# II. MACRO- AND STRUCTURAL CHANGES IN THE EUROPEAN ECONOMY, 1290 - 1520

## B. MONEY AND MONETARY CHANGES IN WESTERN EUROPE, 1290 – 1520 (Part 1)

| | | |
|---|---|---|
| 3. **25 September 2013**<br><br>**Brady**, ch. 5 (Munro); **Cipolla**, ch. 7; **Davis** chs.6,14 | **3** | **MONEY in the Late-Medieval Economy:**<br><br>Coins, moneys-of-account, and their functions.<br><br>The mechanics and economics of coinage debasements. |

# Money in the Medieval Economy

- **Why Population (Demographic Variables)** is more important than Money, in the Medieval Economy
- **The Restricted Scope of the Medieval Market Economies:** and why market economies have to be monetized
- **The expanding scope of money and market economies** from the Commercial Revolution era: from ca. 1100 CE to ca. 1320
- **Functions of Money (4)** in the medieval economy

# The Four Functions of Money

- (1) **Money as a medium of exchange**: **gold and silver** and then **copper** coins (all copper: only from 1543)
- (2) **Money as a standard of value**: i.e., **the monetary function of 'moneys of account' for recording prices**, values, exchanges, wages, rents, interest payments, etc.
- (3) **Money as a store of value**: savings
- (4) **Money as a standard of deferred payment:** money as credit (or as debt instruments).
- NB: **Medieval & Early Modern Europe: operated on a silver-based standard, supplemented by gold**

# Charlemagne (c. 800) and the medieval moneys of account 1

- **Emperor Charlemagne (ca. 795-800)** established what became the most widespread west European money of account: **the system of pounds, shillings, and pence**
- **1 pound weight (libra) of silver was divided**, for accounting purposes into **20 *solidi* or shillings** [*solidus:* Imperial Roman gold coin]
- **Each shilling was subdivided into 12 pence, or** *deniers* = from the Imperial Roman *denarius* silver coin

# Medieval moneys of account 2

- **pennies – were long the only circulating coins**
- **Thus: £1 = 20s = 240d**
- **The system was always tied to** and based on the currently circulating silver penny
- **Based ancient Babylonian system** of counting in units of **12** and the **Celtic-Frankish system** of counting in **20s** [quatre-vingt = 80]

# Ancient & medieval values of gold and silver

- **In Roman Imperial times,** gold:silver ratio was about 12:1
- **1252: re-introduction of gold coinages in the West:** Genoa (genovino) and Florence (florin)
- **1284: Venice:** introduced gold ducat (= florin)
- gold:silver ratio was then also 12:1 – until the early 14$^{th}$ century
- **Today (21 Sept 2013)**: G-S ratio = 60.84:1

**Florence, florin, 1252-1422**

**Genoa, genovino, 1252-1339**

**Venice, ducat, Giovanni Dandolo, 1285-89**

**Venice, zecchino, Ludovico Manin, 1789-97**

# English Medieval Gold Values

- **Medieval England (from 1344):**
- **Noble was the chief gold coin** = 6s 8d = 80d sterling (silver pennies) - [quarter-noble or ferlin = 20d]
- **1351 – 1411:** Noble contained 120 Troy grains = **0.25 Troy ounce fine gold**
- **Value of gold noble in terms of builders' wages:**
- **no. days' wage income for a master mason or master carpenter to earn 1 noble (80d)**: from 1365 to 1411
- **at 6d. per day (12 hour day): 80d (noble)/6d. = 13.333 days** (or over two weeks income: at 6 days per week)

# The English Gold Noble: Edward III

# Modern Day values of gold and skilled labour

- **Master Carpenter: Toronto in Sept. 2013:**
- **$36.91 per hour:  earnings for 13.333 days @ 8 hours per day: $3,936.97 (before taxes, but plus benefits)**
- **Gold today: $ USD = 1,325.60 = $1,363.60 CAD per Troy ounce**
- 0.25 Troy ounce (gold in 14th century Noble)
- **0.25 * $1,363.60 = $340.90 CAD**
- **SO: gold today is worth far less**, in terms of builders' wages, than it was in medieval England:
- **conversely, labour today** is worth far more: i.e. $3,936.97 vs. $340.90 CAD for 13.333 days' wages

# How was the coined money supply increased in medieval Europe?

- (1) **Discovering and developing new gold and/or silver mines**: but most countries lacked such mines: chiefly found in Central Europe
- (2) **Enjoying a 'favourable balance' in foreign trade'**: so that export revenues exceeded the costs of imports (goods & services) → gold inflow
- (3) **By Coinage Debasements**:
- **to increase the number of coins** of a given money of account value (£) struck from a given mint weight of silver: e.g., the English Tower Pound (12 oz), the French *marc* (8 onces):

# Definitions of Debasement

- **Coinage debasement**: is the **reduction of the precious metal content** – silver or gold – in not just the coin itself but in the **unit of the money of account**
- **MONEY OF ACCOUNT**: the penny, the shilling, and the pound (system or reckoning prices)
- With 12d (pence) to the shilling, and 20 s (shillings) to the pound, so that 240d = £ 1

# How Coinage Debasements were Effected

- (1) **By a reduction in the fineness**:
- i.e., in the percentage of fine silver or gold in the coin, by adding proportionately more copper, less precious metal [**copper: a base metal**]
- (2) **By a reduction in the coin's weight**
- (3) **By an increase in the nominal money-of-account value of the coin**

  - reserved normally only for gold coins and high value silver coins (that were not physically debased, as given above): e.g., **gold noble from 6s 8d (80) to 10s 0d (120) in 1464**

