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From *Gutsherrschaft* to *Grundherrschaft*:   Demographic, Monetary, and Fiscal Factors in the Late-medieval Decline of English Manorial Demesne Agriculture

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From *Gutsherrschaft* to *Grundherrschaft*: Demographic, Monetary, and Fiscal Factors in the Late-medieval Decline of English Manorial Demesne Agriculture

In order to explain the late-medieval decline of English manorial demesne agriculture, this paper is based on the paradigm of *Gutsherrschaft* and *Grundherrschaft*, which German historians have utilized to study the transformation of their feudal agriculture, east of the Elbe River, from the 15ᵗʰ to the 18ᵗʰ centuries. The former is a manorial regime in which the lord's incomes were primarily derived from the commercial exploitation of his demesnes lands, using the compulsory labour services of servile tenants. The latter is a manorial regime in which the lord's incomes were instead primarily derived from cash rents paid by largely free peasants. In East Elbia, the early-modern shift was from *Grundherrschaft* to *Gutsherrschaft*.

For manorial England's reverse shift, from *Gutsherrschaft* to *Grundherrschaft*, this paper employs a supplementary monetary and fiscal model to prove that standard 'Ricardian' demographic model is insufficient. The basic contention of the Ricardian model is that the severe fall in population, following the Black Death (1348), so altered the land:labour ratio that it not only raised labour productivity and real wages but also so enhanced the bargaining power of labour that serfdom was no longer economically and socially viable. The Ricardian model also contends that this population decline also lowered the real cost of producing grains and thus their relative prices: by ultimately forcing the abandonment of high-cost marginal lands, so that grain was being produced on more fertile, more productive, lower cost lands (peasant as well as manorial) and with more productive and thus lower cost labour. In the face of these dual problems – falling grain prices and rising wages – combined with severe labour shortages, and higher costs of enforcing serfdom, manorial lords gradually abandoned direct cultivation of their demesnes, leased out parcels of those demesnes to tenants, without servile obligations, and thus also gave up demanding labour services from their *villein* tenants, since contractions in demesne holdings obviously meant that such servile services were generally no longer needed. Most historians agree that these and institutional factors explain the decline of English serfdom.

The first part of my supplementary model, based on my earlier publications on money, prices and wages during the 'bullion famine' era of ca. 1370- ca.1420, contends that the steep fall in agricultural commodity prices, along with a lesser fall in industrial prices, constituted genuine monetary deflation (of 25%). For the logic of the demographic model – as explained here – is that a fall in grain prices, produced by *real* factors, liberated more income to be spent on livestock products (meat, dairy products, leather, woollen textiles, etc), supposedly raising their *relative* prices. And yet the fall in wool prices (42%) and other livestock prices (35%) was commensurate with the fall in grain prices (39%). The second part deals with factor prices: the undisputed fact that at least their nominal prices, in terms of wages and interest, did not fall during this era (experienced at least 'stickiness') and thus that these *real* costs rose severely for most manorial lords, ca. 1370-ca.1420. The third part of the model deals with the particular case of English wool exports: the increasing burden of royal taxation, in *fixed* and not *ad valorem* export duties, whose burden thus rose sharply with deflation (the fall in wool-prices) – amounting to 50% of the value of wool exports, by the 1390s; and these wools constituted about 70% of production costs for England's chief customers, the Flemish draperies, whose production indices fell about 80% in this period. During this period, the wool export trade fell 61% in volume, which was only partially offset by the corresponding rise of the English cloth trade.

While some manorial lords, along with peasants, were able to survive by switching from both arable and wool-oriented sheep raising to the production of other livestock products, a majority did not. Faced with rising real labour costs – so important in grain cultivation – and capital costs, and with sharply falling prices for almost all agricultural products, and possibly even steeper declines in wool sales, these lords found a much better economic solution in leasing the demesne, with a shift to *Grundherrschaft:* for they then received fixed rental incomes, often for long terms, whose *real* value thus rose with deflation. The burden of rising wages and falling prices was thus transferred to their peasant tenants – who probably still welcomed more land to work and more freedom, both economic and personal, a fair 'trade-off'.

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From *Gutsherrschaft* to *Grundherrschaft*: a paradigm to explain the leasing of English manorial demesnes, c. 1380 - c. 1420

  During the later fourteenth and early fifteenth centuries, a majority of English manorial landlords, lay and ecclesiastical, experienced a significant contraction of their demesne holdings: sometimes by sale or partial abandonment, but more often by leasing them to tenants. To explain that phenomenon, we may draw upon a paradigm that German historians have used to explain a contrary process in late-medieval and early-modern East Elbian agriculture: a shift from *Grundherrschaft* to *Gutsherrschaft*, in the context of the so-called 'rise of the Second Serfdom'.[1]   In essence the term *Grundherrschaft* describes a manorial economy in which the landlord derives the bulk of his incomes from the cash rental payments from his peasant tenants, most of whom are free; and in such an economy, most lands that had once been in demesne had been leased out into such rent-paying tenancies In contrast, *Gutsherrschaft* describes a manorial economy in which the landlord derives most, though not all, of his income from the his demesnes, or more precisely from three related sources: (1) the commercial exploitation of his demesne lands, which had become greatly expanded by the absorption of former tenancies; (2) the profits of justice and manorial administration; and (3) the labour services of the now largely servile peasant tenants who worked his demesne lands.[2] Whether or not the

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[1] Jerome Blum, 'The Rise of Serfdom in Eastern Europe', *American Historical Review,* 62 (July 1957), 807-36;   Robert Brenner, 'The Rises and Declines of Serfdom in Medieval and Early Modern Europe', in Michael L. Bush, ed., *Serfdom and Slavery: Studies in Legal Bondage* (London and New York: Addison Wesley Longman Ltd., 1996), pp. 247-76; and William Hagen, 'How Mighty the Junkers? Peasant Rents and Seigneurial Profits in Sixteenth-Century Brandenburg', *Past & Present*, no. 108 (August 1985), pp. 80 - 116. See in particular,

[2] See in particular Hagen, 'Junkers', Table 1, p. 100, concerning the capitalized market value of the manorial estates in Stavenow, Brandenburg, in 1601. The manorial house, demesne farm buildings, and the forest lands provided 31.82% of total income; demesne production, from the sale of grains, livestock products, and fisheries, provided 39.66%; manorial courts, manorial jurisdiction (courts and mills), provided 9.01%; rentals from servile tenancies provided only 15.92% and those from so-called 'foreign peasants' provided the remaining 3.59% . Of the rental income from servile tenancies, 79.06% was in the value of labour services on the demesne, 12.86% was in kind (grain), and only 8.08% was in money payments. Of the rentals from 'foreign peasants', 66.68% was in the value of labour services and the rest, 33.32% was in kind (grain).

manorial Midlands zone of medieval England had ever experienced a comparable, fully-developed *Gutsherrschaft* economy before the Black Death (or the later fourteenth century) is still a matter of dispute. There can be no dispute, however, that the manorial economies of fifteenth-century England were far more closely akin to *Grundherrschaft* than to *Gutsherrschaft*.

The evidence on late-medieval leasing of demesne lands.

There can also be no dispute that, from the late fourteenth century, the manorial regions of England experienced very significant changes that involved a widespread and extensive leasing of demesne lands to a now far freer peasantry. This particular studies utilizes demographic, monetary, and fiscal models to explain those changes related to a drastic contraction of manorial demesne lands. J. M. Bean states that 'there is a general consensus that the crucial years in this process were between 1380 and 1420', and his view is supported by a number of studies of ecclesiastical estates.[3] Thus, Ambrose Raftis contends that a dramatic 'collapse' of the direct management of demesnes on the Ramsey Abbey estates took place during and just after the 1390s.[4] Barbara Harvey, having examined the accounts of Westminster Abbey's large number of manors in southern and central England, similarly concluded that 'the turn of the tide may be placed around the year 1390'.[5] Christopher Dyer also found, on the estates of the bishop of Worcester, that 'the main break [the shift to leasing] came with [Bishop] Wakefield's death in 1395'.[6] In his analysis of the manors of the Archbishop of Canterbury, F. R. H. Du Boulay found that 'by 1400 most of the demesnes, and by 1450,

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[3] J. M. W. Bean, 'Landlords', in Edward Miller, ed., *The Agrarian History of England and Wales*, vol. III: *1348 - 1500* (Cambridge and New York: Cambridge University Press, 1991), pp. 573-76.

[4] Ambrose Raftis, 'Peasants and the Collapse of the Manorial Economy on Some Ramsey Abbey Estates', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England: Essays in Honour of Edward Miller* (Cambridge and New York: Cambridge University Press, 1996), p. 196.

[5] Barbara Harvey, *Westminster Abbey and its Estates in the Middle Ages* (Oxford: The Clarendon Press, 1977), p. 268.

[6] Christopher Dyer, *Lords and Peasants in a Changing Society: the Estates of the Bishopric of Worcester, 680 - 1540*, Past and Present Publications (Cambridge and New York: Cambridge University Press, 1980), p. 147

all of them were being leased out'.[7]

In the view of most historians, the contraction of demesne holdings was fundamentally the consequence of population decline: perhaps by some 40 percent, or even more, by the fifteenth century.[8] Demographic factors alone, however, cannot fully explain the phenomenon of leasing or 'farming' the demesnes itself, so that other economic changes, including monetary forces and fiscal policies, must also be examined for a fuller understanding of what was truly a momentous change in the economy and society of later medieval England.

The Ricardian demographic model for the decline of demesne agriculture and of villeinage

In explaining agricultural change in the later middle ages, in particular the leasing of manorial demesnes, we should first consider the standard demographic model, one that is based on Ricardo's economics. The essential argument is that population decline inevitably led to falling grain prices, and thus to falling economic rents (as determined by grain prices), and also to rising real wages, in so far as the alteration of the land:labour ratio (fewer workers per acre of arable) increased labour productivity. This labour scarcity became all the worse, driving up wages even more, as many cottars and landless labourers took up vacated tenancies, at much lower rents, and frequently with few or no obligations to perform 'customary' labour services on the demesne. Thus manorial landlords became victims of a vicious price-cost squeeze and falling incomes that ultimately forced them to abandon direct cultivation and to lease demesnes lands to peasant tenants, on the best possible terms that the peasants would accept. However, whether this model fits all the historical facts, in particular that concerning the actual timing of this transformation, remains to be seen.

'Mind the Gap': the time-lag between the Black Death and the commencement of leasing

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[7] F. R. H. Du Boulay, 'Who Were Farming the English Demesnes at the End of the Middle Ages?', *The Economic History Review*, 2nd ser., 17:3 (1965), pp. 445-46.

[8] See John Hatcher, *Plague, Population, and the English Economy, 1348-1530* (Studies in Economic History series, London, 1977), pp. 11-73; John Hatcher, 'Mortality in the Fifteenth Century: Some New Evidence', *Economic History Review*, 39 (Feb. 1986), 19-38.

If the Black Death of 1348-52 was indeed the major demographic catastrophe of the fourteenth century, and yet the first major phase of demesne leasing did not begin until the 1380s, how can we explain this time lag of thirty years or more? A. R. Bridbury offered one intriguing solution in contending that England had been so grossly overpopulated that the Black Death was 'more purgative than toxic', in eliminating an excess labour force that constituted 'disguised unemployment', so that only by the later 1370s had ongoing demographic decline become sufficiently severe to bring about the economic changes predicted in the Ricardo model. [9] Few, if any, historians have accepted his thesis, which Bridbury himself subsequently contradicted in an article contending that England was far from being overpopulated on the eve of the Black Death.[10]

Another more promising explanation for this 'time lag' between the Black Death and the onset of demesne leasing is the supposed 'feudal reaction' that immediately followed the Black Death and then endured for the next three decades.[11] The essential argument is that many manorial lords reacted to the threat of labour scarcity and rising wages, not so much by 'reimposing' villeinage (serfdom) in areas where it had waned, but rather by intensifying their exactions of customary villein labour services on their demesnes. While there is some evidence for this thesis, a 'feudal reaction' of this nature is very difficult to substantiate as a widespread phenomenon: i.e., sufficiently powerful to repress the changing market forces in both land and labour. The most substantial support for the 'feudal reaction' thesis is the oppressive parliamentary labour legislation imposed to fix maximum wages, evidently at the behest of landlords, immediately after the Black Death, namely the Ordinance of Labourers (1349), the Statute of Labourers (1351). The final major

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[9] A.R. Bridbury, 'The Black Death', *Economic History Review*, 2nd ser. 26:4 (1973), 557-92.

[10] A.R. Bridbury, 'Before the Black Death', *Economic History Review*, 2nd ser., 30:3 (August 1977), 393-410.

[11] See in particular Richard H. Britnell, 'Feudal Reaction after the Black Death in the Palatinate of Durham', *Past & Present*, no. 128 (August 1990), pp. 28-47; Rodney Hilton, *The Decline of Serfdom in Medieval England*, Studies in Economic History series (London: Macmillan, 1969), pp. 26-59; J. R. Bolton, *The Medieval English Economy, 1150 - 1500* (London: J. M. Dent & Sons, 1980), pp. 214-21; Stephen H. Rigby, *English Society in the Later Middle Ages: Class, Status, Gender* (London: Macmillan, 1995), pp. 104-27.

measure was the Statute of Cambridge (1388). The debate over the effectiveness of this legislation has

generated a vast literature that cannot be considered here.[12] One may observe, however, that, despite

substantial evidence of prosecutions for statute violations (chiefly of employees, not employers), to the 1380s,

manorial wages for both agricultural and industrial workers did rise in the two decades following the Statute,

far above the permitted rates. For example, by the 1360s and 1370s, and constantly thereafter to the 1390s,

the prevailing daily wage rate for carpenters on various Winchester manors was 4d (occasionally 5d): one

third higher than the 3d rate prescribed in the 1351 Statute.[13] That rate was all the more difficult to enforce,

because it was an unusually low rate that had only temporarily prevailed, just before the plague, in the

deflationary 1340s (Tables 4 - 5).[14]

The role of deflation in the decline of manorial demesne agriculture during the 'bullion famine' of c. 1370 - c. 1420

A more effective solution to the problem of the 'time-lag' may be found by resorting to a combined monetary

and a related fiscal model, to supplement the demographic model. The essential thesis is that England's

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[12] The classic study is B.H. Putnam, *The Enforcement of the Statute of Labourers during the First Decade after the Black Death* (New York, 1908). See also Chris Given-Wilson, 'Labour in the Context of the English Government', in James Bothwell, P.J.P. Goldberg, and W. M. Ormrod, eds, *The Problem of Labour in Fourteenth-Century England*, York Medieval Press Publications (Woodbridge, Suffolk and Rochester, NY: The Boydell Press, 2000), pp. 85-100; Simon Penn and Christopher Dyer, 'Wages and Earnings in Late Medieval England: Evidence from Enforcement of the Labour Laws', *Economic History Review*, 2nd ser., 43:3 (August 1990), 356-76; Larry Poos, 'The Social Context of Statute of Labourers Enforcement', *Law and History Review*, 1 (1983), 27-52; John Hatcher, 'England in the Aftermath of the Black Death', *Past & Present*, no. 144 (August 1994), pp. 3 - 35.

[13] Beveridge Price History Collection, Archives: British Library of Political and Economic Science, boxes A.30 - 33: for Ecchinswell, Esher, Taunton, Witney, and Wycombe. See also Table 4 below, for Farmer's 'national' means of carpenters wages: with a mean of 4.194d in the 1370s.

[14] See John Munro, 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), 207-11; John Munro, 'Before and After the Black Death: Money, Prices, and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman, eds, *New Approaches to the History of Late Medieval and Early Modern Europe: Selected Proceedings of Two International Conferences at The Royal Danish Academy of Sciences and Letters in Copenhagen in 1997 and 1999*, Historisk-filosofiske Meddelelser, no. 104 (Copenhagen: The Royal Danish Academy of Sciences and Letters, 2009), pp. 335-64.

manorial economic crisis commenced only with the onset of another severe, prolonged deflation, from the later 1370s to the 1420s, during which not only the Consumer Price Index (CPI) but the prices of all agricultural commodities fell, whereas most agricultural costs did not, thus creating the well-known 'price scissors'.[15] The related fiscal part of the model is that deflation (including the fall of wool prices) exacerbated the very onerous burden of the wool-export taxes, thereby producing a severe contraction in wool exports, and, presumably, in the demand for manorial (and peasant) wools . The deflation itself was the product of a severe, European-wide monetary contraction, the so-called 'bullion famine' (during this same era), which brought to an abrupt end the three-decade long inflation that had followed the Black Death. The evidence that monetary factors were essentially responsible for this deflation have been set forth in so many of publications by so many historians (including the present author) that they need not be presented here.[16] No monetary explanation, however, can ever be divorced from real factors; and the continuing fall in population may have played a role in reducing the income velocity of money, though commercial disruptions, insecurity, and economic pessimism were probably more important.[17]

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[15] See Munro, 'Wage-Stickiness', pp. 185-297; Munro, 'Black Death', pp. 335-64.

[16] See John Day, 'The Great Bullion Famine of the Fifteenth Century', *Past and Present*, no. 79 (May 1978), 1-54; Harry Miskimin, 'Monetary Movements and Market Structures: Forces for Contraction in 14th and 15th Century England', *Journal of Economic History*, 24 (1964): 470-90; Harry Miskimin, *The Economy of Early Renaissance Europe, 1300-1460* (Cambridge: University Press, 1975), 138-50; Peter Spufford, *Money and Its Use in Medieval Europe* (Cambridge: University Press, 1988), chapter 15, 'The Bullion Famines of the Later Middle Ages', pp. 339-62; John Munro, *Bullion Flows and Monetary Policies in England and the Low Countries, 1350 - 1500* (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1992); Munro, 'Wage-Stickiness', pp. 211-19.

[17] Note the nature of the variables in the revised Quantity Theorem equation: M.V = P.y: in which M is the total stock of money, V is the income velocity of money ('turnover'), P is the price level (CPI), and 'y' is *real* net national income or national product. Most economists prefer the alternative Cambridge Cash Balances equation: M = k.P.y, in which 'k' (the reciprocal of V) stands for that proportion of net national income that the public chooses to hold in real cash balances. For late-medieval income velocities, see Nicholas J. Mayhew, 'Population, Money Supply, and the Velocity of Circulation in England, 1300 - 1700', *Economic History Review*, 2nd ser., 48:2 (May 1995), 238-57; and Spufford, *Money and Its Use*, pp. 346-47: 'Fear of disorder made men conceal their coin. Fear of not being able to replace coin made men the keener to keep their assets liquid. With scarcity of coin went a reluctance to spend or invest what one had in hand, so that there was a sluggish circulation, which in itself was equivalent to a further reduction in the available quantity of coin'. Nevertheless he contends, along with most monetary historians, that an increased outflow of bullion to the East was the principal cause of the 'bullion famines'.

The severity and extent of this deflation during the 'bullion famine' era cannot be doubted. In England, as Table 1 shows, the quinquennial mean Consumer Price Index (with a base of 1451-75=100) fell 23.98 percent, from 1366-70 (136.46) to 1421-25 (103.74). Over this same period, the quinquennial price indexes for all agricultural commodities fell together, if not exactly in tandem with each other: grains, by 36.87 percent; meat products, by 29.17 percent; dairy products, by 14.51 percent; and wools (better qualities), by 21.24 percent. Statistical tables for Flanders, published elsewhere, demonstrate a very similar decline in the Flemish CPI and agricultural prices in this same period. As shown in other statistical tables, industrial prices in both England and Flanders also fell, though not by as much as did the agricultural prices, or the CPI.[18] That such a decline in commodity prices, if not in factor prices, was not just confined to grains but was far more general vindicates the view that north-west Europe experienced a genuine monetary deflation during this 'bullion famine' era, to the 1420s.

While the previously discussed demographic model explains why falling population should have led to lower grain prices, that model does not explain the two post-plague series of changes in prices and the price level. In particular, why was the Black Death, producing an indisputably drastic fall in Europe's population, followed not by falling grain prices, as would be expected, but instead by a European-wide inflation that affected all commodity price series (including grain prices) and one that lasted for thirty years?[19] Why did this post-plague inflationary era come to end in the 1370s, and why was that inflation then followed by the prolonged half-century deflation just described? Such problems in population-based explanations indicate that monetary factors, affecting both money stocks and flows, cannot be ignored.

The behaviour of relative prices for grains and livestock products in late-medieval England

In answering such questions about changes in prices, we must always distinguish carefully between changes in the price level and changes in the relative prices of various individual commodities. Though

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[18] Munro, 'Wage-Stickiness', Table 5, pp. 240-4, Tables 8-9, pp. 248-53.

[19] For a monetary explanation of the post-plague inflation (c. 1350-c.1375), see the sources cited in nn. 12, 14, above, in particular Munro, 'Wage-Stickiness', pp. 211-17.

monetary factors may have been predominant in determining the overall price level (CPI), a wide variety of real factors, including demographic, and their interactions, especially in their real income effects, together determined the constantly fluctuating changes in relative prices: for example, changes in grain prices compared to changes in meat and dairy prices. In later medieval England, cereal grains accounted for a large share of house-hold expenditures, on both food and drink, for the majority of society (Table 9); and grains had a low price- and income-elasticity of demand, the more so, as their prices fell. Under such circumstances, a steep fall in grain prices that exceeded the fall in the overall CPI and thus the decline in other commodity prices should have liberated substantial household income to be spent on other commodities. shift in household demand would have led to an increase in the *relative* prices of livestock and industrial products, even when their *nominal* prices were also falling.

The conditions of and changes in supply also, of course, played an important role. In general, historically, grain prices fluctuate up and down far more than do other agricultural prices, especially prices for livestock products, which in turn fluctuate more than do industrial prices. To a considerable extent, differences in their respective long-term supply schedules help explain these differences in price changes. The supply schedules for various grains are generally very steeply sloped (highly inelastic), thus helping to explain the sharp decline in their *real* prices with falling aggregate demand. Those for industrial products are only gently sloped (very elastic: with more or less constant-cost production functions); and those for livestock products usually lie in between these two sets of commodities.

In late medieval England, much evidence indicates that the agricultural sector underwent a relative shift from the production of grains to the production of various livestock commodities (though not wool, for reasons to be explored later). We should not, however, expect that such changes in the supplies of agricultural commodities would have made their longer-term supply schedules any less elastic; and those supply changes would not likely have offset the 'income effects' from falling *real* grain prices. Tables 1 and 2 clearly confirm the foregoing prediction: that the prices for meat and dairy products and for wools fell to

a lesser extent than did grain prices, so that (again) their *relative* commodity prices rose in relation to grain prices.

For most manorial landlords in late-medieval England, from the 1370s to the 1420s, the fall in all *nominal* agricultural prices, in comparison with agricultural costs, obviously posed severe problems. The plight was the more severe for those who continued to pursue a traditional demesne economy based on both grain and wool, rather than on other livestock products, for reasons that are set out below. For grain producers, engaged in a very labour-intensive form of production, in contrast to the far less labour-intensive and more land extensive forms of livestock production, the equally important concern was the behaviour of factor prices, especially wages for hired labour on the demesnes.

The behaviour of factor prices and the problem of 'stickiness'

The related aspect of the monetary model is that, while these agricultural commodity fell steeply, the factor costs of production generally did not fall in nominal terms, and indeed rose in real terms. The principal costs to be considered are interest and wages. While they are indeed 'prices', for the use of capital and labour, historically they have never behaved in the same fashion as commodity prices; and they are not included in any consumer price indexes. It is thus a fallacy to believe that all prices must move together during periods of either inflation of deflation. The primary reason why factor prices generally did not move in tandem with commodity prices is factor-price 'stickiness', a phenomenon well known in Keynesian economics.[20] Although this problem has not yet been well studied for interest rates, the most obvious reason lies in the nature of loan contracts, 'recognizances', mortgages, and related legal instruments used in borrowing money. In virtually all such contracts, the annual interest payments were fixed for the duration of the written agreements. To the extent that manorial lords borrowed money through mortgages, in using their land as collateral, they normally engaged in very long-term contracts.[21]

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[20] John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London, 1936), pp. 4-22, 257-79.

[21] For landlord borrowing, see Ambrose Raftis, *Peasant Economic Development within the English Manorial System* (Montreal and Kingston: McGill-Queen's University Press, 1996), pp. 65 - 70. The

The primary problem that concerned late-medieval manorial lords in using capital (e.g., that invested in livestock herds) was not nominal but *real* interest rates. The real interest rate is the nominal rate *minus* the annual rate of inflation (percentage annual change in the Consumer Price Index); or, for the period concerned here, the nominal interest rate *plus* the annual rate of deflation. Thus, the deflation of the late fourteenth and early fifteenth centuries inexorably increased the real   burdens of the manorial lords' annual interest payments, especially in relation to the much lower prices fetched for the sales of agricultural products. Indeed, Raftis depicts the growing plight of the Ramsey Abbey estates in the 1370s and 1380s as 'a period of lower prices and increasing capital costs on the demesne'.[22]

The novel problem of nominal 'wage stickiness' in late fourteenth-century England

In relation to money wages, the problem of 'stickiness' is all the more complex.   The flexibility of long-term wage movements depends upon the nature of the prevailing price movements. During periods of inflation, in medieval and early modern Europe, wages generally did rise, but sluggishly, with significant time lags, and thus almost never in pace with the rise of commodity prices. Therefore, real wages necessarily fell during most periods of inflation, according to the standard formula, expressed in index numbers: RWI = NWI/CPI (the real wage index = the nominal money wage index divided by the Consumer Price Index). In later medieval and early modern Europe, during periods of deflation, wages were far more rigid, so that real wages rose directly with falling prices. In this respect, what is now called 'downward wage-stickiness' is clearly related to monetary phenomena, in so far as they determine changes in the Consumer Price Index.

