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Real Wages and the 'Malthusian Problem' in Antwerp and South-Eastern England, 1400 - 1700: A regional comparison of levels and trends in real wages for building craftsmen

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Abstract

In a path-breaking but largely overlooked study, published in a *festchrift* thirty years ago (1975), Herman Van der Wee provided a comparison of prices and real wages of building craftsmen in the regions of Antwerp and south-eastern England, from 1400 to 1700. To do so, he constructed a composite price index modelled as closely as possibly on the famous 'basket of consumables' price index that Phelps Brown and Hopkins had produced, for south-eastern England, in 1956. His graphs revealed that real wages for these craftsmen in Antwerp did not suffer the same deterioration as did comparable real wages in England, and in many other parts of Europe, during the era of the Price Revolution, ca. 1520 - ca. 1640 – although the actual levels of the real wages were not shown. Most economic historians have attributed that significant fall in real wages, especially in England, to the consequences of population growth during this era: i.e., to a fall in the marginal productivity of labour, with a dramatic alteration in the land:labour ratio. There is, however, an alternative explanation: the consequences of an inflation, induced primarily by monetary forces, when nominal wages failed to keep pace with the rise in consumer prices (especially those for foodstuffs).

This study examines the role of demographic, monetary, and also institutional factors in producing these diverging trends in real-wages. But the major contribution is to expand upon Van der Wee's study – which used only disembodied index numbers – by calculating the annual values of the baskets of consumables in both England and the Antwerp region, and thus in presenting the actual levels of real wages, in terms of the number of such baskets that building craftsmen could purchase with their annual money wages (for 210 days of employment), in each region, combining wage rates for summer and winter work (seasonal wages).

The results are very striking. As measured in 50-year harmonic means, the level of real wages for master masons in Antwerp was only 83.79% of that for master masons in south-east England, in 1401-50; and worse, only 78.15% of the level for English masons in 1451-1500; but then real wages for Antwerp master masons began to climb above those for their English counterparts: reaching 102.60% in 1501-50, 136.34% in 1551-1600; and, for the peak achievement, 154.49% in 1601-50, before falling back, somewhat, to a level of 125.58% in the final half century studied, in 1651-1700. But part of that gain or achievement for master masons in Antwerp was at the expense of the real incomes for their journeymen-labourers, who did not fare quite as well, in comparison with the English journeymen labourers: earning just 68.94% of their English counterparts in 1401-50; 69.38% in 1451-1500; 91.18% in 1501-50; 107.60% in 1551-1600; 133.46% in 1601-50; and 109.88% in the final period, 1651-1700. Oddly enough, the Antwerp masons (both masters and journeymen) fared the very best after Antwerp had passed its Golden Age.

The hypothetical explanations for these divergencies may be even more interesting than the data themselves. The study concludes by examining the statistical and theoretical nature of 'real wages': in terms of the purchasing power of the annual nominal money wage; in terms of the marginal productivity of labour; in terms of the marginal *revenue* product of labour; and in terms of the Total Factor Productivity of the occupation or economy as a whole. These data, however, do not take account of another factor that may have narrowed the gap between the actual levels of consumption in southern England and the Antwerp region: excise taxes on consumption, which had been a basic feature of urban finances in the southern Low Countries since the thirteenth century, but which were introduced into England only in 1643, shortly after the outbreak of the Civil War between Crown and Parliament.

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Real Wages and the 'Malthusian Problem' in Antwerp and South-Eastern England, 1400 - 1700 :A regional comparison of levels and trends in real wages for building craftsmen

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The Malthusian Model of Labour Productivity and Real Wage: the Phelps Brown and Hopkins index

It has long been a commonplace in the economic history of early-modern Europe that population growth during the 'Price Revolution' era (c.1520 - c.1650) led to diminishing returns, especially in agriculture, or, in other words, to a fall in the marginal productivity of labour, and thus to a decline in real wages, at least for the working classes in both rural and urban societies. We now possess a much better set of demographic statistics for England than we do for any other European country; and a reasonable estimate is that the English population more than doubled from about 2.25 million in 1523 to 5.391 million at its seventeenth-century peak, c.1656: that is a rise of almost 140 percent.[1] Thus, even if such iconoclasts as John Nef and Eric Kerridge have contended, respectively, that Tudor-Stuart England underwent an 'agricultural revolution' and at least a 'minor industrial revolution', most economic historians will continue to assert that England did not, during this era, experience sufficient technological change and capital investment to counteract this 'law of diminishing returns'.[2] Not until the genuine 'industrial revolution', and really not until after the 1820s, would Great Britain, and later the rest of Europe, escape this dismal Malthusian cycle by which population growth inevitably led to falling real wages and their attendant social ills. As Peter Lindert has commented, in summing up this common view, 'the key to Malthusian faith continues to be the belief that population growth lowers living standards'.[3]

Statistical support for that grim Malthusian interpretation was presented in the mid 1950s, in the two well-known articles of E. Henry Phelps Brown and Sheila Hopkins: on wages and prices in S.E. England, principally the Cambridge-Oxford region, from 1264 to 1954, with summary real-wage indexes, employing as the base period chosen the quarter-century 1451-1475 (i.e., the mean of wages and prices = 100, for this

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[1] Data, expressed only in five-year periods, taken from E.A. Wrigley, R.S. Davies, J.E. Oeppen, and R.S. Schofield, *English Population History from Family Reconstitution, 1580- 1837* (Cambridge and New York: Cambridge University Press, 1997), Appendix 9, pp. 613-6. See also E.A. Wrigley and R.S. Schofield, *The Population History of England, 1541 - 1871: A Reconstruction* (Cambridge and New York: Cambridge University Press, 1980), pp. 528-29.

[2] See John U. Nef, 'The Progress of Technology and the Growth of Large Scale Industry in Great Britain, 1540-1640', *Economic History Review*, 1st ser. 5 (1934), reprinted in E.M. Carus-Wilson, ed., *Essays in Economic History*, Vol. I (London, 1954), pp. 88-107; and in John Nef, *Conquest of the Material World* (Chicago, 1964), pp. 121-41; See also John Nef, 'A Comparison of Industrial Growth in France and England, 1540-1640', *Journal of Political Economy*, 44 (1936), reprinted in Nef, *Conquest of the Material World* (1964), pp. 144-212; John Nef, 'Prices and Industrial Capitalism in France and England, 1540-1640', *Economic History Review,* 1st. 7 (1937), reprinted E.M. Carus-Wilson, ed., *Essays in Economic History,* Vol. I (London, 1954), pp.108-34; Eric Kerridge, *The Agricultural Revolution* (London, 1967).

[3] Peter Lindert, 'English Living Standards, Population Growth, and Wrigley-Schofield', *Explorations in Economic History*, 20:2 (April 1983), 131-55; see also Peter Lindert, 'English Population, Wages, and Prices: 1541-1913', *Journal of Interdisciplinary History,* 15:4 (Spring 1985), 609-34.

period).[4] Their mean period just happened to lie in the era that James E. Thorold Rogers (the source of so much of their) data had called 'The Golden Age of the Labourer'.[5] The Phelps Brown and Hopkins real-wage indices do indeed present a shocking and truly dismal picture, that is for building craftsmen in the small towns of S.E. England, for master and journeymen masons and carpenters, in the subsequent early-modern era. From a peak real-wage index number of 111.043 in 1476-80 – expressed as a quinquennial harmonic mean – that index fell to a nadir of 39.155 in 1631-35 (the worst year was 1631, when the index stood at just 31.81), just before England's population had reached its peak. Then in a seemingly Malthusian fashion, that population began to fall: from the aforementioned peak of 5.391 million in 1656 to a nadir of 5.036 million in 1686 (a decline of 6.6 percent); and while it experienced some small recovery thereafter it did not surpass the 1656 peak until 1716 (with a population of 5.428 million). Not surprisingly, as one might anticipate from a Malthusian model, real wages experienced some recovery with this population decline: reaching a quinquennial harmonic mean of 55.359 in 1686-90 and 59.786 in 1716-20.[6]

Subsequently, in two later publications, Phelps Brown and Hopkins sought to prove that England's experience in both population and real wages was not an anomaly: presenting even more dismal data on real wages for building craftsmen for France as a whole, Alsace, Valencia, Münster, Augsburg, and Vienna, in the early-modern era.[7] The statistical foundations for almost all of these series are, admittedly, much weaker than those for S.E. England; but they all present more or less the same picture, if not exactly in tandem: a sharp fall in real wages, reaching their nadir in the mid seventeenth century, and then rising thereafter during a period when, as most historians would now agree, the continental population was also declining, or in some regions, at best static.[8] Certainly Phelps Brown and Hopkins leave the reader with absolutely no doubt that population

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[4] E.H. Phelps Brown and Sheila V. Hopkins, 'Seven Centuries of Building Wages', *Economica*, 22:87 (August 1955), 195-206, reprinted in E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 1-12; and E.H. Phelps Brown and S.V. Hopkins, 'Seven Centuries of the Prices of Consumables Compared with Builders' Wage-Rates', *Economica*, *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. 13-59, containing additional statistical appendices not provided in the original publication, or in earlier reprints. I have corrected a number of the indices from the Phelps Brown Papers Collection, now housed in the Archives of the British Library of Political and Economic Science (LSE), in uncatalogued boxes; and I have also interpolated missing data in their annual series, for both prices and wages. Thus the numbers presented here differ, to a small extent, from those presented in their own publications. Their base period was chosen as one of relative price-stability.

[5] See James E. Thorold Rogers, *A History of Agriculture and Prices in England, from the year after the Oxford Parliament (1259) to the Commencement of the Continental War (1793): Compiled Entirely from Original and Contemporaneous Records*, 7 vols. (Oxford, 1866-1902). For this period see, Vol. III - V: *1401-1582* (1881-87); Vol. VI: *1583-1702* (1887). See also James E. Thorold Rogers, *Six Centuries of Work and Wages: the History of English Labour* (London, 1903).

[6] See sources cited in n. 1 above.

[7] E.H. Phelps Brown and S.V. Hopkins, 'Wage-Rates and Prices: Evidence of Population Pressure in the Sixteenth Century', *Economica*, 24 (Nov. 1957), 289-305; E.H. Phelps Brown and S.V. Hopkins, 'Builders' Wage Rates, Prices, and Population: Some Further Evidence', *Economica*, 26 (Feb. 1959), 18-38. Both were reprinted n E.H. Phelps Brown and Sheila V. Hopkins, *A Perspective of Wages and Prices* (London, 1981), pp. 60-77, 78-98, respectively.

[8] See Jan de Vries, 'Population', in T.A. Brady, H.A. Oberman, and J.D. Tracy, eds., *Handbook of European History, 1400-1600*, Vol. I: *Structures and Assertions* (Leiden, 1994), p. 13.

and the 'law of diminishing returns', i.e., the Malthusian model, explains all of these change in real wages.

The Van der Real-Wage Index for the Antwerp region: a challenge to Phelps Brown & Hopkins

The first scholar to challenge this Malthusian orthodoxy, or to challenge it in part, with a very different set of statistics on real wages in early-modern Europe, but more specifically in the Antwerp region, was Herman Van der Wee in an article that first appeared in a Dutch-language *festschrift* over thirty years ago (1975), but republished in English translation in 1978, though without the extremely valuable statistical tables.[9] His graphs compared the behaviour of prices, nominal wages, and real wages in both the Brabant region of Antwerp-Lier-Mechelen and south-eastern England for the three centuries 1400 - 1700, thus covering the entire Price Revolution era, along with the preceding century. The English price and data were, of course, the Phelps Brown & Hopkins indexes.

For Brabant itself, Van der Wee constructed a Basket of Consumables price index modelled as closely as possible on the Phelps Brown and Hopkins index; and of course he chose the same base period: 1451 - 1475. So far as was possible, he used identical quantities, by weight or volume, of the same commodities — to provide the same component weights as those used in the Phelps Brown & Hopkins price index. But since his basket, with ten commodities, lacks three of the thirteen commodities found in the Phelps Brown & Hopkins index (for this era), he adjusted some commodity weights to provide approximately the same proportional expenditures for each of the seven major commodity groups in the basket: i.e., farinaceous (grains), drink (barley malt for beer), meat, fish, dairy products (butter and cheese) , fuel/light (charcoal candles, lamp oil), and textiles (linen, canvas, coarse woollens). The wage data were, of course, those for both master building craftsmen and their journeymen in the Antwerp region.

Statistical Difference between the Van der Wee and Phelps Brown & Hopkins Price Indexes

There is, however, a significant difference between these two price indexes, one that went unnoticed until very recently.[10] In the Phelps Brown & Hopkins 'Basket of Consumables' price index their commodity weights are fixed and unvaried, over the entire 700 year span, for each of six major groups (though varying within them): 20.0 percent for farinaceous (wheat, rye, barley, peas, to 1725; wheat and potatoes thereafter); 21.0 percent for meat (from pork, mutton, beef); 4.0 percent for fish (herring and then cod); 12.5 percent for dairy products (cheese and butter); 22.5 percent for drink (barley malt, later supplemented with hops, sugar, and tea); 7.5 percent for fuel and light (charcoal, candles, oil); and 12.5 percent for textiles (canvas, linen

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[9] Herman Van der Wee, 'Prijzen en lonen als ontwikkelingsvariabelen: Een vergelijkend onderzoek tussen Engeland en de Zuidelijke Nederlanden, 1400-1700', in *Album aangeboden aan Charles Verlinden ter gelegenheid van zijn dertig jaar professoraat* (Wetteren: Universum, 1975), pp. 413-47; reissued in English translation (without the tables) as 'Prices and Wages as Development Variables: A Comparison Between England and the Southern Netherlands, 1400-1700', *Acta Historiae Neerlandicae*, 10 (1978), 58-78; republished in Herman Van der Wee, *The Low Countries in the Early Modern World*, trans. by Lizabeth Fackelman (Cambridge and New York: Cambridge University Press and Variorum, 1993), pp. 223-41. Only the original Dutch-language version contains the statistical tables.

[10] I revealed the statistical differences that follow in these two publications: 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), 185 - 297; 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 Caviococchi, 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, 2005), pp. 1013-76.

shirting, woollen cloth, and subsequently cotton). Thus 80 percent of the basket always consists of food and drink, though only 20 percent is based on cereal grains; and 20 percent of the basket always consists of industrial products. Note that the Phelps Brown & Hopkins price index consists only of disembodied index numbers: no actual money-of-account values (in shillings and pence sterling) were ever presented.

Van der Wee, however, constructed his index in an entirely different, and, in my view, a much more sensible fashion: for each of the ten commodities in his basket, for each year in his series (1400 - 1700), he assigned a money-of-account value in pence *groot* of Brabant, i.e., a value obtained by multiplying the price per unit times the quantity for each commodity. He then added up all the items in the basket to produce a total value for each year, in pence *groot* Brabant.[11] For this base period, but for this period only, the proportional values of the six commodity groups are close to those assigned in the Phelps Brown & Hopkins index. For this base period, the commodity shares of the Van der Wee basket for southern Brabant, by value, are as follows: cereal gains (rye only), 18.24 percent; drink (barley alone), 17.08 percent; meat (beef), 23.53 percent; fish (herrings), 4.30 percent; dairy products (butter and cheese), 11.05 percent; fuel and light (charcoal, candles), 7.82 percent; textiles (linens, coarse woollens), 18.00 percent. Thus, food and drink together account for 74.20 percent, and industrial goods for the remaining 25.82 percent, but only for this base period, 1451-1475. The values for these years were then summed and divided by 25 to get the mean for the base period. That value therefore served as the denominator in calculating all the index numbers for his three-century series, to 1700.

The major consequence of this very different statistical method is that the components of Van der Wee's Brabant price index do not have fixed shares of the total basket, as they do in the Phelps Brown & Hopkins index, or indeed in any other Laspeyres-type price index. Instead, the proportions accounted for by each commodity group vary over time with changes in relative prices; and the major variation involves grain prices.[12] In both of these consumer baskets, grain prices are the most important, for two obvious reasons: because they command such a large share of each basket, though more so in the Phelps Brown & Hopkins basket; and because grain prices so frequently experienced severe fluctuations (i.e., with a wide amplitude). Thus, during prolonged periods of population growth, and presumed diminishing returns in agricultural production, we naturally find that the *relative* price of grains rose more than did those of animal products, which in turn rose considerably more than did the prices of labour-intensive industrial products.