# Debasements & Money of Account

- **(1) Debasements always increased the money-of-account value of the precious metal struck**
- **(2) With techniques nos. 1 & 2** – reductions in fineness & weight were often combined:
- → **increased the total number of coins struck** from mint weight (pound) → **increased money-of-account** value of lb of silver

## Alterations of the English Silver Coinage: from 1259 (Henry III) to 1526 (Henry VIII)

| Date | Fineness: percentage | No. of Pence to the Tower Pound 349.9133 g. = 5400 Troy grains | Weight of Penny in Troy grains 0.648 g. | Weight of Penny in grams | Grams of Pure Silver in penny | Percentage change in silver contents | Grams of Pure Silver in the pound sterling (240d) | Nominal Value of a Tower lb of Silver 0.925 fine in decimal £ sterling |
|---|---|---|---|---|---|---|---|---|
| **1259** | 92.500% | 242.00 | 22.314 | 1.446 | 1.337 | | 320.996 | 1.0083 |
| **1279 Dec** | 92.500% | 243.00 | 22.222 | 1.440 | 1.332 | -0.41% | 319.675 | 1.0125 |
| **1335 July *** | 83.333% | 252.00 | 21.429 | 1.389 | 1.157 | -13.13% | 277.710 | 1.1655 |
| **1344 July** | 92.500% | 266.00 | 20.301 | 1.315 | 1.217 | 5.16% | 292.034 | 1.1083 |
| **1345 June** | 92.500% | 268.00 | 20.149 | 1.306 | 1.208 | -0.75% | 289.854 | 1.1167 |
| **1346 July** | 92.500% | 270.00 | 20.000 | 1.296 | 1.199 | -0.74% | 287.707 | 1.1250 |
| **1351 Jul** | 92.500% | 300.00 | 18.000 | 1.166 | 1.079 | -10.00% | 258.937 | 1.2500 |
| **1412 April** | 92.500% | 360.00 | 15.000 | 0.972 | 0.899 | -16.67% | 215.781 | 1.5000 |
| **1464 Aug** | 92.500% | 450.00 | 12.000 | 0.778 | 0.719 | -20.00% | 172.624 | 1.8750 |
| **1465 Mar** | 92.500% | 450.00 | 12.000 | 0.778 | 0.719 | 0.00% | 172.624 | 1.8750 |
| **1526 Nov** | 92.500% | 506.25 | 10.667 | 0.691 | 0.639 | -11.11% | 153.444 | 2.1094 |

# Debasements: monetary or fiscal policies?

- **Two questions about the political rationale for medieval debasements:**
- **(1) were the coinage debasements in undertaken principally as**
- **monetary policies: to expand money supply?**
- **or fiscal policies: to earn seigniorage revenues?**
- **(2) were they beneficial or harmful?**
- **And for whom were they harmful or beneficial?**
- the prince and his government?
- or his subjects: the inhabitants of his lands?

# Debasements as Fiscal Policies I

- **Concept of the 'seigniorage tax'**: a burden on the public as an extra tax on real incomes
- **Inflation: almost always the inevitable result**,
- **- often the most important factors in reducing real incomes** (except for some merchants)
- - **certainly for wage-earning labourers** and artisans: nominal wages (in silver pence) not rise with prices

# Debasements as Fiscal Policies II

- **My thesis: that medieval debasements were either AGGRESSIVE OR DEFENSIVE (response to aggression)**
- **(1) Aggressive debasements (unprovoked) were primarily undertaken as fiscal policies,**
- **specifically to finance warfare.**
- – **with the partial exceptions** of England (to 1542) and early-modern Spain (from 1497)
- **Not undertaken to remedy coinage scarcities,** despite evidence for late-medieval bullion famines
- (2) **Defensive debasements**: were undertaken to protect the realm against **GRESHAM'S LAW**: protection against a neighbour's aggressive debasements

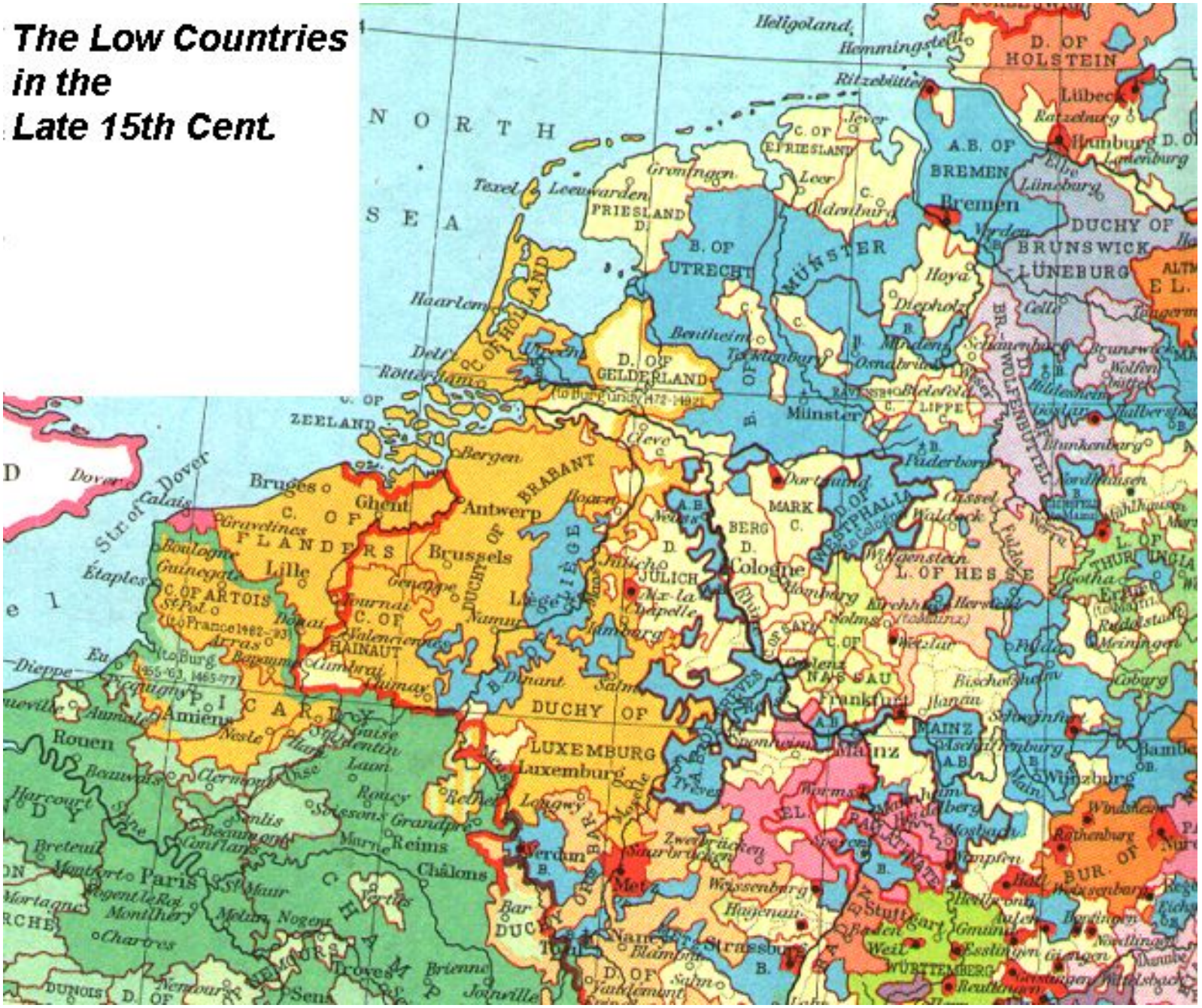
# How Debasements increased a prince's mint revenues