Henry Phelps Brown and Sheila Hopkins were amongst the first historians to call attention to this particular 'wage-stickiness' phenomenon, though they called it the 'elbow-joint' or 'ratchet effect'. They also contended that it was a new phenomenon in England, dating only from the later fourteenth century, but one

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universal prohibition against usury (interest) has made it difficult for historians to ascertain interest rates in commercial contracts.

[22] Raftis, *Peasant Economic Development*, p. 68.

that continued to prevail during subsequent periods of deflation, until the 1920s.[23] As they noted, and as did

Beveridge and Bridbury, the 1370s marked the first time that money wages did not fall with the Consumer

Price Index, as they had done earlier, in the deflationary 1330s and 1340s.[24] The same patterns of nominal

wage-stickiness during deflationary periods can also be demonstrated for the late medieval and early modern

Low Countries.[25] Keynes observed that, while an inflation-induced fall in real wages rarely provokes hostile

responses from organized labour, during deflationary periods, 'every trade union will put up some resistance

to a cut in money-wages, however small', generally for fear that such losses may never be fully recouped.[26]

John Langdon's recent study on this issue confirms patterns of wage-stickiness in medieval England, but

even before the Black Death.[27] The complex reasons for wage-stickiness, which cannot be the focus of this

study, have been explored at length in several of my recent publications.[28]

The evidence of manorial wages in later-medieval England

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[23] Henry Phelps Brown and Sheila Hopkins, 'Seven Centuries of Building Wages', *Economica*, 22:87 (August 1955), 195-206, reprinted in Henry Phelps Brown and Sheila Hopkins, *A Perspective of Wages and Prices* (London: Methuen, 1981), pp. 1- 12, esp. pp. 7-8.

[24] Phelps Brown and Hopkins, ' Building Wages,' pp. 8-10. See in particular William Beveridge, 'Westminster Wages in the Manorial Era,' *Economic History Review*, 2nd ser., 8 (1955-56), 18 - 35, esp. p. 31. See also Bridbury, 'Black Death', pp. 557-92, esp. p. 582

[25] Munro, 'Wage Stickiness', pp. 185-97; John Munro 'Money, Prices, Wages, and "Profit Inflation" in Spain, the Southern Netherlands, and England during the Price Revolution era, c. 1520 - c. 1650', *História e Economia: Revista Interdisciplinar*, 4:1 (2008), 13-71.

[26] Keynes, *General Theory*, p. 15. The late-medieval Low Countries provide examples of labour strikes (textile guilds) or civic revolts when authorities attempted to cut money-wages, during deflationary periods, even though real wages were then rising. See   John Munro, 'Gold, Guilds, and Government: The Impact of Monetary and Labour Policies on the Flemish Cloth Industry, 1390-1435', *Jaarboek voor middeleeuwse geschiedenis*, 5 (2002), 153 - 205.

[27] John Langdon, 'Waged Building Employment in Medieval England: Subsistence Safety Net or Demographic Trampoline?", in Richard Goddard, John Langdon, and Miriam Müller, eds, *Survival and Discord in Medieval Society: Essays in Honour of Christopher Dyer*, The Medieval Countryside vol. 4 (Turnhout: Brepols, 2010), pp. 109-26.

[28] See in particular Munro, 'Wage Stickiness', pp. 185-97; Munro, 'Black Death', pp. 335-64.

The collected evidence for manorial wages, both agricultural and industrial, in later fourteenth- and early fifteenth -century England is presented in Tables 3 to 6. Only those purely money rates for labour alone, paid in silver pence, have been utilized, so that any wage payments that combined money and kind (food, drink, clothing) have been deliberately excluded.[29] The most important series are those for such seasonal agricultural workers as threshers and winnowers, reapers and binders, and mowers, presented in Table 3, in five-year means. They are based the annual index-number data that David Farmer published in two volumes of the *Agrarian History of England and Wales.*[30] Farmer's data have been converted into both silver pence and index numbers for both nominal and real wages, with the Phelps Brown and Hopkins base (1451-75 = 100), which is used in all other tables in this study. The 'real wage' calculations in Tables 3 and 4 are based not on his price index but on my revised Phelps Brown and Hopkins 'Basket of Consumable' Index used in the other tables (see Table 9).

The wage data for medieval English agricultural workers are highly problematic, in two respects. In the first place, these are piece-work wages: payments for the quantity of work done, without any reference to the time taken to fulfill these tasks. Rising piece rates might have meant less work done per day, though of course they still represented a higher labour cost for manorial lords, especially if, in contradiction to traditional economic theory, rising real wages did not represent increased productivity.[31] In the second place,

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[29] David Farmer, 'Prices and Wages', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), pp 760-78, 811-17; and David Farmer, 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), pp.467-90, 516-24; Phelps Brown and Hopkins, 'Building Wages', pp. 8-12; Beveridge, ' Winchester Manors', pp. 22-43, esp. pp. 36-37. 'in the Winchester manors there is no reason for suspecting any general practice of supplementation' of money wages, when food payments are not specified.' When they are, they differ from the money-wage alone 'as a rule by 2d per day'. See also Munro, 'Wage Stickiness', pp. 194-212, and esp. pp. 202-204, and n. 48 (p. 275), for a critique of the view that supplementary wage-payments in kind were used to thwart the wage ordinances: as recently argued in Hatcher, 'Aftermath of the Black Death', pp. 3 - 35.

[30] See also his earlier study: David Farmer, 'Crop Yields, Prices and Wages in Medieval England', *Studies in Medieval and Renaissance History,* 6 (1983), 117-55.

[31] Recently, Gregory Clark has sought a remedy for this vexing problem by using regression analysis (based on other wage data) to convert English agrarian piece work wages into daily wages (again, on a 'national means' basis); but his results are so strikingly at variance with the evidence produced here that they

the annual fluctuations of these piece-work wages do not clearly demonstrate the phenomenon of wage-stickiness, especially downward wage-stickiness during deflation. The problem here lies in the compilation of the data as 'national averages' by a method that suffers from 'compositional' errors. Because of both frequent annual gaps in the manorial data and regional wage variations, the calculations of the mean wage for each class of agricultural worker each year do not necessarily reflect actual wage changes in each and every region but changes in the composition of the data, so that the absence of either higher or lower wage manors in any given year skews the results. Furthermore, the piece rates varied according to the type of grain that was threshed and winnowed (wheat, barley, and oats); and not all were consistently recorded. Thus, even within each manor, annual changes in the composition of the piece-work wage group by such grains would also have skewed the results and produced spurious fluctuations. [32]

Taking account of all these caveats, we observe from Table 3 that the nominal piece-work wages of threshers and winnowers (in index numbers) did indeed rise, as expected, after the Black Death: by 23.51 percent from 1341-45 to 1366-70. That increase in nominal wage rates did not, however, match the inflationary rise in the Consumer Price Index, so that the real wage index actually fell by a striking 23.55 percent over this same period, as a mirror image. Reapers and binders experienced a steeper rise in their nominal wages in this period: a mean of 36.58 percent, from 1341-45 to 1366-70, though also with a temporary decline in 1356-60; and again, nominal wages rose by only by only 5.36 percent from 1351-5 to 1366-70. Similarly their real wages also fell after the Black Death: by 21.80 percent, from 1341-45 to the trough of 1356-60; and, though rising thereafter, their real wages in 1366-70 were still only 85.37 percent of

cannot reasonably be used in this study. Gregory Clark, 'The Long March of History: Farm Wages, Population, and Economic Growth: England, 1209-1869', *The Economic History Review*, 2nd ser., 60:1 (February 2007), 97-135, esp. p. 101; and Table 1, pp. 99-100.

[32] See Munro, 'Wage Stickiness', pp. 196-97. For varying rates according to the type of grain threshed (not made clear in Farmer), see Beveridge, 'Winchester Manors', Table II, p. 39.

what they had earned in the early 1340s. Thus we may thus assume that the rise in nominal wages was largely a monetary phenomenon, as part of the post-plague inflations.[33]

In the deflationary era that ensued, from the later 1370s, real wages did rise, as expected, for the various manorial agricultural workers. If we compare real wages in the quinquennium 1366-70 with those for three decades later, in 1396-1400, we find that those for threshers and winnowers had risen by 48.53 percent; those for reapers and binders, by 28.23 percent; and those for mowers, by only 9.76 percent.[34] The nominal wage-rates for threshers in 1396-1400 were 19.36 percent higher than in 1366-70, but they were virtually unchanged from 1371-75 to 1391-95 (having increased just before and just after those dates). Those for reapers were just 6.5 percent higher, while those for mowers were, in fact, 11.74 per cent lower (for reasons not readily explained). This evidence suggests that the real wage gains were derived from a combination of monetary deflation and varying degrees of institutional wage-stickiness, though one possibly distorted by the calculation of national means, and by the nature of the occupations.

From the end of the fourteenth century through the first three decades of the fifteenth century, we find moderate fluctuations in the price level, but general stability in the CPI from 1396-1400 to 1426-30. During this 30-year period, nominal wages changed overall by very modest amounts: a rise of 3.24 percent, for threshers; a rise of 3.60 percent for reapers, but a decline of 2.34 percent for mowers. Consequently, the mowers suffered a small decrease of 2.34 percent in real wages, while the first two groups enjoyed only minimal real-wage gains: 2.03 percent and 2.50 percent, respectively. These observations do not justify any important conclusions about relative labour scarcities during the first third of the fifteenth century.

Some useful comparisons may be made with the piece-work wage data that Lord Beveridge published so long ago for threshing and winnowing on eight Winchester manors, though regrettably only in decennial

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[33] Munro, 'Wage Stickiness', pp;   Munro, 'Black Death', pp. 335-64.

[34] Note from Table 3 that the quinquennial mean real wages are computed by the harmonic mean, which is always somewhat lower than the arithmetic mean. For an explanation of these two means, see Munro, 'Wage Stickiness', n. 83, pp. 278-79. Farmer supplied no wages for mowers before 1350.

means.[35] For the thirty-year period from 1340-49 to 1360-69, the threshers piece-work wages rose, on average, by 21.27 percent, from 5.03d to 6.10d per quarter (= 8 bushels), and thus by less than half the rate of inflation: a 48.40 rise in the CPI. Over the same period, Farmer's 'national wage data' for threshers rose somewhat less: by 15.03 percent (from 5.62 d to 6.46 d per quarter). The Beveridge wage data for threshers also continue to rise after the inflation had ceased. If we examine the threshing rates for the individual Winchester manors we find that threshing rates had peaked at 7.25d per quarter at Downton in 1370-79, at Meon in 1380-89, and at both Overton and Ecchinswell (Itchingswell) in 1400-09. They had peaked at the higher rate of 7.50d in Wycombe in 1370-79, and at both Wargrave and Farnham in 1380-89. Thereafter, those threshing rates remained fixed in all these manors until the Beveridge data terminate in the 1450s. Thus they demonstrate the same wage stickiness found in English (and Flemish) industrial wages during prolonged deflation.[36]

The evidence of manorial and urban wage data for building craftsmen

The 'national mean' daily wage rates for manorial building craftsmen are presented in Table 4, but only for masters (carpenters, masons, thatcher, and tilers/slaters). This wage-rate series is again based on Farmer's published data, which are subject to similar caveats previously noted.[37] If we focus only on carpenters, we do find the expected rise in nominal daily wages after the Black Death: by 44.47 percent from the mean of 1341-45 (3.00d) to the mean of 1366-70 (4.33d); and this table also reveals the same fall in real wages, because the CPI had risen so much more during this period. While these 'national' wage data do not portray the same wage-stickiness found elsewhere, they do reveal a remarkable stability in nominal wages, from the early 1360s to the late 1390s, never varying by more than 1.40 percent from the mean wage of 4.247d for these three decades. If, however, we examine the annual wage data for carpenters on individual

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[35] Beveridge, 'Winchester Manors', pp. 22-43. Data are missing for Witney and Esher manors in the later fourteenth and fifteenth centuries; but the Esher data are excluded from the Beveridge mean.

[36] Munro, 'Wage Stickiness', Table 6, pp. 243-44; Tables 10-15, pp. 252-63.

[37] See above pp. 000-00 and n. 27.

Winchester manors we do indeed find that expected 'wage-stickiness': carpenters' wages that are constantly at 4d from the 1370s to the 1390s at Ecchinswell, Taunton, Witney (some at 5d), and Wycombe; and constantly at 5d at Esher, for these same three decades.[38]

In Farmer's 'national' wage means for carpenters for the fifteenth century, we find another rise in nominal wages during the first-quarter: overall, by 8.91 percent, from a mean of 4.276d 1396-1400 to one of 4.657d in 1421-25. That rise parallels the rise shown in Tables 5-6 for urban carpenters. Thereafter, however, unlike these urban wage data, the 'national' means of nominal manorial industrial wages continue to rise (despite two quinquennial declines), reaching a mean, for carpenters, of 5.283d in 1446-50, when they are 23.57 percent higher than the nominal wages of the late 1390s. Over this same half-century period, the real wage index (for carpenters) also rose – and even more – by 34.77 percent.[39]

In nominal money values, Farmer's 'national' average daily wage for manorial master carpenters in the base period 1451-75 was 5.508d, which is 91.80 percent of the Phelps Brown and Hopkins mean wage for small–town master carpenters: 6.000d (see Table 5). At the end of the fourteenth century, Farmer's 'national' average daily money wage for manorial carpenters (4.276d in 1396-1400) was 85.52 percent of the urban daily wage (5.000d). Earlier, in 1361-65, the gap had been even wider: 83.76 percent (Tables 4-5). This growing convergence of manorial and urban industrial wages may reflect one or even both of the following possibilities. The first possibility is a growing relative labour scarcity in rural areas, possibly in response to urban industrial competition, aided by an enhanced rural labour mobility – itself a reflection of manorial economic decline.[40] The second but speculative possibility to explain this growing wage convergence is the continual abandonment of direct demesne cultivation from the 1370s to the 1420s; for that

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[38] Beveridge Price History Collection, Archives: British Library of Political and Economic Science, boxes A.30 - 33.

[39] See Table 3: the percentage changes are calculated by the index numbers.

[40] See J. Ambrose Raftis, *Tenure and Mobility: Studies in the Social History of the Mediaeval English Village* (Toronto: Pontifical Institute of Mediaeval Studies, 1964).

may have left only fewer and possibly more profitable manorial and higher wage-paying demesnes to record wage payments, in documents that are indeed very sparse by the mid century.

Finally, we may supplement Farmer's and Beveridge's 'wage means' with annual data extracted from several individual manorial accounts: for the Battle Abbey manors, Westminster Abbey, Bury-St. Edmonds Abbey manor of Redgrave (Suffolk), Croyland Abbey, and for eight of the Winchester manors (Downton, Ecchinswell, Esher, Ivinghoe, Overton, Taunton, Witney, Wycombe).[41] For the period immediately following the Black Death, all extant manorial accounts indicate a rise in the daily money wages for master carpenters, masons, and other building craftsmen (daubers, tilers, thatchers) from about 3d (or less) to 4d; but, as just noted, 4d had been the prevailing daily money wage in the 1330s (at Redgrave, Croyland Abbey, Westminster, and Overton – though not at Wycombe and Ecchinswell). By the later fourteenth or early fifteenth century, the prevailing daily money wage for maser carpenters on these manors had risen from 4d to 5d. In the 1450s (when the Winchester manorial wage accounts cease), Beveridge has computed a decennial mean average daily wage of 5.23d for carpenters on eight Winchester manors.[42] The analysis of the aforesaid individual various manorial accounts indicates that the following were the prevailing daily wage rates for carpenters in the 1440s and 1450s: 5d and sometimes 6d, at Ecchinswell, Esher, Ivinghoe, Witney, and Wycombe; 5d, at Overton and Taunton; 5d or 6d, at Winchester College; 5d, at Oakington (Croyland Abbey); 5d, at Redgrave; 4d, 5d, or even 6d, at Battle Abbey (but many at 3d or 4d with food).[43] In so far as the very sparse subsequent manorial evidence indicates, these rates prevailed into the early sixteenth century.

The overall picture of late-fourteenth and early fifteenth-century agrarian wages is quite clear. Despite the evidence for wage-stickiness and despite evidence for some periodic if modest declines in other

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[41] Beveridge Price and Wage History Commission, Archives of the British Library of Political and Economic Science: Ecchinswell, Ivinghoe, Overton, Witney, and Wycombe (Box A.33: Winchester Manors); Winchester College (Box F. 8); Croyland (Box G. 10); Redgrave (Box G.14); Battle Abbey (Box H.10).

[42] Beveridge, 'Winchester Manors', Table III, p. 40

[43] See n. 39 above.

agrarian wage data, previously cited, the costs of employing labour on English demesnes had generally risen to a very high level by the early fifteenth-century, while the prices of the primary agricultural commodities (along with the consumer price index) continued to fall, sometimes sharply, during the first quarter of this century, as may be clearly seen in Tables 1 and 2. Hence, the price-cost scissors was widening even more for so many manorial lords.

The debate about real wages and labour productivity

While the 'price-cost scissors' theorem is expressed in terms of purely nominal prices and wages, the vexing question of real wages still has considerable relevance for this debate, in so far as it also concerns the important issue of changes in labour productivity. The evidence for the real-wage changes are presented in Table 3 - 6.[44] The previously advanced thesis (that the rise of real wages from the 1370s to about 1400 was due essentially to a combination of monetary deflation and downward wage-stickiness) fails, however, to explain the early fifteenth-century rise in real wages for industrial craftsmen, both manorial and urban. Why did their nominal wages rise even more, without any significant adjustments in the Consumer Price Index? As noted earlier, however, the evidence for purely agricultural manorial workers (threshers, reapers, mowers) is mixed, without any consistent overall trend in either nominal or real wages. [45] We may well ask how the English economy produced and maintained or justified any sustained rise in nominal wages in and from the early fifteenth century. Was it primarily a question of increased labour productivity, or of Total Factor Productivity (combining land, labour, and capital)? For one answer (but not a definitive one), we may revert to the alternative formula of the real wage, which now must be properly defined as: $RW = MRP_{L}$: that is, the Real Wage is a function of the *Marginal Revenue Product* of Labour. Thus, if the worker's labour

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[44] See: Munro, 'Wage Stickiness', pp. 185-297.

[45] See above, pp. 000-00. Downward wage-stickiness once again became important during the second deflationary 'bullion famine' from the 1440s to the 1470s, for both England and the Low Countries. See Munro, 'Wage Stickiness', pp. 217-30.

productivity rose but the *real* market value of his output fell, the expected increase in his real wage would have been indeterminate (or even negative).

In this respect, we should reconsider the Ricardian argument advanced earlier in this study, and the one that most economic historians continue to favour: namely, that the post-plague fall in population and the consequent alteration of the land:labour ratio necessarily led to a sharp rise in labour productivity. Indeed, Gregory Clark, in a recent article, stoutly defending the Malthusian-Ricardian approach to European economic history, has presented two dramatic graphs on this issue. The first shows a tripling of labour productivity in English agriculture, apparent from immediately after the Black Death, reaching its peak in the mid fifteenth century; and the second shows a comparable tripling in agricultural real wages over this same period.[46] The evidence presented in this study, while certainly substantiating the view that real agrarian wages ultimately did rise (from the 1370s), does not support Clark's conclusion that they 'tripled'.[47]

There are two major problems in using the Ricardian 'real wage' model on rising labour productivity to explain a price-cost squeeze, and specifically one that led to the abandonment of manorial demesne cultivation. The first is theoretical. If rising 'real' wages had been the product of an increasing marginal productivity of labour, with a much smaller quantity of more efficient labour working far better residual lands, why would manorial landlords have been concerned? For their total wage bill, with fewer workers per arable acre, might have decreased, not increased. Furthermore, why would any medieval English landlord have been concerned if his hired labourers earned a higher 'real' wage because their cost of living had fallen, with so much cheaper foodstuffs? To be sure, in accordance with Ricardian theory, the economic rent ('Ricardian surplus') on his demesne lands would have declined over time, but we may doubt that such manorial lords have gained any more by leasing such lands at a presumably lower annual rental income. Answers to this first problem may lie in an examination of the second problem.

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[46] Clark, 'Long March of History', Figure 2, p. 104; and Figure 3, p. 106; and Figure 4, p. 109.

[47] See above, pp. 000-00.

The second problem concerns the evidence on arable labour productivity, evidence that Clark neglected to consider. Several recent studies indicate that labour productivity in arable agriculture very likely fell, not rose, from the Black Death to the late fourteenth century, though they do not explain this paradox.[48] One possible reason may lie in earlier studies of Bruce Campbell. He had utilized Esther Boserup's well known demographic-agrarian thesis to contend that, in the later thirteenth and early fourteenth centuries, growing population pressures on relatively inelastic supplies of arable land had provided the requisite spur for innovations that led to productivity increases, especially in multiple-course crop rotations designed to reduce the proportion of land in fallow.[49] The subsequent fall in population, especially after the Black Death, resulting (as already noted) in more abundant supplies of land and falling grain prices, and thus evidently removed the incentives to use the more advanced fallow-reducing techniques. At the same time, many of those techniques were labour intensive, so that labour scarcities may have prevented their proper implementation. Tables in Campbell's recent publications clearly demonstrate a steady decline in crop yields and thus in agricultural productivity (Total Factor Productivity), following the Black Death, and well into the fifteenth century. In Norfolk, the weighted annual cereal yields fell from a mean of 11.9 bushels

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[48] Ambrose Raftis, 'Ramsey Abbey Estates', pp. 191-206; David Farmer, 'The Famuli in the Later Middle Ages', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England: Essays in Honour of Edward Miller* (Cambridge and New York: Cambridge University Press, 1996), pp. 207-36. See also: David Stone, 'Medieval Farm Management and Technological Mentalities: Hinderclay Before the Black Death', *The Economic History Review*, 2nd ser., 54:4 (November 2001), 612-38; David Stone, 'The Productivity of Hired and Customary Labour: Evidence from Wisbech Barton in the Fourteenth Century,' *The Economic History Review*, 2nd ser., 50:4 (November 1997), 640-56; David Stone, 'The Productivity and Management of Sheep in Late Medieval England', *Agricultural History Review,* 51:I (2003), 1-22; David Stone, *Decision-Making in Medieval Agriculture* (Oxford and New York: Oxford University Press, 2005).

[49] Esther Boserup, *Population and Technological Change: A Study of Long-Term Trends* (Chicago, 1981); Bruce Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Economic History Review*, 2nd ser., 36:1 (Feb. 1983), 26-47; Bruce M. Campbell, 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Journal of Economic History*, 43 (June 1983), 379-404; and Bruce M. S. Campbell, 'Progressiveness and Backwardness in Thirteenth and Early Fourteenth-Century English Agriculture: the Verdict of Recent Research', in Jean Marie Duvosquel and Erik Thoen, eds, *Peasants & Townsmen in Medieval Europe: Studia in Honorem Adriaan Verhulst*, Belgisch Centrum voor Landelijk Geschiedenis nr. 114/Centre belge d'histoire rurale no. 114 (Ghent, 1995), pp. 541-559.

per acre in 1325-49 to one of 8.0 bushels per acre in 1400-24.[50] Various other various studies (Raftis, Farmer, Stone, Dyer) on arable productivity in post-Plague English agriculture also indicate, however, a corresponding rise in labour productivity in pastoral or livestock agriculture, in that fewer persons were employed to look after a given flock of sheep or herd of cattle.[51]

The shift from manorial arable to pastoral (livestock) agriculture: price incentives and evidence

Changes in relative agricultural prices in the later fourteenth century further explain why many manorial landlords, in retaining their demesnes, shifted more and more from arable to pastoral agriculture, though not necessarily in the form of wool-growing. As previously noted, and as may be seen again in Table 2, *relative* commodity prices clearly moved in favour of livestock products, especially meats and dairy products, though that favourable movement did not persist into the fifteenth century, except briefly for dairy products.[52] Furthermore, Christopher Dyer has contended that the sustained rise of real wages, by the later fourteenth century, had led to a substantial increase in the consumption of meat and dairy products.[53]

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[50] Bruce M. S. Campbell and Mark Overton, 'A New Perspective on Medieval and Early Modern Agriculture: Six Centuries of Norfolk Farming, c.1250 - c.1850' , *Past & Present*, no. 141 (November 1993), 38 - 105; esp. Table 5, p. 70; Bruce M. S. Campbell, *English Seigniorial Agriculture, 1250 - 1450*, Cambridge Studies in Historical Geography no. 31 (Cambridge: Cambridge University Press, 2000), Table 7.13, p. 374; Bruce Campbell, 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History*, 57:4 (December 1997),Tables 4-5, pp. 837, 840.