The role of inflation in altering household expenditures and relative prices, during the Price Revolution

But there is another and often overlooked explanation for this behaviour in relative prices: the consequences of monetary inflation for those with fixed budgets for household expenditures. That was especially true when an economy experienced nominal wage stickiness; and although nominal wage stickiness is more evident in times of deflation, in most inflationary periods nominal wage increases usually do not keep pace with the rise in consumer prices in general. Thus, as food prices rose, most lower income households would face an often severe budget constraint, so that they would be forced to spend a larger share of their budget, first, on bread grains, then on drink, and somewhat less on meat, fish, and dairy products. If man lives not by bread alone, bread is often the chief consideration in lower class households. Industrial goods, on the

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[11] From 1435, with the monetary unification of the Burgundian Low Countries, to the end of the series, in 1700, 1.0d *groot* of Brabant = 0.667d *groot* of Flanders; 1.0d *groot* Flemish = 1.50d *groot* Brabant. See Herman Van der Wee, *The Growth of the Antwerp Market and the European Economy, 14th - 16th Centuries*, 3 vols. (The Hague, 1963), Vol. I: *Statistics*, Tables XIII-XIV, pp. 123-26.

[12] See Munro, 'Wage Stickiness', Tables 8-9, pp. 249-51; John Munro, 'Gold, Guilds, and Government: The Impact of Monetary and Labour Policies on the Flemish Cloth Industry, 1390-1435', *Jaarboek voor middeleeuwsche geschiedenis*, 5 (2002), 153 - 205.

other hand, would usually rank last in importance in the household budget, because, with the exception of fuel, most such expenditures could be postponed. Consequently, consumer demand for most such products would rise less than would demand for foodstuffs; and that would be reflected in the corresponding behaviour of relative consumer prices.

Conversely, during prolonged periods of population decline, especially with the absence of any inflationary factors, such as coinage debasement, and disruptions from warfare or other 'supply shocks', grain prices tended to fall, and fell more so than did other commodity prices. If, furthermore, such periods were also deflationary, for purely monetary reasons, and also if wage-earning artisans and labourers also enjoyed nominal wage stickiness, as I have myself already demonstrated for several periods in late-medieval England and the southern Low Countries, then their budget constraints were relaxed as, indeed, they came to enjoy higher real wages. Consequently those wage earners, especially in the lower income strata, could now afford to spend more of their household budget on industrial goods, meats, and dairy products. Thus, in a similar, if obverse fashion, that shift in consumer demand would have led to an increase in the 'real' prices of these products; or, viewing the situation in terms of nominal prices, we would expect to find that their prices fell less than did grain prices.

To repeat the obvious statistical consequences in determining the utility of these two quite different price indexes: during inflationary periods, usually accompanied by population growth, grains (bread grains and barley malt) accounted for a larger share of Van der Wee's 'basket of consumables' price index, while industrial products accounted for a smaller share; and during periods of deflation, usually accompanied by demographic decline or stagnation, such grains accounted for a smaller share, while industrial goods accounted for a larger share (see Table 9). But in the Phelps Brown & Hopkins price index the expenditures shares, as emphasized earlier, remain constant throughout the entire period (even though the commodities in the basket do change over time). For this reason, one may well contend that Van der Wee's 'basket of consumables' price index better reflects the historical reality of consumer expenditures than does the Phelps Brown & Hopkins price index. [13]

Van der Wee himself indirectly provided evidence for this point in analysing the food budgets for Antwerp labourers in the later sixteenth century. He found that the share for bread (or cereal grains) was only 25 percent in years of low grain prices (1561-62) but as much as 70 percent in years of high grain prices (1586-87).[14] Unfortunately his evidence concerned only the food budgets, and not the total household budget; but even so, that analysis may suggest that the proportion of his price index in particular that is allocated to grains is too low: too low if we are interested primarily in measuring real wages for labourers and artisans in early-modern urban societies. Obviously the nature and composition of these baskets will vary greatly according to economic and social status, and by regions.

Commodity expenditure shares in the two 'baskets of consumables'

We thus must ask how Phelps Brown and Hopkins justified the allocation of expenditure shares in their 'basket of consumables' price index. They did so by examining the proportional outlays of such

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[13] See below, pp. and n.

[14] Herman Van der Wee, 'Voeding en Dieet in het Ancien Régime', *Spiegel Historiael*, 1 (1966), 94-101, republished in translation: as 'Nutrition and Diet in the Ancien Régime', in Herman Van der Wee, *The Low Countries in the Early Modern World*, trans. by Lizabeth Fackelman (Cambridge and New York, 1993), pp. 279-87, especially pp. 284-85 and figure 15:1. For the period 1526 to 1602, the average shares of the food budget in the Beguinage Infirmary in Lier was: 44% for bread, 16% for beer, 1% only for wine, 20% for meat, 3% for fish, and 10% for dairy products.

expenditures in the household accounts of William Savernak, in Bridport, Dorsetshire in the years 1453-1460 (and thus within their base period). In the Savernak budget (as the mean values for these years), farinaceous products (cereal grains and peas) accounted for 20.0 percent; meat and fish together, for 35.0 percent; dairy products, for only 2.0 percent; drink (beer or barley malt), 23.0 percent, totalling 80 percent; fuel and light, for 7.5 percent; and textiles, though not explicitly stated, were estimated to account for the remaining 12.5 percent. They justified the use of this 12.5 percent share -- as noted, the one used in their own 'basket of consumables' price index -- by citing similar shares allocated to textiles in the David Davies and Frederic Eden report on consumer expenditures, produced in 1795-97 [11.5 percent]. and by the UK Board of Trade estimate for 1904-1913 [13.5 percent].[15] Overall, the Phelps Brown budget matched the Savernak budget in allocating 80 per cent to foodstuffs and 20 percent to industrial products. Their allocations are indeed virtually identical for all commodities except for two: meat (combined with fish) and dairy products. Their allocations of 25.0 percent for meat and fish, rather than Savernak's 35.0 percent, and of 12.5 percent for dairy products, rather than Savernak's mere 2.0 percent would seem reasonable for most economic historians of this era, if also not all that important for any examination of real wages.

Van der Wee justified his choice of commodity weights – i.e., his reliance on the Phelps Brown & Hopkins commodity weights (expenditure shares) – by citing the proportions of expenditures detailed in various early-modern expenditure budgets: those for the Beguinage Infirmary of Lier (1526-1602); the St. James Hospice at Lier (1450); an Antwerp orphanage, 1586-1600 (listing food expenditures for Antwerp labourers employed there); the soldiers of the Antwerp garrison (1568); and the soldiers of the Frisian expeditionary corps sent to Brazil (1648).[16] He did not, however, explain why his allocation of expenditures for 'drink' (barley malt for beer), at 17.1 per cent , is so much lower than the 22.5 percent share in the Phelps Brown and Hopkins 'basket of consumables'. Had his index given the same weight to 'drink' – for the base period, that is – the overall division between food products and industrial goods would have been closer to the 80:20 ratio of expenditures in the Phelps Brown and Hopkins 'basket'. The issue of expenditure shares given to drink in other consumer price indexes has, in fact, generated considerable debate, which, need not nor may not be discussed here, because I have addressed this very same issue in a recent publication.[17]

Were Phelps Brown and Hopkins aware of the implicit economic issues involved in their use of a Laspeyres type price index? On the one hand, they did concede this interesting point (which very few users of their index have ever observed) concerning the following 'limitations' of their price-index, in that:[18]

> it takes the relative quantities of the main heads [of expenditures] as constant, whereas in such a fall, for instance, in the purchasing power of the wage as the sixteenth century brought, the proportion of meat to bread surely must have fallen.

But later they explicitly justify their use of this Laspeyres 'constant expenditure shares' price index citing 'the similarity between Savernak's budget and that of the wage-earners four-and-a half centuries later', especially

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[15] Phelps Brown and Hopkins, 'Prices of Consumables', Table 1, pp. 297-98; based upon K.L. Wood-Legh, *A Small Household of the Fifteenth Century* (Manchester, 1956).

[16] Van der Wee, *The Growth of the Antwerp Market,* vol I: *Statistics*, Appendix 47:1, pp. 533-37; Van der Wee, 'Voeding en Dieet in het Ancien Régime', pp. 279-87.

[17] Munro, 'Builders' Wages in Southern England and the Southern Low Countries, 1346 -1500', pp. 1021-26.

[18] Phelps Brown and Hopkins, 'Prices of Consumables', p. 303.

taking into account textile expenditures.[19] Furthermore, one must note that two other recently published studies on real wages used author- compiled consumer price indexes for early-modern Europe that are also based on constant proportions of the chief household expenditures: those of Robert Allen and of Gregory Clark.[20] In another recent publication, I have examined their statistical techniques and given my reasons for disagreeing with their methodology.[21]

In any event, the utility of this current study, comparing both the trends and, more importantly, the actual levels of real wages in southern England and the Antwerp region of Brabant, lies in utilizing basically similar consumer price indexes and measures of real wages. Furthermore, the Phelps Brown & Hopkins 'basket of consumables' price index is now so familiar and so widely used that it would futile, or at least counter-productive, to invent yet another index to measure real wages.

Almost all economic historians measure real wages, or rather, changes in their trends, by the very same way that Van der Wee and Phelps Brown & Hopkins did: in terms of index numbers for prices and wages, when the index numbers for both are anchored to the same base period, in this case the aforementioned quarter century 1451-1475. The standard formula for doing so is: RWI = NWI/CPI [Real Wage Index equals the Nominal Money Wage Index divided by the Consumer Price Index]. As noted earlier, Van der Wee's 1970 *festscrhift* paper presented graphs representing the real wage trends using precisely this formula, and the price and wage indexes just discussed.

A new measure of real wages: the number of commodity baskets bought with the annual money wage

As Robert Allen has already observed, the problem with this method is that 'the real wage [index] shows [only] proportional changes and relative levels', and thus 'it has no absolute interpretation'.[22] For reasons that I have discussed elsewhere, Allen's alternative is unsatisfactory for a variety of reasons: in particular in using constant expenditure shares and in expressing prices and wages in terms of grams of silver.[23]

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[19] Phelps Brown and Hopkins, 'Prices of Consumables', p. 298. The distribution of expenditures in the Savernak budget is indeed fairly close to the estimates of the UK Board of Trade, 1904-13, but not to the consumption accounts of 60 poor households recorded by David Davies and Frederic Morton (*State of the Poor*) in 1795-97 (Table 1, p. 297), which allocates 53 percent to cereal grains, when grain prices were very high.

[20] Robert Allen, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38:4 (October 2001), 411-47; Gregory Clark, 'Work, Wages and Living Conditions: Building Workers in England from Magna Carta to Tony Blair', in Simonetta Caviococchi, 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, 2005), pp. 889-932.

[21] Munro, 'Builders' Wages in Southern England and the Southern Low Countries, 1346 -1500', pp. 1013-31.

[22] Allen, 'Great Divergence', p. 424.

[23] See nn. 20-21 above. For an excellent critique of 'the problem of gold and silver equivalents', see Van der Wee, *Growth of the Antwerp Market*, vol. I, pp. 115-22, which was much influenced by Jean Meuvret, 'Histoire des prix des céréales en France dans la seconde moitié du XVIIe siècle: sources et publication', *Mélanges d'histoire sociale*, 5 (1944), 27-45. Because the use of 'silver equivalents' is designed to compensate for the effects of coinage debasement on commodity prices, I would also add or elaborate that

Van der Wee, by the method of constructing his price index, has implicitly offered us the correct route to a feasible alternative method: namely, a calculation of the number of commodity baskets that a master building craftsmen and his journeyman labourer could purchase each year with their annual money wage incomes. There is, of course, one very major stumbling block to adopting this method for comparing annual real wage incomes in both south-eastern England and the Antwerp region of Brabant. For while Van der Wee did provide the annual values of his commodity 'basket of consumables' each year, in pence *groot* Brabant, Phelps Brown and Hopkins did not: as noted already, they provided only disembodied index numbers.

A solution was, however, found when the Archives of the British Library of Political and Economic Science (London School of Economics) acquired all the academic paper of E. Henry Phelps Brown, including the working papers used to construct his famous 'basket of consumables' price index. I was the first to make use of these papers. Over the course of several research-summers, from 1997, I computed the values of all of the components in the Phelps Brown & Hopkins 'basket of consumables' index from 1264 to 1800: a total of 22 in all (as compared to 13 in their base period). At the same time, with the aid of computers, I corrected numerous errors in their tubulations (compiled by research assistants, who had used mechanical calculators). But I also used various statistical techniques to interpolate missing data, which I found superior to their method of allowing other series to 'carry the weight' when data were lacking: e.g., to use fish prices as a proxy for missing meat prices. By other statistical techniques, to be discussed more fully when I finally publish the entire series, I succeeded in calculating the value of each annual 'basket' in pence sterling (1264-1800).

When the value of each annual basket is computed in terms of its current money-of-account value, the question naturally arises: what is this value supposed to express? Curiously, no one seems to have considered this question since Phelps Brown and Hopkins published their famous article (1956). The answer, however, can be found in one brief passage in their explanation of this basket: namely, that it represents 'what a hundred pence [sterling] would buy in 1451-75'.[24] My calculations indicate, however, that the mean value of the basket for this period is 112.08d sterling. Table 1 presents the composition of this 'basket of consumables' for both south-eastern England (Phelps Brown and Hopkins) and the Antwerp region of Brabant (Van der Wee), for the base period 1451-1475: with the quantities of each component and their value in the basket. The aggregate value of the Antwerp basket, for this same period, was 232.524d *groot* Brabant = 155.016d *groot* Flemish.

Thus, even if these two baskets are not meant to provide a measure of the basic minimum requirements for the subsistence of building craftsmen in either country, we are now able, finally, to compute the actual levels of real wages for both south-eastern England, and to compare them in reasonably equivalent terms for the three centuries of this and Van der Wee's study: from 1400 to 1700. Surely this method also provides the best indication for the true meaning of the term 'real wage': the purchasing power of the nominal, money wage. Certainly it obviates the necessity or even the basic idea of using 'silver gram equivalents'. In computing such wages we are really restricted chiefly to those for building craftsmen (in both urban and rural locations): masons (brick and stone), carpenters, tilers, thatcher, plasterers, street-pavers; and for each, both masters and journeymen. For the textile industries, we do possess some daily wage data for fullers – but not

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the use of 'silver equivalents' involves two historically false assumptions: (a) that the increase in the money supply is proportional (or inversely proportional, to be more accurate) to the extent of the debasement; and (b) that the increase in the money supply leads to a proportional rise in prices. This is an outdated and very crude representation of the Quantity Theory of Money, particularly in overlooking the changing behaviour of the income velocity of money (the Fisher-Friedman V, as the reciprocal of Cambridge 'k').

[24] Phelps Brown and Hopkins, 'Prices of Consumables', p. 298.

in the long, virtually continuous series that we possess for both England and the southern Low Countries.[25]

Annual wage incomes: the number of days of employment per year

Since, however, our wage data are almost always available only a daily basis (or weekly, with six days employment per week), we are really entitled only to calculate the daily real wage. Nevertheless, an annual wage income has been selected for this study, using a standard of 210 days paid employed for building craftsmen in both countries. This is the average number of days of paid employment for the century 1450 - 1550 that Herman Van der Wee found in calculating periods of employment in the building trades in Antwerp and Lier (1437 to 1660); and it was also the average number of days of employment in the base period 1451-1475. [26] In several other publications, I have elaborated on the justification for using this standard employment year, citing other sources on employment in later-medieval England and the Low Countries.[27] If this estimate seems lower than others often cited (e.g., 250 - 275 days a year), which basically take account only of holidays, one may offer yet another assumption for the building trades: that employment would have been disrupted by bad weather and/or by discontinuities in supplies of bricks, stone, wood, and other materials for some short periods . Furthermore, most master building craftsmen worked for a variety of employers and thus could not count on sustained, continuous employment through the year. If so, one might also suppose that when real wages were high many craftsmen may have chosen to substitute more leisure for paid employment. But my own research does not sustain any such conclusions: for I have found absolutely no statistical correlation between real wages and the number of days worked in the Antwerp-Lier region, for the full century from 1436 to 1535. [28]

The problem of seasonal wages

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[25] For Flemish fullers, see Munro, 'Gold, Guilds, and Governments', pp. 153-105; and Munro, 'Wage Stickiness', pp. 185-297.

[26] Van der Wee, *Growth of the Antwerp Market,* Vol. I: *Statistics*: Appendix 48, pp. 540-44.

[27] See sources in n. 24; and also John Munro, 'Urban Wage Structures in Late-Medieval England and the Low Countries: Work-Time and Seasonal Wages', in Ian Blanchard, ed., *Labour and Leisure in Historical Perspective, Thirteenth to Twentieth Centuries*, *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte Beiheft* series no. 116 (Stuttgart, 1994), pp. 65-78. In thirteenth-century England, the chronicler Walter of Henley stated that the normal working year for agricultural labourers was 264 days. See Doreathea Oshinksky, ed., *Walter of Henley and Other Treatises on Estate Management and Accounting* (Oxford, 1971), pp. 314-15: *Hosbondrye*, c.30: after 'holydayes and for such other lettes .. there remayne 44 weekes woorkable', so that 44 x 6 = 264 days. For fifteenth- and early sixteenth-century Antwerp, Scholliers has given that same number of 264 days as the *maximum* number of workdays in the building trades, with conditions of 'full employment' (after deducting holidays). See E. Scholliers, *Loonarbeid en honger: de levenstandaard in de XVe en XVIe eeuw te Antwerpen*, Interuniversitair centrum voor de geschiedenis van prizen en lonen in België (Antwerp: De Sikkel, 1960), pp.84- 88. For fifteenth-century England, a higher figure of 272 work days is cited in Douglas Knoop and G.P. Jones, *The Mediaeval Mason: An Economic History of English Stone Building in the Later Middle Ages and Early Modern Times*, 3rd edn. (Manchester, 1967), p. 107.