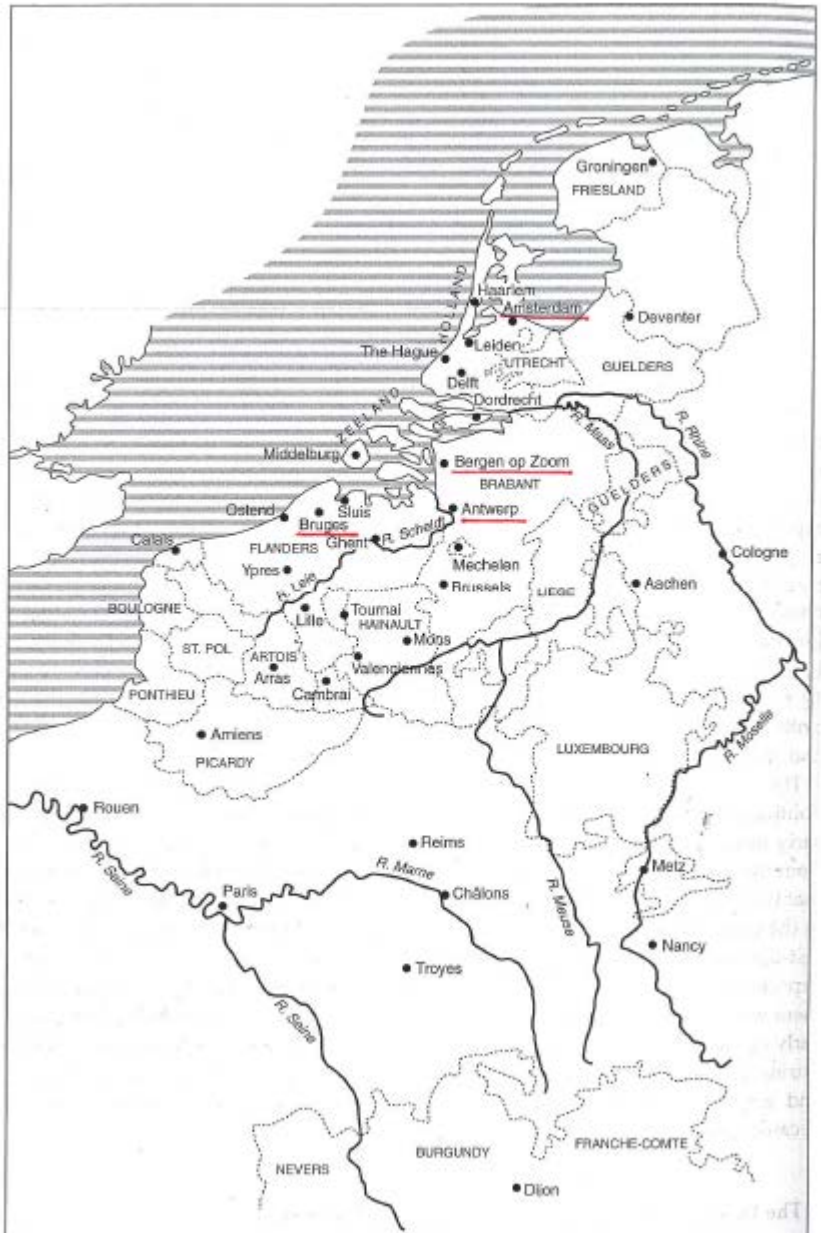
- **Objective: to increase his seigniorage revenues, by two means:**
- (1) **by increasing the seigniorage tax rate** (tax on minting): as a proportion of the bullion brought to mint); and
- (2) **by enticing an increased bullion inflow into his mints: especially influx of foreign bullion**
  - **by the debasement techniques** themselves
  - **and by auxiliary bullionist policies:**
  - esp. to prevent bullion exports (but not coin exports),
  - enticing bullion influxes from abroad – esp by minting counterfeits of neighbours coins → **GRESHAM'S LAW**