[51] See sources cited in n. 46 above; and see also Dyer, *Lords and Peasants*, pp. 150-51: noting that on the Worcester manors, in 1449-50, one shepherd managed flocks of 400-500 sheep, compared to a ratio of one shepherd to 250-300 sheep on these manors in the late 1380s.

[52] In these commodity price ratios the price-index for the commodity being considered is the numerator, and that for the product being compared is the denominator. If the ratio moves above 100, the change favours the first product (numerator), if the ratio falls below 100, the change favours the other product (denominator).

[53] Christopher Dyer, 'English Diet in the Later Middle Ages', in T. H. Aston, P. R. Coss, C. Dyer, Joan Thirsk, eds, *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge University Press, 1983), pp. 191 - 216; Christopher Dyer, 'Changes in Diet in the Late Middle Ages: The Case of Harvest Workers', *The Agricultural History Review*, 36 (1988), 21 - 38; Christopher Dyer, *Standards of Living in the Later Middle Ages: Social Change in England c. 1200 - 1520* (Cambridge, 1989), especially chapters 5-8; Christopher Dyer, 'The Consumer and the Market in the Later Middle Ages', *Economic History Review*, 2nd ser., 42:3 (August 1989), 305-27. See also Michael Hicks, ed., *Revolution and Consumption in Late Medieval England* (Woodbridge, UK: The Boydell Press, 2001)

To substantiate this thesis of a shift from arable to pastoral agriculture, we may cite Bruce Campbell's abundant evidence on the use of manorial demesne lands for arable and livestock agriculture. He found that arable sown areas fell from a mean of 172.10 acres per demesne ('retained in hand') in 1300-49 to a one of 147.10 acres in 1350-99 and then to one of 142.80 acres in 1400-50: an overall decline of 17.02 percent. Over these same three periods, the percentage sown in grain (as opposed to legumes, etc.) fell from 90.47 percent to 82.21 per cent of total sown acreage. For those 'home' counties servicing the London market, during a different set of comparisons periods, 1288-1315 and 1375-99, the mean cropped or sown arable demesne areas fell even more: 23.21 percent, from a mean of 224.0 acres to one of 172.0 acres.[54] Campbell's other tables make clear that a corresponding shift to livestock raising had taken place on the surviving demesnes. From the first half of the fourteenth century through the first half of the fifteenth, mean livestock units, per 100 grain acres in demesne, increased from 64.80 units to 89.30 units.[55] Finally, his statistical tables also demonstrate a relative shift in manorial demesne incomes from their arable to their livestock sectors, between the late thirteenth and late fourteenth centuries. In the period 1288-1315, in the counties servicing the London market, manorial demesne revenues from arable lands constituted 64.40 percent of the total, and livestock for the remaining 35.60 percent. For 1375-1400, the proportions were almost reversed: only 47.80 percent of incomes came from arable agriculture and the remaining 52.20 percent came from livestock raising.[56]

The economics of wool production and of wool exports in the fourteenth century

Nevertheless, the relative shift from arable to pastoral farming, even in the classic Midlands manorial zone of 'sheep-corn' husbandry, had not necessarily favoured wool production *per se*. Rather, as Table 2

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[54] Bruce Campbell, 'Matching Supply to Demand', Tables 4-5, pp. 837, 840; Campbell, *English Seigniorial Agriculture,* Table 4.07, pp. 174-75.

[55] Campbell, *English Seigniorial Agriculture*, Table 4.07, pp. 174-75. 'All national means are the weighted product of six regional means: Norfolk, eastern counties, south-east, midlands, south-west, and the north: 41 counties and districts'. The livestock units are: horses = 1.0; oxen and adult cattle = 1.2; immature cattle = 0.8; sheep and swine = 0.1.

[56] *Ibid.,* Table 4.10, pp. 184-85.

shows, changes in the relative prices ratios, from the 1380s, became more favourable to meat and to dairy products than to wools. Of much more concern for many manorial landlords (and peasants) was the fate of the wool-export trade in the later fourteenth century. As Table 8 indicates, total raw wool-exports fell precipitously and drastically: by 58.39 percent, from the post-plague peak of 1356-60 (32,666.4 sacks) to the trough of 1411-15 (13,593.20 sacks), a decline that was not fully offset by the cloth export trade until the late fifteenth century.

The explanation for this drastic decline is to be found in changes in both the overseas and domestic economies that had begun as early as the 1290s, with the almost incessant warfare that spread throughout the entire Mediterranean basin and western Europe and merged into the Hundred Years War (1337-1453). Those wars, directly and indirectly, led to steep increases in both transportation and transactions costs that virtually destroyed long distance trade in the cheaper textiles from north-west Europe to their principal markets in the Mediterranean basin.[57] The only surviving export-oriented textile producers in this region were those (with few exceptions) that marketed very costly luxury woollens, but directed to very much smaller, wealthier markets. They did so from the 1320s and 1330s, by changing from 'price-takers' into 'price-makers': engaging in a 'monopolistic competition' based not on price but on the distinctively superior qualities of their woollens. So costly were these ultra-luxury cloths that transportation and transaction costs constituted a far smaller proportion of their sales prices than those for cheaper textiles. By far the most successful cloth manufacturers were those in the Low Countries (Flanders, Brabant, and Holland), and northern Italy (Lombardy, Tuscany: with much closer access to still lucrative Mediterranean markets). The English cloth

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[57] John Munro, 'Industrial Transformations in the North-West European Textile Trades, c. 1290 - c. 1340: Economic Progress or Economic Crisis?' in Bruce M. S. Campbell, ed., *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester and New York: Manchester University Press, 1991), pp. 110 - 48; John Munro, 'The Origins of the English 'New Draperies': The Resurrection of an Old Flemish Industry, 1270 - 1570', in Negley B. Harte, ed., *The New Draperies in the Low Countries and England, 1300 - 1800*, Pasold Studies in Textile History no. 10 (Oxford and New York: Oxford University Press, 1997), pp. 35-127; John Munro, 'The "Industrial Crisis" of the English Textile Towns, 1290 - 1330', *Thirteenth-Century England:* VII, ed. Michael Prestwich, Richard Britnell, and Robin Frame (Woodbridge, UK: Boydell Academic Press, 1999), pp. 103-41.

industry underwent a similar transformation, from the 1350s, but less successfully than these foreign rivals, before the 1460s.[58]

England, however, had greatly benefited from this industrial-commercial transformation, from its outset, simply because its high grade wool were the *sine qua non* for luxury woollen- cloth production. The very best wools, which encountered no serious rivals before the sixteenth-century improvement of Spanish *merino* wools, were those from the 'Welsh Marches' of Herefordshire and Shropshire, the Cotswolds (Gloucestershire, Worcestershire, Wiltshire, Oxfordshire, and Berkshire), and Lincolnshire (Kesteven and Lindsey).[59] The rapid reorientation of the Flemish cloth industry towards luxury products, from the 1330s, may well explain why, despite the population losses from the Black Death, the English wool export trade grew from a mean 18,075.6 sacks in 1341-45 to the aforesaid peak of 32,666.4 sacks in 1356-60.[60]

The wool export duties of Edward III and the Calais Staple

These economic transformations also explain how and why Edward III and his successors came to finance the Hundred Years' War: by heavily taxing the export of wools, which then accounted for about 90

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[58] Munro, 'Industrial Crisis', pp. 103-41; John Munro, 'The Symbiosis of Towns and Textiles: Urban Institutions and the Changing Fortunes of Cloth Manufacturing in the Low Countries and England, 1270 - 1570', *The Journal of Early Modern History*, 3:1 (February 1999), 1-74; John Munro, 'Medieval Woollens: The Western European Woollen Industries and their Struggles for International Markets, c.1000 - 1500', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols. (Cambridge and New York: Cambridge University Press, 2003), Vol. I, pp. 228-324 (esp. pp. 231-48).

[59] John Munro, 'Medieval Woollens: Textiles, Textile Technology, and Industrial Organisation, c. 800 - 1500', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols. (Cambridge and New York: Cambridge University Press, 2003), Vol. I, pp. 179-227, esp. pp. 186-91; John Munro, 'Spanish *Merino* Wools and the *Nouvelles Draperies*: an Industrial Transformation in the Late-Medieval Low Countries', *Economic History Review*, 2nd ser., 58:3 (August 2005), 431-84; John Munro, 'Wool-Price Schedules and the Qualities of English Wools in the Later Middle Ages, ca. 1270 - 1499', *Textile History*, 9 (1978), 118-69.

[60] A post-plague hedonistic spending spree, especially of inherited cash balances may also have boosted a relative demand for luxurious textiles and also contributed to an increased income velocity of money that fueled inflation, from the 1350s to the 1370s. See Robert Lopez and Harry Miskimin, 'The Economic Depression of the Renaissance', *Economic History Review*, 2nd ser., 14 (1962), 408-26; Miskimin, *Economy of Early Renaissance Europe,* pp. 134-50; Herman Van der Wee and Theo Peeters, 'Un modèle dynamique de croissance interseculaire du commerce mondiale, XIIe-XVIIIe siècles', *Annales: Economies, Sociétés, Civilisations*, 15 (1970), 100-28; John Day, 'Crises and Trends in the Late Middle Ages', in John Day, *The Medieval Market Economy* (Oxford: Blackwell, 1987)*,* pp. 185-224.

percent of total exports by value.[61] Edward's new fiscal policy began modestly with a special export levy of

20s per sack: in addition to the Old Custom of 6s 8d per sack (from 1275), and, for aliens, the additional New

Custom (1303) of 3s 4d.[62] As the costs of war mounted, so did the wool taxes. By the 1370s, total export

taxes had risen to 50s 0d a sack for denizens and 53s 4d for aliens. From 1336-50 to 1371-75, the mean

prices of better quality wools (those exported to Calais), including the export taxes, had risen from £6.123

to a £10.395 per sack, an increase of 70 percent (Table 7). Initially, the tax 'incidence' or burden was born

more by the domestic wool growers (in lower real prices) than by the foreign customers and thus was not

immediately injurious to the export trade. As Table 2 demonstrates, the ratio of wool prices to grain prices

and to the CPI itself moved sharply against wool prices from the mid 1340s until the early 1360s. Noble and

gentry landowners in both houses of parliament soon mounted a strenuous opposition to the wool export

taxes. In March 1363, Edward III sought to resolve this problem by establishing an official staple for all wool

exports to northern Europe, at the recently conquered French port of Calais (1347), just across the Channel.

The administration of the new Company of the Staple, vested in the hands of 24 merchant-aldermen,

with full powers to supervise and control all wool sales at Calais, endeavoured to shift the newly increased

export-tax burden more fully on to the foreign buyers. At the same time, the Company enforced an older

policy of stipulating minimum wool prices, county by country, in order to thwart internal competition.[63] The

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[61] See Munro, 'Medieval Woollens: Struggles for International Markets', pp. 241-55, 269-83; and
Terence H. Lloyd, *The English Wool Trade in the Middle Ages* (Cambridge: University Press, 1977), pp.
288-317. In the early 1640s, wool and wool-based textiles still accounted for 92.3 percent of total export
values. See C. G. A. Clay, *Economic Expansion and Social Change: England, 1500 - 1700*, Vol. II:
Industry, Trade, and Government (Cambridge and New York, 1984), Table XIII, p. 144.

[62]   For the following see, F.R. Barnes, 'The Taxation of Wool, 1327-1348', in G. Unwin, ed.,
Finance and Trade Under Edward III (London, 1918), pp. 137-77; N.S.B. Gras, *The Early English Customs
System: a Documentary Study of the Institutional and Economical History of the Customs from the Thirteenth
to the Sixteenth Century* (Cambridge, Mass., 1918), pp. 75-80; Eileen Power, *The Wool Trade in English
Medieval History* (London and Oxford: Oxford University Press, 1941), pp. 63-85; W. M. Ormrod, 'The
Crown and the English Economy, 1290-1348', in Bruce M.S. Campbell, ed., *Before the Black Death: Studies
in the 'Crisis' of the Early Fourteenth Century* (Manchester, 1991), pp. 149-83; Lloyd, *English Wool Trade*,
pp. 144-224.

[63] See Lloyd, *English Wool Trade*, pp. 193-256; Power, *Wool Trade*, pp. 81-85; Munro, 'Medieval
Woollens: Struggle for Markets', pp. 278-85. The Nottingham Assembly, which had granted Edward III's

Calais Staplers soon found, however, that parliament was undermining its monopoly powers. Parliament did so, first, by selling various Staple exemptions or export licences; and then second, by periodically removing the Staple itself from Calais: in 1369-76, in 1382-88, and 1390-92. Finally, in 1392, parliament restored the Staple permanently to Calais (until the port's loss to France in 1558), and the Staple's full powers, while also agreeing to sell fewer export licences for Staple exemptions (generally allowing them only for the cheaper wools that could not be sold at Calais). By this time, when the Staple finally became an effective cartel, the heavy alien duties (Table 7) had virtually eliminated the Italian merchants from the wool export trade. As Table 8 indicates, the alien share of total wool exports fell from 43.19 percent in 1366-70 to just 8.43 percent in 1401-05.[64]

By the 1390s, the deepening deflation had severely increased the wool-export tax burden, because the taxes were *specific* (fixed per sack) and not *ad valorem* (percentage): thus, the real tax burden rose as prices fell. As Table 7 demonstrates, that tax burden had now risen to 50 percent of the current wholesale export price (though diminishing somewhat in the early fifteenth century). Unfortunately, for both exporters and importers, these English wools accounted for very high proportions of pre-finishing production costs in the luxury woollen draperies in the Low Countries: ranging from 65 to 75 percent of the total .[65] It would appear that the Low Countries' woollen draperies had a relatively inelastic demand for fine quality English wools.[66] But, as economists will note, a producer's demand for industrial inputs is derived from the market

first wool subsidy in 1336, initiated this policy of fixed minimum prices by county. See Munro, 'Wool-Price Schedules', pp. 135-37.

[64] See Lloyd, *English Wool Trade*, pp. 193-256; Power, *Wool Trade*, pp. 86-103; Munro, 'Medieval Woollens: Struggle for Markets', pp. 278-85.

[65] For the data sources, see John Munro, 'Industrial Protectionism in Medieval Flanders: Urban or National?' in Harry Miskimin, David Herlihy, and A. L. Udovitch, eds, *The Medieval City* (New Haven and London: Yale University Press, 1977), Table 13.2, p. 256; John Munro, 'The Medieval Scarlet and the Economics of Sartorial Splendour', in Negley B. Harte and Kenneth G. Ponting, eds, *Cloth and Clothing in Medieval Europe: Essays in Memory of Professor E. M. Carus-Wilson*, Pasold Studies in Textile History No. 2 (London: Heinemann Educational Books, 1983), pp. 13-70, Table 3.12, p. 52.

[66] As noted earlier (p. 000 and n. 57), Spanish *merino* wools would not finally rival the best English wools until the sixteenth century; but they were being imported into the Low Countries by the 1430s. The

demand for the final product. The demand for luxury goods is by definition elastic, all the more so if there were effective available substitutes. Even if one argues that luxury apparel was a social 'necessity' for much of the European nobility and for the upper bourgeoisie, they were now finding substitutes in a wide variety of Italian-made and imported silk fabrics and other luxury textiles.[67]

The dire fate of the luxury woollen cloth industries in the late fourteenth-century Low Countries

The effect of this wool export-tax burden (admittedly combined with other negative factors) for both English wool exports and woollen cloth production in the southern Low Countries can be seen in Tables 8 and 9: in particular, for the urban draperies of Ghent, Mechelen, and Leuven in the fourteenth century and, in the first half of the fifteenth century, of Ypres as well (for which no data are available before 1406). They tell a tale even more dismal than that for the English wool trade (whose decline of almost 60 percent, by the early fifteenth century, has already been stressed).[68] The Ghent and Leuven indices reflect a slow decline to about the 1360s, and then a very precipitous decline, into the early fifteenth century (with an unfortunate lacuna for Ghent in the 1390s). This sharp decline may indicate that even from its inception, the Calais Staple had a significant impact in shifting the wool-tax burden from English growers to the Flemish and Brabantine woollen draperies. From the mean of 1356-60 to that of 1401-05, the Ghent A series data fell by 90.46 percent; the Ghent B series data fell by 86 .32 percent; the Leuven data, from the peak of 1366-70, fell by

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major urban draperies refused to consider using them, fearing the loss of customers by damaging their reputation for the ultra-luxury qualitites of their finer woollens. Only their upstart small-town rivals, known as the *nouvelles draperies*, who were then marketing cheaper imitations of traditional luxury woollens, dared to experiment with *merino* wools, although mixing them with the finer English wools. See Munro, 'Spanish *Merino* Wools', pp. 431-84.

[67] The most luxurious and most costly of all textiles worn in later-medieval and early-modern Europe were silks. For the late-medieval silk industry, see Anna Muthesius, 'Silk in the Medieval World', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols, (Cambridge: University Press, 2003), vol. I, pp. 325-54; Luca Mola, *The Silk Industry of Renaissance Venice (*Johns Hopkins University Press, 2000). For the very high prices of some silk fabrics in fifteenth-century England, with comparison with woollens' prices, see Munro, 'Medieval Scarlet', Table 3.15, p. 69; and Munro, 'Industrial Protectionism ', Table 13.3, Part I, pp. 257-60.

[68]   See Table 8. If we focus, however, only on the denizen exports, which chiefly went to Calais, and only from the imposition of the Calais Staple in 1363, we find a less drastic decline: one of 34.96 percent, from the mean of 20,899.95 sacks in 1361-65 to a mean of 13,593.2 sacks in 1391-95.

83.19 percent; the Mechelen data fell by 61.82 percent from the earlier mean of 1351-55 to the 1401-05 mean.[69]

The explanations for this decline of the Low Countries ' urban draperies are very complex, involving a myriad of factors, domestic and foreign, all of which have been considered at length in numerous recent publications.[70] Some of the latter are considered in the debate about the so-called 'Great Depression' of the later Middle Ages, including the continued negative impact of warfare on the economy: especially in terms of the rising burden of taxation, and continuous disruptions of international trade, and continuously falling population, which, however cannot account for all of the indicated industrial decline.[71]

 The rise of the English cloth export trade: **its impact on manorial demesne economies**

As is well known, the sharp decline of the English wool export trade was countered by a rise in woollen cloth exports, which clearly bore a major responsibility for the decline of both the wool-export trade and of the Low Countries' luxury cloth industries. As Table 8 indicates, the English cloth trade had enjoyed only a very minimal importance before the Black Death, or indeed before the imposition of the heavier wool-export duties. The major if quite unintended beneficiaries of English fiscal policies were the producers and exporters of English woollens, because domestic clothiers were able to purchase the same fine English wools (the same as those sold in the Low Countries) tax free, while cloth exporters paid only minimal duties. Denizens had in fact paid no duties at all, until the imposition of the Cloth Custom of 1347, which levied a

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[69] These are not based on cloth outputs but on the sale of tax farms: i.e., the right to collect taxes imposed on the production and sales of woollen cloths (their and inputs). Since they were sold at competitive annual auctions, they should reflect the dire economic realities, though possibly they exaggerate them as well (if tax rates declined with economic adversities).

[70] See in particular, Munro, 'Medieval Woollens: Struggle for Markets', pp. 244-62, 269-91; Munro, 'Symbiosis of Towns and Textiles', pp. 1-74.

[71] See the sources cited above, in nn. 14 and 58 ; and also Michael Postan, 'The Trade of Medieval Europe: the North', in M.M. Postan and Edward Miller, eds, *Cambridge Economic History of Europe*, Vol. II: *Trade and Industry in the Middle Ages* (Cambridge, 1987), pp. 168-305; John Hatcher, 'The Great Slump of the Mid-Fifteenth Century', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England* (Cambridge and New York: Cambridge University Press, 1996), pp. 237-72; Pamela Nightingale, 'England and the European Depression of the Mid-Fifteenth Century', *The Journal of European Economic History*, 26:3 (Winter 1997), 631-56.

very small export tax of 1s 2d per standard broadcloth of assize. German Hanseatic merchants refused to pay

this new duty, claiming their 1303 *Carta Mercatoria* privilege of paying only 1s 0d per broadcloth; but other

alien merchants were forced to pay both duties, for a total of 2s 4d per cloth, and later a five-percent

'poundage' tax, as well.[72]   Not surprisingly, English and Hanse merchants together soon achieved an

overwhelming dominance in the English cloth export trade, usually commanding 75 to 85 percent of the total.

[73] Their low export duties amounted to about 2.5 per cent of the mean value of broadcloths that they shipped:

about £2 to £2 10s 0d per broadcloth, in the early fifteenth century. The cost advantage of the English cloth

trade over its Flemish rivals has been calculated at about 25 to 30 per cent. By the early fifteenth century,

the mean export prices of English woollens were only about only 35 - 40 percent of the prices for the finer

Flemish and Brabantine woollens, though English woollens were not of the same quality.[74]

As Tables 8-9 indicate, English broadcloth exports enjoyed a 21-fold increase in the second half of

the fourteenth century: from a mere 1,921.2 cloths in 1351-55 to a peak of 39,525.20 in 1391-95 (in

quinquennial means). Thereafter, for reasons explained elsewhere, those exports declined to a mean of

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[72] Eleanora M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 13-18, 194-98; Gras, *The Early English Customs System,* pp. 66-85; Munro, 'Medieval Woollens: Struggle for Markets', pp. 278-88, 292-96; Munro, 'Industrial Protectionism', pp. 229-68; Munro, 'Symbiosis of Towns and Textiles', pp. 1-74. Broadcloths that were dyed either partially or wholly in 'grain' (in kermes, the scarlet dye) were subjected to much higher duties; but very few were exported in the later medieval era. See also nn. 71- 72 below.

[73] See Munro, 'Medieval Woollens: Struggle for Markets', Table 5.4, pp. 306-07. See also John Munro, 'Hanseatic Commerce in Textiles from the Low Countries and England during the Later Middle Ages: Changing Trends in Textiles, Markets, Prices, and Values, 1290 - 1570', in Marie-Luise Heckmann and Jens Röhrkasten, eds, *Von Nowgorod bis London: Studien zu Handel, Wirtschaft und Gesellschaft im mittelalterlichen Europa: Festschrift für Stuart Jenks zum 60. Geburtstag*, Nova Mediaevalia, Quellen und Studien zum europäischen Mittelalter, vol. 4 (Göttingen: Vandenhoeck & Ruprecht Unipress, 2008), pp. 97-182.

[74] Munro, 'Medieval Woollens: Struggle for Markets', Table 5.10, pp. 318-24; Munro, 'Industrial Protectionism', Table 13.3, pp. 257-62, Table 13.5, pp. 266-67; Munro, 'New Draperies', Tables 1-2, pp. 39-40, Table 3, pp. 42-44; Munro, 'Symbiosis', Table 2, p. 50; and especially John Munro, 'Three Centuries of Luxury Textile Consumption in the Low Countries and England, 1330 - 1570: Trends and Comparisons of Real Values of Woollen Broadcloths (Then and Now)', in Kathrine Vestergård and Marie Louise Nosch, eds., *The Medieval Broadcloth: Changing Trends in Fashions, Manufacturing,, and Consumption*, Ancient Textile Series, vol. 5 (Oxford: Oxbow Books, 2009), Tables 1.3 - 1.4, pp. 20-25; Tables 1.5-1.6, pp. 27-29; Table 1.7, pp. 31-32; Tables 1.11 - 1.17, pp. 39-50.

27,183.4 cloths in 1411-15; but then English cloth exports recovered to reach a mean of 40,274.6 cloths in

1421-25.[75] Despite the impressive expansion of the English cloth-export trade, and then its strong recovery

by the 1420s, it did not offer manorial landlords much hope of maintaining the prosperity of their wool-

growing demesnes during the later fourteenth and early fifteenth centuries. As the final column in Table 8

clearly indicates, the combined total volume of wool and of cloth exports, expressed as broadcloths (at the

accepted ratio of 4.333 broadcloths per wool sack), had fallen by 32.27 percent: from a mean of 150,615.29

cloths in 1356-60 to one of 102,003.75 cloths in 1421-25.   Furthermore, evidence from taxes on domestic

production (from the aulnage accounts) indicates that the English home market absorbed an increased

domestic production of only 2,800 broadcloths, by 1390s (when the evidence ceases), chiefly displacing the

former foreign imports.[76] Furthermore, the fact that a broadcloth fetched a higher value when exported than

did the same quantity of raw wool in a woolsack (apart from taxes) clearly benefited domestic clothiers and

cloth merchants, but did not directly benefit the wool-sellers.[77]   Presumably, manorial and peasant wools

were sold to domestic clothiers at the same price as those wools sold to agents of the Staplers.

The late-medieval changes in manorial demesne economies: the varieties of landlord responses.

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[75] See Munro, 'Medieval Woollens: Struggle for Markets', pp. 283-88; Munro, 'Hanseatic Commerce', pp. 97-102.