[28] Data in Van der Wee, *Antwerp Market*, vol. I, Appendix 48, pp. 540-44. For this regression, in which we would expect a negative correlation, R-Square = 0.00002943; adjusted R-Square = -0.01017; F = 0.002885. See also Munro, 'Urban Wage Structures in Late-Medieval England and the Low Countries', pp. 65-78; and especially Munro, 'Wage Stickiness', pp. 185 - 297.

The chief reason why comparisons involving an annual wage income is preferred to those with just daily wage incomes is the problem of seasonal wages. In many parts of medieval and early modern Europe the daily wage was, in one sense, a proxy for the hourly wage in that the daily wage was lower in the winter, with fewer hours of sunlight in which to work: sometimes a quarter or even a third lower, for an 8 hour winter day, compared to a 12 -14 hours summer workday. In Antwerp, from 1400 to 1600, the winter wage rate was, on average, 77.7 percent of the summer wage, though the period of the year to which the winter wage applied varied. In these calculations, for the wage income of Antwerp building craftsmen I have calculated the seasonally adjusted annual wage income by allocating 75 percent of the total paid employment (i.e., 157.5 days) to the summer wage and thus 25 per cent (52.5 days) to the winter wage.

In England, however, finding evidence for seasonal wages after the Black Death is very difficult. There are very, very few examples of winter wages in the raw data that Thorold Rogers supplied for the various Oxford and Cambridge colleges; and I have had no greater success in using various manorial and urban wage accounts. The London Bridgemaster accounts, one of the most extensive, beginning in the 1370s, record only a few, just in the 1430s; and none can be found in the various London guild accounts (for brewers, bakers), which record payments made to building craftsmen repairing guild properties. Nor do accounts for the Bishop of Winchester's London manor of Southwark provided any such evidence.[29] Knoop and Jones also found only a few instances of lower winter wages (some Oxford colleges, York Minster, Vale Abbey, Adderbury).[30] One hypothesis to explain this absence of seasonal wages is that since Parliament's Statute of Labourers imposed in 1350-51, after the Black Death, set maximums only for summer wages, ignoring winter wages, the summer wage was made uniform throughout the year, in order to give artisans and labourers a higher wage without attracting the attention of those Justices of the Peace who were required to enforce the statute. In the absence of any definitive patterns, a uniform annual daily wage has therefore been employed for the southern English building workers in this study (not including London), though doing so may overstate their real annual wage incomes, relative to those of Antwerp building craftsmen.[31]

The statistical results are expressed in quinquennial (five-year) means: arithmetic means for both prices (values of the commodity baskets) and nominal wages, but in harmonic means for the real wages. The harmonic mean is 'the reciprocal of the arithmetic mean of the reciprocals of the individual numbers in a given

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[29] Thorold Rogers, *A History of Agriculture and Prices in England,* vol. I (for raw wage data); Vol. II-III, for wages in decennial means; Corporation of London Record Office: Bridge Master's Account Rolls, 1381-1398; Bridge Master's Accounts: Weekly Payment Series, 1404- 1510 (Vols. I - III); London Guildhall Manuscripts Library: Armourers' Company Accounts (1499-1557): MS 12.065, vol. I; Bakers' Audit Books (1505-1547), MS 5174, vol. 1; Brewers' Guild, Warden's Accounts (1424-1562): MS 5440; Carpenters' Guild, Warden's Accounts (1456-1573): MS 4326, vols. I and II; Cutlers's Guild Accounts (1442-1497): MS 7146, roll 1; Grocers' Guild, Warden's Accounts (1452-1578): MS 11,570-571, vols. I - VI: Ironmongers' Guild Accounts (1455-1561): MS 11,698: Vols. I - II; Pewterers' Company Accounts (1474-1500): MS 7086, Vol. I; Archives of the British Library of Political and Economic Science, the Beveridge Price and Wage History Collection: Southwark (Bishop of Winchester), 1406-1454 (Box A.34).

[30] Knoop and Jones, *The Mediaeval Mason*, pp. 104-06, noting for example that Eton college paid a uniform wage of 6d daily throughout the year from 1442 to 1454, but a higher rate of 6 2/3 d in the summer months in 1456-60.

[31] But see Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations* [1776], ed. with introduction and notes by Edwin Cannan (New York: Modern Library, 1937), p. 74: 'in almost every part of Great Britain there is a distinction, even in the lowest species of albour, between summer and winter wages. Summer wages are always highest'.

series'; and it is always somewhat less than the arithmetic mean.[32] The reasons why it must be used instead of the arithmetic mean in calculating means of real wages I have explored elsewhere.[33] That inflexible rule, requiring the harmonic mean, applies to calculations of real wages both by the traditional method of index numbers (RWI = NWI/CPI) and by this new method, based on the number of commodity baskets (as valued in money-of-account) that master masons and journeymen could have purchased with their annual money-wage incomes. If those values are then converted into index numbers (with the same base, 1451-75), the results are precisely the same as those for the standard method (i.e., RWI = NWI/CPI).

The results can be seen in Table 2, which presents the real wages for building craftsmen in Antwerp and in south-eastern England in both formats: in such index numbers and in the number of commodity baskets that could have been purchased with the annual money-wage income. The table also includes the quinquennial arithmetic mean value of the commodity baskets for each region, both in index numbers and in money-of-account (i.e., in silver pence *groot* Brabant and in pence sterling). Both sets of wage data, it must be noted, are for those artisans whose wages were paid fully and solely in money (silver coin), without any supplementary payments in kind.[34] Herman Van der Wee had already demonstrated, in his path-breaking article (1975), in using index numbers, that building craftsmen in the Antwerp region did not suffer the same deterioration in real wages, during the Price Revolution era (c. 1520 - 1650), that their counterparts in south-eastern England did.

Real wage levels in the two regions compared: annual wage incomes expressed as commodity baskets

But an equally interesting result revealed by this statistical analysis is the evidence that real wages (in terms of commodity baskets) in Antwerp were generally lower than those in England during the earlier part of this three-century survey, but much higher in the latter. For the first half of the fifteenth century (1401-50), the mean real wage for master masons in Antwerp was only 83.79 per cent of the mean real wage for English master masons; and in the second half (1451-1500), the comparison is even more unfavourable, since the mean real wage in Antwerp was then only 78.15 per cent of the English real wage. In the sixteenth century, however, real wages begin their steady climb above the English real wage. In the first half of the century

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[32] F.C. Mills, *Introduction to Statistics* (New York, 1956), pp. 108-12, 401. The mathematical equation is: $HM = 1/ [\sum (1/r_1 + 1/r_2 + 1/r_3 + ... 1/r_n)] / N$. The letter 'r' indicates the prices or wages in a series, so that 1/r means the reciprocal of that price or wage for each year in the series. These reciprocal values in the series are then summed; the reciprocal of that value is then taken (i.e., 1 divided by the result); and that result is divided in turn by the number of items (N) in the series (thus 5, for a quinquennial or five-year mean) to obtain the harmonic mean. For index numbers of real wages, the harmonic mean of these numbers for the base period – here, 1451-75 – must also be calculated, i.e., as a 25-year mean. It does not appear that either Allen or Clark used the harmonic mean in calculating their real-wage averages (50-year means in Allen's paper; 10-year means in Clark's paper).

[33] John Munro, 'Money, Wages, and Real Incomes in the Age of Erasmus: The Purchasing Power of Coins and of Building Craftsmen's Wages in England and the Southern Low Countries, 1500 - 1540', in Alexander Dalzell and Charles G. Nauert, Jr., eds., *The Correspondence of Erasmus*, Vol. 12: *Letters 1658 - 1801, January 1526- March 1527* (Toronto, 2003), pp. 592-94. See also Harold S. Sloan and Arnold J. Zurcher, *A Dictionary of Economics*, 3rd edn, (New York: Barnes and Noble, 1953), pp. 149-50: 'In economic computation, the harmonic mean is used in averaging such data as time rates and rate-per-dollar prices'.

[34] For a discussion of this issue, see Munro, 'Wage Stickiness', pp. 200-04; and also Munro, 'Urban Wage Structures', pp. 65-78.

(1501-50), just before and then during the first phase of the Price Revolution era (ca.1520 - ca. 1650), real wages for master masons in Antwerp rose from 79.7 percent of the English average in the first quinquennium, 1501-05 to 173.25 percent of the English average in the final quinquennium, 1546-50; but for the fifty-year period as whole (1501-50), the mean value of the real wage in Antwerp was just 102.60 percent of the English, and thus virtually identical. For the second half of the sixteenth century (1551-1600), with several major fluctuations (so that real wages were identical in 1591-95), the 50-year mean value of the real wage for Antwerp master masons was a full third, 36.34 percent, higher than the mean value of the English mason's real wage.

That gap widened in the first half of the seventeenth century, but then narrowed somewhat in the second half of the seventeenth century. Thus for the fifty-year period 1601-50, the mean real wage for Antwerp master masons was 54.49 percent higher than the mean real wage for English master masons. Of all the half century periods studied, this represented the best achievement of Antwerp masons (both masters and journeymen); but oddly enough this took place well after Antwerp had passed its Golden Age, and indeed had lost its commercial and financial supremacy to Amsterdam. In the next fifty-year period, 1651-1700, the Antwerp advantage in real wages over the English master masons had fallen to 25.58 percent higher.

Note that the Antwerp wages have been seasonally adjusted, as noted earlier, with 75 of the annual wage income in summer wages and 25 percent in winter wages. The data on winter wages becomes, however, much thinner in the latter part of the sixteenth century, and is unavailable for the seventeenth century. I have, therefore, calculated the winter wage by using its historic ratio of 75 percent of the summer wage; but if the gap in seasonal wages had narrowed (or disappeared) then these data on real-wage levels underestimate those for Antwerp masons.

Comparative differences for the real wages of masons' labourers in the two regions

A somewhat different picture emerges when we compare the levels of real wages for masons' journeymen labourers (or 'men') over this same period. That difference is explained by the ratios of the journeyman's daily wage to those of his master, in each country. In England, before the Black Death, the journeyman consistently earned only 50 percent of his master's daily money wage; but just after the Black Death, from the mid-1350s, the journeyman's relative daily wage rose to reach 60 percent of his master's rate in the 1360s, maintaining that ratio until just after 1400; and by 1411, it had risen to a new plateau of 66.67 percent (i.e., two-thirds), where it generally remained until the 1530s, when the ratio again rose, reaching 75 percent of the master's rate by the later 1550s. From the mid 1580s, however, it fell back to the traditional ratio of two-thirds of the master's rate, generally remaining at that level until the end of the period under review (i.e., to 1700), except for another brief, but temporary rise in the Civil War years of the 1640s.

In Antwerp, however, the ratio of the journeyman's daily wage to his master's pay was much more irregular, but generally inferior to that found in England. At the beginning of our period of study, in the early fifteenth century, to about 1430, the journeymen typically earned only one half (50 percent) of his master's pay, the very same situation that prevailed in builders' wages in Bruges, and other Flemish cities (remaining at that rate until the end of the fifteenth century). But in Antwerp, the journeyman's relative daily wage began to rise from 1430, reaching what became the prevailing ratio of (curiously) 58.33 percent of the master's pay by the later 1440s, remaining at that level until the late 1480s, when it began to rise again, reaching a peak of 64.00 percent of the master's pay in 1506-10. In the sixteenth century, it fluctuated between a low of 46.86 percent (in 1561-65) to a high of 61.61 percent (1591-95), and then fell back to the more traditional ratio of 58.33 percent. In the absence of reliable data, that ratio has been used to calculate the journeyman's daily wage in the seventeenth century.

In the light of this information on relative wages, we may better understand why, in Antwerp, the

masons' labourers generally fared so badly, in comparison with their English counterparts: i.e., in comparing their annual money-wage incomes in terms of the number of comparable commodity baskets that could have been bought. In the first half of the fifteenth century (1401-1450), the Antwerp labourer's mean real wage income was only 68.94 percent of that earned by masons' labourers in south-eastern England. There was virtually no change in the second half of the century (1451-1500): the mean real income for the Antwerp labourer was still only 69.38 percent of that for his English counterpart. But, as was the case for the master masons, the Antwerp labourer almost caught up in the first half of the sixteenth century: with a mean real income of 91.18 percent of that for his English counterpart, rising from 73.59 percent in 1501-05 to 125.73 percent in 1546-50, but fluctuating, with falls and recoveries, thereafter in the second half of the century (1551-1600), when his mean real income in commodity baskets was 107.60 percent of that for the English labourer. The best performance of the Antwerp mason's labourers took place, as now to be expected, in the first half of the seventeenth century (1601-50), i.e., during the latter phase of the Price Revolution era, when his mean real income was a third higher than that for the English labourer, i.e., 133.46 percent. But thereafter, in the second half of the century (1651-1700), his mean real income fell to just 109.88 percent of that for his English counterpart; but at least it was somewhat higher, and in sharp contrast to the relative performances of real income for the Antwerp and English labourers in the fifteenth-century (the supposed 'Golden Age' of the working man).

How, then do we interpret these data: for clearly what is involved in this comparison is not just levels of real incomes, but shares of the total pay package that masons received – masters and their journeymen – in Antwerp and south-eastern England, respectively.

What is meant by 'real wages': in statistics and in micro-economic theory?

That also, therefore, complicates the fundamental question to be asked: what do real wages mean? As Robert Allen has commented, in his aforementioned (and prize-winning) article: 'Wages and prices have long been central concerns of economic historians, for they bear on such fundamental issues as the pace of economic development, economic leadership, and the standard of living'.[35]

As the term is used in this study, the real wage simply and solely represents the purchasing power of the nominal money wage: in this case, to repeat, the number of fixed commodity baskets that a mason could purchase with his annual money wage income. The 'fixed components' nature of the basket is usually stipulated, because , if economic historians were permitted to make qualitative judgements about altering the composition of the basket, we could be accused of altering the evidence to suit our own purposes. On the other hand, many economists are aware of the fundamental problem of having 'fixed components' in that ignores a fundamental rule of consumer behaviour in coping with adverse relative price changes: by making substitutions in their purchases. For this reason, they would question whether this standard RWI formula properly measures changes in real wage incomes. Such a criticism, however, would surely justify the approach that both Van der Wee and I have utilized in constructing our baskets, in seeming violation of the Laspeyres method: i.e., by allowing the behaviour of relative prices a greater role in determining annual shares of expenditures on the components of our two baskets.

As was indicated in the introduction to this study, however, the term 'real wage' has a much different

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[35] Allen, 'The Great Divergence in European Wages and Prices', p. 411. His study also uses the daily wage data for building craftsmen and their labourers. Since his study covers a later period, from 1500 to 1913, with 50-year means for prices and wages (based on silver contents) in 17 European towns, it is not really relevant for this study, covering the period 1346-1500. My disagreements with his methodology will be presented in a separate article.

meaning for most economists. For, as Keynes reminded us, a basic postulate of Classical Economics is that 'the wage is equal to the marginal product of labor'.[36] It is more accurate to say instead: the marginal *revenue* product of labour: i.e., the market value of the last unit of output produced by the last unit of labour hired and added to the production process. Certainly in the micro-economic theory of the firm, a rational employer will maximize profits if he continues employing workers until the marginal revenue product of the last one hired does equal the prevailing wage rate; and he would be foolish to hire any more workers if their MRP falls below that wage rate. But that is rather different from saying that, in the economy or occupational field as a whole, the real wage is determined by the marginal revenue product, let alone the marginal productivity of labour. The distinction involving the latter, ignored by most economic historians, is an important one to observe. For if, say, in the agricultural sector the marginal productivity of field labourers falls when their increased number on the land leads to diminishing returns, but the real value of the grain that they produce rises, the results for the marginal revenue product of labour may be a wash.

Our observations about trends in real wages become all the more complicated when we view the oscillating patterns, sometimes with radical fluctuations, of the real wage index in both regions over these three centuries. Are we really supposed to believe that sudden falls in the real wage were due to adverse changes in the marginal productivity of labour? If we properly expand the definition to make the real wage equal to the marginal revenue product of labour, we might find ourselves on somewhat more secure ground. But if so, that forces us to pay closer attention to changes in prices: both relative prices and the price-level itself, or, here, the Consumer Price Index.