# Conditions for effective medieval debasements

- (1) **that merchants supplying bullion receive more coins of the same face value** and thus with a greater aggregate money-of-account value than before (or than from other mints);
- (2) **that the public accept such debased coins** at the same face value, by tale; and
- (3) **that the merchants spent their increased supply of coins quickly**, before any ensuing inflation eroded those gains.
- - NB: merchants: enjoyed asymmetric information about the debasement & mint price

# The Low Countries in the Late 15th Cent.




Groningen
FRIESLAND
HOLLAND
Haarlem
Amsterdam
Deventer
The Hague
Leiden
UTRECHT
GUELDERS
Delft
Dordrecht
ZEELAND
R. Meuse
R. Rhine
Middelburg
Bergen op Zoom
BRABANT
GUELDERS
Ostend
Sluis
Antwerp
Bruges
Ghent
R. Scheldt
Calais
FLANDERS
Mechelen
Cologne
Ypres
R. Lys
Brussels
LIEGE
Aachen
BOULOGNE
Tournai
Lille
HAINAULT
Mons
ST. POL
ARTOIS
Valenciennes
Arras
Cambrai
PONTHIEU
Amiens
PICARDY
LUXEMBOURG
R. Moselle
Rouen
Reims
R. Seine
R. Marne
Paris
Châlons
R. Meuse
Metz
Nancy
Troyes
R. Seine
BURGUNDY
FRANCHE-COMTE
NEVERS
Dijon

## Flemish Coinage Debasement: The Mint Ordinances of June 1418 and November 1428

| **Double Groot (Gros)** | **June 1418** | | | **November 1428** | | |
|---|---|---|---|---|---|---|
| **Value in money-of-account** [a] | 2d *groot* [or *gros* Flemish] | | | 2d *groot* [or *gros* Flemish] | | |
| **Fineness** [b] **in *argent-le-roy* (AR)** | **6 deniers AR** = = | | **50.0% fine** 47.92% pure | **5 deniers 8 grains AR** = = | | **44.44% fine** 42.59% pure |
| **Weight (Taille)** [c] **in grams**<br>Fine silver content AR in g.<br>Pure silver content in g. | 68 cut to the marc | | **3.599 grams**<br>1.800 g.<br>1.725 g. | 68.5 cut to the marc = | | **3.573 grams**<br>1.588 g.<br>1.522 g. |
| ***Traite* per *marc*** [d] ***argent-le-roy*** | $\frac{68.0 \times 2d.}{6/12} = \frac{136d}{0.5}$ = | | **22s 8d** | $\frac{68.5 \times 2d.}{5.333/12} = \frac{137d}{0.444}$ = | | **25s 8d 6mites** |
| **Division of the Traite Value per marc argent-le-roy** | **Value in groot Flemish** | **Number of coins** | **Percentage of the traite** | **Value in groot Flemish** | **Number of coins** | **Percentage of the traite** |
| **Brassage** | 1s 2d | 7 | 5.15% | 1s 2d 6m | 7 1/8 | 4.62% |
| **Seigniorage** | 4d | 2 | 1.47% | 6d 0m | 3 | 1.95% |
| **Total Mint Charges** (of the above) | 1s 6d | 9 | 6.62% | 1s 8d 6m | 10 1/8 | 6.57% |
| **Mint Price**: for merchants' bullion | 21s 2d | 127 | 93.38% | 24s 0d 0m | 144 | 93.43% |
| **Traite per Marc argent-le-roy** | **22s 8d** | **136** | **100.00%** | **25s 8d 6m** | **154 1/8** | **100.00%** |

# Flemish Coinage Terms

(1) **Values in money-of-account**

– 1 penny or 1 d groot = 24 mites = 12d or 1s parisis

(2) **Fineness or silver purity**: reckoned out of 12 deniers argent-le-roy, with 24 grains per denier

= 23/24 or 95.833% pure silver

(3) **Weight**: reckoned not in terms of ounces, but in terms of the 'taille' or the number cut from the Marc de Troyes of 8 onces = 244.753 grams

## The Flemish Silver Coinage Debasement of November 1428 and its Aftermath

| Year | Mint Outputs in Marcs argent le roy * | Mint Outputs Kilograms of pure silver | Percentage Change | Output in £ groot Flemish | Percentage Change | Seigniorage in £ groot Flemish | Percentage Change |
|---|---|---|---|---|---|---|---|
| 1428 | 4,598.700 | 1,078.647 | | 5,267.280 | | 123 | |
| 1429 | 72,460.700 | 16,996.010 | 1475.68% | 93,021.380 | 1666.02% | 2,035 | 1554.47% |
| 1430 | 34,992.400 | 8,207.638 | -51.71% | 45,065.400 | -51.55% | 1,316 | -35.33% |
| 1431 | 5,595.200 | 1,312.381 | -84.01% | 7,240.240 | -83.93% | 283 | -78.50% |
| 1432 | 104.300 | 24.464 | -98.14% | 135.140 | -98.13% | 55 | -80.57% |

* *Marc argent-le-roy* = 244.7529 grams commercially fine silver, at 23/24 or 95.833% purity, with 4.167% copper.

# Hammered Coinages I

- **Hammered Coinages: Crudity of Medieval Minting Techniques** explains successes of both debasements and counterfeiting
- **Results**: no two coins were exactly identical in size, shape, and weight
- **Weight**: defined not in fractions of an ounce but in the number (*taille*) struck from the marc/ pound
- **Therefore most consumers and shopkeepers could not readily detect newly debased coins:** note from Flemish debasement of 1428 how small the changes were, in both fineness and weight

FIG. 50. Operations in a mint of the early sixteenth century, from an engraving by Hans Burgkmair in the Emperor Maximilian's *Weisskunig*.