[76] For the aulnage accounts, see H.L. Gray, 'The Production and Exportation of English Woollens in the Fourteenth Century', *English Historical Review*, 39:153 (Jan. 1924), 13-35, esp. Appendix II, p. 34. The fourteenth-century accounts are available for only two periods: 1353-58 and 1394-98; and they have lacuna for London, Norfolk, Shropshire, and Worcestershire. If we subtract the annual means for total cloth exports from those for total taxed cloth outputs, for 1356-58 and 1394-98, we find that the net balance, presumably indicating domestic consumption, were 5,445 cloths and 8,256 cloths, respectively, a difference of 2,811. For cloth exports, see Carus-Wilson and Coleman, *England's Export Trade*, pp. 76, 85-86. For foreign cloth imports see also Alice Beardwood, *Alien Merchants in England, 1350 to 1377: Their Legal and Economic Position* (Cambridge, Mass: Medieval Academy, 1931), Appendix C:3: pp. 161-77.

[77] On the basis of the standard ratio of 4.333 woollen broadcloths per sack of raw wool, and a mean export value of £2.25 per broadcloth, in the early fifteenth century, a sack of finer wools (those exported to Calais) was worth, on average, £5.269 in 1421-25 (Table 7); and the same amount of wool exported in manufactured broadcloths would have been worth £9.750, or 85.04 percent more; i.e., the wool content was worth 54.04 percent of the value of the broadcloth. But when export taxes were added, the woolsack was worth, on average, £7.461: or 75.66 percent as much as the 4,333 broadcloths, with export taxes (£9.993).

Not all manorial lords were experiencing severe economic difficulties or the same difficulties in the late fourteenth and early fifteenth centuries. As already indicated, some benefited from switching to the production of other livestock products (other than wool): especially meat (beef, mutton, pork), dairy products, hides (leather). J. M. Bean notes that many gentry landowners maintained sheep flocks more for meat (and for manure) than for the wool clips in the later fourteenth and early fifteenth centuries, and that 'the abandonment of pastoral activities occurred later than that of arable farming'. [78] J. N. Hare similarly found that many ecclesiastical manors in Wiltshire had retained sheep flocks long after having leased their arable demesne lands, as did Christopher Dyer on the Bishop of Worcester's estates.[79] While the agrarian changes in some manors had involved only a shift from wool production to other forms of livestock production within the pastoral sector, that reorientation had required, in many other manors, a major shift in demesne land use from arable to pasture, as indicated earlier, with Campbell's extensive data.[80]   However, not all manorial lords were able to make such adjustments and to cope well with the new, harsh economic realties. Their failure was due to several reasons. The first was institutional. Many manorial lords had chosen to have their demesne lands intermixed with those of their tenants, in the form of plough strips, often in order to take advantage of their tenants' communal ploughing. But, in doing so, they had subjected their own demesne strips to the rigidities of communal or Open Field arable agriculture in the Midlands region.[81] They would

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[78] Bean also contended that 'lay magnates continued to maintain large flocks of sheep beyond 1420'; and that not until the 1440s did the Duchy of Lancaster give up its large sheep flocks. Bean, 'Landlords', pp. 574-76. See also Dyer, *Lords and Peasants* (1980), pp. 148-54; Bolton, *Medieval English Economy*, pp. 228-29; Power, *Wool Trade*, pp. 38-40: she also acknowledges that many manorial lords retained sheep flocks longer than they did grain cultivation on their demesnes – but does not mention the products consumed from these sheep.

[79] J. N. Hare, 'The Monks as Landlords: the Leasing of the Demesnes in Southern England', in Caroline M. Barron and Christopher Harper-Bill, eds, *The Church in Pre-Reformation Society: Essays in Honour of R. H. Du Boulay* (Boydell Press: Woodbridge, Suffolk, and Dover, N.H., 1985), p. 85-87; Dyer, *Lords and Peasants,* pp. 150-54.

[80] See above, p. 000.

[81] See Richard H. Tawney, *The Agrarian Problem in the Sixteenth Century* (London, 1912: re-issued New York and London: Harper Torchbooks, 1967), maps I-V, between pp. 166-67: of Salford, Edgeware, Maids Morton, Weedon Weston manors, in the 1590s, showing the intermixing of demesne lands with those

have had great difficulty in converting such lands to livestock raising without engrossing and enclosing such lands, in most cases by evicting tenants. That was hardly a common practice in the late fourteenth and early fifteenth centuries, and would not become so until the 1460s.[82]

The second problem was one of capital (affecting both landlords and peasants). Any extensive conversion of arable lands into pasture required very large amounts of new capital to acquire and build up herds of cattle and flocks of sheep. As already noted, *real* capital costs were rising with deflation (especially with no evidence of any significant fall in nominal interest rates during the later fourteenth and fifteenth centuries). By no means all manorial landlords had ready access to capital, especially in an era when, according to both Pamela Nightingale and Chris Briggs, supplies of credit were seriously contracting, in both the urban and rural economies. Their research provides further evidence that credit instruments were not a remedy for periodic coin shortages (at least in England) and that, instead, access to credit diminished with the effective money supply, especially if lenders feared that they would not be repaid in coin.[83]

The third problem was, again, one of labour supplies. To be sure, later-medieval livestock raising required much less labour, per acre, than did arable cultivation; and as noted earlier, labour productivity in pastoral agriculture was evidently rising.[84] Nevertheless, in the Midlands zone of classic 'sheep-corn' mixed

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of tenancy lands (plough strips).

[82] For the beginnings of the late Yorkist and Tudor Enclosure movement, see Ian Blanchard, 'Population Change, Enclosure, and the Early Tudor Economy', *Economic History Review*, 2nd ser. 23:3 (1970), 427-45; Clay, *Economic Expansion and Social Change,* chapter 3, 'Rural Society', pp. 53-101; and chapter 4, 'The Progress of Agriculture', pp. 102-41. See also n. 83 below.

[83] Pamela Nightingale, 'Monetary Contraction and Mercantile Credit in Later Medieval England', *Economic History Review*, 2nd ser., 43:4 (November 1990), 560 - 75; Chris Briggs, *Credit and Village Society in Fourteenth-Century England* (Oxford and New York: Oxford University Press, 2009); and especially Chris Briggs, 'The Availability of Credit in the English Countryside, 1400 - 1480', *Agricultural History Review*, 56:I (2008), 1-24. In establishing 'a substantial late-medieval decline in debt litigation [evidently greater than the demographic decline], and hence in real levels of [agrarian] credit' (p. 23), Briggs suggests that institutional changes in courts that handled debt litigation were also responsible, especially in between the two 'bullion famine' eras. See also Raftis, *Peasant Economic Development*, p. 68; Munro, 'Wage-Stickiness', pp. 216-17; and Spufford, *Money and Its Use*, pp. 346-47, and n. 15 above.

[84] See above pp. 000-00 and nn. 46, 49.

husbandry, many manorial lords, in first encountering manifestations of crisis in the late fourteenth century, were unwilling to contemplate a total abandonment of arable, especially because of the symbiotic relationship between arable and pastoral agriculture (e.g., sheep-folding on the post-harvest arable), simply to save on labour costs.[85] They soon found, furthermore, that the problem was not just rising wages (nominal and real) but the actual supply of available labour, even for pastoral agriculture. That was especially the plight of those manorial lords who had previously relied on at least some customary labour services on their demesnes. We hardly need now belabour the often cited point, so well developed in the literature on the decline of English serfdom or *villeinage,* during this era, that so many manorial lords found it more and more difficult to exact labour services from their villein tenants.[86] Kosminsky, having focused on this particular problem, concluded that the lesser manorial lords, the gentry small holders, fared better than did the great magnates, lay and ecclesiastical, in this economically depressed era, because they had relied to a far lesser degree on villein labour; but he did not take full account of the sharp rises in piece-work rates for hired agricultural labourers.[87]

The economic and social varieties of demesne leasing: benefits and costs for landlords and tenants

Finally, more and more manorial lords, perhaps beginning with the greater magnates, found that their simplest solution, and an increasing popular one by the 1390s, was to lease out more and more of demesne lands into leasehold tenancies, and to convert vacant villein tenancies into leaseholds, with fewer or no servile obligations. When they chose, finally, to do so, evidently depended on their particular economic and social circumstances. Many indeed may have leased their lands not specifically because of a price-cost scissor, or

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[85] For other reasons why a shift from arable to pasture was not necessarily profitable (nor all that labour-saving), before the 1520s, see Blanchard, 'Population Change', pp. 427-45, esp. pp. 437-38; and Appendix A, pp. 443-45.

[86] See Hilton, *Decline of Serfdom*, pp. 52-59; John Hatcher, 'English Serfdom and Villeinage: Towards a Reassessment', *Past and Present*, no. 90 (Feb. 1981), 3-39; and other sources cited in nn. 1-4 above.

[87] Evgenii A. Kosminsky, *Studies in the Agrarian History of England in the Thirteenth Century*, ed. R. H. Hilton and trans. Ruth Kisch, Studies in Mediaeval History, vol. 8 (Oxford: Blackwell, 1956), pp. 256-82.

because of an actual lack of capital and labour, but because of problems of personal indebtedness and lack of ready cash.

Published studies by various historians indicate a very wide variety of leaseholds, from short to long term; but the historical tendency by the early fifteenth century was towards much longer leases: of 30 to 40 years, and more.[88] During the deflationary era from the 1370s to the 1420s, most landlords preferred a longer term over a short term lease, and as just indicated, came to insist on longer term leases. Thus, a general fall in consumer prices *ipso facto* meant that the *real* value of fixed annual leasehold-rents was steadily rising (even if rents on new leases were lower). Consequently the burden of sustaining rising operating costs in commercial agriculture generally had to be born by the tenants, especially if they were unable to depend wholly on family labour and had to hire agricultural labourers now in scarce supply.

The positive 'trade-off' for such peasants, economic and social, lay in having that much more land to work, and, if they were villeins by ancestry, greater freedom and especially dignity as well, and greater freedom to conserve their labour for working their own lands: that is, if manorial lords who had abandoned direct cultivation of their former demesnes had thereby reduced their demand for villein labour services.

All these changes did not mean that there was ever a formal 'abolition of serfdom', and did not necessarily mean the abolition of other servile obligations, such as *merchet* and *heriots*.[89] But they did lead to an inexorable erosion of villeinage. Rodney Hilton commented that 'as customary [villeinage] tenures were turned into copyhold, as was general by the beginning of the fifteenth century, the servility associated with them seemed ... to melt away'.[90] But in so many cases, what also 'melted away' was security of tenure

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[88] Hilton, *Decline of Serfdom*, p. 45-46; Harvey, 'Leasing', pp. 18-21; Dyer, *Lords and Peasants*, pp. 210-11; Eric Kerridge, *Agrarian Problems in the Sixteenth Century and After*, Historical Problems: Studies and Documents no. 6 (London: Barnes and Noble, 1969), p. 47: giving examples of leases for 40, 60, or even 99 years, in the early sixteenth century.

[89] See Hilton, *Decline of Serfdom*, pp. 51-59 ('The last profits of serfdom').

[90] Hilton, *Decline of Serfdom*, p. 47. Also, p. 31: 'Villeinage was never abolished; it withered away'. 'Copyhold' means: tenure 'by copy of the court roll according to the custom of the manor'. See Tawney, *Agrarian Problem*, p. 47. He cites Noreen, *The Surveyor's Dialogue*, to note that "All copyhold land is commonly customary, but all customary land is not copyhold'.

for themselves and their offspring, i.e., inheritance rights that applied when villeins and their offspring were bound to the estate, since so many copyhold tenures were either 'at will' or were held from one to three 'lives'. As Eric Kerridge has observed, 'twenty-one years and three lives were regarded as equivalents and were of much the same length in practice', at least in the sixteenth century.[91] If so, that change to copyhold tenures meant a substantial loss of the inheritance and thus property rights actually enjoyed by so many (if not all) *villein* tenants.[92]

The variety of these agrarian changes is far too great and far too complex to be fully considered in this study, all the more so since the extant estate accounts are so few, and often incomplete. Nevertheless, at the risk of oversimplification, we may view these changes in the English agrarian economy and society, from the 1380s to the 1420s, as almost the mirror image of the subsequent transformation of the East German agrarian economy: from *Grundherrschaft* to *Gutsherrschaft* (from the later fifteenth to early seventeenth centuries).[93]

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[91] Kerridge, *Agrarian Problems,* p. 47.

[92] Hatcher, 'English Serfdom and Villeinage', pp. 3-39.

[93] See note 1 above.

List of Sources

Barnes, F.R., 'The Taxation of Wool, 1327-1348', in G. Unwin, ed., *Finance and Trade Under Edward III* (London, 1918), pp. 137-77.

Bean, J. M. W. , 'Landlords', in Edward Miller, ed., *The Agrarian History of England and Wales*, vol. III: *1348 - 1500* (Cambridge and New York: Cambridge University Press, 1991), pp. 526-86.

Beardwood, Alice, *Alien Merchants in England, 1350 to 1377: Their Legal and Economic Position* (Cambridge, Mass: Medieval Academy, 1931).

Beveridge, William, 'Westminster Wages in the Manorial Era,' *Economic History Review*, 2nd ser., 8 (1955-56), 18 - 35.

Blanchard, Ian, 'Population Change, Enclosure, and the Early Tudor Economy', *Economic History Review*, 2nd ser. 23:3 (1970), 427-45.

Blum, Jerome,'The Rise of Serfdom in Eastern Europe', *American Historical Review,* 62 (July 1957), 807-36.

Bolton, John R., *The Medieval English Economy, 1150 - 1500* (London: J. M. Dent & Sons, 1980).

Boserup, Esther, *Population and Technological Change: A Study of Long-Term Trends* (Chicago, 1981).

Brenner, Robert, 'The Rises and Declines of Serfdom in Medieval and Early Modern Europe', in Michael L. Bush, ed., *Serfdom and Slavery: Studies in Legal Bondage* (London and New York: Addison Wesley Longman Ltd., 1996), pp. 247-76.

Bridbury, Anthony R., 'The Black Death', *Economic History Review*, 2nd ser. 26:4 (1973), 557-92.

Bridbury, Anthony R., 'Before the Black Death', *Economic History Review*, 2nd ser., 30:3 (August 1977), 393-410.

Bridbury, Anthony R., *Medieval English Clothmaking: An Economic Survey* (London, 1982).

Briggs, Chris, 'The Availability of Credit in the English Countryside, 1400 - 1480', *Agricultural History Review*, 56:I (2008), 1-24.

Briggs, Chris, *Credit and Village Society in Fourteenth-Century England* (Oxford and New York: Oxford University Press, 2009).

Britnell, Richard H., 'Feudal Reaction after the Black Death in the Palatinate of Durham', *Past & Present*, no. 128 (August 1990), pp. 28-47.

Campbell, Bruce M. S., 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Economic History Review*, 2nd ser., 36:1 (Feb. 1983), 26-47. Reprinted in Bruce M. S. Campbell, *The Medieval Antecedents of English Agricultural Progress*, Variorum Collected Studies Series CS872 (Aldershot, Hampshire; and Burlington, VT: Ashgate Publishing Ltd, 2007).

Campbell, Bruce M. S., 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Journal of Economic History*, 43 (June 1983), 379-404. Reprinted in Bruce M. S. Campbell, *The Medieval Antecedents of English Agricultural Progress,* Variorum Collected Studies Series CS872 (Aldershot, Hampshire; and Burlington, VT: Ashgate Publishing Ltd, 2007).

Campbell, Bruce M. S., Campbell, 'Progressiveness and Backwardness in Thirteenth and Early Fourteenth-Century English Agriculture: the Verdict of Recent Research', in Jean Marie Duvosquel and Erik Thoen, eds, *Peasants & Townsmen in Medieval Europe: Studia in Honorem Adriaan Verhulst*, Belgisch Centrum voor Landelijk Geschiedenis nr. 114/Centre belge d'histoire rurale no. 114 (Ghent, 1995), pp. 541-559.

Campbell, Bruce M. S., 'Matching Supply to Demand: Crop Production and Disposal by English Demesnes in the Century of the Black Death', *Journal of Economic History*, 57:4 (December 1997). Reprinted in Bruce M. S. Campbell, *The Medieval Antecedents of English Agricultural Progress,* Variorum Collected Studies Series CS872 (Aldershot, Hampshire; and Burlington, VT: Ashgate Publishing Ltd, 2007).

Campbell, Bruce M. S., *English Seigniorial Agriculture, 1250 - 1450*, Cambridge Studies in Historical Geography no. 31 (Cambridge: Cambridge University Press, 2000).

Campbell, Bruce M. S., Campbell; and Mark Overton, 'A New Perspective on Medieval and Early Modern Agriculture: Six Centuries of Norfolk Farming, c.1250 - c.1850', *Past & Present*, no. 141 (November 1993), 38 - 105. Reprinted in Bruce M. S. Campbell, *The Medieval Antecedents of English Agricultural Progress,* Variorum Collected Studies Series CS872 (Aldershot, Hampshire; and Burlington, VT: Ashgate Publishing Ltd, 2007).

Carus Wilson, Eleanora M.; and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963).

Clark, Gregory, 'The Long March of History: Farm Wages, Population, and Economic Growth: England, 1209-1869', *The Economic History Review*, 2nd ser., 60:1 (February 2007), 97-135.

Clay, C. G. A. , *Economic Expansion and Social Change: England, 1500 - 1700*, Vol. II: *Industry, Trade, and Government* (Cambridge and New York, 1984).

Day, John, 'The Great Bullion Famine of the Fifteenth Century', *Past and Present*, no. 79 (May 1978), 1-54.

Day, John, 'Crises and Trends in the Late Middle Ages', in John Day, *The Medieval Market Economy* (Oxford: Blackwell, 1987), pp. 185-224.

Du Boulay, F. R. H., 'Who Were Farming the English Demesnes at the End of the Middle Ages?', *The Economic History Review*, 2nd ser., 17:3 (1965), 433-55.

Dyer, Christopher, *Lords and Peasants in a Changing Society: the Estates of the Bishopric of Worcester, 680 - 1540*, Past and Present Publications (Cambridge and New York: Cambridge University Press, 1980).

Dyer, Christopher, 'English Diet in the Later Middle Ages', in T. H. Aston, P. R. Coss, C. Dyer, Joan Thirsk, eds, *Social Relations and Ideas: Essays in Honour of R. H. Hilton* (Cambridge University Press, 1983), pp. 191 - 216.

Dyer, Christopher, 'Changes in Diet in the Late Middle Ages: The Case of Harvest Workers', *The Agricultural History Review*, 36 (1988), 21 - 38.

Dyer, Christopher, *Standards of Living in the Later Middle Ages: Social Change in England c. 1200 - 1520* (Cambridge, 1989).

Dyer, Christopher, 'The Consumer and the Market in the Later Middle Ages', *Economic History Review*, 2nd ser., 42:3 (August 1989), 305-27.

Farmer, David L., 'Crop Yields, Prices and Wages in Medieval England', *Studies in Medieval and Renaissance History,* 6 (1983), 117-55.

Farmer, David L., 'Prices and Wages', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), pp 760-78, 811-17.

Farmer, David L., 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), pp.467-90, 516-24

Farmer, David L., 'The Famuli in the Later Middle Ages', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England: Essays in Honour of Edward Miller* (Cambridge and New York: Cambridge University Press, 1996), pp. 207-36.

Given-Wilson, Chris, 'Labour in the Context of the English Government', in James Bothwell, P.J.P. Goldberg, and W. M. Ormrod, eds, *The Problem of Labour in Fourteenth-Century England*, York Medieval Press Publications (Woodbridge, Suffolk and Rochester, NY: The Boydell Press, 2000), pp. 85-100.

Gras, Norman S.B., *The Early English Customs System: a Documentary Study of the Institutional and Economical History of the Customs from the Thirteenth to the Sixteenth Century* (Cambridge, Mass., 1918).

Gray, H.L., 'The Production and Exportation of English Woollens in the Fourteenth Century', *English Historical Review*, 39:153 (Jan. 1924), 13-35.

Hagen, William, 'How Mighty the Junkers? Peasant Rents and Seigneurial Profits in Sixteenth-Century Brandenburg', *Past & Present*, no. 108 (August 1985), pp. 80 - 116.

Hare, J. N. , 'The Monks as Landlords: the Leasing of the Demesnes in Southern England', in Caroline M. Barron and Christopher Harper-Bill, eds, *The Church in Pre-Reformation Society: Essays in Honour of R. H. Du Boulay* (Boydell Press: Woodbridge, Suffolk, and Dover, N.H., 1985), pp. 82-95

Harvey, Barbara, *Westminster Abbey and its Estates in the Middle Ages* (Oxford: The Clarendon Press, 1977).

Hatcher, John, *Plague, Population, and the English Economy, 1348-1530* (Studies in Economic History series, London, 1977).

Hatcher, John, 'English Serfdom and Villeinage: Towards a Reassessment', *Past and Present*, no. 90 (Feb. 1981), 3-39.

Hatcher, John , 'Mortality in the Fifteenth Century: Some New Evidence', *Economic History Review*, 39 (Feb. 1986), 19-38.

Hatcher, John, 'England in the Aftermath of the Black Death', *Past & Present*, no. 144 (August 1994), 3 - 35.

Hatcher, John, 'The Great Slump of the Mid-Fifteenth Century', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England* (Cambridge and New York: Cambridge University Press, 1996), pp. 237-72.

Hicks, Michael, ed., *Revolution and Consumption in Late Medieval England* (Woodbridge, UK: The Boydell Press, 2001).

Hilton, Rodney H., *The Decline of Serfdom in Medieval England*, Studies in Economic History series (London: Macmillan, 1969).

Kerridge, Eric, *Agrarian Problems in the Sixteenth Century and After*, Historical Problems: Studies and Documents no. 6 (London: Barnes and Noble, 1969).

Keynes, John Maynard, *The General Theory of Employment, Interest and Money* (London, 1936).

Kosminsky, Evgenii A., *Studies in the Agrarian History of England in the Thirteenth Century*, ed. R. H. Hilton and trans. Ruth Kisch, Studies in Mediaeval History, vol. 8 (Oxford: Blackwell, 1956).

Langdon, John, 'Waged Building Employment in Medieval England: Subsistence Safety Net or Demographic Trampoline?", in Richard Goddard, John Langdon, and Miriam Müller, eds, *Survival and Discord in Medieval Society: Essays in Honour of Christopher Dyer*, The Medieval Countryside vol. 4 (Turnhout: Brepols, 2010), pp. 109-26.

Terence H. Lloyd, *The Movement of Wool Prices in Medieval England*, Economic History Review Supplements no. 6 (Cambridge, 1973).

Lloyd, Terence H., *The English Wool Trade in the Middle Ages* (Cambridge: University Press, 1977).

Lopez, Robert; and Harry Miskimin, 'The Economic Depression of the Renaissance', *Economic History Review*, 2nd ser., 14 (1962), 408-26.

Mayhew, Nicholas J., 'Population, Money Supply, and the Velocity of Circulation in England, 1300 - 1700', *Economic History Review*, 2nd ser., 48:2 (May 1995), 238-57.

Miskimin, Harry, 'Monetary Movements and Market Structures: Forces for Contraction in 14th and 15th Century England', *Journal of Economic History*, 24 (1964): 470-90.

Miskimin, Harry, *The Economy of Early Renaissance Europe, 1300-1460* (Cambridge: University Press, 1975).

Mola, Luca, *The Silk Industry of Renaissance Venice (*Johns Hopkins University Press, 2000).

Munro, John H. , 'Industrial Protectionism in Medieval Flanders: Urban or National?' in Harry Miskimin, David Herlihy, and A. L. Udovitch, eds, *The Medieval City* (New Haven and London: Yale University Press, 1977), pp. 229-68. Reprinted in John Munro, *Textiles, Towns, and Trade: Essays in the Economic History*

of Late-Medieval England and the Low Countries, Variorum Collected Studies series CS 442 (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1994).

Munro, John H. , 'Wool-Price Schedules and the Qualities of English Wools in the Later Middle Ages, ca. 1270 - 1499', *Textile History*, 9 (1978), 118-69. Reprinted in John Munro, *Textiles, Towns, and Trade: Essays in the Economic History of Late-Medieval England and the Low Countries*, Variorum Collected Studies series CS 442 (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1994).

Munro, John H. , 'The Medieval Scarlet and the Economics of Sartorial Splendour', in Negley B. Harte and Kenneth G. Ponting, eds, *Cloth and Clothing in Medieval Europe: Essays in Memory of Professor E. M. Carus-Wilson*, Pasold Studies in Textile History No. 2 (London: Heinemann Educational Books, 1983), pp. 13-70. Reprinted in John Munro, *Textiles, Towns, and Trade: Essays in the Economic History of Late-Medieval England and the Low Countries*, Variorum Collected Studies series CS 442 (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1994).

Munro, John H. , 'Industrial Transformations in the North-West European Textile Trades, c. 1290 - c. 1340: Economic Progress or Economic Crisis?' in Bruce M. S. Campbell, ed., *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester and New York: Manchester University Press, 1991), pp. 110 - 48. Reprinted in John Munro, *Textiles, Towns, and Trade: Essays in the Economic History of Late-Medieval England and the Low Countries*, Variorum Collected Studies series CS 442 (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1994).

Munro, John H. , *Bullion Flows and Monetary Policies in England and the Low Countries, 1350 - 1500* (Aldershot, Hampshire; and Brookfield, Vermont: Ashgate Publishing Ltd., 1992).