Nominal wage-stickiness, deflation, inflation, and trends in real wages

In two previous publications, I had argued that the chief explanation for the rise in real wages of labourers and artisans during the so-called 'Golden Age of the Labourer' during the later Middle Ages, but especially in the mid-fifteenth century, in both England and the Low Countries, was a combination of institutional 'wage stickiness' and deflation.[37] In brief, after the Black Death (1348), nominal money wages rose, for a variety of reasons, both monetary and real; but the rise in nominal wages did not keep pace with the post-Plague inflation, so that real wages in fact declined, for a full generation. Thus, only with the onset of long-term deflation, in England, from the later 1370s, and in the southern Low Countries, from the early 1390s (after coinage debasements had ended in 1389), did real wages recover and then finally surpass the previous peak of the mid 1330s (in England).

In essence, nominal money wages did not fall with other prices during the ensuing deflation, as they had during the previous era of deflation, from the mid 1320s to the early 1340s. Instead, in both countries, nominal money wages remained rigid or fixed over long periods of time. For the longest example ever recorded, over 130 years, we may note that at Oxford and Cambridge, the prevailing daily wage for the most skilled master masons was 6d per day, from 1363 to 1536 (though the overall means of urban wages in southern England indicate a rise from 5d to 6d in the early fifteenth century, c. 1410).

Phelps Brown and Hopkins themselves called this phenomenon of downward wage stickiness the 'elbow joint or ratchet effect', in noting the surprising fact that over the ensuing six centuries nominal wages never fell – not until the post World War I recession-depression, when daily money wages of these craftsmen

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[36] John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London, 1936), p. 5.

[37] See Munro, 'Wage Stickiness', pp. 185-297; Munro, 'Builders' Wages', pp. 1013-76.

declined from from the peak of 240d in 1920 to a low of 165d in 1934.[38] Adam Smith himself had observed the same phenomena (an observation ignored by almost all other Classical economists) in stating that 'the wages of labour do not in Great Britain fluctuate with the price of provisions', which vary everywhere from year to year, even monthly; instead, 'the money price of labour remains uniformly the same, sometimes for a half a century together'.[39]

Thus, as Smith himself virtually stated, when nominal money wages experience such a rigidity, the real wage is essentially a function of the changing price level, which changes, I also argued in these two other publications, were essentially the product of monetary factors, not demographic or other 'real factors'. In late-medieval England, real wages for building craftsmen reached their peak, therefore, with the nadir of deflation, in 1476-80, when the CPI = 90.055 and the RWI = 111.043, as a harmonic mean.[40] In both Flanders and Brabant, similarly, real wages for such craftsmen peaked with the somewhat earlier nadir of deflation, in 1461-65: when the Flemish CPI = 88.705 and the RWI = 112.733 (harmonic mean); and when the Brabant CPI = 91.070 and the RWI = 109.805 (harmonic mean).[41]

Real-wage trends in England during the Price Revolution era (ca. 1520 - ca. 1650)

This current study, however, focuses on the subsequent inflationary era of the Price Revolution (ca. 1520 - ca. 1650), which, however, was followed by another half century of general deflation or price stability. Though clearly, as the accompanying table demonstrate, wages were not 'sticky' during the Price Revolution era itself, clearly wages did lag behind prices, but much more so in southern England than, overall, in the Antwerp region. Thus, in England, the CPI rose from an arithmetic mean of 103.773 in 1506-10 to a peak of 734.390 in 1646-60, a 7.08 fold rise; over the same period, the nominal wage index rose from an arithmetic mean of 100.00 in 1506-10 to a mean of just 283.333; therefore, mathematically (NWI/CPI), the English real wage index for master building craftsmen (masons) fell from a harmonic mean of 96.365 in 1506-10 to an astoundingly low level of 38.652 in 1646-50.[42]

Since the deterioration in real wages commenced immediately with the onset of the Price Revolution, ca. 1515-20, it would be very difficult to blame this decline on population growth. For, in 1523-24, the best estimate of England's population, from tax and military muster records, was 2.25 million – just one half of the currently most conservative estimate of England's population in 1300: 4.5 million (rather than the most widely

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[38] Phelps Brown and Hopkins, 'Seven Centuries of Building Wages', pp. 8 - 12 (with Table 1).

[39] Smith, *Wealth of Nations*, p. 74. Indeed, the wage evidence for master masons and carpenters in southern England indicates that the predominant wage (for those highly skilled) was an unvarying 24d a day from 1736 to 1773. Phelps Brown and Hopkins, 'Seven Centuries of Building Wages', p. 205 (Table 1).

[40] Munro, 'Wage Stickiness', Table 6, p. 244.

[41] Munro, 'Wage Stickiness', Table 10, p. 253; Table 12, p. 257.

[42] See Table 2, below. The base period, so that RWI = 100, remains the same: the mean of 1451-75. The actual nadir, however, was a RWI = 37.756 in 1616-20; the very slight rise to the level noted for 1646-50 was due to a rise in the NWI from 203.333 to 283.333, which, for once, rose slightly faster than did the price level (CPI).

accepted estimate of 6.0 million, or more). [43] Thus, how could population growth itself, from such a very low level, increasing to only 2.83 million in 1541 and to 5.31 million in 1646, produce such a rapid and such a drastic deterioration in real wages? [44] Surely diminishing returns could not have set in that soon, when the country was drastically underpopulated in the early to mid sixteenth century; and the population in the mid-seventeenth century was, it should be noted, well below that figure that most historians still accept for the England of 1300.[45] Furthermore, why would we expect to find a declining marginal productivity of labour with building craftsmen – as opposed to farm labourers?

Similarly, in Brabant, demographic decline continued into the early sixteenth century: for the number of households recorded in periodic tax censuses declined from 92,738 in 1437 to 75,343 in 1496 – a fall of 18.75 percent; and if we assume that such decline was accompanied by a smaller average size of the household, then the demographic decline was all the greater.[46] Sometime around or just after 1500, these demographic forces were reversed, so that Brabant experienced an annual average population growth of 0.96 percent, from 1496 to 1526.[47]

In other publications, I have contended that the Price Revolution was fundamentally monetary in its origins and nature, commencing not with the influx of silver from the Spanish Americas – which arrived far too late to do anything but fuel the current and ongoing inflation – but rather with the South German-Central

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[43] See Bruce M. S. Campbell, 'The Population of Early Tudor England: A Re-evaluation of the 1522 Muster Returns and the 1524 and 1525 Lay Subsidies', *Journal of Historical Geography*, 7 (1981), 145-54; Ian Blanchard, 'Population Change, Enclosure, and the Early Tudor Economy', *Economic History Review*, 2nd ser. 23:3 (December 1970), 427-45; Bruce M.S. Campbell, James A. Galloway, Derek Keene, and Margaret Murphy, *A Medieval Capital and Its Grain Supply: Agrarian Production and Distribution in the London Region c. 1300*, Institute of British Geographers, Historical Geography Research Series no. 30 (London, 1993); Pamela Nightingale, 'The Growth of London in the Medieval English Economy', in Richard Britnell and John Hatcher, eds., *Progress and Problems in Medieval England* (Cambridge and New York: Cambridge University Press, 1996), pp. 89-106. See n. 43 below.

[44] Wrigley, Davies, Oeppen, and Schofield, *English Population History from Family Reconstruction,* pp. 613-17; John Hatcher, 'Understanding the Population History of England, 1450 - 1750', *Past & Present*, no. 180 (August 2003), 83-130

[45] Michael Postan and J.Z. Titow, 'Heriots and Prices on Winchester Manors', *Economic History Review*, 2nd ser. 11 (1959); reprinted in Michael Postan, *Essays on Medieval Agriculture* (Cambridge, 1973), pp. 150-85; Michael Postan, *The Medieval Economy and Society: An Economic History of Britain, 1100-1500* (Cambridge, 1972), chapter 3, pp. 27-40; J. Z. Titow, *English Rural Society, 1200-1350* (London, 1969), chapter 3, 'The Standard of Living Controversy', pp. 64-96; John Hatcher, *Plague, Population, and the English Economy, 1348-1530* (London, 1977); Edward Miller and John Hatcher, *Medieval England: Rural Society and Economic Change, 1086-1348* (London, 1978), chapters 2 and 9; Richard M. Smith, 'Demographic developments in rural England, 1300-48: a survey', 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. 25 - 78.

[46] See Joseph Cuvelier, *Les dénombrements de foyers en Brabant, XIVe- XVIe siècle*, 2 vols. (Brussels, 1912-13), vol. I. Antwerp, not surprisingly, was the exception: its number of households almost doubled, from 3,440 in 1437 to 6,586 in 1496.

[47] Van der Wee, *Growth of the Antwerp Market*, Vol. I, Appendix 49/1, p. 546.

European silver mining boom, which quintupled Europe's silver supplies from the 1460s to its peak in the 1540. But I also argued that perhaps an equally important factor was a veritable financial revolution in negotiable credit instruments, both private and public (a theme of course even better developed by Herman Van der Wee); and I also gave some weight to demographic, institutional, and real factors in increasing the income velocity of money (both coined and paper-credit money).[48]

Following the end of the Price Revolution era, in the 1650s, the English price level (CPI) fell, quite markedly, from the aforementioned peak of 734.39 in 1646-50 to a low 547.58 in 1686-90, a decline of 25.44 percent (followed by a marked rise of 20.98 percent in the 1690s, explained by a combination of monetary and real factors). Nominal money wages quite predictably did not fall, experiencing a slight rise in the NWI from a mean of 283.33 in 1646-50 to 300.00 in 1656-60, thereafter, as in the previous era of sustained deflation, remaining perfectly 'sticky', at that same index until the 1690s, when they rose again to 326.667 (mean of 1696-1700). Consequently, real wages experienced some substantial recovery, rising from the RWI of 38.652 in 1646-50 (harmonic mean) to a peak of 55.359 in 1686-90 (and thus still far, far below the fifteenth-century peak). Again, constraints of time and space do not permit an examination of the monetary and real factors that contributed to this later seventeenth-century deflation;[49] but we must note that some population decline did

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[48] See John Munro, 'The Monetary Origins of the "Price Revolution:" South German Silver Mining, Merchant-Banking, and Venetian Commerce, 1470-1540', in Dennis Flynn, Arturo Giráldez, and Richard von Glahn, eds., *Global Connections and Monetary History, 1470 - 1800* (Aldershot and Brookfield, Vt: Ashgate Publishing, 2003), pp. 1-34; John Munro, 'The Central European Mining Boom, Mint Outputs, and Prices in the Low Countries and England, 1450 - 1550', in Eddy H.G. Van Cauwenberghe, ed., *Money, Coins, and Commerce: Essays in the Monetary History of Asia and Europe (From Antiquity to Modern Times)*, Studies in Social and Economic History (Leuven: Leuven University Press, 1991), pp. 119 - 83; John Munro, 'Patterns of Trade, Money, and Credit', in James Tracy, Thomas Brady Jr., and Heiko Oberman, eds., *Handbook of European History in the Later Middle Ages, Renaissance and Reformation, 1400 - 1600*, Vol. I: *Structures and Assertions* (Leiden: E.J. Brill, 1994), pp. 147-95; John Munro, 'English "Backwardness" and Financial Innovations in Commerce with the Low Countries, 14th to 16th centuries', in Peter Stabel, Bruno Blondé, and Anke Greve, eds., *International Trade in the Low Countries (14th - 16th Centuries): Merchants, Organisation, Infrastructure*, Studies in Urban, Social, Economic, and Political History of the Medieval and Early Modern Low Countries (Marc Boone, general editor), no. 10 (Leuven-Apeldoorn: Garant, 2000), pp. 105-67; John Munro, 'The Medieval Origins of the Financial Revolution: Usury, *Rentes*, and Negotiablity', *The International History Review*, 25:3 (September 2003), 505-62; Herman Van der Wee, 'Anvers et les innovations de la technique financière aux XVIe et XVIIe siècles', *Annales: E.S.C.*, 22 (1967), 1067-89, republished as 'Antwerp and the New Financial Methods of the 16th and 17th Centuries', in Herman Van der Wee, *The Low Countries in the Early Modern World* , trans. by Lizabeth Fackelman, Variorum Series (Aldershot, 1993), pp. 145-66; Herman Van der Wee, 'Monetary, Credit, and Banking Systems', in E.E. Rich and Charles Wilson, eds., *The Cambridge Economic History of Europe*, Vol. V: *The Economic Organization of Early Modern Europe* (Cambridge, 1977), pp. 290-392; Herman Van der Wee, 'European Banking in the Middle Ages and Early Modern Period (476-1789)', in Herman Van der Wee and G. Kurgan-Van Hentenrijk, eds., *A History of European Banking*, 2nd edn. (Antwerp, 2000), pp. 152-80.

[49] 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; Lindert, 'English Population, Wages, and Prices' pp., 609-34; John Munro, South German Silver, European Textiles, Warfare, and Venetian Trade with the Levant and Ottoman Empire, c. 1370 to c. 1720: A non-mercantilist approach to the balance of payments problem', in Simonetta Caviacocchi, ed., *Relazioni economiche tra Europa e mondo islamico, Secoli XIII-XVIII,* Atti delle "Settimana di Studi" e altri convegni, no. 38, Istituto Internazionale di Storia Economica "Francesco Datini" (Florence, 2007), forthcoming.

occur during this deflationary period. England's estimated population fell from a peak of 5.391 million in 1656 to a low of 5.360 million in 1681, a decline of 5.8 percent (recovering to 5.211 million in 1701, at the end of this study). We should, however, consider the possibility that demographic changes are consequences rather than independent causes: responses to other deeper changes in the economy, changes that are reflected in both monetary changes and fluctuations of the price level.

Real wage trends in the Antwerp region during the Price Revolution era

In the Antwerp region, as Herman Van der Wee has already established, in his 1975 article, the behaviour of wages, both nominal and real, are rather different from the English experience during the sixteenth and seventeenth centuries.[50] But initially, with the onset of the Price Revolution, their behaviour was rather more similar to the English price and wage indexes. For the same period of comparison, the price level or CPI rose even more than in England: from an arithmetic mean of 114.801 in 1506 to a peak of 1015.138, a 8.84 fold rise. Indeed note that the Price Revolution peaked in both countries in the very same years. The principal reason for the greater extent of inflation in the southern Low Countries was the greater frequency and degree of coinage debasements. To be sure England did experience the horrendous 'Great Debasement' from 1542 to 1552; but otherwise it enjoyed perfect monetary stability during the rest of the sixteenth and seventeenth centuries, except for a very minor reduction in the weight of the silver penny in 1601 (by 3.2 percent). From 1525 to 1664, the Brabant silver coinage lost 41.4 percent of its precious metal contents (from 0.29 g . to 0.17 g. fine silver in the Brabant *groot*). Over the same period (to 1700), the English silver coinage lost 27.1 percent of its precious metal contents (from 0.639 g. to 0.464 g. silver in the penny).[51]

Over this same period, the nominal wage index, for master masons in Antwerp rose from a quinquennial mean of 103.333 in 1506-10 to exactly 600.00 in 1646-50, well more than double the rise of the English nominal wage index (283.333 in that quinquennium, 1646-50). Consequently, the overall decline in the real wage index was far less in Antwerp: having fallen (but after an earlier rise) from a harmonic mean RWI 90.011 in 1506-10 to one of 59.105 in 1646-50 (compared to the English RWI = 38.652).

But in between the commencement and conclusion of the Price Revolution era, there are even more fascinating differences between the English and Antwerp nominal and real wage indexes. In Antwerp, after the RWI had deteriorated from the aforesaid mean of 90.011 in 1506-10 to a mean of 71.408 in 1531-35, it then rose strongly to one of 99.326 in 1546-50, fell to 72.930 in 1556-60 and then abruptly and sharply rose to a peak of 115.735 in 1561-65. Then with the ensuing commercial disruptions with England and then the Revolt of the Low Countries (1568-1609), the RWI fell to another low of 52.519 in 1586-90 (just after Farnese's siege and sack of Antwerp in 1584-85). But then the real wage index for Antwerp masons once again rose strongly, with economic recovery, to reach 97.99 in 1601-05, and was thus almost the same as the mid fifteenth century peak (in 1461-65). If, however, we take fifty-year harmonic means of Antwerp's real wages, we find that each half of the sixteenth century is virtually identical: RWI = 80.530 in 1501-50, and

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[50] Van der Wee, 'Prices and Wages as Development Variables', pp. 223-41. See n. above.

[51] See the sources cited in the previous note; and also Christopher E. Challis, 'The Debasement of the Coinage, 1542 - 1551', *Economic History Review*, 2nd ser., 20 (1967), 441-66; Christopher Challis, *The Tudor Coinage* (Manchester, 1978), Christopher Challis, *Currency and the Economy in Tudor and Early Stuart England* (Oxford and New York: Oxford University Press, 1989); J.D. Gould, *The Great Debasement: Currency and the Economy in Mid-Tudor England* (Oxford, 1970); Sir Albert Feavearyear, *The Pound Sterling: A History of English Money*, 2nd ed. revised by E. Victor Morgan (Oxford, 1963), chapter 3, 'The Great Debasement', pp. 46-75; chapter 4, 'Restoration and Reform', pp. 76-98. For Brabant, see Van der Wee, *Growth of the Antwerp Market*, vol. I, pp. 122-35, especially Table XV, pp. 1218-29.