# Hammered Coinages II

- (1) **Scales and Touchstones**: necessary tools to test coins: available only to money-changer bankers.
- (a) **accurate scales**: having to weigh many coins – 50 or 100, in batches
- (b) **touchstones**: to gauge the fineness or purity of the metals (rubbing coins against the stone)
- **- touchstones** were accurate only to about 5%
- (2) **Coins circulated by TALE**: **number** --not by weight and fineness (except for high-valued gold coins): too costly to test coins (transaction costs)

# Hammered Coinages III

- **SWEATING AND CLIPPING COINS**: private means of debasing coins
- **Introduction of water-powered machinery** in 1690s: to produce almost perfectly shaped coins, with milled edges
- **allowed recipient to detect** changes visually
- major factor ending debasements

# Quentin Massys: The Banker and His Wife (d. Antwerp: c. 1530)

# Debasements and Inflation

- **Debasements were, indeed, generally inflationary**, if only by increasing the money supply: no. of coins in circulation
- **BUT the inflationary consequences of debasements were always less than those predicted** by the mathematical formula:
- $\Delta T = [1/(1 - x)] - 1$
- **in part, because those debasements failed to counteract the prevailing forces of monetary contraction and deflation:** in the later $14^{th}$ and $15^{th}$ centuries (1390s to the 1480s).

# Defensive Debasements: Gresham's Law

(1) **to protect domestic mints from foreign competition**, i.e., from aggressive coinage debasements from one's neighours

(2) **to protect domestic money supplies:** from influxes of debased and counterfeit imitations from neighbouring realms

**i.e., to counteract Gresham's Law: that 'cheap money drives out dear money'**

# Gresham's Law

- (1) **Elizabethan financier (ca. 1570)** who popularized the so-called 'law', well known from 14th century
- (2) **'Cheap Money Drives out Dear'**

- **i.e., if two coins appear to have the same nominal face value (e.g. 1d), but one has less silver content than the other, therefore →**
- **One spends the lower-value or inferior ('cheap') coin, with the same nominal face value;**
- **and hoards, melts down, or exports the higher silver-content coins (to wherever it has higher value)**

# Gresham's Law & Bimetallic Ratios

- (1) **MINT RATIO:** ratio of the official values of gold and silver (as coined) with country A
- - **10:1 bimetallic ratio** means that 1 ounce of coined gold has 10 times purchasing power of 1 ounce of coined silver (silver = 1/10$^{th}$ gold)
- (2) **MARKET RATIO: 12:1**, determined by:
- (a) **foreign bimetallic mint ratios**: gold & silver
- (b) **market supply of and demand** for both metals
- (c) **industrial demand for two metals** (jewellry)

# Gresham's Law & Bimetallic Ratios

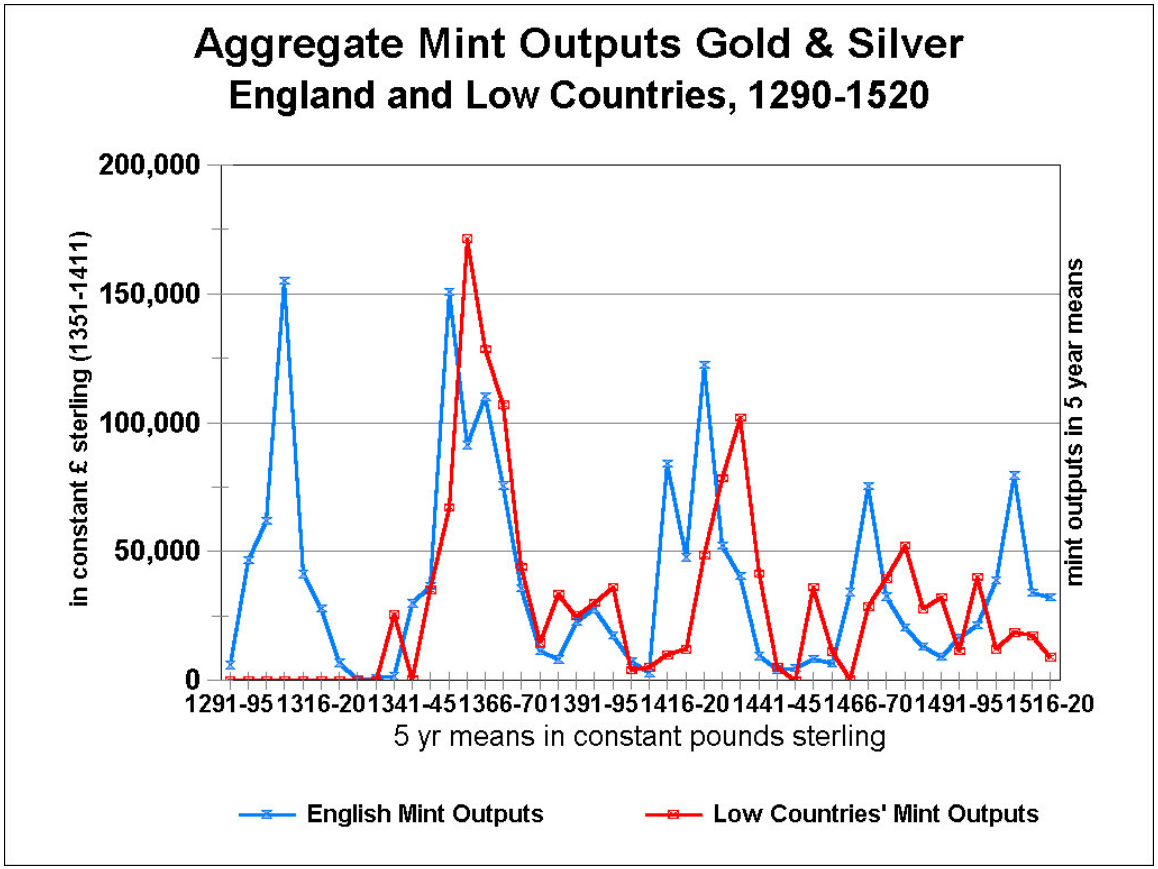
- (3) **With this difference, merchants: will take**
- **silver to mints in Country A**, with relatively higher price for silver
- **gold to mints in Country B**, offering the higher mint ratio for gold (thus lower mint ratio for silver)
- (4) **Thus differing mint ratios may drive** gold out of A, and so drive silver out of B

