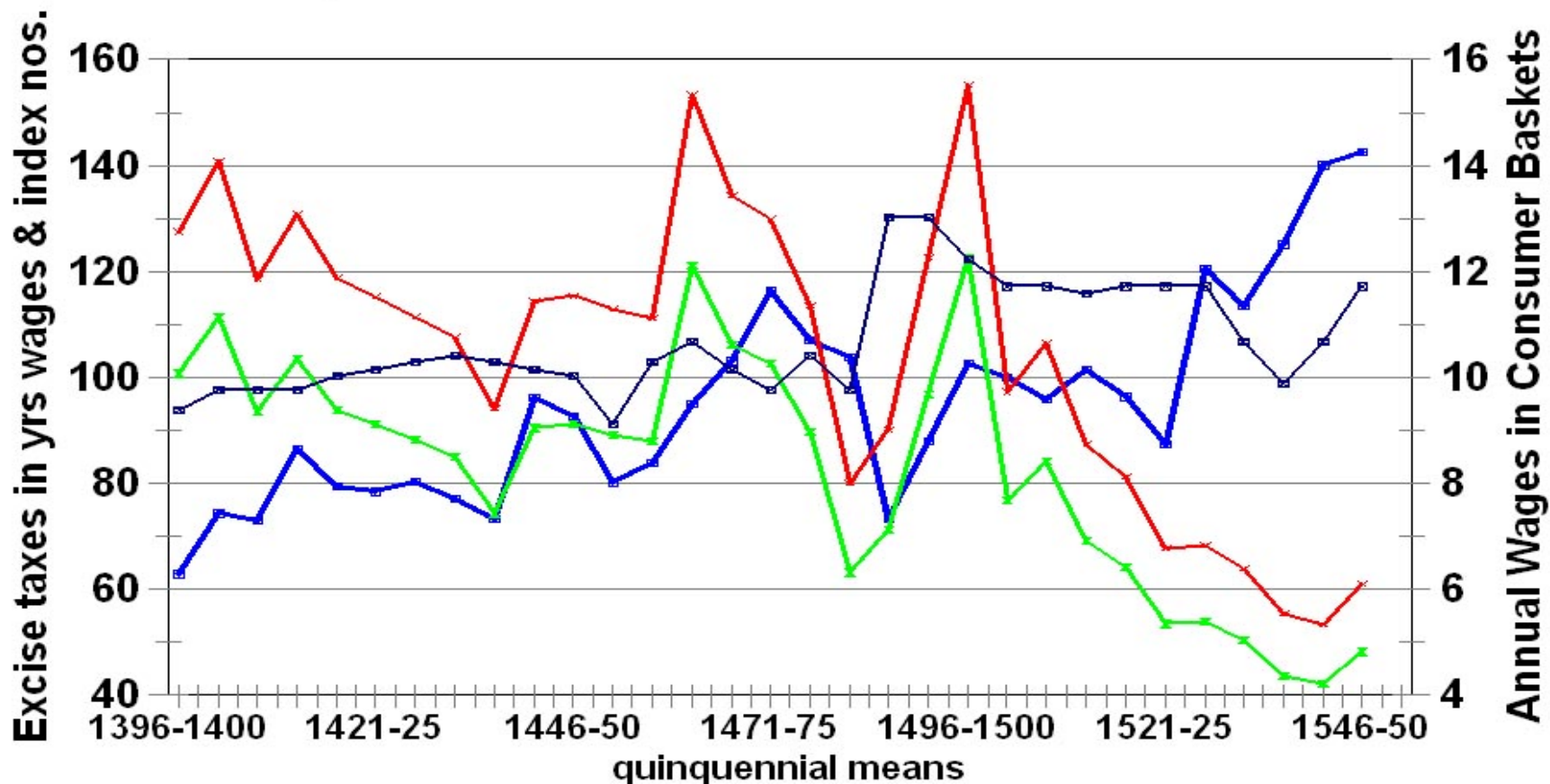- Composite Price Index: 1451-75=100
- Nominal Wage Index (Bruges)
- Real Wage Index (Bruges)
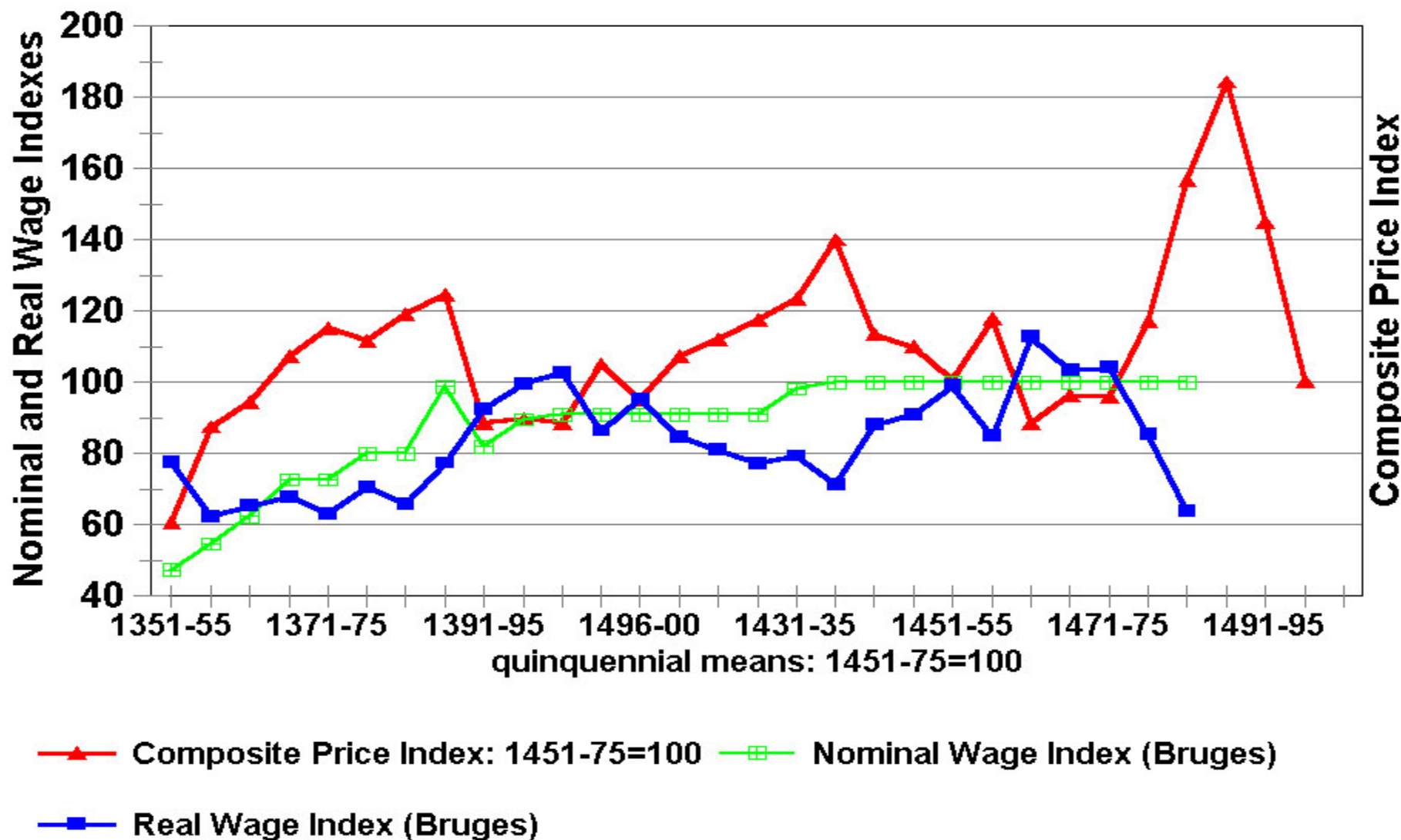
Aalst Masons' Wages, 1396-1550
Wages in baskets, index nos., & taxes

Legend:
- Value of Taxes in Years' Wages
- Masons' Annual Wage in Baskets
- Real Wage Index 1451-75=100
- Nominal Wage Index 1451-75=100

X-axis: quinquennial means (1396-1400, 1421-25, 1446-50, 1471-75, 1496-1500, 1521-25, 1546-50)

Left Y-axis: Excise taxes in yrs wages & index nos. (40 to 160)

Right Y-axis: Annual Wages in Consumer Baskets (4 to 16)

Demographic Recovery from 1520s

1) **In northern Europe, the demographic slump came to an end in the 1520s**: followed by a fairly rapid recovery in population levels

2) **In southern Europe, recovery may have begun somewhat earlier:** by mid 15th century – see Florence's population figures

3) **Causes of the demographic recoveries:** will be considered when we come back to Demography, in January

Population of Florence (Tuscany)

Date	Estimated Urban Population
1300	120,000
1349	36,000?
1352	41, 600
1390	60,000
1427	37,144
1459	37,369
1469	40,332
1488	42,000
1526 (plague year)	70,000