80.643 in 1551-1600; and in terms of commodity baskets: a mean of 8.182 baskets in 1501-50 and 8.194 baskets in 1551-1600.

Even more surprising is the behaviour of the nominal wage index, during the later phases of the Price Revolution in the southern Low Countries. Unexpectedly, for an inflationary era, it demonstrates perfect wage stickiness from 1596-1600 to 1661-65, at a stable NWI = 600 (= 72 d *groot* Brabant). But, by this time, deflation had also taken place in this region: as the price level (CPI) fell from the peak of 1015.138 in 1646-50 to a nadir of 652.217 in 1686-90, a decline of 35.75 percent, and thus even steeper than the 25.44 fall in the English price index, taking place in virtually the same years. Since nominal wages for Antwerp master masons began to rise from the late 1660s, peaking at a NWI = 650.00 in 1676-85, then declining slightly thereafter, to 625.00 (still above the level that had prevailed until the 1660s), real wages again recovered: rising from the low of RWI = 59.105 in 1646-50 to a high of 98.017 in 1686-90, again virtually matching the mid-fifteenth century peak . But thereafter, in the few remaining years for this study, when prices again rose (to a CPI of 867.995 in 1696 - 1700), and nominal wages actually fell, as just noted, the real wage index for Antwerp fell sharply to just 64.566 in that final quinquennium. If, however, we divide this into two segments, we again find that the 50-year harmonic means of real wages are gain almost identical in each half: RWI = 74.026 in 1601-50 (7.521 commodity baskets) and RWI = 75.794 in 1651-1700 (7.701 commodity baskets). But also note that the mean real wage for the seventeenth century is 7.0 percent lower than for the sixteenth century (i.e., 74.91 compared to 80.49, as the mean for each century), which, of the three centuries in this survey, is the one in which Antwerp's master masons fared the best, as noted earlier.

Differences in levels of real wages between Antwerp and England: Total Factor Productivity

While these analyses of changes in the price level and in nominal wages – i.e., either wage-stickiness or the sluggish response of nominal wages to rising prices – may explain the fluctuations and oscillations in real wage, they do not provide any useful answers to the major question revealed by these statistics: why did the real wages for master masons in Antwerp rise from a level below that for English master masons throughout the fifteenth century to one so far above the English level of real wages (as measured by commodity baskets) in the later sixteenth and seventeenth centuries? The other related question is: why did the Antwerp journeymen labourers receive a smaller share of the total pay package for masons than did their English counterparts, even if, in absolute terms, they also ended gaining a higher real wage (in commodity baskets), though to a significant degree only in the first half of the seventeenth century.

If the answer to first question lies not in the marginal productivity of labour, it may instead lie in Total Factor Productivity, across the economy as a whole. A contemporary analogy may provide some useful insights. Salaries for full professors at the University of Toronto and other comparable Canadian universities are only about 75 to 80 percent of the mean average for such professors in ten comparable public universities in the United States.[52] While it would be difficult to argue that the productivity of professors in Canadian universities (many of whom are Americans or non-Canadians) is so much inferior to those in American universities, all economists would readily admit that Total Factor Productivity in the Canadian economy is significantly inferior to that of the American economy – indeed only about 75 percent of the US level. That difference, which affects government revenues and thus the ability to finance public institutions, certainly can explain much of the difference between these two sets of academic salaries.

Thus, similarly, because the southern Low Countries were so much more commercially, industrially, and in general more economically advanced than was England, and far wealthier, we would expect to find that

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[52] From University of Toronto Faculty Association, News Bulletin (9 April 1999): http://www.utfa.org/html/newsbul/html/apr0999.htm.

difference reflected in the prevailing level of real wages in both countries.[53] Perhaps the greatest contrast lies in the extent of urbanization: almost 40 percent in the southern Low Countries, but under ten percent in England, during the fifteenth century, but of course growing from that period. Urbanization is itself an important consideration in interpreting real-wage statistics for masons, since many or most of their employers were urban institutions: town governments and hospitals, in particular. The former (Antwerp town government, for our data) paid building craftsmen and other workers from the excise-consumption taxes levied on the town inhabitants; and such tax revenues and thus wage payments were a function of urban wealth, itself a function of Total Factor Productivity..

England, in contrast, still remained essentially an agrarian economy, despite the seemingly remarkable growth of its woollen cloth industry and trade; to be sure it became somewhat more urbanized and industrialized by the seventeenth century, if by no means to the extent that John Nef had suggested in his thesis on the Tudor-Stuart 'minor industrial revolution'.[54] Most of that urban growth was confined to London.

Why did the level of real wages in Antwerp rise above the English from the 15th to 16th centuries?

Why, then were real wages for building craftsmen, over the span of most of the fifteenth century, lower in Antwerp than in England? Two reasons may be suggested. Antwerp escaped from the tutelage and control of the count of Flanders, whose government would not allow it then to rival Bruges, only in 1405; and while Antwerp acquired, in 1421, the role as the staple port for the distribution of English woollen cloth exports to continental markets, thus establishing the first leg of the tripod that would support its role as the commercial and financial centre of Europe, it was really only with the influx of South German silver, copper, and merchant banking that Antwerp's economy really began to blossom and expand so rapidly.[55] The second

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[53] See Van der Wee, *Growth of the Antwerp Market*, vol. II, pp. 41-280, 369-88; Herman Van der Wee, 'The Economy as a Factor in the Revolt of the Southern Low Countries', *Acta Historia Neerlandica*, 5 (1971), pp. 52-67, reprinted in his collection *The Low Countries in the Early Modern World* (1993), pp. 264-78; along with other important studies, especially 'Prices and Wages as Development Variables', pp. 223-44; 'The Low Countries in Transition: from the Middle Ages to Early-Modern Times', pp. 3-28; 'The Low Countries in Transition: from Commercial Capitalism to the Industrial Revolution', pp. 29-46; and 'Structural Changes and Specialization in Southern Netherlands Industry, 1100 - 1600', pp. 201-22 (republished from *Economic History Review*, 2nd ser., 2nd ser., 28 (1975), 203-21). And see also: Hermann Van der Wee, 'Industrial Dynamics and the Process of Urbanization and De-Urbanization in the Low Countries from the Late Middle Ages to the Eighteenth Century: A Synthesis', in Herman Van der Wee, ed., *The Rise and Decline of Urban Industries in Italy and in the Low Countries: Late Middle Ages - Early Modern Time* (Leuven, 1988), pp. 307-81; Herman Van der Wee and Jan Materné, 'Antwerp as a World Market in the Sixteenth and Seventeenth Centuries', in J. Van der Stock, ed., *Antwerp: Story of a Metropolis, 16th - 17th Centur*y, Antwerp 93, Hessenhuis 25 June - 10 October 1993 (Ghent, 1993), 19-31; Jan de Vries and Ad van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500 - 1815* (Cambridge and New York, 1997).

[54] See the publications of Nef cited in n. 2 above.

[55] Van der Wee, *Growth of the Antwerp Market*, vol. II, pp. 7-142; John Munro, 'Bruges and the Abortive Staple in English Cloth: An Incident in the Shift of Commerce from Bruges to Antwerp in the Late Fifteenth Century', *Belgisch tijdschrift voor filologie en geschiedenis*/ *Revue belge de philologie et d'histoire*, 44 (1966), 1137-59; 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, chapter 5, pp. 228-

reason is one already indicated: that the duchy of Brabant was subjected to so many drastic coinage debasements during much of the fifteenth century, enjoying monetary stability only from 1434 to 1466, while England experienced that stability for most of the century, with only two defensive debasements: in 1411-12 and 1464-65. Those debasements in the fifteenth-century Low Countries had a very deleterious impact on real wages: for they instigated a severe inflation in consumer prices, while nominal money wages remained fixed or at least 'sticky', as can be readily seen in Table 2.

Those fifteenth-century debasements (ending in the 1490s) were certainly far worse than those experienced in the ensuing and sixteenth centuries. Furthermore, for most of the sixteenth century, at least until the outbreak of the Revolt of the Netherlands in 1566-68, Brabant probably experienced more substantial industrial growth, especially in textiles and various luxury oriented crafts , than did England; at the same time English cloth exports to the Brabant Fairs also provided Antwerp with a considerable industrial benefit, during its 'Golden Age', in promoting the growth of its very substantial cloth dyeing and finishing industries.[56] Those English broadcloth exports reached their peak in the early 1550s (mean of 115,003 broadcloths), followed by a severe and prolonged slump, during which the Revolt of the Netherlands ended Antwerp's role as the chief outlet for those woollens.[57]

The changing economy and changes in real wages in the Antwerp region in the 17th century

That Revolt, as Van der Wee has so cogently asserted, and the ensuing 'Eighty Years' War was clearly an important factor in the structural decline of the economy of Brabant'. [58] Nevertheless, we should not paint too bleak a picture of the economy of the southern Low Countries during the seventeenth century, even if it clearly fell behind the north (i.e., the 'Dutch' Republic of the United Provinces), when Amsterdam so decisively displaced Antwerp as the leading commercial and financial centre. For, despite that tectonic shift, the southern Low Countries did achieve some significant recovery in the first third, even during the years of resumed warfare (1621-48), as can be seen, for example, in industrial statistics for the Flemish Hondschoote sayetterie, which, before the Revolt, had been Europe's leading producer of the light worsted-type say fabrics, most of which were marketed at or from Antwerp. Its sales had reached a peak of 93,057 says in 1566-70 (quinquennial mean), just when that Revolt began; its sales then, quite understandably, fell sharply to a mean of just 12,128 says in 1586-90. But then the industry staged a significant recovery, achieving an mean output of 54,767 says in 1626-30 (its seventeenth century peak). By that time its English rival, the so-called New Draperies, largely created , from the 1570s, by Flemish refugee artisans in East Anglia, had successfully displaced the Flemish (and the Dutch industry as well), as the European leader in producing these cheaper, light fabrics.[59]

324; Munro, 'Monetary Origins of the Price Revolution', pp. 1-34.

[56] See Van der Wee, *Growth of the Antwerp Market*, vol. I, Appendix 46/2, p. 532: admissions into the Cloth Shearers' Guild in Antwerp, 1536-1562.

[57] Gould, *The Great Debasement*, p. 136; F.J. Fisher, 'Commercial Trends and Policy in Sixteenth-Century England', *The Economic History Review*, 1st ser., 10:2 (Nov. 1940), 95-117 ; F.J. Fisher, 'London's Export Trade in the Early Seventeenth Century', *The Economic History Review*, 2nd ser., 3 (1950), 151-61; J.D. Gould, 'Cloth Exports, 1600 - 1640', *The Economic History Review*, 2nd ser. 24:2 (1971), 249-52.

[58] Quotation from Van der Wee, 'Prices and Wages', p. 240. See also the sources cited in n.

[59] See Emile Coornaert, *La draperie-sayetterie d'Hondschoote, XIVe-XVIIIe siècles* (Paris, 1930); Coornaert, 'Draperies rurales, draperies urbaines: l'evolution de l'industrie flamande au moyenâge et au XVI

As Van der Wee has himself noted, the 'economic decay of Brabant' from the second quarter of the seventeenth century has to be explained by a complex set of other factors, including changes in international trade. Of particular concern were the increasingly prevalent Mercantilist or protectionist policies pursued by so many nation states during the seventeenth century, and pursued at the expense of many industries in the southern Low Countries.[60] Yet, we must also remember that the heyday of European Mercantilism was also the 'Golden Age' of the Dutch, with their financial-commercial hegemony (also, to be sure, at the expense of the southern Low Countries).

At the same time, it is far from clear that demographic variables – population growth during the Truce of 1609-21, followed by decline – have that much explanatory power, especially since real wages rose the most strongly during that Truce, and then fell with the ensuring demographic and economic decline.[61] Note that, during the quinquenniums from 1601-05 to 1616-20, embracing the Truce period, the harmonic quinquennial-mean real income for Antwerp's master masons varied within a narrow band, from a high of 9.956 baskets to a low of 9.583 baskets; but from 1621 they abruptly fell, reaching a low of just 6.005 baskets in 1646-50 – a drastic decline of 39.7 percent, just when peace was finally restored with the 1648 Treaty of Westphalia. On the one hand, we would certainly expect real wages to fall during an economic decline, but not, according to the Malthusian model, during a demographic decline.[62]

Institutional factors: the role of guilds or corporate structures

Next, we must consider the irrefutable fact that, during the Price Revolution era as a whole, master masons in Antwerp, and other master building craftsmen, and presumably many other industrial workers, in sixteenth-century Brabant, were far more successful in maintaining or even in improving their real wages than were their English counterparts. Since, as was also noted, inflation, further fuelled by coinage debasements, was more severe in Brabant than in England, especially also with a more pronounced rise in the price of

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siècle', *Belgische tijdschrift voor filologie en gescheidenis/Revue belge de philologie et d'histoire*, 28 (1950), 60-96; Jan Craeybeckx, 'L'industrie de la laine dans les anciens Pays-Bas méridionaux de la fin du XVIe au début du XVIIIe siècle', in Marco Spallanzani, ed., *Produzione, commercio e consumo dei panni di lana* (Florence, 1976), pp. 21-43; John H. Munro, 'The Origins of the English 'New Draperies': The Resurrection of an Old Flemish Industry, 1270 - 1570', in Negley Harte, ed., *The New Draperies in the Low Countries and England*, *1300 - 1800*, Pasold Studies in Textile History no. 10 (Oxford and New York, 1997), pp. 35-127.

[60] Van der Wee, 'Prices and Wages', p. 240.

[61] See Tables 3-4; and Van der Wee, 'Prices and Wages', p. 240. Perhaps Van der Wee means that the subsequent fall in real wages, from 1621-25 to 1646-50 inclusive, was a time-lagged effect of prior population increase; but this longer period of falling real wages also encompassed a period of prolonged demographic decline, for a which a time-lagged effect is more difficult to explain. Van der Wee also maintains (p. 240) that the earlier war-induced demographic decline had led to 'a rise in the real *per capita* wage income from 1587 onwards'; but that seems to be contradicted by Table 2: for, real wages for master masons in Antwerp fell from a quinquennial harmonic mean index of 91.133 (9.259 baskets) to just 62.519 in 1586-90 (6.352 baskets), a drastic decline of 31.4 percent; and then they recovered to a quinquennial mean of only 79.687 in 1596-1600 (8.096 baskets).

[62] Though Herman Van der Wee has sought, in my view very successfully to challenge the Malthusian model in many of his publications, I seem to be, on this issue, much more anti-Malthusian than he is. See in particular Herman Van der Wee and Theo Peeters, 'Un modèle dynamique de croissance interseculaire du commerce mondiale, XIIe-XVIIIe siècles', *Annales: E.S.C.*, 15 (1970), 100-28.

foodstuffs, the explanation must lie in the ability of the Brabantine building craftsmen to secure better compensation in terms of rising money wages.

Quite possibly, as Van der Wee suggests, their success lay in superior corporate organization and more effective guild powers.[63] If so, that must have also meant a far greater dominance of the masters, since, as we also observed, their journeymen labourers fared *relatively* worse – in terms of their share of the pay package for masonry tasks – than did English journeyman masons.

Why that was so, however, yet remains to be fully explained, especially within England. As Phelps Brown and Hopkins also note, the 3:2 ratio between the money wages for masters and labourers, over a five-century period from ca. 1410, underwent 'no sustained change until the First World War', so that 'we cannot believe that market forces always worked to keep the equilibrium prices of the two grades of labour in so constant a relation'.[64]

The major question to be asked about real wages over the three centuries: 1400 - 1700

A major and, in many respects, the most surprising question to be asked is: why did real wages not rise, even those of Antwerp, over these three centuries, from 1400 to 1700. Thus, if master masons in Antwerp ended up, over most of this three-century period, from 1400 to 1700, in achieving a relatively superior level of real wages, compared to English masons, it would be more accurate to state that they succeeded better in 'holding their own', in not sustaining as much of the loss in real wages that their English counterparts experienced. Thus, the harmonic mean real wage for Antwerp master masons in 1401-50 was 8.417 commodity baskets, but only 8.194 baskets in 1551-1600; and markedly less, 7.701 baskets in the final half century, 1651-1700 – which was thus 8.51 percent lower than that earned in the first half century of this three-century study.

Yet that decline was minor compared to the one suffered by English master masons. Their harmonic 50-year mean wage had fallen from 10.046 commodity baskets in the first period (1451-50) to just 4.868 baskets in the last phase of the Price Revolution era, 1601-50 -a truly drastic decline of 51.54 percent; and then the real wage recovered in the next half century (1651-1700) to a harmonic mean of 6.132 commodity baskets, for an overall decline of 38.96 percent during this three century period. Not until the 1840s does the Phelps Brown and Hopkins real wage index again rise above 100 (i.e., the mean for 1451-75).