Munro, John H. , 'The Origins of the English 'New Draperies': The Resurrection of an Old Flemish Industry, 1270 - 1570', in Negley B. Harte, ed., *The New Draperies in the Low Countries and England, 1300 - 1800*, Pasold Studies in Textile History no. 10 (Oxford and New York: Oxford University Press, 1997), pp. 35-127.

Munro, John H. , 'The Symbiosis of Towns and Textiles: Urban Institutions and the Changing Fortunes of Cloth Manufacturing in the Low Countries and England, 1270 - 1570', *The Journal of Early Modern History*, 3:1 (February 1999), 1-74.

Munro, John H. , 'The "Industrial Crisis" of the English Textile Towns, 1290 - 1330', *Thirteenth-Century England:* VII, ed. Michael Prestwich, Richard Britnell, and Robin Frame (Woodbridge, UK: Boydell Academic Press, 1999), pp. 103-41.

Munro, John H. , 'Gold, Guilds, and Government: The Impact of Monetary and Labour Policies on the Flemish Cloth Industry, 1390-1435', *Jaarboek voor middeleeuwse geschiedenis*, 5 (2002), 153 - 205.

Munro, John H. , 'Medieval Woollens: The Western European Woollen Industries and their Struggles for International Markets, c.1000 - 1500', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols. (Cambridge and New York: Cambridge University Press, 2003), Vol. I, pp. 228-324.

Munro, John H., 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), 185 - 297.

Munro, John H. , 'Medieval Woollens: Textiles, Textile Technology, and Industrial Organisation, c. 800 - 1500', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols. (Cambridge and New York: Cambridge University Press, 2003), Vol. I, chapter 4, pp. 181-227.

Munro, John H. , 'Medieval Woollens: The Western European Woollen Industries and their Struggles for International Markets, c.1000 - 1500', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols. (Cambridge and New York: Cambridge University Press, 2003), Vol. I, chapter 5, pp. 228-324, 378-86 (bibliography).

Munro, John H., 'Spanish *Merino* Wools and the *Nouvelles Draperies*: an Industrial Transformation in the Late-Medieval Low Countries', *Economic History Review*, 2nd ser., 58:3 (August 2005), 431-84.

John Munro, 'Builders' Wages in Southern England and the Southern Low Countries, 1346 -1500: A Comparative Study of Trends in and Levels of Real Incomes', in Simonetta Cavaciocchi, ed., *L'Edilizia prima della rivoluzione industriale, secc. XIII-XVIII*, Atti delle "Settimana di Studi" e altri convegni, no. 36, Istituto Internazionale di Storia Economica "Francesco Datini" (Florence: Le Monnier, 2005), pp. 1013-76.

Munro, John H. , 'Money, Prices, Wages, and "Profit Inflation" in Spain, the Southern Netherlands, and England during the Price Revolution era, c. 1520 - c. 1650', *História e Economia: Revista Interdisciplinar*, 4:1 (2008), 13-71.

Munro, John H. , 'Hanseatic Commerce in Textiles from the Low Countries and England during the Later Middle Ages: Changing Trends in Textiles, Markets, Prices, and Values, 1290 - 1570', in Marie-Luise Heckmann and Jens Röhrkasten, eds, *Von Nowgorod bis London: Studien zu Handel, Wirtschaft und Gesellschaft im mittelalterlichen Europa: Festschrift für Stuart Jenks zum 60. Geburtstag*, Nova Mediaevalia, Quellen und Studien zum europäischen Mittelalter, vol. 4 (Göttingen: Vandenhoeck & Ruprecht Unipress, 2008), pp. 97-182.

Munro, John H. , 'Three Centuries of Luxury Textile Consumption in the Low Countries and England, 1330 - 1570: Trends and Comparisons of Real Values of Woollen Broadcloths (Then and Now)', in Kathrine Vestergård and Marie Louise Nosch, eds., *The Medieval Broadcloth: Changing Trends in Fashions, Manufacturing,, and Consumption*, Ancient Textile Series, vol. 5 (Oxford: Oxbow Books, 2009), pp. 1-73.

Munro, John H. , 'Before and After the Black Death: Money, Prices, and Wages in Fourteenth-Century England', in Troels Dahlerup and Per Ingesman, eds, *New Approaches to the History of Late Medieval and Early Modern Europe: Selected Proceedings of Two International Conferences at The Royal Danish Academy of Sciences and Letters in Copenhagen in 1997 and 1999*, Historisk-filosofiske Meddelelser, no. 104 (Copenhagen: The Royal Danish Academy of Sciences and Letters, 2009), pp. 335-64.

Muthesius, Anna, 'Silk in the Medieval World', in David Jenkins, ed., *The Cambridge History of Western Textiles*, 2 vols, (Cambridge: University Press, 2003), vol. I, pp. 325-54.

Nightingale, Pamela, 'Monetary Contraction and Mercantile Credit in Later Medieval England', *Economic History Review*, 2nd ser., 43:4 (November 1990), 560 - 75.

Nightingale, Pamela, 'England and the European Depression of the Mid-Fifteenth Century', *The Journal of European Economic History*, 26:3 (Winter 1997), 631-56.

Ormrod, W. Mark , 'The Crown and the English Economy, 1290-1348', in Bruce M.S. Campbell, ed., *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester, 1991), pp. 149-83.

Penn, Simon; and Christopher Dyer, 'Wages and Earnings in Late Medieval England: Evidence from Enforcement of the Labour Laws', *Economic History Review*, 2nd ser., 43:3 (August 1990), 356-76,

Phelps Brown, E. Henry; and Sheila V. Hopkins, 'Seven Centuries of Building Wages', *Economica*, 22:87 (August 1955), 195-206, reprinted in Henry Phelps Brown and Sheila Hopkins, *A Perspective of Wages and Prices* (London: Methuen, 1981), pp. 1- 12.

Phelps Brown, E. Henry; and Sheila Hopkins, 'Seven Centuries of the Prices of Consumables, Compared with Builders' Wage Rates', *Economica*, 23:92 (November 1956), 296-314; reprinted in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 13-39 (with price indexes not in the original).

Poos, Larry, 'The Social Context of Statute of Labourers Enforcement', *Law and History Review*, 1 (1983), 27-52.

Postan, Michael M., 'The Trade of Medieval Europe: the North', in M.M. Postan and Edward Miller, eds, *Cambridge Economic History of Europe*, Vol. II: *Trade and Industry in the Middle Ages* (Cambridge, 1987), pp. 168-305.

Power, Eileen, *The Wool Trade in English Medieval History* (London and Oxford: Oxford University Press, 1941).

Putnam,   Bertha H., *The Enforcement of the Statute of Labourers during the First Decade after the Black Death* (New York, 1908).

Raftis, J. Ambrose, *Tenure and Mobility: Studies in the Social History of the Mediaeval English Village* (Toronto: Pontifical Institute of Mediaeval Studies, 1964).

Raftis, J. Ambrose, 'Peasants and the Collapse of the Manorial Economy on Some Ramsey Abbey Estates', in Richard Britnell and John Hatcher, eds, *Progress and Problems in Medieval England: Essays in Honour of Edward Miller* (Cambridge and New York: Cambridge University Press, 1996), pp. 191-206.

Raftis, J. Ambrose, *Peasant Economic Development within the English Manorial System* (Montreal and Kingston: McGill-Queen's University Press, 1996).

Rigby, Stephen H. *, English Society in the Later Middle Ages: Class, Status, Gender* (London: Macmillan, 1995).

Spufford, Peter, *Money and Its Use in Medieval Europe* (Cambridge: Cambridge University Press, 1988).

Stone, David, 'The Productivity of Hired and Customary Labour: Evidence from Wisbech Barton in the Fourteenth Century,' *The Economic History Review*, 2nd ser., 50:4 (November 1997), 640-56.

Stone, David, 'Medieval Farm Management and Technological Mentalities: Hinderclay Before the Black Death', *The Economic History Review*, 2nd ser., 54:4 (November 2001), 612-38.

Stone, David, 'The Productivity and Management of Sheep in Late Medieval England', *Agricultural History Review,* 51:I (2003), 1-22.

Stone, David, *Decision-Making in Medieval Agriculture* (Oxford and New York: Oxford University Press, 2005).

Tawney, Richard H., *The Agrarian Problem in the Sixteenth Century* (London, 1912: re-issued New York and London: Harper Torchbooks, 1967).

Van der Wee, Herman; and Theo Peeters, 'Un modèle dynamique de croissance interseculaire du commerce mondiale, XIIe-XVIIIe siècles', *Annales: Economies, Sociétés, Civilisations*, 15 (1970), 100-28

Table 1. Price Indexes for the Phelps Brown & Hopkins 'Basket of Consumables' and
for the Prices of Grains, Meat, Dairy Products, and Wool English Wools,

mean of 1451- 1475 = 100

Year	Phelps Brown & Hopkins Composite Price Index (Revised)	Total Grains: wheat, rye, barley, peas Price Index	Meat Products beef, mutton swine Price Index	Dairy Products: butter & cheese Price Index	Wools: Better Qualities: Price Index
	base value in d 112.801d	base value in d 21.799d	base value in d 23.950d	base value in d 15.579d	base value in £ £4.8544
1331-35	109.108	110.302	110.021	95.281	110.614
1336-40	89.256	84.730	96.346	94.622	95.699
1341-45	85.533	81.356	89.666	88.547	101.910
1346-50	100.064	101.499	94.572	97.299	97.093
1351-55	126.472	131.100	113.987	102.921	91.577
1356-60	118.092	115.863	108.455	112.790	108.009
1361-65	137.976	130.413	131.419	104.738	115.474
1366-70	136.460	150.487	131.607	106.830	137.799
1371-75	127.345	133.638	143.653	107.403	162.637
1376-80	109.891	96.219	118.580	105.066	155.243
1381-85	113.190	104.029	110.890	105.709	123.494
1386-90	101.233	83.336	108.055	96.590	104.463
1391-95	103.953	96.639	106.471	73.130	102.039
1396-1400	110.648	105.084	111.064	100.898	107.966
1401-05	112.653	117.530	110.071	102.790	117.455
1406-10	109.927	108.229	106.555	106.878	128.114
1411-15	108.261	91.411	105.599	110.132	122.651
1416-20	113.598	114.066	103.055	107.879	94.586
1421-25	103.740	94.999	93.213	91.331	108.538
1426-30	112.610	107.222	99.581	104.979	103.298

Year	Phelps Brown & Hopkins Composite Price Index (Revised)	Total Grains: wheat, rye, barley, peas Price Index	Meat Products beef, mutton swine Price Index	Dairy Products: butter & cheese Price Index	Wools: Better Qualities: Price Index
	base value in d 112.801d	base value in d 21.799d	base value in d 23.950d	base value in d 15.579d	base value in £ £4.8544
1431-35	109.122	110.106	106.078	106.810	115.634
1436-40	124.218	148.525	109.585	110.342	109.627
1441-45	92.574	75.504	96.624	97.290	107.145
1446-50	101.241	97.399	106.245	106.978	110.796

Sources:

Prices (except for wools): based upon the Phelps Brown and Hopkins 'Basket of Consumables' Price Index:

Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a;

These archives contain Phelps Brown's original hand-written working papers, with prices for individual commodities contained in the Phelps Brown and Hopkins 'basket of consumables' price index, which they had presented in:

E. H. Phelps Brown and Sheila V. Hopkins, 'Seven Centuries of the Prices of Consumables, Compared with Builders' Wage Rates', *Economica*, 23:92 (November 1956), 296-314: reprinted in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 13-39 (with price indexes not in the original).

Apart from correcting hundreds of computational errors in their original series, I constructed an entirely new index based on actual prices rather than their index numbers. Using the data in their worksheets, for each commodity, I first calculated the annual prices for all the commodities in the basket. The using their commodity weights, I calculated the sum value of those commodities, to calculate the annual value of the basket. I then constructed the price index, with their base, 1451-75 = 100, from the values of the basket for each year in that 25-year base period.

While the original PB&H commodity basket consisted of fixed commodity weights throughout the entire series – so that, for example, grain prices always account for 20 percent of the total weight in the basket, the commodity weights, in my revised version, change with changes in relative prices.   The commodity price weights for the basket are thus fixed only for the base period: 1451 - 75 = 100.

Table 2.   **Ratios of Agricultural Prices to the Consumer Price Index**
(Phelps Brown & Hopkins) and to each other

mean of 1451-75 = 100

Year	Ratio of Wool Prices to PBH CPI (Wool/CPI)	Ratio of Wool Prices to Grain Prices	Ratio of Grain Prices to CPI	Ratio of Meat Prices to Grain Prices	Ratio of Meat Prices to Wool Prices	Ratio of Meat Prices to CPI	Ratio of Dairy Products to CPI
1331-35	101.380	100.283	93.384	99.745	99.463	100.837	87.328
1336-40	107.218	112.945	68.845	113.709	100.677	107.943	106.012
1341-45	119.146	125.265	80.805	110.215	87.985	104.831	103.524
1346-50	97.031	95.659	105.200	93.175	97.403	94.511	97.237
1351-55	72.409	69.853	116.148	86.947	124.471	90.128	81.379
1356-60	91.461	93.222	81.215	93.606	100.413	91.839	95.510
1361-65	83.691	88.545	97.901	100.772	113.809	95.248	75.910
1366-70	100.981	91.568	96.691	87.454	95.507	96.444	78.287
1371-75	127.713	121.700	86.819	107.494	88.327	112.806	84.340
1376-80	141.270	161.343	66.984	123.239	76.383	107.907	95.609
1381-85	109.103	118.711	83.923	106.595	89.794	97.968	93.391
1386-90	103.191	125.351	65.270	129.661	103.438	106.739	95.414
1391-95	98.159	105.588	84.629	110.175	104.344	102.423	70.350
1396-1400	97.576	102.743	89.617	105.691	102.869	100.376	91.188
1401-05	104.263	99.936	94.166	93.653	93.713	97.708	91.245
1406-10	116.545	118.372	85.171	98.453	83.172	96.933	97.226
1411-15	113.292	134.175	73.719	115.522	86.097	97.541	101.728
1416-20	83.264	82.922	93.405	90.347	108.954	90.719	94.966
1421-25	104.625	114.252	74.137	98.120	85.881	89.852	88.039
1426-30	91.731	96.340	91.627	92.874	96.402	88.430	93.223
1431-35	105.968	105.021	86.681	96.341	91.735	97.210	97.881
1436-40	88.254	73.810	120.664	73.783	99.962	88.220	88.829
1441-45	115.740	141.908	53.885	127.972	90.180	104.374	105.095
1446-50	109.438	113.754	93.273	109.081	95.892	104.942	105.667

Sources: see the sources for Table 18.

Table 3, Part A.

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National Means of Manorial Agricultural Wages in England:
Piece-Work Rates for Processing Agricultural Commodities
Threshing and Winnowing; Reaping and Binding; Mowing and Spreading
in silver pence and in index numbers (base: 1451-75 = 100)

with calculations of real wages based on the Phelps Brown and Hopkins Consumer Price Index

</div>

Years 5-year period	CPI: based on Phelps Brown Hopkins (revised)	THRESHING AND WINNOWING GRAINS Piece rates per razed quarter (8 bushels) Threshing & Winnowing razed quarter of grains pence	Threshing & Winnowing razed quarter of grains Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means	REAPING AND BINDING GRAINS per acre of grains Reaping & Binding per acre of grains pence	Reaping & Binding per acre of grains Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means
1331-35	109.108	5.358	51.692	46.586	6.402	64.242	58.730
1336-40	89.256	5.358	51.692	57.893	5.919	59.394	66.710
1341-45	85.533	5.402	52.107	60.912	6.076	60.970	71.277
1346-50	100.064	5.832	56.259	55.738	7.055	70.788	66.331
1351-55	126.472	6.262	60.411	46.468	7.876	79.030	62.273
1356-60	118.092	5.746	55.429	46.704	6.572	65.939	55.741
1361-65	137.976	6.252	60.307	43.542	8.033	80.606	58.291
1366-70	136.460	6.671	64.355	46.566	8.299	83.273	60.776
1371-75	127.345	7.414	71.518	55.280	8.480	85.091	65.891
1376-80	109.891	7.704	74.320	67.418	9.954	99.879	90.925
1381-85	113.190	8.038	77.538	68.007	9.072	91.030	78.986
1386-90	101.233	7.500	72.348	71.425	9.205	92.364	91.244
1391-95	103.953	7.414	71.518	68.700	8.734	87.636	83.473
1396-1400	110.648	7.962	76.811	69.165	8.734	87.636	77.934
1401-05	112.653	8.436	81.378	69.795	9.241	92.727	82.430
1406-10	109.927	8.726	84.181	76.101	9.918	99.515	90.550

THRESHING AND WINNOWING GRAINS   **REAPING AND BINDING GRAINS**
per acre of grains

Piece rates per razed quarter (8 bushels)

Years 5-year period	CPI: based on Phelps Brown Hopkins (revised)	Threshing & Winnowing razed quarter of grains pence	Threshing & Winnowing razed quarter of grains Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means	Reaping & Binding per acre of grains pence	Reaping & Binding per acre of grains Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means
1411-15	108.261	7.812	75.358	69.618	10.038	100.727	93.009
1416-20	113.598	8.920	86.049	74.925	9.857	98.909	86.918
1421-25	103.740	8.317	80.237	77.243	9.362	93.939	90.009
1426-30	112.610	8.221	79.302	70.570	9.048	90.788	79.884
1431-35	109.122	8.070	77.849	71.231	9.386	94.182	86.265
1436-40	124.218	10.254	98.920	77.342	9.561	95.939	77.596
1441-45	92.574	9.415	90.824	97.297	10.981	110.182	118.832
1446-50	101.241	8.920	86.049	84.038	9.942	99.758	98.561

Table 3, Part B

National Means of Manorial Agricultural Wages in England:
Piece-Work Rates for Processing Agricultural Commodities
Threshing and Winnowing; Reaping and Binding; Mowing and Spreading
in silver pence and in index numbers (base: 1451-75 = 100)

with calculations of real wages based on the Phelps Brown and Hopkins Consumer Price Index

MOWING AND SPREADING PER ACRE OF PASTURE
per acre of meadow lands

Years 5-year period	CPI: based on Phelps Brown Hopkins (revised)	Mowing & Spreading per acre of meadow pence	Mowing & Spreading per acre of meadow Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means
1331-35	109.108			
1336-40	89.256			
1341-45	85.533			
1346-50	100.064			
1351-55	126.472	6.452	97.486	76.788
1356-60	118.092	6.181	93.381	78.689
1361-65	137.976	6.328	95.605	68.743
1366-70	136.460	7.618	115.102	83.481
1371-75	127.345	7.641	115.444	89.996
1376-80	109.891	7.505	113.391	103.194
1381-85	113.190	7.811	118.009	104.173
1386-90	101.233	7.392	111.681	110.193
1391-95	103.953	6.883	103.985	99.552
1396-1400	110.648	6.724	101.591	91.630
1401-05	112.653	6.764	102.189	89.673

MOWING AND SPREADING PER ACRE OF PASTURE
per acre of meadow lands

Years 5-year period	CPI: based on Phelps Brown Hopkins (revised)	Mowing & Spreading per acre of meadow pence	Mowing & Spreading per acre of meadow Index: 1451-75=100	RWI = NWI/ CPI 1451-75=100 harmonic means
1406-10	109.927	7.273	109.885	99.923
1411-15	108.261	6.962	105.182	95.792
1416-20	113.598	6.735	101.762	89.307
1421-25	103.740	7.200	108.774	104.626
1426-30	112.610	6.684	100.992	89.487
1431-35	109.122	6.226	94.065	86.110
1436-40	124.218	6.764	102.189	82.098
1441-45	92.574	6.407	96.802	104.580
1446-50	101.241	6.305	95.263	93.925

Sources:

Consumer Prices: see the sources for Table 18

Wages:

David Farmer, 'Prices and Wages [1042-1350]', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), statistical appendixes, pp 760-78, 811-17.

David Farmer, 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), statistical appendixes, pp.467-90, 516-24.

Table 4, Part A

National Means of Manorial Building Wages in England:
Daily Wages for Master Carpenters, Thatchers (& Mates), Slaters (& Mates), and Masons

in silver pence and in index numbers (base: 1451-75 = 100)

with calculations of real wages based on the Phelps Brown and Hopkins Consumer Price Index

Year Michaelmas Five-year period	Phelps Brown & Hopkins CPI (Revised)	CARPENTERS: MANORIAL in pence per day			THATCHER & MATES: MANORIAL in pence per day		
		Carpenter solo per day pence	Carpenter solo per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means	Thatcher & mate per day pence	Thatcher & mate per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means
1331-35	109.108	3.243	58.877	54.050	3.792	41.639	38.030
1336-40	89.256	3.136	56.945	63.373	3.882	42.625	47.834
1341-45	85.533	2.999	54.444	63.364	3.553	39.011	45.560
1346-50	100.064	3.293	59.786	59.090	4.204	46.156	45.180
1351-55	126.472	3.524	63.992	50.181	4.682	51.413	40.626
1356-60	118.092	3.956	71.835	60.774	4.608	50.591	42.687
1361-65	137.976	4.188	76.040	55.102	5.333	58.558	42.389
1366-70	136.460	4.332	78.654	57.697	5.685	62.418	45.798
1371-75	127.345	4.194	76.154	59.602	5.887	64.635	50.731
1376-80	109.891	4.194	76.154	69.304	6.066	66.606	60.747
1381-85	113.190	4.319	78.427	69.095	6.171	67.756	59.676
1386-90	101.233	4.207	76.381	75.388	6.119	67.181	66.293
1391-95	103.953	4.269	77.518	74.465	6.313	69.317	66.240
1396-1400	110.648	4.276	77.631	70.193	6.253	68.660	62.010
1401-05	112.653	4.639	84.224	74.644	6.567	72.109	63.613

| | | CARPENTERS: MANORIAL | | | THATCHER & MATES: MANORIAL | | |
		in pence per day			in pence per day		
Year Michaelmas Five-year period	Phelps Brown & Hopkins CPI (Revised)	Carpenter solo per day pence	Carpenter solo per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means	Thatcher & mate per day pence	Thatcher & mate per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means
1406-10	109.927	4.733	85.929	77.377	6.829	74.984	67.938
1411-15	108.261	4.344	78.882	72.716	6.552	71.945	66.124
1416-20	113.598	4.582	83.201	73.118	6.882	75.558	66.445
1421-25	103.740	4.657	84.565	81.328	6.171	67.756	65.038
1426-30	112.610	4.970	90.248	80.267	7.667	84.182	74.515
1431-35	109.122	4.826	87.634	79.953	7.443	81.718	74.736
1436-40	124.218	5.396	97.977	79.105	8.774	96.337	77.113
1441-45	92.574	5.064	91.953	99.365	8.767	96.255	102.614
1446-50	101.241	5.283	95.931	94.597	8.804	96.666	95.316

Table 4, Part B

National Means of Manorial Building Wages in England:
Daily Wages for Master Carpenters, Thatchers (& Mates), Slaters (& Mates), and Masons

in silver pence and in index numbers (base: 1451-75 = 100)

with calculations of real wages based on the Phelps Brown and Hopkins Consumer Price Index

		SLATER/TILERS & MATES				**MASONS** solo		
Year Michaelmas Five-year period	**Phelps Brown & Hopkins CPI (Munro)**	**Slater/Tiler & mate per day** pence	**Slater/Tiler & mate per day** Index: 1451-75=100	**Slater/Tiler & mate per day** Index: 1451-75=100	**Real Wage Index RWI=NWI/CPI harmonic means**	**Mason solo per day** pence	**Mason solo per day** Index: 1451-75=100	**Real Wage Index RWI=NWI/CPI harmonic means**
1331-35	109.108	5.565	57.381	57.381	52.569			
1336-40	89.256	5.135	52.946	52.946	59.428			
1341-45	85.533	5.246	54.095	54.095	63.104			
1346-50	100.064	5.172	53.329	53.329	52.674			
1351-55	126.472	6.011	61.980	61.980	49.061	3.901	68.495	54.123
1356-60	118.092	6.117	63.075	63.075	53.339	4.031	70.770	59.784
1361-65	137.976	6.499	67.017	67.017	48.544	4.331	76.039	55.057
1366-70	136.460	7.041	72.602	72.602	53.385	4.215	74.003	53.838
1371-75	127.345	7.668	79.063	79.063	60.777	4.488	78.793	60.605
1376-80	109.891	7.052	72.711	72.711	66.205	4.713	82.745	75.299
1381-85	113.190	7.519	77.530	77.530	68.059	4.788	84.062	73.735
1386-90	101.233	7.492	77.256	77.256	76.249	4.269	74.961	73.418
1391-95	103.953	7.190	74.135	74.135	71.409	4.528	79.511	75.455
1396-1400	110.648	7.381	76.106	76.106	68.835	4.324	75.919	68.453
1401-05	112.653	8.050	83.005	83.005	73.674	4.651	81.667	71.885
1406-10	109.927	7.848	80.924	80.924	73.568	5.054	88.732	80.270

		SLATER/TILERS & MATES					MASONS solo		
Year Michaelmas Five-year period	Phelps Brown & Hopkins CPI (Munro)	Slater/Tiler & mate per day pence	Slater/Tiler & mate per day Index: 1451-75=100	Slater/Tiler & mate per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means	Mason solo per day pence	Mason solo per day Index: 1451-75=100	Real Wage Index RWI=NWI/CPI harmonic means
1411-15	108.261	7.816	80.596	80.596	73.867	4.849	85.140	77.680
1416-20	113.598	8.326	85.852	85.852	75.202	5.296	92.983	80.323
1421-25	103.740	8.358	86.180	86.180	83.027	5.429	95.318	91.175
1426-30	112.610	8.167	84.209	84.209	74.237	5.313	93.282	82.142
1431-35	109.122	8.454	87.166	87.166	79.566	4.979	87.415	78.991
1436-40	124.218	9.006	92.860	92.860	74.641	5.569	97.773	77.873
1441-45	92.574	9.091	93.736	93.736	101.119	5.224	91.726	98.609
1446-50	101.241	9.154	94.393	94.393	92.497	5.531	97.114	95.690

Sources: see the sources for Table 20.