# Traite of the Marc de Troyes

- **Monetary unit of medieval France & Flanders: expressed in livres tournois (£) of France**
- **Marc de Troyes= 8 onces = 244.753 grams**
- **argent-le-roy:** 23/24 fine silver = 95.833% pure
- **Traite: money-of-account value of the total amount of coinage struck from one marc *argent le roy***
- **Traite = (taille * value)/percent fineness**
- **taille:** number of coins struck to the marc* the face value of the coin/ divided by →
- **The finenesss of the coin:** in deniers and grains AR:
- - e.g. 68.0 * 2/ (6/12) = 136d = 22s 8d groot (or gros)

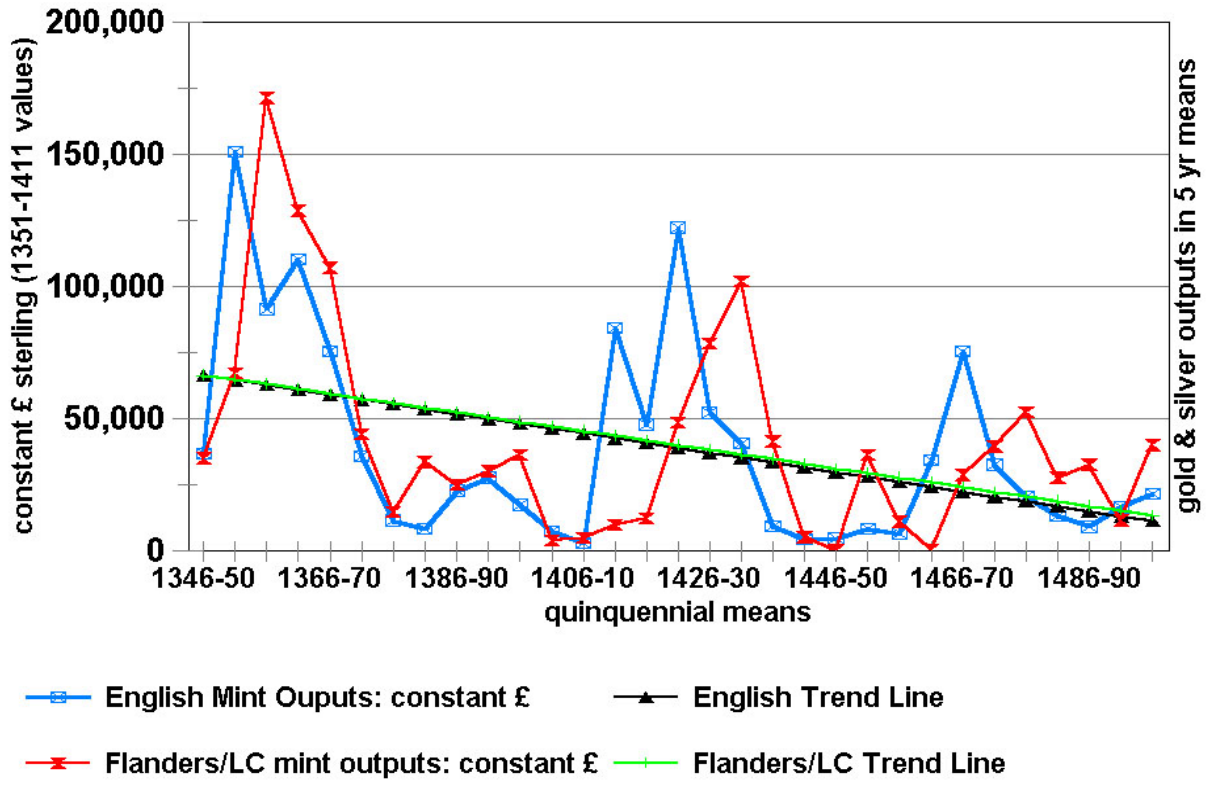