It is therefore very difficult to believe that the marginal productivity of labour underwent such a drastic decline, during the ensuing centuries of evidently substantial economic growth from the fifteenth to eighteenth centuries, growth that finally manifested itself manifested in the Industrial Revolution (which finally did produce a remarkable rise in real wages, especially from the 1870s). It is all the more difficult to believe that the marginal productivity of urban building craftsmen underwent any decline at all. If again we define the real wage in terms of the marginal product, that must lead us to a closer examination of commodity prices (and thus the relationship between nominal wages and prices).

Does that mean that we should discard the Phelps Brown and Hopkins 'basket of consumables' as the method of measuring real wages? Before we do, we must realize that no other real wage index now available

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[63] Van der Wee, 'Prices and Wages', p. 240; and Van der Wee, *Growth of the Antwerp Market*, vol. II, pp. 381-88, 419-22.

[64] Phelps Brown and Hopkins, 'Seven Centuries of Building Wages', p. 8.

substantially alters these paradoxical results — not those of Robert Allen nor those of Gregory Clark.[65] And certainly no one is likely to produce yet another real wage index, not in the near future. On the other hand, none of the alternative real-wage index is (in my opinion) is as effective as the one in this study, based on the value of consumer baskets, in demonstrating the actual levels, changing levels, of real wages in a proper comparative perspective.

A final issue on levels of real wages and consumption: taxation

This comparison of real wages, however, has necessarily omitted another major issue that directly and seriously affected the levels of consumption that are supposed to be reflected in these cost of living indexes (and thus the number of consumer baskets that a master mason could have purchased each year with his annual money wage income): excise taxes on consumption. Such taxes, known in Flemish generally as *accijnzen*, were those that the consumer paid in purchasing food, drink, textiles, and often other commodities, such as soap, leather, furs, iron, etc. In Flanders, they originate with the civic finances of the major towns, from about the mid-thirteenth century. They were fundamentally important in funding annual payments on the town's public debt, both in the forms of loans, but increasingly in the form of annuities, both life and perpetual annuities, known as *lijfrenten* and *erfelike renten* (or later, *losrenten).*[66] The major ones were, of course, taxes on alcoholic consumption: beer and wine. Some, of these excise taxes may have been included in the prices of the commodities contained in the Brabant 'basket of consumables', but only those that were sold as final products, at retail outlets: such as butter, cheese, meat, fish, and textiles. The major items in the baskets, by value, were primary commodities, such as grains, and thus were not subject to these excise taxes, which would have been imposed instead on the products manufactured from them: e.g, bread and beer.

We do possess ample archival records of the collection of excise taxes on consumption of these commodities in many Flemish and Brabantine towns, from the later thirteenth and fourteenth century: e.g., Ghent, Bruges, Ypres, Kortrijk, Aalst, Mechelen, Leuven, but regrettably not Antwerp, whose town accounts – the source of such information – is lacking for much of this period. Furthermore, the tax records are in the form of revenues derived from the annual sales (by auction) of tax farms, not the actual collection of the taxes themselves, directly from the consumers.[67] Furthermore, we have no way of measuring the burden of these consumption taxes on individuals, and certainly not on the masons who are the object of this study.

Nevertheless that likely tax burden, in reducing the actual levels of individual consumption, remain

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[65] See those of Robert Allen and Gregory Clark in n. 19 above.

[66] See John Munro, 'The Medieval Origins of the Financial Revolution: Usury, *Rentes*, and Negotiablity', *The International History Review*, 25:3 (September 2003), 505-62; Hans Van Werveke, *De Gentsche stadsfinanciën in de middeleeuwen*, Koninklijke Academie voor Wetenschappen, Letteren, en Schone Kunsten van België, Klasse der Letteren, Jaargang XXXIV (Brussels, 1934); Raymond Van Uytven, *Stadsfinanciën en stadsekonmie te Leuven: van de XII^e tot het einde der XVI^s eeuw*, Verhandelingen van de Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België, Klasse der Letteren, Jaaregang XXIII (Brussels, 1961); James D. Tracy, *A Financial Revolution in the Habsburg Netherlands: Renten and Renteniers in the County of Holland, 1515 - 1565* (Berkeley-London, 1985).

[67] The records of the annual auction sales of the tax farms for the various *accijnzen* or excise taxes are contained in the annual *stadsrekeningen* (town treasuerer's accounts) of these towns, in the civic archives or *stadsarchieven* of Bruges, Ghent, Mechelen, and the *stedelijke archief* of Leuven. For Ypres, Aalst, Kortrijk and other towns, the copies of their *stadsrekeningen* are contained in the Rekenkamer of the Algemeen Rijksarchief België, in Brussels.

a very important and relevant consideration, in comparing real wages in the Antwerp region with southern England for one fundamentally important reason. England's Parliament (under John Pym) did not introduce excise taxes on consumption until July 1643, shortly after the outbreak of the English Civil War between Crown and Parliament.[68] Therefore, until at least the mid-seventeenth century, the gap between levels of consumption of basic commodities in southern England and Antwerp may have been somewhat narrower than are indicted by the indices for levels of real wages contained in this study.

[68] See Maurice Ashley, *Financial and Commercial Policy Under the Cromwellian Protectorate* (Oxford: Oxford University Press, 1934; revised edn: London: Frank Cass and Co. Ltd, 1962), chapter VII:' Taxes, ii. Excise', pp. 62-71; Charles Wilson, *England's Apprenticeship, 1603 - 1763*, The Social and Economic History of England (ed. Asa Briggs) (London: Longmans, Green and Co. Ltd, 1965), pp. 129-33.

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Table 1 **Basket of Consumables Commodity Price Indexes for England and Brabant**

mean of 1451-75 = 100

Commodity	ENGLAND						BRABANT				
	Amount	Unit	Metric Measure	Value in d sterling England	Munro Percent	PBH Percent	Amount	Unit	Value in d gr. Brabant	Value in d gr. Flemish	Percent
Farinaceous											
Wheat	1.250	bu	45.461	9.967	8.84%						
Rye	1.000	bu	36.369	6.279	5.57%		126.000	litre	42.404	28.269	18.24%
Barley	0.500	bu	18.184	2.606	2.31%						
Peas	0.667	bu	24.243	2.947	2.61%						
Sub-total	3.417	bu	124.257	21.799	19.33%	20.00%	126.000	litre	42.404	28.269	18.24%
Drink											
barley (or malt)	4.500	bu	163.659	24.227	21.48%	22.50%	162.000	litre	39.712	26.475	17.08%
Total Farinaceous	7.917	bu	287.917	46.026	40.80%	42.50%	288.000	litre	82.116	54.744	35.32%
Meat											
Pigs	0.500	no.	0.500	15.418	13.67%						
Sheep	0.500	no.	0.500	8.532	7.56%						
Beef	33.000	lb.	14.969	0.000	0.00%		23.500	kg	54.704	36.469	23.53%
Sub-total				23.950	21.23%	21.00%			54.704	36.469	23.53%
Fish: Herrings	40.000	no.	40.000	6.595	5.85%	4.00%	40.000	no.	9.988	6.659	4.30%

Commodity	ENGLAND						BRABANT				
	Amount	Unit	Metric Measure	Value in d sterling England	Munro Percent	PBH Percent	Amount	Unit	Value in d gr. Brabant	Value in d gr. Flemish	Percent 33
Sub-total				30.545	27.08%	25.00%			119.396	79.597	51.35%
Dairy											
Butter	10.000	lb.	4.536	10.238	9.08%		4.800	kg	19.728	13.152	8.48%
Cheese	10.000	lb.	4.536	5.341	4.73%		4.700	kg	5.968	3.979	2.57%
Sub-total				15.579	13.81%	12.50%			25.696	17.131	11.05%
Food and Drink				92.149	81.69%	80.00%			172.504	115.003	74.19%
Industrial: Fuel											
Charcoal	4.250	bu	154.567	3.813	3.38%		162.000	litre	10.568	7.045	4.54%
Candles	2.750	lb.	1.247	3.475	3.08%		1.333	kg	7.608	5.072	3.27%
Lamp Oil	0.500	pt	0.284	0.865	0.77%						
Sub-total				8.153	7.23%	7.50%			18.176	12.117	7.82%
Industrial: Textiles											
Canvas/Linen	0.667	yd	0.610	2.757	2.44%		1.800	metre	17.000	11.333	7.31%
Shirting	0.500	yd	0.457	2.718	2.41%						
Coarse Woollens	0.333	yd	0.304	7.023	6.23%		1.125	metre	24.844	16.563	10.68%
Sub-total				12.499	11.08%	12.50%			41.844	27.896	18.00%
TOTAL				**112.801**	100.00%	100.00%			**232.524**	**155.016**	**100.00%**

Table 2

Trends in and Levels of Real Wage Income in the Antwerp Region of Brabant and in South Eastern England, in quinquennial means: arithmeric and harmonic 1401-05 to 1696-1700

Index Base: 1451-75 =

100

PART A:

Years 5 yr & 50 yr means	ANTWERP: Value of the Commodity Basket in d groot Brabant	ANTWERP: Brabant Price Index 1451-75=100 arithmetic means	ANTWERP: Brabant Nominal Wage Index 1451-75=100 Seasonally adjusted	ANTWERP: Brabant Real Wage Index 1451-75=100 harmonic means	ANTWERP: Annual Wage in Commodity Baskets seasonally adjusted
1401-05	149.440	64.269	65.000	101.001	10.262
1406-10	159.400	68.552	66.667	97.250	9.881
1411-15	172.000	73.971	66.667	90.126	9.157
1416-20	187.280	80.542	66.667	82.772	8.410
1421-25	209.720	90.193	66.667	73.916	7.510
1426-30	232.880	100.153	66.667	66.565	6.763
1431-35	238.940	102.759	80.222	77.336	7.858
1436-40	291.660	125.432	84.444	67.323	6.840
1441-45	245.260	105.477	96.000	90.475	9.192
1446-50	231.540	99.577	100.000	100.425	10.203
1401-50	211.812	91.093	75.900	82.845	8.417
1451-55	229.140	98.545	100.000	101.477	10.310
1456-60	266.420	114.577	100.000	87.277	8.868
1461-65	211.760	91.070	100.000	109.805	11.156
1466-70	225.440	96.953	100.000	103.142	10.480
1471-75	229.860	98.854	100.000	101.159	10.278
1476-80	280.640	120.693	100.000	82.855	8.418
1481-85	362.160	155.752	100.000	64.205	6.523
1486-90	404.820	174.098	108.000	62.166	6.316
1491-95	309.760	133.216	100.000	75.066	7.627

Years 5 yr & 50 yr means	ANTWERP: Value of the Commodity Basket in d groot Brabant	ANTWERP: Brabant Price Index 1451-75=100 arithmetic means	ANTWERP: Brabant Nominal Wage Index 1451-75=100 Seasonally adjusted	ANTWERP: Brabant Real Wage Index 1451-75=100 harmonic means	ANTWERP: Annual Wage in Commodity Baskets seasonally adjusted
1496-1500	268.220	115.352	102.667	88.960	9.039
1451-1500	278.822	119.911	101.067	84.536	8.589
1501-05	291.700	125.449	103.333	82.371	8.369
1506-10	266.940	114.801	103.333	90.011	9.145
1511-15	320.660	137.904	114.667	82.925	8.425
1516-20	349.400	150.264	123.333	82.078	8.339
1521-25	418.400	179.938	126.667	70.210	7.134
1526-30	415.100	178.519	130.000	72.708	7.387
1531-35	404.580	173.995	124.667	71.408	7.255
1536-40	431.660	185.641	148.000	79.498	8.077
1541-45	484.440	208.340	172.667	83.076	8.441
1546-50	463.700	199.420	198.000	99.326	10.092
1501-50	384.658	165.427	134.467	80.530	8.182
1551-55	605.760	260.515	200.000	76.771	7.800
1556-60	699.240	300.717	222.667	72.930	7.410
1561-65	729.980	313.937	364.667	115.735	11.759
1566-70	740.100	318.290	290.333	90.811	9.227
1571-75	984.580	423.432	300.000	70.678	7.181
1576-80	1,117.780	480.716	454.000	92.671	9.416
1581-85	1,435.660	617.424	582.000	91.133	9.259
1586-90	1,859.620	799.754	500.000	62.519	6.352
1591-95	1,600.540	688.333	520.000	76.006	7.722

Years 5 yr & 50 yr means	ANTWERP: Value of the Commodity Basket in d groot Brabant	ANTWERP: Brabant Price Index 1451-75=100 arithmetic means	ANTWERP: Brabant Nominal Wage Index 1451-75=100 Seasonally adjusted	ANTWERP: Brabant Real Wage Index 1451-75=100 harmonic means	ANTWERP: Annual Wage in Commodity Baskets seasonally adjusted
1596-1600	1,750.780	752.946	600.000	79.687	8.096
1551-1600	1,152.404	495.606	403.367	80.643	8.194
1601-05	1,423.800	612.324	600.000	97.987	9.956
1606-10	1,432.100	615.893	600.000	97.419	9.898
1611-15	1,479.160	636.132	600.000	94.320	9.583
1616-20	1,457.840	626.963	600.000	95.699	9.723
1621-25	1,896.820	815.752	600.000	73.552	7.473
1626-30	2,138.400	919.647	600.000	65.242	6.629
1631-35	2,112.560	908.534	600.000	66.040	6.710
1636-40	2,250.060	967.668	600.000	62.005	6.300
1641-45	2,295.400	987.167	600.000	60.780	6.175
1646-50	2,360.440	1,015.138	600.000	59.105	6.005
1601-50	1,884.658	810.522	600.000	74.026	7.521
1651-55	2,102.780	904.328	600.000	66.348	6.741
1656-60	1,961.260	843.466	600.000	71.135	7.227
1661-65	2,047.640	880.614	600.000	68.134	6.923
1666-70	1,716.280	738.109	620.000	83.838	8.518
1671-75	1,926.940	828.706	650.000	78.436	7.969
1676-80	1,827.540	785.958	650.000	82.702	8.403
1681-85	1,712.660	736.552	650.000	88.249	8.966
1686-90	1,516.560	652.217	640.000	98.017	9.959
1691-95	2,083.780	896.157	625.000	69.742	7.086

Years 5 yr & 50 yr means	ANTWERP: Value of the Commodity Basket in d groot Brabant	ANTWERP: Brabant Price Index 1451-75=100 arithmetic means	ANTWERP: Brabant Nominal Wage Index 1451-75=100 Seasonally adjusted	ANTWERP: Brabant Real Wage Index 1451-75=100 harmonic means	ANTWERP: Annual Wage in Commodity Baskets seasonally adjusted
1696-1700	2,250.820	967.995	625.000	64.566	6.560
1651-1700	1,914.626	823.410	626.000	75.794	7.701

Table 3

Trends in and Levels of Real Wage Income in the Antwerp Region of Brabant and in South Eastern England, in quinquennial means: arithmeric and harmonic 1401-05 to 1696-1700

PART B: Index Base: 1451-75 = 100

Years 5 yr & 50 yr means	ENGLAND: Value of the Commodity Basket in d sterling	ENGLAND: Price Index 1451-75=100 arithmetic means	ENGLAND: Nominal Wage Index 1451-75=100 arithmetic means	ENGLAND: Real Wage Index 1451-75=100 harmonic means	ENGLAND: Annual Wage in Commodity Baskets	ANTWERP: Real Wage as Percent of English Real Wage 50-yr arithmetic means	ANTWERP: Real Wage as Percent of English Real Wage 50-yr harmonic means
1401-05	127.073	114.840	85.000	73.717	8.395	122.24%	122.24%
1406-10	123.998	111.235	96.667	87.067	9.843	100.39%	100.39%
1411-15	122.119	108.105	100.000	92.503	10.318	88.75%	88.75%
1416-20	128.139	113.403	100.000	88.181	9.833	85.53%	85.53%
1421-25	117.020	101.476	100.000	98.546	10.767	69.75%	69.75%
1426-30	127.025	112.267	100.000	89.074	9.919	68.18%	68.18%
1431-35	123.090	108.475	100.000	92.187	10.236	76.76%	76.76%
1436-40	140.118	122.010	100.000	81.960	8.992	76.07%	76.07%
1441-45	104.424	92.525	100.000	108.079	12.066	76.18%	76.18%
1446-50	114.200	100.900	100.000	99.108	11.033	92.48%	92.48%
1401-50	122.721	108.523	98.167	90.117	10.046	85.63%	83.79%
1451-55	114.774	100.250	100.000	99.751	10.978	93.92%	93.92%
1456-60	110.500	97.055	100.000	103.034	11.403	77.77%	77.77%
1461-65	114.489	102.733	100.000	97.340	11.005	101.37%	101.37%