Table 5.

**Wages for Master Building Craftsmen (masons and carpenters) in small
towns of southern England (excluding London)**

compared with the Phelps Brown and Hopkins (Revised) Consumer Price Index

and with the value of the annual real wage income expressed in PBH 'Consumer Baskets'

From 1331-35 to 1446-50 in quinquennial means (arithmetic and harmonic)

RWI = NWI/CPI: Real Wage Index = Nominal Wage Index/Consumer Price Index

5 Year Means	Total Value of PBH Basket in d sterling Arithmetic	PBH Prices Consumer Price Index Munro version 1451-75=100 Arithmetic	Master Nominal Day Wage in d. sterling Arithmetic	Master Mason: Nominal Wage Index 1451-75=100 [= 6d. daily] Arithmetic	Master Mason: Real Wage Index (Munro) 1451-75=100 Arithmetic	Master Mason: Real Wage Index (Munro) 1451-75=100 Harmonic	Master RWI No. of Baskets Consumed in one year (210 days) Harmonic
1331-35	123.074	109.108	4.000	66.667	62.454	61.102	6.825
1336-40	100.682	89.256	3.600	60.000	68.025	66.986	7.482
1341-45	96.482	85.533	3.000	50.000	58.586	58.457	6.530
1346-50	112.873	100.064	3.000	50.000	50.478	49.968	5.582
1351-55	142.661	126.472	3.600	60.000	48.657	46.552	5.200
1356-60	133.209	118.092	4.600	76.667	64.902	64.611	7.217
1361-65	155.637	137.976	5.000	83.333	60.609	60.397	6.746
1366-70	153.928	136.460	5.000	83.333	62.159	61.068	6.821
1371-75	143.646	127.345	5.000	83.333	65.966	65.439	7.310
1376-80	123.958	109.891	5.000	83.333	76.871	75.832	8.471
1381-85	127.679	113.190	5.000	83.333	73.729	73.622	8.224
1386-90	114.191	101.233	5.000	83.333	82.501	82.319	9.195
1391-95	117.259	103.953	5.000	83.333	81.269	80.165	8.955
1396-1400	124.812	110.648	5.000	83.333	75.701	75.314	8.413

RWI = NWI/CPI: Real Wage Index = Nominal Wage Index/Consumer Price Index

5 Year Means	Total Value of PBH Basket in d sterling Arithmetic	PBH Prices Consumer Price Index Munro version 1451-75=100 Arithmetic	Master Nominal Day Wage in d. sterling Arithmetic	Master Mason: Nominal Wage Index 1451-75=100 [= 6d. daily] Arithmetic	Master Mason: Real Wage Index (Munro) 1451-75=100 Arithmetic	Master Mason: Real Wage Index (Munro) 1451-75=100 Harmonic	Master RWI No. of Baskets Consumed in one year (210 days) Harmonic
1401-05	127.073	112.653	5.100	85.000	76.605	75.156	8.395
1406-10	123.998	109.927	5.800	96.667	88.612	88.115	9.843
1411-15	122.119	108.261	6.000	100.000	92.491	92.369	10.318
1416-20	128.139	113.598	6.000	100.000	88.744	88.030	9.833
1421-25	117.020	103.740	6.000	100.000	96.599	96.395	10.767
1426-30	127.025	112.610	6.000	100.000	90.703	88.802	9.919
1431-35	123.090	109.122	6.000	100.000	91.801	91.641	10.236
1436-40	140.118	124.218	6.000	100.000	84.039	80.504	8.992
1441-45	104.424	92.574	6.000	100.000	108.344	108.022	12.066
1446-50	114.200	101.241	6.000	100.000	98.912	98.774	11.033

Sources for Tables 22 and 23:

For English consumer prices: see sources for Table 18

Wages for building craftsmen: masters and labourers

Henry Phelps Brown and Sheila Hopkins, 'Seven Centuries of Building Wages', *Economica*, 22:87 (August 1955), 195-206; reprinted in Henry Phelps Brown and Sheila Hopkins, *A Perspective of Wages and Prices* (London: Methuen, 1981), pp. 1- 12.

John Munro, 'Builders' Wages in Southern England and the Southern Low Countries, 1346 -1500: A Comparative Study of Trends in and Levels of Real Incomes', in Simonetta Cavaciocchi, ed., *L'Edilizia prima della rivoluzione industriale, secc. XIII-XVIII*, Atti delle "Settimana di Studi" e altri convegni, no. 36, Istituto Internazionale di Storia Economica "Francesco Datini" (Florence: Le Monnier, 2005), pp. 1013-76.

Table 6. **Wages For Labourers of Master Building Craftsmen in small towns**
of southern England (excluding London).

Compared with the Revised Phelps Brown and Hopkins
'Basket of Consumables' Consumer Price Index
 and with the annual real wage income expressed in PBH 'Consumer Baskets'

 in quinquennial means (arithmetic and harmonic), 1331 - 35 to 1446-50

   base: 1451-75=100

   RWI = NWI/CPI: Real W

5 Year Means	PBH Prices Consumer Price Index Revised version 1451-75=100 Arithmetic	Labourer Nominal Day Wage in d. sterling Arithmetic	Labourer's Wage as Percent of Master Arithmetic	Mason Labourer Nominal Wage Index 1451-75=100 [= 4d. daily] Arithmetic	Mason Labourer Real Wage Index (Munro) 1451-75=100 Arithmetic	Mason Labourer Real Wage Index (Munro) 1451-75=100 Harmonic	Labourer RWI No. of Baskets Consumed in one year (210 days) Harmonic
1331-35	109.108	2.000	50.00%	50.000	46.841	45.826	3.413
1336-40	89.256	1.800	50.00%	45.000	51.019	50.239	3.741
1341-45	85.533	1.500	50.00%	37.500	43.939	43.843	3.265
1346-50	100.064	1.500	50.00%	37.500	37.858	37.476	2.791
1351-55	126.472	1.800	50.00%	45.000	36.492	34.914	2.600
1356-60	118.092	2.600	56.22%	65.000	54.943	54.039	4.024
1361-65	137.976	3.000	60.00%	75.000	54.548	54.357	4.048
1366-70	136.460	3.000	60.00%	75.000	55.943	54.961	4.093
1371-75	127.345	3.000	60.00%	75.000	59.369	58.895	4.386
1376-80	109.891	3.000	60.00%	75.000	69.184	68.249	5.082
1381-85	113.190	3.000	60.00%	75.000	66.357	66.260	4.934
1386-90	101.233	3.000	60.00%	75.000	74.251	74.087	5.517
1391-95	103.953	3.000	60.00%	75.000	73.142	72.148	5.373
1396-1400	110.648	3.000	60.00%	75.000	68.131	67.782	5.048

5 Year Means	PBH Prices Consumer Price Index Revised version 1451-75=100 Arithmetic	Labourer Nominal Day Wage in d. sterling Arithmetic	Labourer's Wage as Percent of Master Arithmetic	Mason Labourer Nominal Wage Index 1451-75=100 [= 4d. daily] Arithmetic	Mason Labourer Real Wage Index (Munro) 1451-75=100 Arithmetic	Mason Labourer Real Wage Index (Munro) 1451-75=100 Harmonic	Labourer RWI No. of Baskets Consumed in one year (210 days) Harmonic
1401-05	112.653	3.200	62.73%	80.000	72.499	70.065	5.218
1406-10	109.927	3.800	65.45%	95.000	86.910	86.562	6.446
1411-15	108.261	4.000	66.67%	100.000	92.491	92.369	6.879
1416-20	113.598	4.000	66.67%	100.000	88.744	88.030	6.555
1421-25	103.740	4.000	66.67%	100.000	96.599	96.395	7.178
1426-30	112.610	4.000	66.67%	100.000	90.703	88.802	6.613
1431-35	109.122	4.000	66.67%	100.000	91.801	91.801	6.824
1436-40	124.218	4.000	66.67%	100.000	84.039	80.504	5.995
1441-45	92.574	4.000	66.67%	100.000	108.344	108.022	8.044
1446-50	101.241	4.000	66.67%	100.000	98.912	98.774	7.356

Sources: see the sources for Table 22.

Table 7. **Prices and Price Indexes for Wools, Livestock Products and the Phelps Brown and Hopkins Composite Price Index, and wool export taxes, in quinquennial means: from 1331-35 to 1446-1450**

Prices in shillings and pounds sterling

Price Indexes: mean of 1451-75 = 100

Woolsack = 364 lb. = 165.45 kg

Year	All Wools:	Wool Price Index:	Better Wools:* Mean Price	Better Wools:* Price Index	CPI: Phelps Brown & Hopkins	Denizen Export Duties on Wool Sacks	Denizen Export Duties as Per Cent of Prices for Better Wools	Alien Export Duties on Wool Sacks	Alien Export Duties as Per Cent of Prices for Better Wools	Mean Price of Better Wools with Denizen Export Duties £ sterling
5 year means	Mean Prices per Sack £ sterling	1451-75 = 100 £3.4917	per sack £ sterling	1451-75 = 100 £4.8544	1451-75 = 100	in shillings		in shillings		
1331-35	5.031	144.080	5.370	110.610	109.108	10.373	9.66%	14.559	13.56%	5.888
1336-40	4.264	122.110	4.646	95.700	89.256	29.556	31.81%	41.501	44.67%	6.123
1341-45	4.498	128.830	4.947	101.910	85.533	40.247	40.68%	43.333	43.80%	6.959
1346-50	4.222	120.910	4.713	97.090	100.064	40.000	42.43%	43.333	45.97%	6.713
1351-55	3.923	112.360	4.446	91.580	126.472	40.000	44.99%	43.333	48.74%	6.446
1356-60	4.050	116.000	5.243	108.010	118.092	40.000	38.14%	43.333	41.32%	7.243
1361-65	4.306	123.310	5.606	115.470	137.976	42.776	38.16%	46.110	41.13%	7.744
1366-70	5.624	161.080	6.689	137.800	136.460	46.667	34.88%	50.000	37.37%	9.023
1371-75	6.422	183.920	7.895	162.640	127.345	50.000	31.67%	53.333	33.78%	10.395
1376-80	6.582	188.490	7.536	155.240	109.891	50.000	33.17%	53.333	35.38%	10.036
1381-85	5.097	145.960	5.995	123.490	113.190	50.000	41.70%	53.333	44.48%	8.495
1386-90	4.111	117.740	5.071	104.460	101.233	48.516	47.84%	52.166	51.43%	7.497

Year	All Wools: Wool Price Index:	Wool Price Index: 1451-75 = 100	Better Wools:* Mean Price	Better Wools:* Price Index 1451-75 = 100	CPI: Phelps Brown & Hopkins 1451-75 = 100	Denizen Export Duties on Wool Sacks	Denizen Export Duties as Per Cent of Prices for Better Wools	Alien Export Duties on Wool Sacks	Alien Export Duties as Per Cent of Prices for Better Wools	Mean Price of Better Wools with Denizen Export Duties £ sterling
5 year means	Mean Prices per Sack £ sterling	1451-75 = 100 £3.4917	per sack £ sterling	1451-75 = 100 £4.8544	1451-75 = 100	in shillings		in shillings		
1391-95	4.266	122.170	4.953	102.040	103.953	49.830	50.30%	53.163	53.66%	7.445
1396-1400	4.814	137.860	5.241	107.970	110.648	50.000	47.70%	56.555	53.95%	7.741
1401-05	5.065	145.050	5.702	117.460	112.653	51.187	44.89%	61.187	53.66%	8.261
1406-10	4.974	142.440	6.219	128.114	109.927	50.000	43.41%	60.000	52.09%	8.259
1411-15	5.426	155.380	5.954	122.650	108.261	50.000	41.99%	60.000	50.39%	8.454
1416-20	4.155	119.000	4.592	94.590	113.598	50.000	54.45%	68.000	74.05%	7.092
1421-25	4.205	120.420	5.269	108.540	103.740	43.841	41.60%	62.658	59.46%	7.461
1426-30	4.613	132.110	5.015	103.300	112.610	40.000	39.88%	53.333	53.18%	7.015
1431-35	4.928	141.130	5.613	115.630	109.122	40.000	35.63%	57.103	50.86%	7.613
1436-40	4.440	127.160	5.322	109.630	124.218	40.000	37.58%	62.267	58.50%	7.322
1441-45	4.188	119.930	5.201	107.150	92.574	40.000	38.45%	63.333	60.88%	7.201
1446-50	4.119	117.960	5.379	110.800	101.241	40.000	37.19%	63.333	58.88%	7.379

* Prices for wools from Wiltshire, Hampshire, and St. Swithin's manors (all of the Bishop of Winchester's manors), Wiltshire and the Berkshire Downs, the Vale of White Horse to Thames Valley; Oxfordshire, Berkshire, and adjacent Wiltshire; Worcestershire, the Cotswolds (Oxfordshire, Gloucestershire, and adjacent Wiltshire); the Chilterns (Oxon, Bucks, Herts); NE Oxfordshire and north Bucks.

Sources:

English Wool Prices and Export Duties:

Terence H. Lloyd, *The Movement of Wool Prices in Medieval England*, Economic History Review Supplements no. 6 (Cambridge, 1973), Statistical Appendix, cols. 2-5, 10-13; pp.35-51; *Calendar of the Fine Rolls*, *Edward II - Henry VII,* Vols. IV (*1327-1337*) to XXI (*1471-1485*); Great Britain, Parliament, *Rotuli parliamentorum ut et petitiones et placita in Parliamento*, 6 vols. (London, 1767-77), Vols. II - V; F.R. Barnes, 'The Taxation of Wool, 1327-1348', in G. Unwin, ed., *Finance and Trade Under Edward III* (London, 1918), pp. 137-77; N.S.B. Gras, *The Early English Customs System* (Cambridge, Mass., 1918), pp. 76-80; E.M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 194-96; W.M. Ormrod, 'The Crown and the English Economy, 1290-1348', in Bruce M.S. Campbell, ed., *Before the Black Death: Studies in the 'Crisis' of the Early Fourteenth Century* (Manchester, 1991), pp. 149-83.

Consumer Prices: based upon the Phelps Brown and Hopkins 'Basket of Consumables' Price Index:

Archives of the British Library of Political and Economic Science, the Phelps Brown Papers Collection: boxes Ia:324, J.IV.2a;

See the sources for Table 18.

**Table 8.   Exports of English Wools (in sacks) and Woollen Broadcloths (pieces)
in quinquennial means, 1331-35 to 1446-50**

Year Michaelmas	Denizen Wool Exports in sacks	Per cent of Total	Alien Wool Exports in sacks	Alien Exports as percent of total exports	Total Wool Sacks Exported	Equivalent Broadcloths Exported	Broadcloth Exports	Total as Equivalent Broadcloths
1331-35	24,633.000	72.97%	9,012.600	27.03%	33,645.600	145,797.490		145,797.490
1336-40	13,180.000	69.44%	7,344.800	30.56%	20,524.800	88,940.730		88,940.730
1341-45	10,565.510	58.09%	7,510.070	41.91%	18,075.580	78,327.430		78,327.430
1346-50					27,183.130	117,793.450	2,556.000	120,349.120
1351-55	10,169.400	34.39%	20,581.000	65.61%	30,750.400	133,251.630	1,921.000	135,172.830
1356-60					32,666.400	141,554.290	9,061.000	150,615.290
1361-65	20,899.950	69.03%	9,229.250	30.97%	30,129.200	130,559.770	11,717.000	142,276.970
1366-70	16,345.600	56.81%	10,106.200	43.19%	26,451.800	114,624.380	14,527.000	129,151.580
1371-75	16,712.020	64.39%	9,155.780	35.61%	25,867.800	112,093.710	12,211.000	124,305.110
1376-80	16,898.000	82.67%	3,572.200	17.33%	20,470.200	88,704.130	13,643.000	102,346.730
1381-85	13,886.800	78.97%	3,630.600	21.03%	17,517.400	75,908.670	22,242.000	98,150.670
1386-90	15,574.200	80.07%	3,737.800	19.93%	19,312.000	83,685.270	25,610.000	109,295.270
1391-95	13,593.200	72.00%	4,920.600	28.00%	18,513.800	80,226.400	39,525.000	119,751.600
1396-1400	14,515.800	86.15%	2,373.800	13.85%	16,889.600	73,188.210	38,775.000	111,963.310
1401-05	11,803.400	91.57%	1,100.800	8.43%	12,904.200	55,918.160	34,570.000	90,487.760
1406-10	13,392.800	89.41%	1,575.400	10.59%	14,968.200	64,862.150	31,746.000	96,608.350
1411-15	12,633.200	92.72%	960.000	7.28%	13,593.200	58,903.820	27,183.000	86,087.220
1416-20	13,355.400	92.98%	1,009.600	7.02%	14,365.000	62,248.290	27,977.000	90,225.490
1421-25	13,363.600	93.77%	881.600	6.23%	14,245.200	61,729.150	40,275.000	102,003.750
1426-30	12,429.000	92.60%	929.600	7.40%	13,358.600	57,887.220	40,406.000	98,292.820
1431-35	8,679.400	85.18%	705.200	14.82%	9,384.600	40,666.570	40,027.000	80,693.970
1436-40	4,197.800	41.65%	1,181.000	58.35%	5,378.800	23,308.120	47,072.000	70,380.120
1441-45	6,502.200	69.96%	1,527.200	30.04%	8,029.400	34,794.040	56,456.000	91,249.840
1446-50	9,176.800	88.50%	588.400	11.50%	9,765.200	42,315.830	45,847.000	88,162.630

Sources:

a. one woolsack = 26 stones = 364.00 lb. = 165.108 kg.   b.   one woolsack = 4.333 broadcloths of assize (24 by 1.75 yards)

Sources:

E.M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 36-119;
A.R. Bridbury, *Medieval English Clothmaking: An Economic Survey* (London, 1982), Appendix F, pp. 118-22

Table 9.   **Exports of English Woolsacks and Broadcloths and**

Production Indices for the Woollen Draperies of the

Southern Low Countries, 1331-35 to 1446-50

in quinquennial means

Years	English Wool Exports in Sacks	English Broadcloth Exports in pieces	Total English Wool & Cloth Exports as Cloths	Ghent Drapery Farms A in £ groot Flemish	Ghent Drapery Farms B in £ groot Flemish	Ypres Drapery Farms in £ groot Flemish	Ypres: No of Stalls rented in Lakenhalle	Mechelen Drapery Farms in £ oude groot	Leuven: Drapery Farms £ oude groot
1331-35	33,645.600		145,797.490	108.485	150.283			1,563.710	
1336-40	20,524.800		88,940.730	87.913	123.660			1,045.045	
1341-45	18,075.580		78,327.430	84.015	125.070			782.313	
1346-50	27,183.130	2,555.670	120,349.120	67.240	109.378			506.862	250.292
1351-55	30,750.400	1,921.200	135,172.830	68.875	114.505			707.914	240.809
1356-60	32,666.400	9,061.000	150,615.290	61.720	112.785			467.723	351.436
1361-65	30,129.200	11,717.200	142,276.970	55.778	96.825			496.240	709.398
1366-70	26,451.800	14,527.200	129,151.580	34.590	67.425			597.661	803.344
1371-75	25,867.800	12,211.400	124,305.110	22.800	47.721			540.698	525.557
1376-80	20,470.200	13,642.600	102,346.730	19.355	39.311			471.236	564.943
1381-85	17,517.400	22,242.000	98,150.670	14.402	22.421			397.290	394.331
1386-90	19,312.000	25,610.000	109,295.270	11.743	23.550			353.349	259.114
1391-95	18,513.800	39,525.200	119,751.600	missing	missing			297.670	224.730
1396-1400	16,889.600	38,775.100	111,963.310	missing	missing			300.804	169.338
1401-05	12,904.200	34,569.600	90,487.760	5.885	15.433			270.285	135.072
1406-10	14,968.200	31,746.200	96,608.350	7.654	16.030	183.192	407.000	272.011	170.875
1411-15	13,593.200	27,183.400	86,087.220	7.309	15.498	266.902	426.000	275.450	143.177
1416-20	14,365.000	27,977.200	90,225.490	8.253	17.782	266.912	489.300	276.334	81.769
1421-25	14,245.200	40,274.600	102,003.750	8.623	20.619	265.633	410.000	357.119	58.932
1426-30	13,358.600	40,405.600	98,292.820	9.331	23.648	249.817	356.600	352.707	
1431-35	9,384.600	40,027.400	80,693.970	7.267	22.314	235.327	319.400	220.532	
1436-40	5,378.800	47,072.000	70,380.120	4.267	14.783	156.022	192.600	186.976	

Years	English Wool Exports in Sacks	English Broadcloth Exports in pieces	Total English Wool & Cloth Exports as Cloths	Ghent Drapery Farms A in £ groot Flemish	Ghent Drapery Farms B in £ groot Flemish	Ypres Drapery Farms in £ groot Flemish	Ypres: No of Stalls rented in Lakenhalle	Mechelen Drapery Farms in £ oude groot	Leuven: Drapery Farms £ oude groot
1441-45	8,029.400	56,455.800	91,249.840	4.418	14.431	176.453	182.400	190.881	
1446-50	9,765.200	45,846.800	88,162.630	4.773	14.512	177.450	152.200	162.950	

Sources:

1 wool sack = 26 stones = 364 lb = 165.108 kg = 4.333 woollen broadcloths of assize

English wool and cloth exports: E.M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 36-119; A.R. Bridbury, *Medieval English Clothmaking: An Economic Survey* (London, 1982), Appendix F, pp. 118-22

Ghent A: Total drapery excise farms; Ghent B: Excises for 'Ramen en Nieuwe Huusgeld' only: all from: Stadsarchief Gent, Stadsrekeningen, Reeks 400:4-43, 1335-1520; Algemeen Rijksarchief België, Rekenkamer, reg. nos. 38,635-72;

Ypres: Algemeen Rijksarchief België, Rekenkamer, reg. nos. 38,636-722.

Mechelen: Stadsarchief Mechelen, Stadsrekeningen, 1316-1550, Series I: nos. 3-225; Algemeen Rijksarchief, Rekenkamer, reg. nos. 41,219-85;

Leuven: Stadsarchief Leuven, Stadsrekeningen, 1345-1500, nos. 4986-5124.