**Wizard of Id**

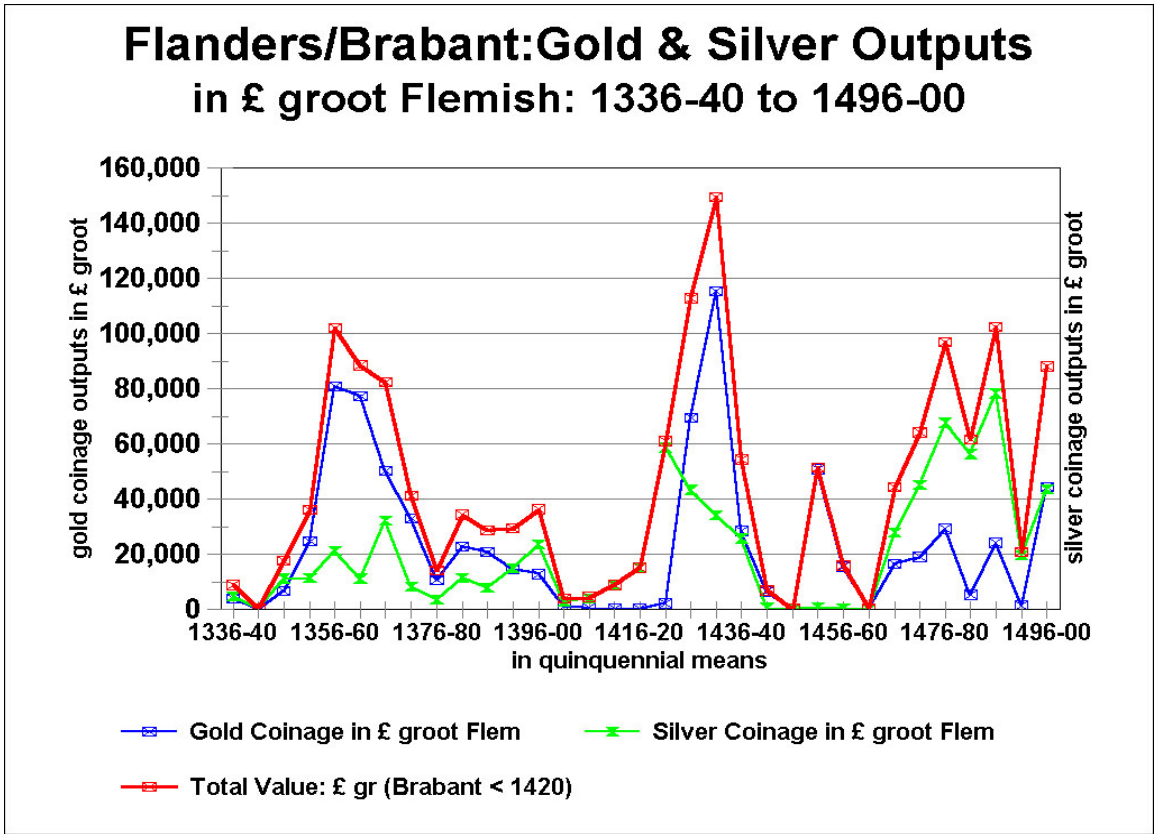

THAT COMES TO 128 DOLLARS
...WOULD YOU CARE FOR A MINT?
6-18
FORTUNATELY, I OWN ONE
©News America Syndicate, 1985 PARKER.


Aggregate Mint Outputs Gold & Silver
England and Low Countries, 1290-1520
200,000
150,000
100,000
50,000
0
in constant £ sterling (1351-1411)
mint outputs in 5 year means
1291-95
1316-20
1341-45
1366-70
1391-95
1416-20
1441-45
1466-70
1491-95
1516-20
5 yr means in constant pounds sterling
English Mint Outputs
Low Countries' Mint Outputs

# Mint Outputs of England & Flanders/LC

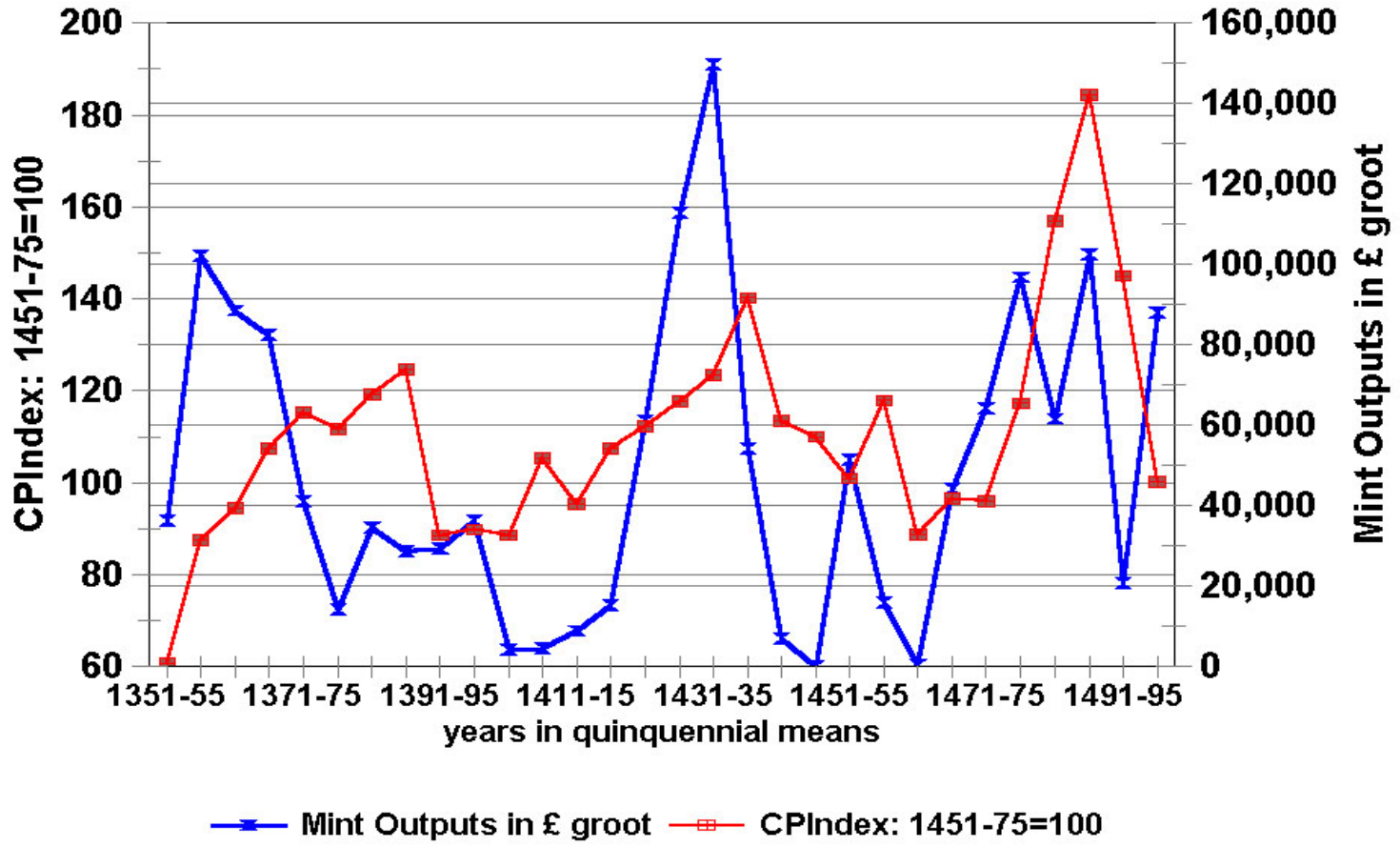
1346 - 1500 in constant £ sterling:

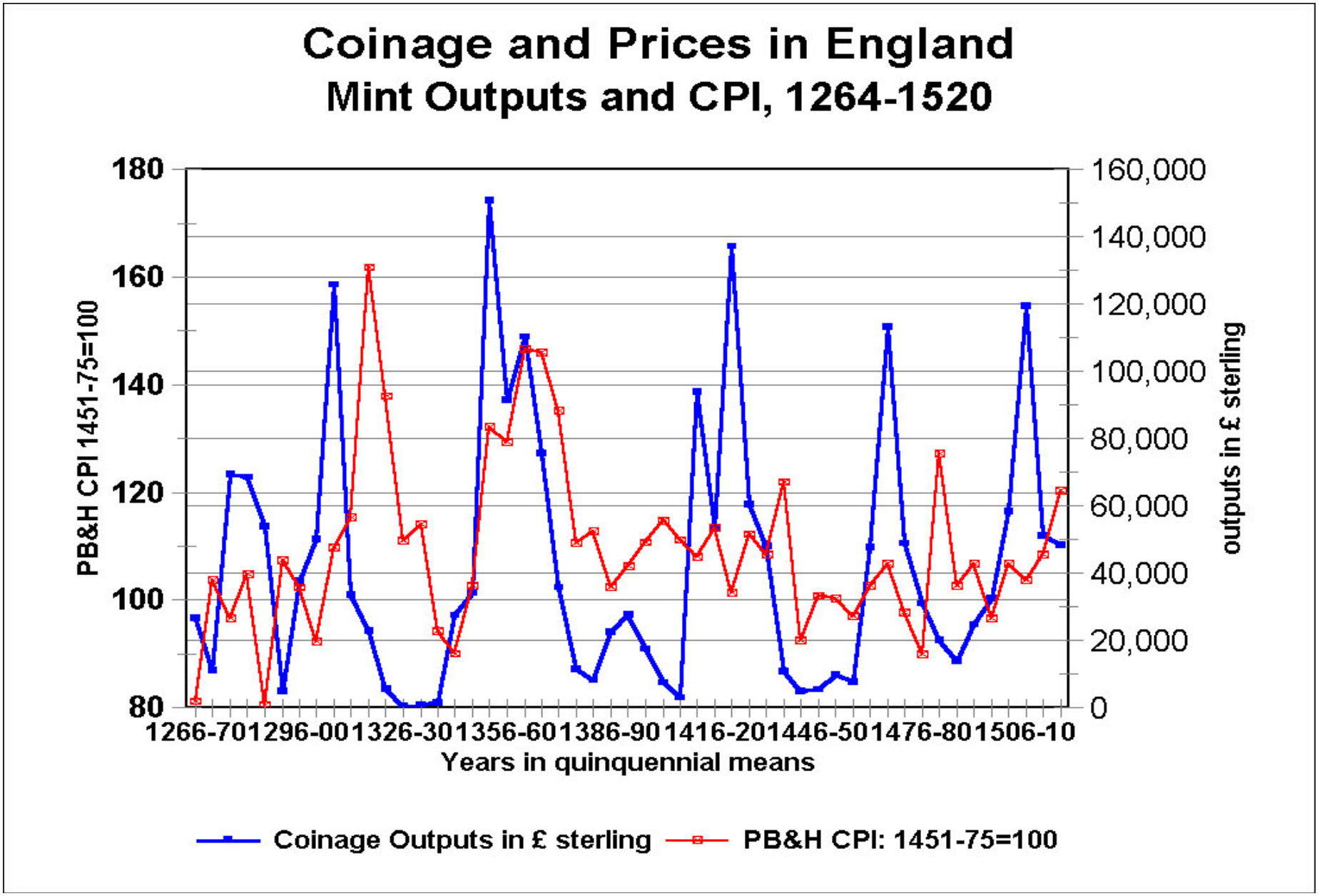



Flanders/Brabant:Gold & Silver Outputs
in £ groot Flemish: 1336-40 to 1496-00
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
gold coinage outputs in £ groot
silver coinage outputs in £ groot
1336-40
1356-60
1376-80
1396-00
1416-20
1436-40
1456-60
1476-80
1496-00
in quinquennial means
Gold Coinage in £ groot Flem
Silver Coinage in £ groot Flem
Total Value: £ gr (Brabant < 1420)

# Coinage and Prices in Low Countries

## Mint Outputs in £ gr & CPI, 1351-1500




Coinage and Prices in England
Mint Outputs and CPI, 1264-1520
PB&H CPI 1451-75=100
outputs in £ sterling
180
160
140
120
100
80
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1266-70
1296-00
1326-30
1356-60
1386-90
1416-20
1446-50
1476-80
1506-10
Years in quinquennial means
Coinage Outputs in £ sterling
PB&H CPI: 1451-75=100