Years 5 yr & 50 yr means	ENGLAND: Value of the Commodity Basket in d sterling	ENGLAND: Price Index 1451-75=100 arithmetic means	ENGLAND: Nominal Wage Index 1451-75=100 arithmetic means	ENGLAND: Real Wage Index 1451-75=100 harmonic means	ENGLAND: Annual Wage in Commodity Baskets	ANTWERP: Real Wage as Percent of English Real Wage 50-yr arithmetic means	ANTWERP: Real Wage as Percent of English Real Wage 50-yr harmonic means
1466-70	115.869	106.745	100.000	93.681	10.874	96.37%	96.37%
1471-75	108.370	97.755	100.000	102.297	11.627	88.40%	88.40%
1476-80	104.529	90.055	100.000	111.043	12.054	69.84%	69.84%
1481-85	136.921	127.380	100.000	78.505	9.202	70.89%	70.89%
1486-90	114.232	102.770	100.000	97.305	11.030	57.26%	57.26%
1491-95	115.671	106.795	100.000	93.637	10.893	70.02%	70.02%
1496-1500	111.152	96.700	100.000	103.413	11.336	79.73%	79.73%
1451-1500	114.651	102.824	100.000	97.254	10.990	80.56%	78.15%
1501-05	120.005	106.793	100.000	93.640	10.500	79.71%	79.71%
1506-10	118.499	103.773	100.000	96.365	10.633	86.01%	86.01%
1511-15	119.584	108.520	100.000	92.149	10.537	79.96%	79.96%
1516-20	139.678	120.438	100.000	83.031	9.021	92.45%	92.45%
1521-25	165.804	146.045	100.000	68.472	7.599	93.87%	93.87%
1526-30	180.336	157.345	100.000	63.555	6.987	105.73%	105.73%
1531-35	183.709	155.640	100.000	64.251	6.859	105.78%	105.78%
1536-40	173.368	152.330	108.333	71.118	7.873	102.59%	102.59%
1541-45	202.607	176.545	115.000	65.157	7.155	117.96%	117.96%
1546-50	259.509	229.640	120.000	52.249	5.825	173.25%	173.25%
1501-50	166.310	145.707	104.333	72.253	7.974	103.73%	102.60%
1551-55	306.956	275.453	140.000	50.718	5.749	135.68%	135.68%
1556-60	361.264	315.846	160.000	50.263	5.544	133.65%	133.65%
1561-65	325.668	289.311	166.667	57.608	6.448	182.36%	182.36%

Years 5 yr & 50 yr means	ENGLAND: Value of the Commodity Basket in d sterling	ENGLAND: Price Index 1451-75=100 arithmetic means	ENGLAND: Nominal Wage Index 1451-75=100 arithmetic means	ENGLAND: Real Wage Index 1451-75=100 harmonic means	ENGLAND: Annual Wage in Commodity Baskets	ANTWERP: Real Wage as Percent of English Real Wage 50-yr arithmetic means	ANTWERP: Real Wage as Percent of English Real Wage 50-yr harmonic means
1566-70	319.721	292.292	166.667	57.021	6.568	140.47%	140.47%
1571-75	338.647	296.095	170.000	57.511	6.337	113.32%	113.32%
1576-80	369.523	336.495	190.000	56.420	6.481	145.29%	145.29%
1581-85	367.187	337.515	200.000	59.257	6.863	134.92%	134.92%
1586-90	400.272	387.170	200.000	51.657	6.296	100.90%	100.90%
1591-95	421.625	416.010	200.000	48.076	5.977	129.21%	129.21%
1596-1600	550.228	540.540	200.000	37.000	4.580	176.78%	176.78%
1551-1600	376.109	348.673	179.333	51.631	6.010	139.26%	136.34%
1601-05	462.484	461.265	200.000	43.359	5.449	182.71%	182.71%
1606-10	522.608	496.995	200.000	40.242	4.822	205.27%	205.27%
1611-15	542.507	532.840	200.000	37.535	4.645	206.31%	206.31%
1616-20	535.456	520.390	200.000	38.433	4.706	206.60%	206.60%
1621-25	550.053	529.720	200.000	37.756	4.581	163.12%	163.12%
1626-30	552.630	525.060	203.333	38.775	4.640	142.85%	142.85%
1631-35	637.294	608.383	226.667	37.190	4.473	150.02%	150.02%
1636-40	622.961	615.125	248.333	40.324	5.017	125.57%	125.57%
1641-45	591.160	560.495	268.333	47.874	5.718	107.99%	107.99%
1646-50	729.148	734.390	283.333	38.652	4.906	122.42%	122.42%
1601-50	574.630	558.466	223.000	39.793	4.868	161.29%	154.49%
1651-55	617.277	601.330	296.667	49.256	6.048	111.46%	111.46%
1656-60	671.247	640.255	300.000	46.856	5.631	128.34%	128.34%
1661-65	679.595	672.970	300.000	44.579	5.562	124.46%	124.46%

Years 5 yr & 50 yr means	ENGLAND: Value of the Commodity Basket in d sterling	ENGLAND: Price Index 1451-75=100 arithmetic means	ENGLAND: Nominal Wage Index 1451-75=100 arithmetic means	ENGLAND: Real Wage Index 1451-75=100 harmonic means	ENGLAND: Annual Wage in Commodity Baskets	ANTWERP: Real Wage as Percent of English Real Wage 50-yr arithmetic means	ANTWERP: Real Wage as Percent of English Real Wage 50-yr harmonic means
1666-70	600.671	599.645	300.000	50.030	6.293	135.36%	135.36%
1671-75	638.202	615.650	300.000	48.729	5.923	134.55%	134.55%
1676-80	614.139	611.620	300.000	49.050	6.155	136.52%	136.52%
1681-85	592.792	595.145	300.000	50.408	6.377	140.61%	140.61%
1686-90	538.696	547.580	303.333	55.359	7.089	140.48%	140.48%
1691-95	587.687	604.840	315.000	52.126	6.759	104.83%	104.83%
1696-1700	707.813	719.990	326.667	45.351	5.813	112.85%	112.85%
1651-1700	624.812	620.903	304.167	48.993	6.132	126.95%	125.58%

Table 4

Comparison of Real Wages for Master Masons and their Labourers in Antwerp and South-Eastern England in Index Numbers and in Commodity Baskets
Quinquennial Means, Arithmetic and Harmonic
1401-05 to 1696-1700

PART A: Years 5 yr & 50 yr means	BRABANT Price Index 232.524 Base 100= 1451-75=100	ANTWERP Masons Mean Annual Wage Index: 1451-75=100 (nominal wage) 11.250d groot	ANTWERP Master Mason's Real Wage Index NWI/CPI harmonic means 1451-75=100	ANTWERP Masons Labourers' Mean Annual Wage Index: 1451-75=100 seasonal wage 6.5625d groot	ANTWERP Masons Labourers' Mean Annual Real Wage Index harmonic means 1451-75=100	Master Mason's Annual Wage in Commodity Basket Units for 210 days earnings seasonal: summer-summer wage	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means
1401-05	64.269	65.000	101.001	57.521	89.517	10.262	5.306
1406-10	68.552	66.667	97.250	57.143	83.357	9.881	4.940
1411-15	73.971	66.667	90.126	57.143	77.250	9.157	4.578
1416-20	80.542	66.667	82.772	57.143	70.948	8.410	4.205
1421-25	90.193	66.667	73.916	57.143	63.356	7.510	3.755
1426-30	100.153	66.667	66.565	57.143	57.056	6.763	3.382
1431-35	102.759	80.222	77.336	86.498	83.546	7.858	4.952
1436-40	125.432	84.444	67.323	92.648	73.979	6.840	4.385
1441-45	105.477	96.000	90.475	98.223	92.935	9.192	5.508
1446-50	99.577	100.000	100.425	100.000	100.425	10.203	5.952
1401-50	91.093	75.900	82.845	72.061	77.088	8.417	4.569
1451-55	98.545	100.000	101.477	100.000	101.477	10.310	6.014
1456-60	114.577	100.000	87.277	100.000	87.277	8.868	5.173
1461-65	91.070	100.000	109.805	100.000	109.805	11.156	6.508
1466-70	96.953	100.000	103.142	100.000	103.142	10.480	6.113

PART A: Years 5 yr & 50 yr means	BRABANT Price Index 232.524 Base 100= 1451-75=100	ANTWERP Masons Mean Annual Wage Index: 1451-75=100 (nominal wage) 11.250d groot	ANTWERP Master Mason's Real Wage Index NWI/CPI harmonic means 1451-75=100	ANTWERP Masons Labourers' Mean Annual Wage Index: 1451-75=100 seasonal wage 6.5625d groot	ANTWERP Masons Labourers' Mean Annual Real Wage Index harmonic means 1451-75=100	Master Mason's Annual Wage in Commodity Basket Units for 210 days earnings seasonal: summer-summer wage	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means
1471-75	98.854	100.000	101.159	100.000	101.159	10.278	5.995
1476-80	120.693	100.000	82.855	100.000	82.855	8.418	4.911
1481-85	155.752	100.000	64.205	100.000	64.205	6.523	3.805
1486-90	174.098	108.000	62.166	109.079	62.771	6.316	3.720
1491-95	133.216	100.000	75.066	105.714	79.015	7.627	4.683
1496-1500	115.352	102.667	88.960	111.417	96.514	9.039	5.720
1451-1500	119.911	101.067	84.536	102.621	85.769	8.589	5.083
1501-05	125.449	103.333	82.371	109.120	86.917	8.369	5.151
1506-10	114.801	103.333	90.011	113.371	98.755	9.145	5.853
1511-15	137.904	114.667	82.925	115.215	83.449	8.425	4.946
1516-20	150.264	123.333	82.078	119.810	79.733	8.339	4.726
1521-25	179.938	126.667	70.210	132.530	73.519	7.134	4.357
1526-30	178.519	130.000	72.708	132.468	74.133	7.387	4.394
1531-35	173.995	124.667	71.408	127.366	72.985	7.255	4.326
1536-40	185.641	148.000	79.498	140.086	75.209	8.077	4.458
1541-45	208.340	172.667	83.076	162.432	77.982	8.441	4.622
1546-50	199.420	198.000	99.326	169.714	85.136	10.092	5.046
1501-50	165.427	134.467	80.530	132.211	80.119	8.182	4.748
1551-55	260.515	200.000	76.771	174.286	66.879	7.800	3.964
1556-60	300.717	222.667	72.930	222.734	71.506	7.410	4.238
1561-65	313.937	364.667	115.735	293.733	92.965	11.759	5.510

PART A: Years 5 yr & 50 yr means	BRABANT Price Index 232.524 Base 100= 1451-75=100	ANTWERP Masons Mean Annual Wage Index: 1451-75=100 (nominal wage) 11.250d groot	ANTWERP Master Mason's Real Wage Index NWI/CPI harmonic means 1451-75=100	ANTWERP Masons Labourers' Mean Annual Wage Index: 1451-75=100 seasonal wage 6.5625d groot	ANTWERP Masons Labourers' Mean Annual Real Wage Index harmonic means 1451-75=100	Master Mason's Annual Wage in Commodity Basket Units for 210 days earnings seasonal: summer-summer wage	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means
1566-70	318.290	290.333	90.811	270.264	84.883	9.227	5.031
1571-75	423.432	300.000	70.678	312.957	73.472	7.181	4.355
1576-80	480.716	454.000	92.671	449.887	92.921	9.416	5.507
1581-85	617.424	582.000	91.133	494.674	79.074	9.259	4.687
1586-90	799.754	500.000	62.519	497.143	60.406	6.352	3.580
1591-95	688.333	520.000	76.006	557.143	81.585	7.722	4.835
1596-1600	752.946	600.000	79.687	600.000	79.687	8.096	4.723
1551-1600	495.606	403.367	80.643	387.282	77.009	8.194	4.564
1601-05	612.324	600.000	97.987	600.000	97.987	9.956	5.808
1606-10	615.893	600.000	97.419	600.000	97.419	9.898	5.774
1611-15	636.132	600.000	94.320	600.000	94.320	9.583	5.590
1616-20	626.963	600.000	95.699	600.000	95.699	9.723	5.672
1621-25	815.752	600.000	73.552	600.000	73.552	7.473	4.359
1626-30	919.647	600.000	65.242	600.000	65.242	6.629	3.867
1631-35	908.534	600.000	66.040	600.000	66.040	6.710	3.914
1636-40	967.668	600.000	62.005	600.000	62.005	6.300	3.675
1641-45	987.167	600.000	60.780	600.000	60.780	6.175	3.602
1646-50	1015.138	600.000	59.105	600.000	59.105	6.005	3.503
1601-50	810.522	600.000	74.026	600.000	74.026	7.521	4.387
1651-55	904.328	600.000	66.348	600.000	66.348	6.741	3.932
1656-60	843.466	600.000	71.135	600.000	71.135	7.227	4.216

PART A: Years 5 yr & 50 yr means	BRABANT Price Index 232.524 Base 100= 1451-75=100	ANTWERP Masons Mean Annual Wage Index: 1451-75=100 (nominal wage) 11.250d groot	ANTWERP Master Mason's Real Wage Index NWI/CPI harmonic means 1451-75=100	ANTWERP Masons Labourers' Mean Annual Wage Index: 1451-75=100 seasonal wage 6.5625d groot	ANTWERP Masons Labourers' Mean Annual Real Wage Index harmonic means 1451-75=100	Master Mason's Annual Wage in Commodity Basket Units for 210 days earnings seasonal: summer-summer wage	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means
1661-65	880.614	600.000	68.134	600.000	68.134	6.923	4.038
1666-70	738.109	620.000	83.838	620.000	83.838	8.518	4.969
1671-75	828.706	650.000	78.436	650.000	78.436	7.969	4.649
1676-80	785.958	650.000	82.702	650.000	82.702	8.403	4.902
1681-85	736.552	650.000	88.249	650.000	88.249	8.966	5.230
1686-90	652.217	640.000	98.017	640.000	98.017	9.959	5.809
1691-95	896.157	625.000	69.742	625.000	69.742	7.086	4.133
1696-1700	967.995	625.000	64.566	625.000	64.566	6.560	3.827
1651-1700	823.410	626.000	75.794	626.000	75.794	7.701	4.492

Table 5

Comparison of Real Wages for Master Masons and their Labourers in Antwerp and South-Eastern England in Index Numbers and in Commodity Baskets
Quinquennial Means, Arithmetic and Harmonic
1401-05 to 1696-1700

Part B	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:
Years 5 yr & 50 yr means	Master Masons Nominal Wage Index 1451-75=100 arithmetic means	Master Masons Real Wage Index 1451-75=100 harmonic means	Master Masons Annual Wage in Commodity Baskets harmonic means	Mason's Labourer Nominal Wage Index 1451-75=100 arithmetic means	Mason's Labourer Real Wage Index 1451-75=100 harmonic means	Mason's Labourer Annual Wage Commodity Baskets harmonic means
1401-05	85.00	73.717	8.395	80.00	71.288	5.218
1406-10	96.67	87.067	9.843	95.00	85.887	6.446
1411-15	100.00	92.503	10.318	100.00	92.633	6.879
1416-20	100.00	88.181	9.833	100.00	89.126	6.555
1421-25	100.00	98.546	10.767	100.00	98.867	7.178
1426-30	100.00	89.074	9.919	100.00	90.998	6.613
1431-35	100.00	92.187	10.236	100.00	92.358	6.824
1436-40	100.00	81.960	8.992	100.00	85.413	5.995
1441-45	100.00	108.079	12.066	100.00	108.574	8.044
1446-50	100.00	99.108	11.033	100.00	99.228	7.356
1401-50	98.167	90.117	10.046	97.500	90.405	6.628
1451-55	100.000	99.751	10.978	100.000	100.064	7.319
1456-60	100.000	103.034	11.403	100.000	103.115	7.602
1461-65	100.000	97.340	11.005	100.000	99.009	7.337
1466-70	100.000	93.681	10.874	100.000	93.723	7.250
1471-75	100.000	102.297	11.627	100.000	102.590	7.751