Table 10. The Commodity Price Index for England, 1300 - 1500

mean of prices for: 1451-75 = 100

**A Revision of the Phelps Brown and Hopkins
‘Basket of Consumables’ Price Index**

Commodity	Amount	Unit	Metric Measure	Percent by PBH weights	Value in d sterling	Percent by value (Munro)
Farinaceous						
	1.25	bu	45.461		9.967	8.84%
Rye	1	bu	36.369		6.279	5.57%
Barley	0.5	bu	18.184		2.606	2.31%
Peas	0.667	bu	24.243		2.947	2.61%
Sub-total	3.417	bu	124.257	**20.00%**	**21.799**	**19.33%**
Drink						
barley (or malt)	4.5	bu	163.659	**22.50%**	**24.227**	**21.48%**
Total Farinaceous	7.917	bu	287.917	**42.50%**	**46.026**	**40.80%**
Meat, Fish, Dairy						
Sheep	0.5	no.	0.050		8.532	7.56%
Pigs	0.5	no.	0.05	21.00%	15.418	13.67%
Herrings	40	no.	40.000	4.00%	6.595	5.85%
Butter	10	lb	4.536		10.238	9.08%
Cheese	10.000	lb	4.536	12.50%	5.341	4.74%

Sub-total			**37.50%**	**46.124**	**40.89%**
Industrial					
Charcoal	4.250	bu		3.813	3.38%
Candles	2.750	lb		3.475	3.08%
Lamp Oil	0.500	pt	7.50%	0.865	0.77%
Canvas/Linen	0.670	yd		2.757	2.44%
Shirting	0.500	yd		2.718	2.41%
Coarse Woollens	0.330	yd	12.50%	7.023	6.23%
Sub-total			**20.00%**	**20.651**	**18.31%**
TOTAL			**100.00%**	**112.801**	**100.00%**

Abbreviations:

no.   number

bu   bushels = 36.36872 dm^3

lb   pounds avoirdupois = 16 ounces = 453.59237 grams

pt   pint = 20 fluid ounces = 0.568261 dm^3

yd   yard = 36 inches = 0.9144 metre

Sources:

Archives of the British Library of Political and Economic Science, The Phelps Brown Papers: boxes Ia:324, J.IV.2a;
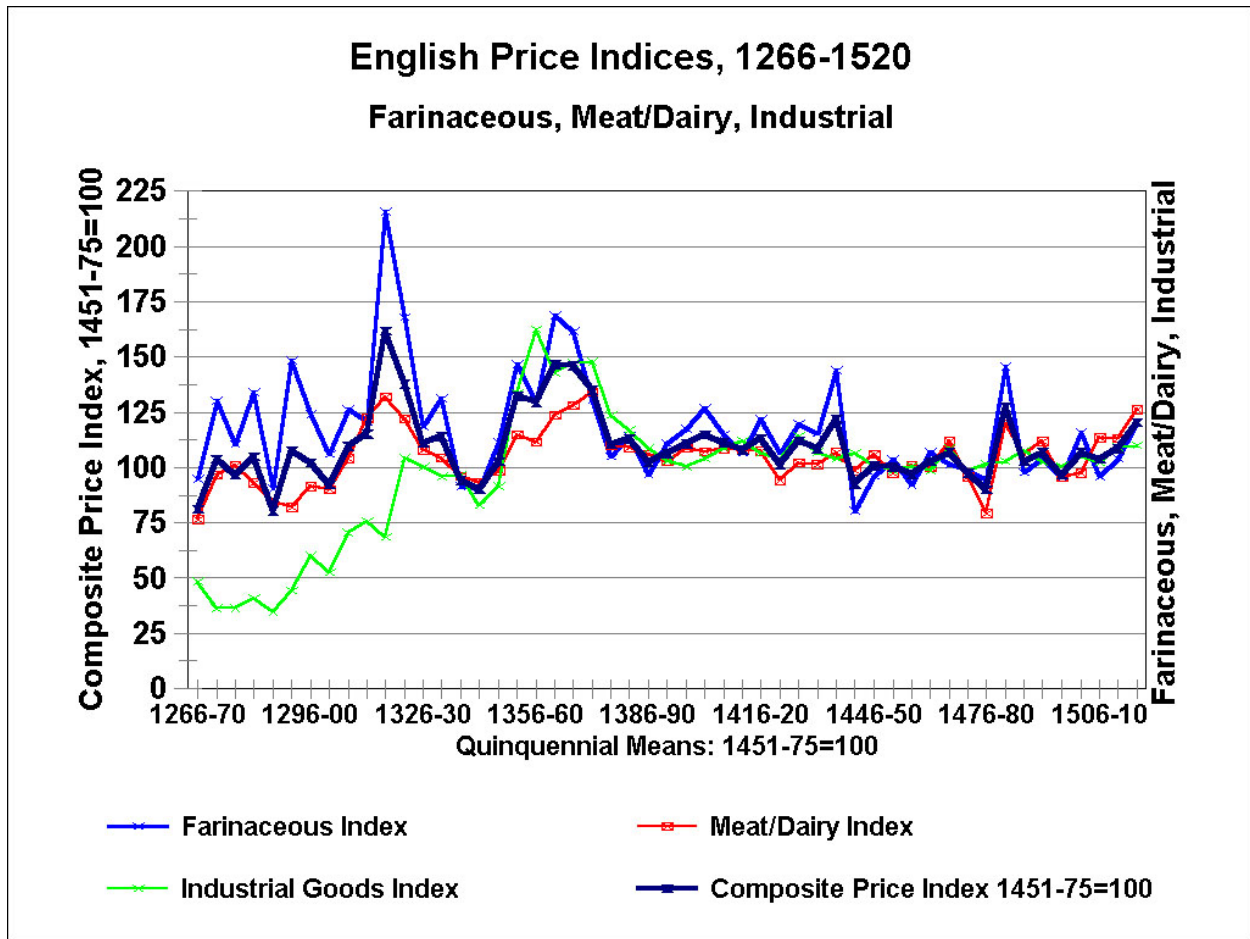E. H. Phelps Brown and Sheila V. Hopkins, 'Seven Centuries of the Prices of Consumables, Compared with Builders' Wage Rates', *Economica*, 23:92 (November 1956), 296-314: reprinted in E.M. Carus-Wilson, ed., *Essays in Economic History*, 3 vols. (London, 1954-62), II, 168-78, 179-96, and in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 13-39 (with price indexes not in the original).
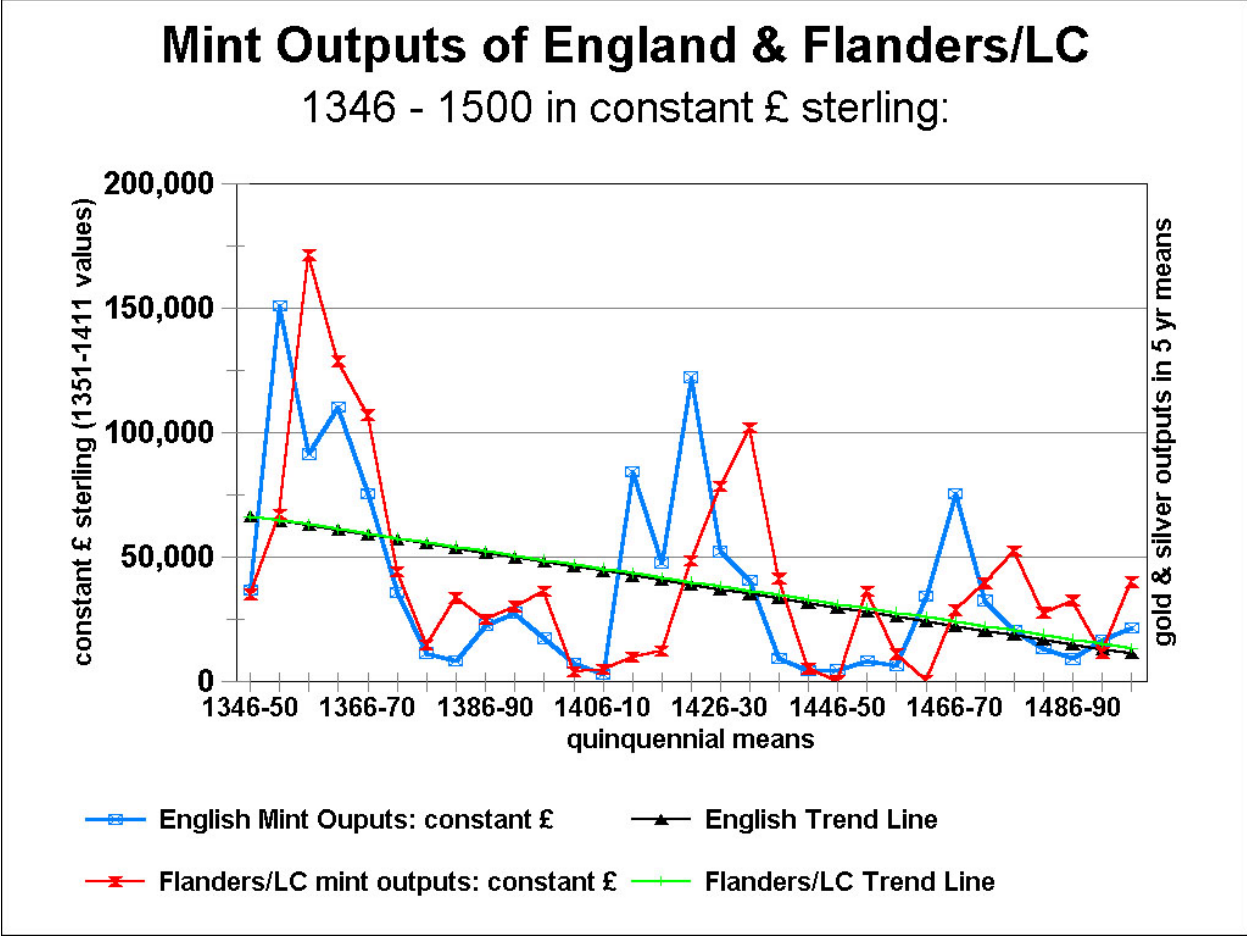
Figure 1: the Aggregate Mint Outputs (Gold and Silver) of England and the Low Countries (Flanders alone to 1384): expressed in constant values of the English pound sterling from 1351-1411

In quinquennial means: 1346-50 to 1496-1500, with least-squares regression trend lines for the mint outputs over this period.

Sources:

See the mint-account sources cited in John Munro, 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), Table 3, pp. 233-36; Table 4, pp. 237-39.
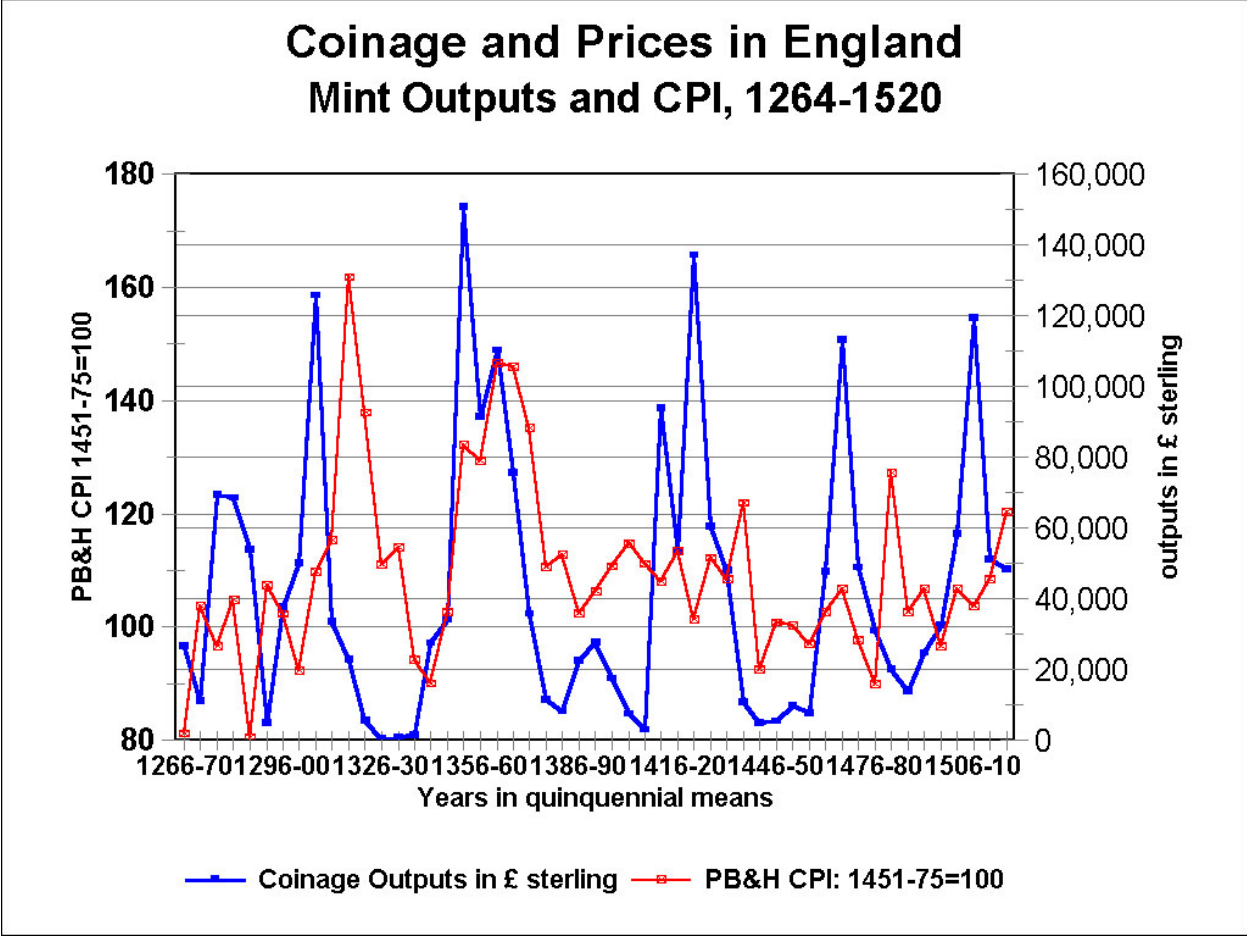
Figure 2: Coinage Outputs and Prices in England, 1266-1520

The value of aggregate mint outputs of gold and silver, in current pounds sterling, and the Phelps Brown and Hopkins Consumer Price Index (base: mean of 1451-75 = 100), in quinquennial means, from 1266-70 to 1516-20.

Sources:

John Munro, 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300 - 1500: Did Money Matter?' *Research in Economic History*, 21 (2003), Table 3, pp. 233-36; Table 4, pp. 237-39.

E. Henry Phelps Brown, and Sheila Hopkins, Centuries of the Prices of Consumables, Compared with Builders' Wage Rates', *Economica*, 23:92 (November 1956), 296-314; reprinted in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 13-39 (with price indexes not in the original).

Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Figure 3: Medieval English Price Indices: 1266 to 1520

The Phelps Brown and Hopkins Price Index series for Farinaceous Products (wheat, rye, barly, peas), for Meat and Dairy Products, and for Industrial Goods, and their Composite Price Index, with the base: mean of 1451 – 75 = 100

In quinquennial means: from 1266-70 to 1516-20.

Sources:

E. Henry Phelps Brown, and Sheila Hopkins, Centuries of the Prices of Consumables, Compared with Builders' Wage Rates', *Economica*, 23:92 (November 1956), 296-314; reprinted in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 13-39 (with price indexes not in the original).

Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html
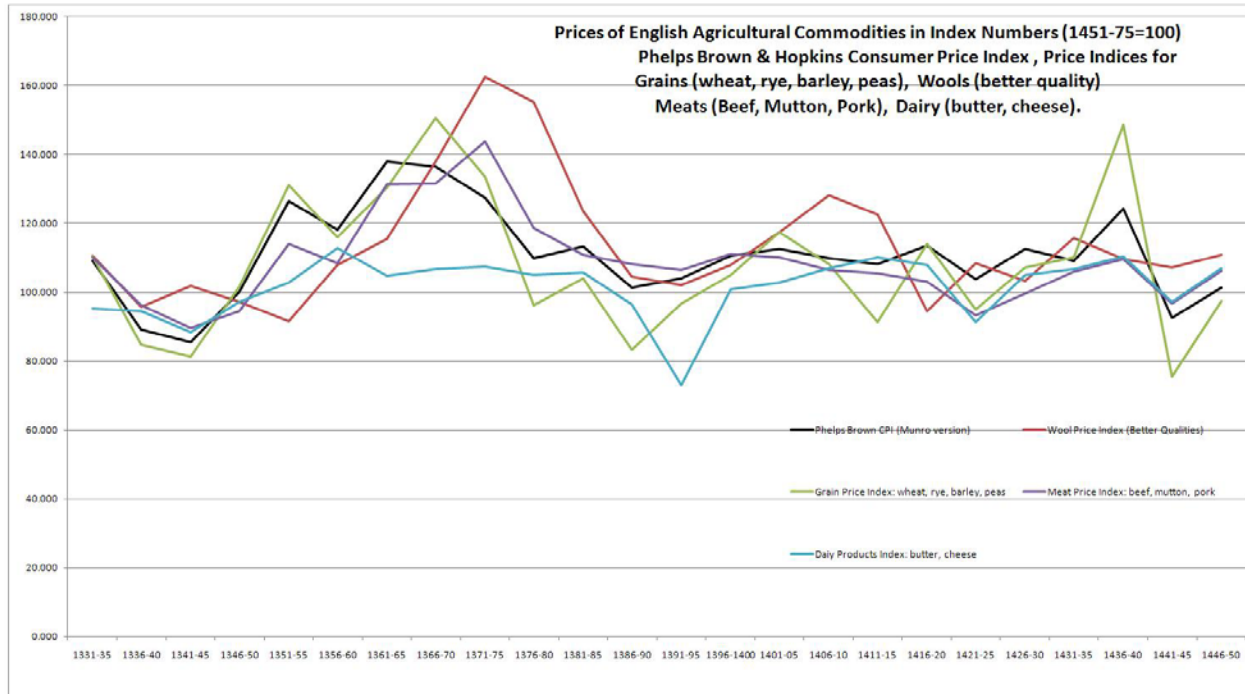
Figure 4: Prices of English Agricultural Commodities in Index Numbers (Base: 1451 – 1475 = 100), from 1331-35 to 1446-50: in quinquennial means

Price Indices for Grains (wheat, rye, barley, peas), Wools (better quality wools: exported to Calais), Meats (beef, mutton, and pork) and Dairy Products (butter and cheese), with the Phelps Brown and Hopkins Consumer Price index:

Source: Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html
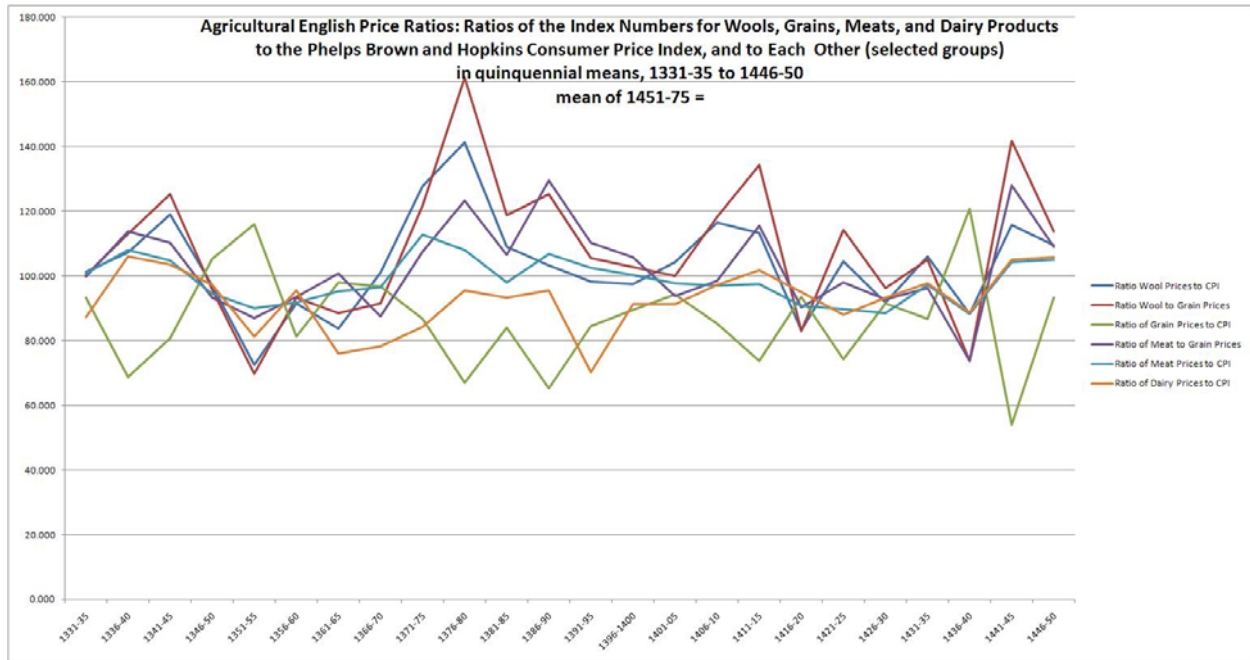
Figure 5:

English Agricultural Price Ratios: Ratios of the Index Numbers for Wools, Grains, Meats, and Dairy Products to the Phelps Brown and Hopkins Consumer Price Index, and to Each Other (in selected groups)

In quinquennial means, 1331-35 to 1446-50

Base: mean of 1451 – 75 = 100

Source: Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a
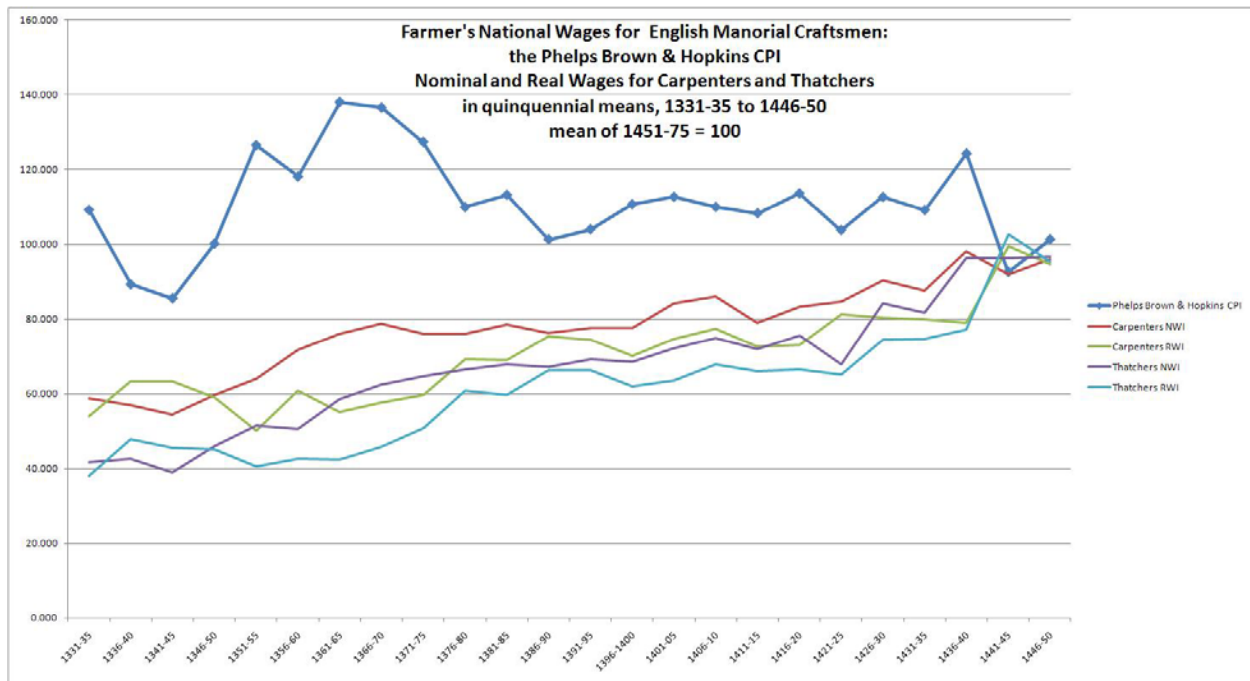
Munro's website for online research data: http://www.economics.utoronto.ca/munro5/ResearchData.html
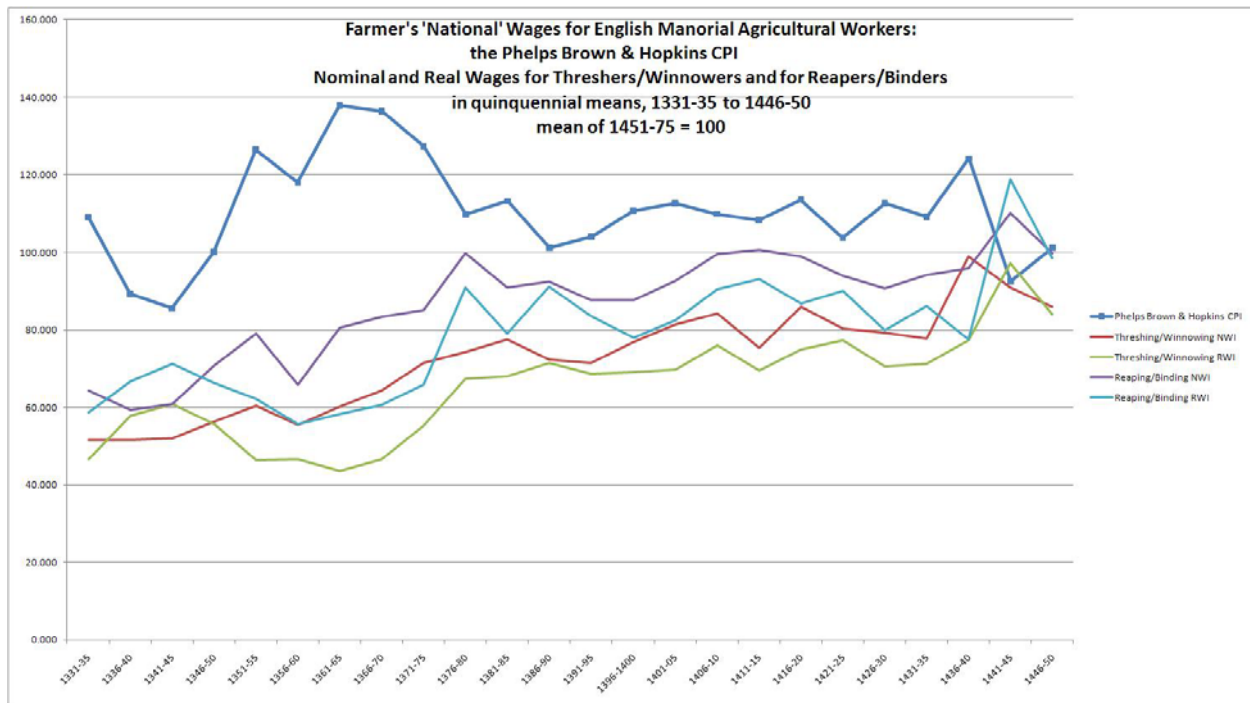
Figure 6:   Farmers' 'National Wages' for English Manorial Agricultural Workers, with the Phelps Brown and Hopkins Consumer Price Index

Nominal and Real Wages for Threshers/Winnowers and for Reapers/Binders

In quinquennial means, from 1331-35 to 1446-50

Base: mean of 1451-75 = 100

Sources:

(1) David Farmer, 'Prices and Wages [1042-1350]', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), statistical appendixes, pp 760-78, 811-17.

David Farmer, 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), statistical appendixes, pp.467-90, 516-24.

(2) Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

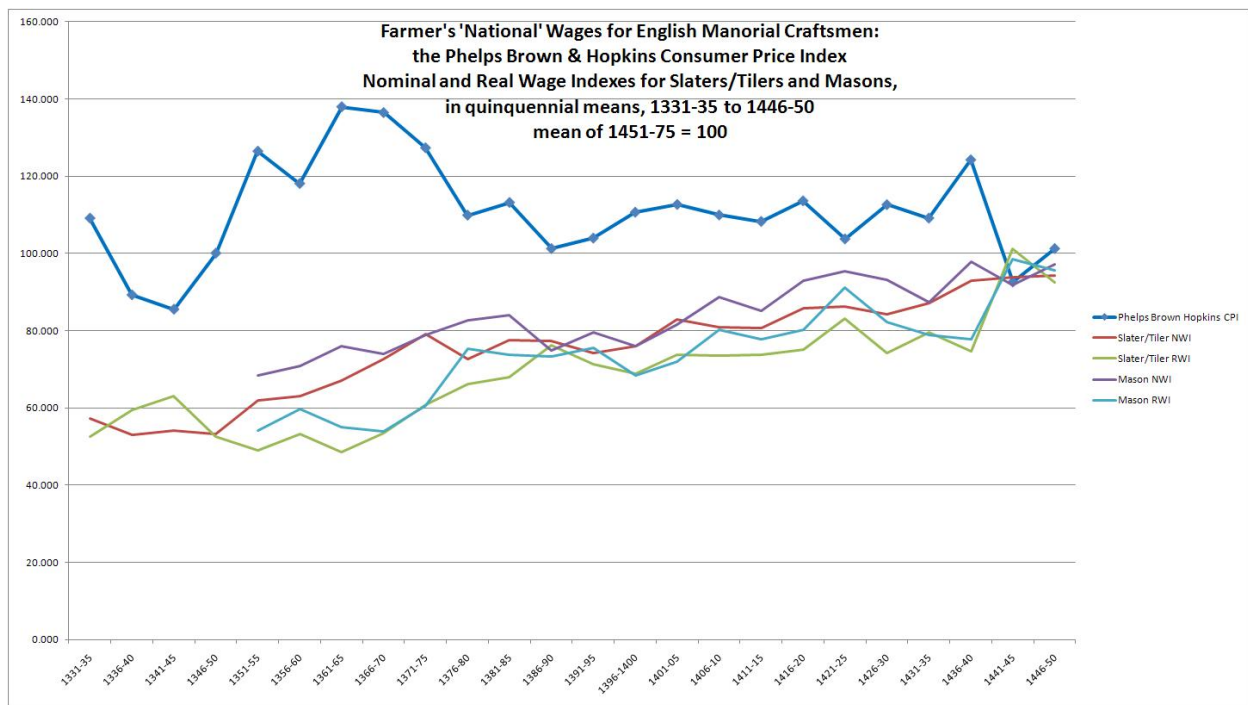Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html

Figure 7: Farmer's 'National' Wages for English Manorial Craftsmen:

Nominal and Real Wage Indexes for Carpenters and Thatchers, with the Phelps Brown and Hopkins Consumer Price Index

In quinquennial means: from 1331-35 to 1446-50

Base: mean of 1451-75 = 100

Sources:

(1) David Farmer, 'Prices and Wages [1042-1350]', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), statistical appendixes, pp 760-78, 811-17.

David Farmer, 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), statistical appendixes, pp.467-90, 516-24.

(2) Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html

Figure 8: Farmer's 'National Wages' for English Manorial Craftsmen:

Nominal and Real Wage Indexes for Slaters/Tilers and Masons, with the Phelps Brown and Hopkins Consumer Price Index

In quinquennial means, from 1331-35 to 1446-50

Sources:

(1) David Farmer, 'Prices and Wages [1042-1350]', in H. E. Hallam, ed., *The Agrarian History of England and Wales*, Vol. II: *1042-1350* (Cambridge, 1988), statistical appendixes, pp 760-78, 811-17.

David Farmer, 'Prices and Wages, 1350-1500', in Edward Miller, ed., *The Agrarian History of England and Wales*, Vol. III: *1348-1500* (Cambridge, 1991), statistical appendixes, pp.467-90, 516-24.

(2) Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a
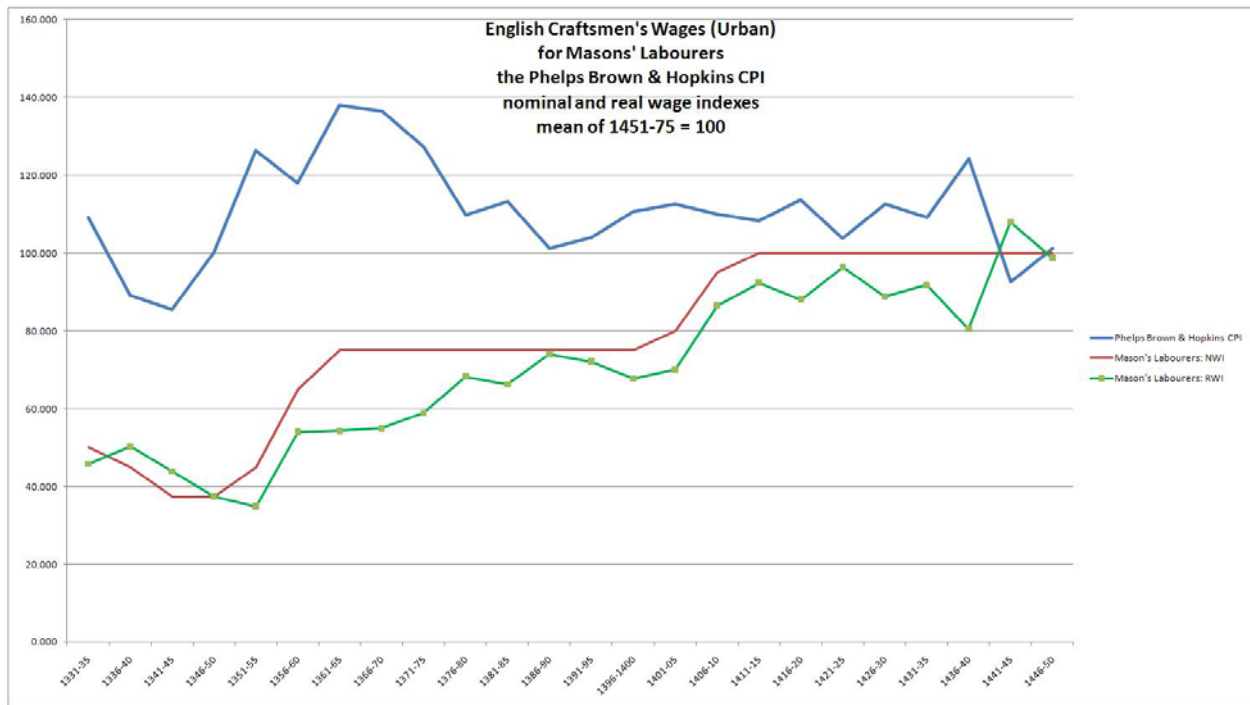
Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html
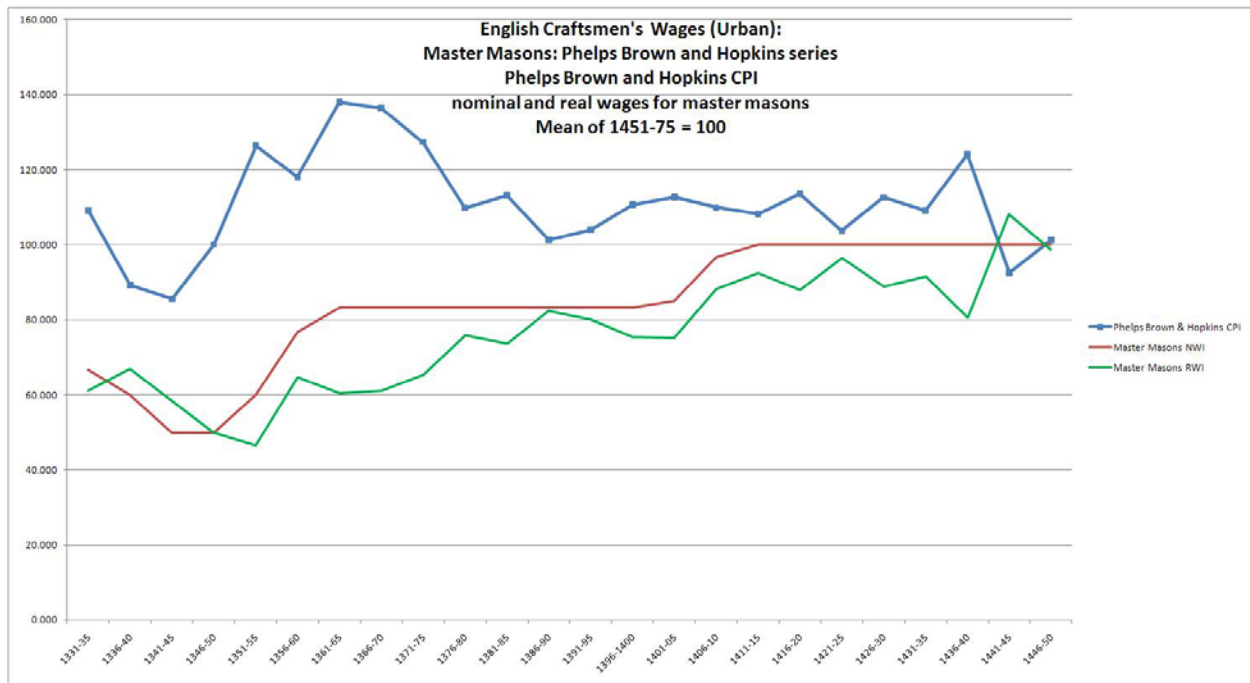
Figure 9: English Urban Craftsmen's Wages (Oxford-Cambridge region and small towns of SE England)

Nominal and Real Wages for Master Masons, with the Phelps Brown and Hopkins Consumer Price Index

In quinquennial means: 1331-35 to 1446-50

Base: mean of 1451-75 = 100

Source: Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html

Figure 10: English Urban Craftsmen's Wages (Oxford-Cambridge region and small towns of SE England)

Real and Nominal Wage Indexes for Masons' Labourers and the Phelps Brown and Hopkins Consumer Price Index

Source: Archives of the British Library of Political and Economic Science, the Phelps Brown Papers: boxes Ia:324, J.IV.2a

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html
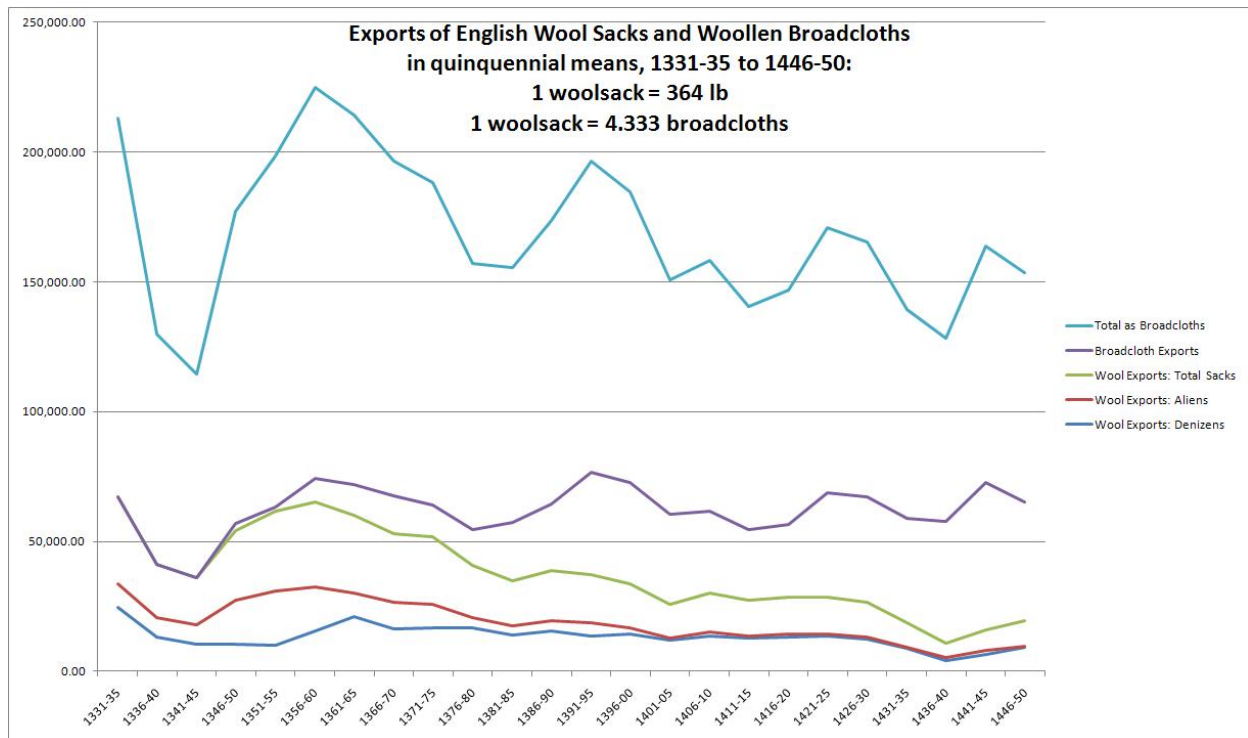
Figure 11: Exports of English Wool Sacks and Woollen Broadcloths (and equivalent textiles)

In quinquennial means, from 1331-35 to 1446-50

One woolsack = 364 lb (165.108 kg) = 4.333 broadcloths of assize (24 yards by 1.75 yd)

Sources:

Eleanor M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 36-119; A.R. Bridbury, *Medieval English Clothmaking: An Economic Survey* (London, 1982), Appendix F, pp. 118-22

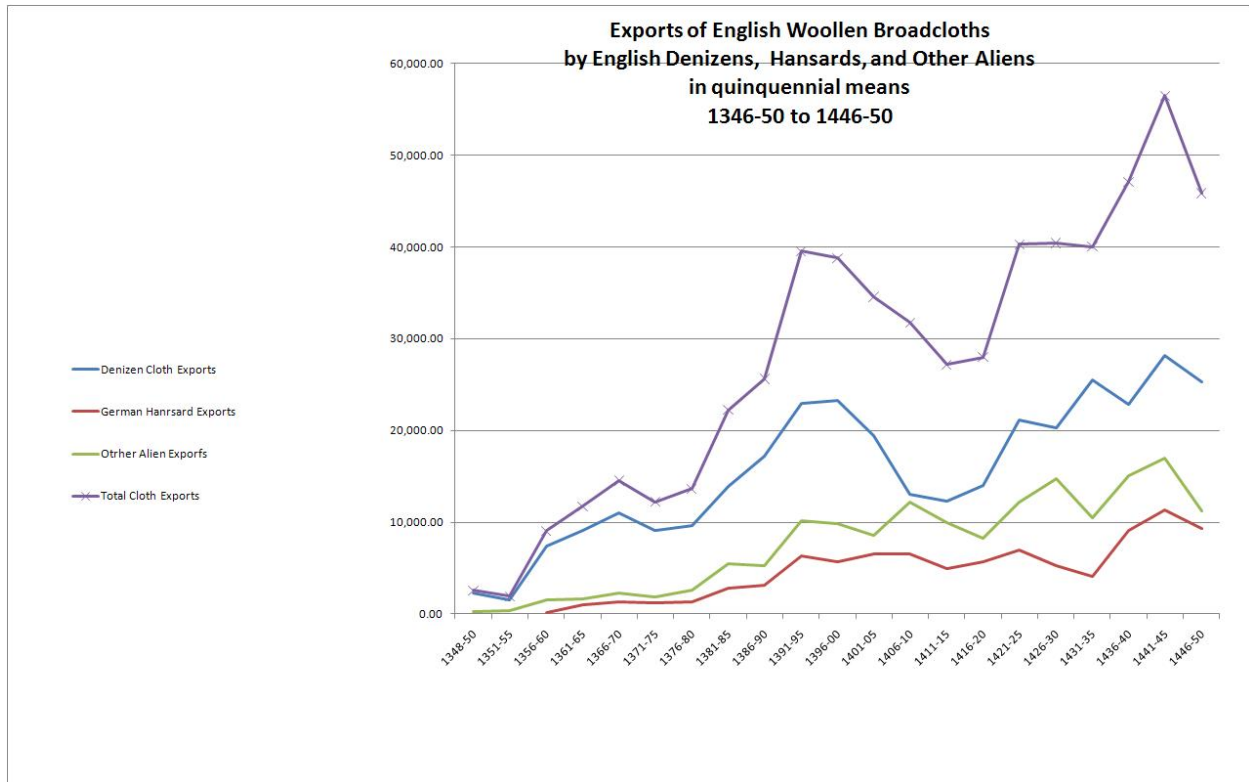Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html

Figure 12:   Exports of English Woollen Broadcloths (and equivalents), by English Denizens, German Hansards, and Other Aliens

In quinquennial means, from 1331-35 to 1446-50

Sources:

 E.M. Carus Wilson and Olive Coleman, eds., *England's Export Trade, 1275-1547* (Oxford, 1963), pp. 36-119; A.R. Bridbury, *Medieval English Clothmaking: An Economic Survey* (London, 1982), Appendix F, pp. 118-22
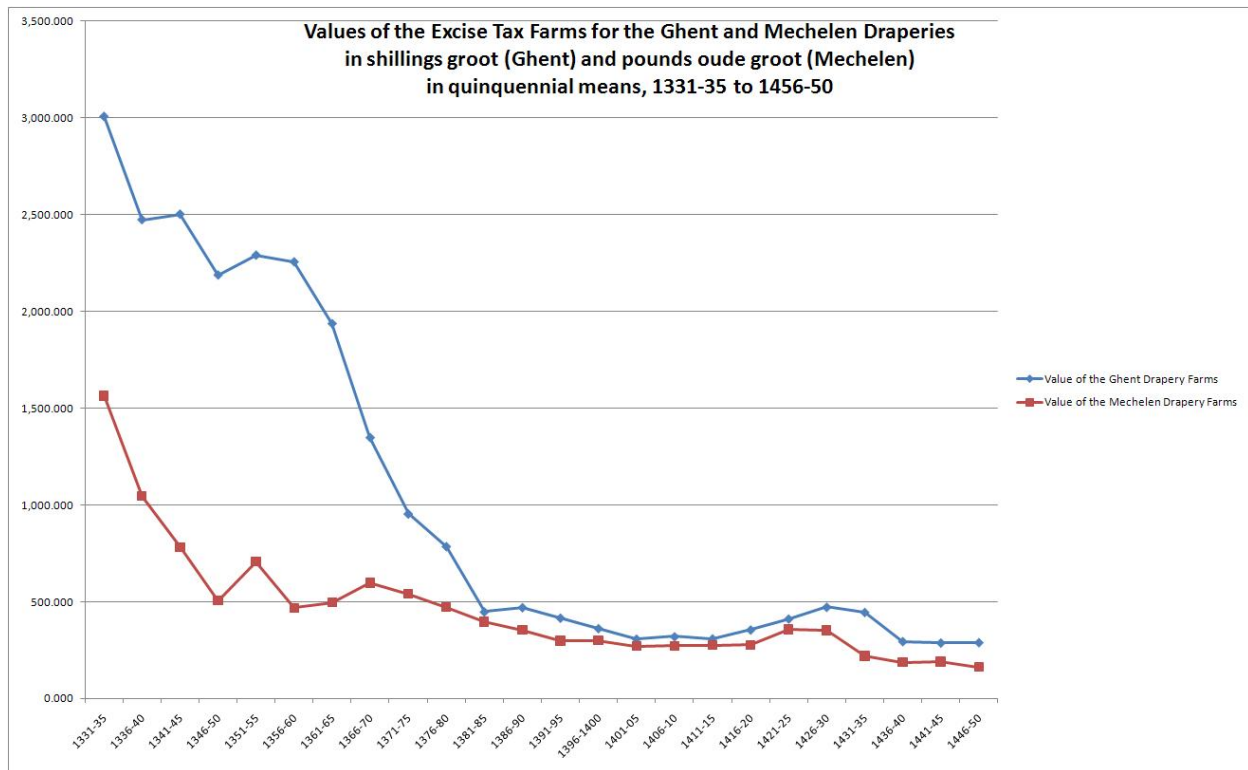
Figure 13: The Values of the Excise Tax Farms for the Woollen Draperies of Ghent (Flanders) and Mechelen (Brabant)

In shillings groot Flemish for Ghent, and pounds oude groot for Mechelen

In quinquennial means, 1331-35 to 1446-50

Sources:

Ghent A: Total drapery excise farms; Ghent B: Excises for 'Ramen en Nieuwe Huusgeld' only**:** all from: Stadsarchief Gent, Stadsrekeningen, Reeks 400:4-43, 1335-1520; Algemeen Rijksarchief België, Rekenkamer, reg. nos. 38,635-72;

Mechelen**:** Stadsarchief Mechelen, Stadsrekeningen, 1316-1550, Series I: nos. 3-225; Algemeen Rijksarchief, Rekenkamer, reg. nos. 41,219-85;
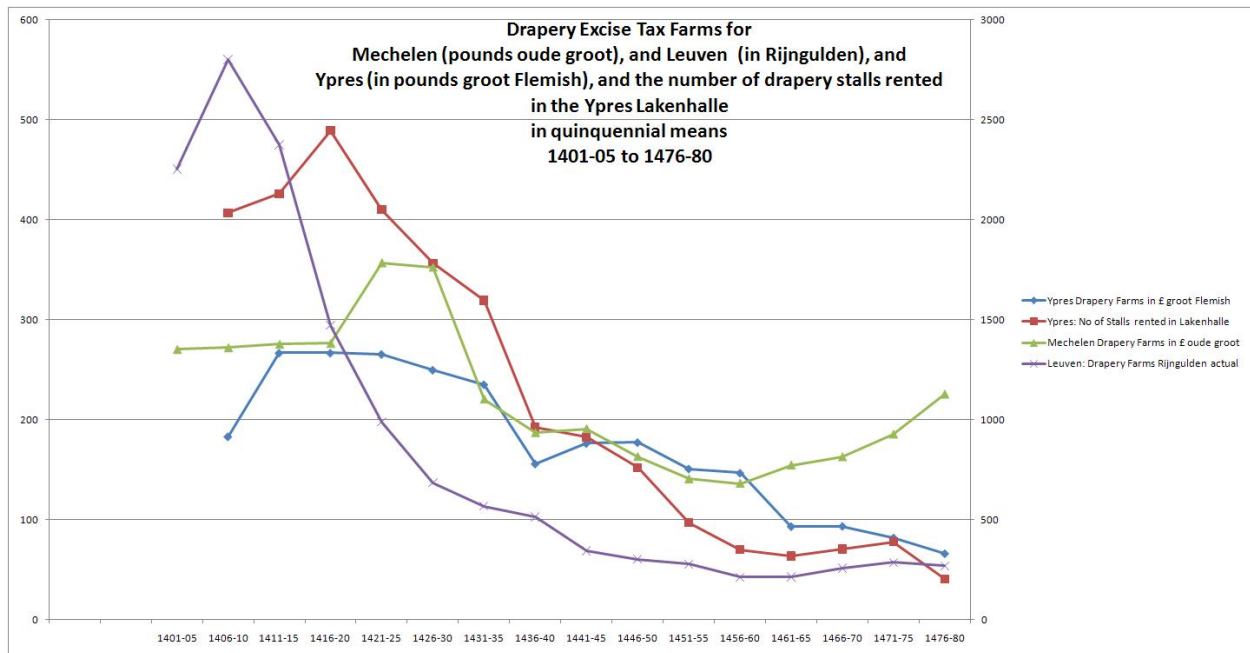
Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html

Figure 14: Cloth Production in the Fifteenth-Century Southern Low Countries

The Drapery Excise Tax Farms for Mechelen (in pounds oude groot), Leuven (in Rijngulden), and Ypres (in pounds groot Flemish), with the number of drapery stalls rented in the Ypres Lakenhalle,

In quinquennial means, from 1401-05 to 1476-80.

Sources:

Ypres: Algemeen Rijksarchief België, Rekenkamer, reg. nos. 38,636-722.

Mechelen: Stadsarchief Mechelen, Stadsrekeningen, 1316-1550, Series I: nos. 3-225; Algemeen Rijksarchief, Rekenkamer, reg. nos. 41,219-85;

Leuven: Stadsarchief Leuven, Stadsrekeningen, 1345-1500, nos. 4986-5124.

Munro's website for online research data:
http://www.economics.utoronto.ca/munro5/ResearchData.html