Part B	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:
Years 5 yr & 50 yr means	Master Masons Nominal Wage Index 1451-75=100 arithmetic means	Master Masons Real Wage Index 1451-75=100 harmonic means	Master Masons Annual Wage in Commodity Baskets harmonic means	Mason's Labourer Nominal Wage Index 1451-75=100 arithmetic means	Mason's Labourer Real Wage Index 1451-75=100 harmonic means	Mason's Labourer Annual Wage Commodity Baskets harmonic means
1476-80	100.000	111.043	12.054	100.000	111.678	8.036
1481-85	100.000	78.505	9.202	100.000	80.745	6.135
1486-90	100.000	97.305	11.030	100.000	98.059	7.353
1491-95	100.000	93.637	10.893	100.000	93.931	7.262
1496-1500	100.000	103.413	11.336	100.000	103.510	7.557
1451-1500	100.000	97.254	10.990	100.000	97.988	7.327
1501-05	100.000	93.640	10.500	100.000	93.746	7.000
1506-10	100.000	96.365	10.633	100.000	96.391	7.089
1511-15	100.000	92.149	10.537	100.000	92.528	7.024
1516-20	100.000	83.031	9.021	100.000	83.659	6.014
1521-25	100.000	68.472	7.599	100.000	69.128	5.066
1526-30	100.000	63.555	6.987	100.000	64.274	4.658
1531-35	100.000	64.251	6.859	100.000	65.008	4.572
1536-40	108.333	71.118	7.873	100.000	65.901	4.845
1541-45	115.000	65.157	7.155	100.000	56.895	4.146
1546-50	120.000	52.249	5.825	125.000	55.112	4.013
1501-50	104.333	72.253	7.974	102.500	71.375	5.208
1551-55	140.000	50.718	5.749	160.000	58.161	4.377
1556-60	160.000	50.263	5.544	180.000	59.929	4.161
1561-65	166.667	57.608	6.448	187.500	64.958	4.836
1566-70	166.667	57.021	6.568	187.500	64.161	4.926

Part B	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:
Years 5 yr & 50 yr means	Master Masons Nominal Wage Index 1451-75=100 arithmetic means	Master Masons Real Wage Index 1451-75=100 harmonic means	Master Masons Annual Wage in Commodity Baskets harmonic means	Mason's Labourer Nominal Wage Index 1451-75=100 arithmetic means	Mason's Labourer Real Wage Index 1451-75=100 harmonic means	Mason's Labourer Annual Wage Commodity Baskets harmonic means
1571-75	170.000	57.511	6.337	187.500	64.198	4.651
1576-80	190.000	56.420	6.481	192.500	57.398	4.375
1581-85	200.000	59.257	6.863	200.000	59.292	4.575
1586-90	200.000	51.657	6.296	200.000	52.529	4.197
1591-95	200.000	48.076	5.977	200.000	49.045	3.985
1596-1600	200.000	37.000	4.580	200.000	37.810	3.053
1551-1600	179.333	51.631	6.010	189.500	55.371	4.242
1601-05	200.000	43.359	5.449	200.000	43.729	3.633
1606-10	200.000	40.242	4.822	200.000	40.473	3.215
1611-15	200.000	37.535	4.645	200.000	37.742	3.097
1616-20	200.000	38.433	4.706	200.000	38.546	3.138
1621-25	200.000	37.756	4.581	200.000	37.990	3.054
1626-30	203.333	38.775	4.640	212.500	40.751	3.228
1631-35	226.667	37.190	4.473	230.000	37.952	3.029
1636-40	248.333	40.324	5.017	245.000	40.103	3.302
1641-45	268.333	47.874	5.718	277.500	49.584	3.932
1646-50	283.333	38.652	4.906	300.000	41.730	3.456
1601-50	223.000	39.793	4.868	226.500	40.602	3.287
1651-55	296.667	49.256	6.048	300.000	50.469	4.082
1656-60	300.000	46.856	5.631	300.000	47.165	3.754
1661-65	300.000	44.579	5.562	300.000	44.824	3.708

Part B	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:	ENGLAND:
Years 5 yr & 50 yr means	Master Masons Nominal Wage Index 1451-75=100 arithmetic means	Master Masons Real Wage Index 1451-75=100 harmonic means	Master Masons Annual Wage in Commodity Baskets harmonic means	Mason's Labourer Nominal Wage Index 1451-75=100 arithmetic means	Mason's Labourer Real Wage Index 1451-75=100 harmonic means	Mason's Labourer Annual Wage Commodity Baskets harmonic means
1666-70	300.000	50.030	6.293	300.000	50.181	4.195
1671-75	300.000	48.729	5.923	300.000	49.026	3.949
1676-80	300.000	49.050	6.155	300.000	49.168	4.103
1681-85	300.000	50.408	6.377	300.000	50.535	4.251
1686-90	303.333	55.359	7.089	300.000	54.881	4.678
1691-95	315.000	52.126	6.759	305.000	51.168	4.365
1696-1700	326.667	45.351	5.813	335.000	46.683	3.973
1651-1700	304.167	48.993	6.132	304.000	49.270	4.088

Table 6

Real Wages of Master Masons and their Joureymen Labourers in Antwerp and England compared: real wages expressed as the number of commodity baskets purchased with the annual money wage income in quinquennial and fifty-year means, 1401-05 to 1696-1700

Years 5 yr & 50 yr means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ENGLAND: Mason's Labourer Annual Wage Commodity Baskets harmonic means	ENGLAND: Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ANTWERP Master Mason's Annual Wage in Baskets as percent of English	ANTWERP Mason's Labourer Annual Wage in Baskets as percent of English
1401-05	5.306	51.70%	5.218	62.15%	122.24%	101.69%
1406-10	4.940	50.00%	6.446	65.49%	100.39%	76.64%
1411-15	4.578	50.00%	6.879	66.67%	88.75%	66.56%
1416-20	4.205	50.00%	6.555	66.67%	85.53%	64.14%
1421-25	3.755	50.00%	7.178	66.67%	69.75%	52.31%
1426-30	3.382	50.00%	6.613	66.67%	68.18%	51.14%
1431-35	4.952	63.02%	6.824	66.67%	76.76%	72.56%
1436-40	4.385	64.10%	5.995	66.67%	76.07%	73.14%
1441-45	5.508	59.92%	8.044	66.67%	76.18%	68.47%
1446-50	5.952	58.33%	7.356	66.67%	92.48%	80.92%
1401-50	4.569	54.71%	6.628	66.10%	83.79%	68.94%
1451-55	6.014	58.33%	7.319	66.67%	93.92%	82.18%
1456-60	5.173	58.33%	7.602	66.67%	77.77%	68.05%
1461-65	6.508	58.33%	7.337	66.67%	101.37%	88.70%
1466-70	6.113	58.33%	7.250	66.67%	96.37%	84.32%
1471-75	5.995	58.33%	7.751	66.67%	88.40%	77.35%

Years 5 yr & 50 yr means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ENGLAND: Mason's Labourer Annual Wage Commodity Baskets harmonic means	ENGLAND: Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ANTWERP Master Mason's Annual Wage in Baskets as percent of English	ANTWERP Mason's Labourer Annual Wage in Baskets as percent of English
1476-80	4.911	58.33%	8.036	66.67%	69.84%	61.11%
1481-85	3.805	58.33%	6.135	66.67%	70.89%	62.03%
1486-90	3.720	58.90%	7.353	66.67%	57.26%	50.59%
1491-95	4.683	61.40%	7.262	66.67%	70.02%	64.49%
1496-1500	5.720	63.29%	7.557	66.67%	79.73%	75.69%
1451-1500	5.083	59.19%	7.327	66.67%	78.15%	69.38%
1501-05	5.151	61.55%	7.000	66.67%	79.71%	73.59%
1506-10	5.853	64.00%	7.089	66.67%	86.01%	82.57%
1511-15	4.946	58.70%	7.024	66.67%	79.96%	70.41%
1516-20	4.726	56.67%	6.014	66.67%	92.45%	78.58%
1521-25	4.357	61.08%	5.066	66.67%	93.87%	86.01%
1526-30	4.394	59.48%	4.658	66.67%	105.73%	94.33%
1531-35	4.326	59.62%	4.572	66.67%	105.78%	94.60%
1536-40	4.458	55.19%	4.845	61.54%	102.59%	92.00%
1541-45	4.622	54.76%	4.146	57.94%	117.96%	111.48%
1546-50	5.046	50.00%	4.013	68.90%	173.25%	125.73%
1501-50	4.748	58.10%	5.208	65.50%	102.60%	91.18%
1551-55	3.964	50.82%	4.377	76.14%	135.68%	90.56%
1556-60	4.238	57.19%	4.161	75.05%	133.65%	101.85%
1561-65	5.510	46.86%	4.836	75.00%	182.36%	113.93%
1566-70	5.031	54.53%	4.926	75.00%	140.47%	102.13%

Years 5 yr & 50 yr means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ENGLAND: Mason's Labourer Annual Wage Commodity Baskets harmonic means	ENGLAND: Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ANTWERP Master Mason's Annual Wage in Baskets as percent of English	ANTWERP Mason's Labourer Annual Wage in Baskets as percent of English
1571-75	4.355	60.64%	4.651	73.39%	113.32%	93.63%
1576-80	5.507	58.49%	4.375	67.51%	145.29%	125.87%
1581-85	4.687	50.61%	4.575	66.67%	134.92%	102.43%
1586-90	3.580	56.36%	4.197	66.67%	100.90%	85.30%
1591-95	4.835	62.61%	3.985	66.67%	129.21%	121.35%
1596-1600	4.723	58.33%	3.053	66.67%	176.78%	154.68%
1551-1600	4.564	55.64%	4.242	70.88%	136.34%	107.60%
1601-05	5.808	58.33%	3.633	66.67%	182.71%	159.87%
1606-10	5.774	58.33%	3.215	66.67%	205.27%	179.61%
1611-15	5.590	58.33%	3.097	66.67%	206.31%	180.52%
1616-20	5.672	58.33%	3.138	66.67%	206.60%	180.78%
1621-25	4.359	58.33%	3.054	66.67%	163.12%	142.73%
1626-30	3.867	58.33%	3.228	69.57%	142.85%	119.79%
1631-35	3.914	58.33%	3.029	67.71%	150.02%	129.24%
1636-40	3.675	58.33%	3.302	65.82%	125.57%	111.29%
1641-45	3.602	58.33%	3.932	68.76%	107.99%	91.62%
1646-50	3.503	58.33%	3.456	70.45%	122.42%	101.36%
1601-50	4.387	58.33%	3.287	67.56%	154.49%	133.46%
1651-55	3.932	58.33%	4.082	67.50%	111.46%	96.32%
1656-60	4.216	58.33%	3.754	66.67%	128.34%	112.30%
1661-65	4.038	58.33%	3.708	66.67%	124.46%	108.90%

Years 5 yr & 50 yr means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets harmonic means	ANTWERP Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ENGLAND: Mason's Labourer Annual Wage Commodity Baskets harmonic means	ENGLAND: Masons Labourers' Annual Wage in Commodity Baskets as Percent of Master's Wage	ANTWERP Master Mason's Annual Wage in Baskets as percent of English	ANTWERP Mason's Labourer Annual Wage in Baskets as percent of English
1666-70	4.969	58.33%	4.195	66.67%	135.36%	118.44%
1671-75	4.649	58.33%	3.949	66.67%	134.55%	117.73%
1676-80	4.902	58.33%	4.103	66.67%	136.52%	119.45%
1681-85	5.230	58.33%	4.251	66.67%	140.61%	123.04%
1686-90	5.809	58.33%	4.678	65.99%	140.48%	124.18%
1691-95	4.133	58.33%	4.365	64.57%	104.83%	94.70%
1696-1700	3.827	58.33%	3.973	68.35%	112.85%	96.31%
1651-1700	4.492	58.33%	4.088	66.64%	125.58%	109.88%

Table 7

Wages of Master Building Craftsmen and Their Labourers in Southern England in pence (d) sterling per day, with wage- and price-relatives from the Phelps Brown and Hopkins indexes in quinquennial means, 1401-05 to 1696-1700: mean of 1451-75 = 100

Year	Total Value of the PBH Basket of Consumables in d sterling	Aggregate M Price Index (Adjusted) 1451-75=100	Nominal Day Wage in d. for a Master	Nominal Day Wage in d. for a Labourer	Labourer's Day Wage as percent of master's wage	Master Nominal Wage Index 1451-75=100 [= 6d daily]	Laborer Nominal Wage Index 1451-75=100 [= 4d daily]
1401-05	127.073	114.840	5.100	3.20	62.75%	85.00	80.00
1406-10	123.998	111.235	5.800	3.80	65.52%	96.67	95
1411-15	122.119	108.105	6.000	4.00	66.67%	100.00	100.00
1416-20	128.139	113.403	6.000	4.00	66.67%	100.00	100.00
1421-25	117.020	101.476	6.000	4.00	66.67%	100.00	100.00
1426-30	127.025	112.267	6.000	4.00	66.67%	100.00	100.00
1431-35	123.090	108.475	6.000	4.00	66.67%	100.00	100.00
1436-40	140.118	122.010	6.000	4.00	66.67%	100.00	100.00
1441-45	104.424	92.525	6.000	4.00	66.67%	100.00	100.00
1446-50	114.200	100.900	6.000	4.00	66.67%	100.00	100.00
1451-55	114.774	100.250	6.000	4.000	66.67%	100.000	100.000

Year	Total Value of the PBH Basket of Consumables in d sterling	Aggregate M Price Index (Adjusted) 1451-75=100	Nominal Day Wage in d. for a Master	Nominal Day Wage in d. for a Labourer	Labourer's Day Wage as percent of master's wage	Master Nominal Wage Index 1451-75=100 [= 6d daily]	Laborer Nominal Wage Index 1451-75=100 [= 4d daily]
1456-60	110.500	97.055	6.000	4.000	66.67%	100.000	100.000
1461-65	114.489	102.733	6.000	4.000	66.67%	100.000	100.000
1466-70	115.869	106.745	6.000	4.000	66.67%	100.000	100.000
1471-75	108.370	97.755	6.000	4.000	66.67%	100.000	100.000
1476-80	104.529	90.055	6.000	4.000	66.67%	100.000	100.000
1481-85	136.921	127.380	6.000	4.000	66.67%	100.000	100.000
1486-90	114.232	102.770	6.000	4.000	66.67%	100.000	100.000
1491-95	115.671	106.795	6.000	4.000	66.67%	100.000	100.000
1496-1500	111.152	96.700	6.000	4.000	66.67%	100.000	100.000
1501-05	120.005	106.793	6.000	4.000	66.67%	100.000	100.000
1506-10	118.499	103.773	6.000	4.000	66.67%	100.000	100.000
1511-15	119.584	108.520	6.000	4.000	66.67%	100.000	100.000
1516-20	139.678	120.438	6.000	4.000	66.67%	100.000	100.000
1521-25	165.804	146.045	6.000	4.000	66.67%	100.000	100.000

Year	Total Value of the PBH Basket of Consumables in d sterling	Aggregate M Price Index (Adjusted) 1451-75=100	Nominal Day Wage in d. for a Master	Nominal Day Wage in d. for a Labourer	Labourer's Day Wage as percent of master's wage	Master Nominal Wage Index 1451-75=100 [= 6d daily]	Laborer Nominal Wage Index 1451-75=100 [= 4d daily]
1526-30	180.336	157.345	6.000	4.000	66.67%	100.000	100.000
1531-35	183.709	155.640	6.000	4.000	66.67%	100.000	100.000
1536-40	173.368	152.330	6.500	4.000	61.54%	108.333	100.000
1541-45	202.607	176.545	6.900	4.000	57.97%	115.000	100.000
1546-50	259.509	229.640	7.200	5.000	69.44%	120.000	125.000
1551-55	306.956	275.453	8.400	6.400	76.19%	140.000	160.000
1556-60	361.264	315.846	9.600	7.200	75.00%	160.000	180.000
1561-65	325.668	289.311	10.000	7.500	75.00%	166.667	187.500
1566-70	319.721	292.292	10.000	7.500	75.00%	166.667	187.500
1571-75	338.647	296.095	10.200	7.500	73.53%	170.000	187.500
1576-80	369.523	336.495	11.400	7.700	67.54%	190.000	192.500
1581-85	367.187	337.515	12.000	8.000	66.67%	200.000	200.000
1586-90	400.272	387.170	12.000	8.000	66.67%	200.000	200.000
1591-95	421.625	416.010	12.000	8.000	66.67%	200.000	200.000

Year	Total Value of the PBH Basket of Consumables in d sterling	Aggregate M Price Index (Adjusted) 1451-75=100	Nominal Day Wage in d. for a Master	Nominal Day Wage in d. for a Labourer	Labourer's Day Wage as percent of master's wage	Master Nominal Wage Index 1451-75=100 [= 6d daily]	Laborer Nominal Wage Index 1451-75=100 [= 4d daily]
1596-1600	550.228	540.540	12.000	8.000	66.67%	200.000	200.000
1601-5	462.484	461.265	12.000	8.000	66.67%	200.000	200.000
1606-10	522.608	496.995	12.000	8.000	66.67%	200.000	200.000
1611-15	542.507	532.840	12.000	8.000	66.67%	200.000	200.000
1616-20	535.456	520.390	12.000	8.000	66.67%	200.000	200.000
1621-25	550.053	529.720	12.000	8.000	66.67%	200.000	200.000
1626-30	552.630	525.060	12.200	8.500	69.67%	203.333	212.500
1631-35	637.294	608.383	13.600	9.200	67.65%	226.667	230.000
1636-40	622.961	615.125	14.900	9.800	65.77%	248.333	245.000
1641-45	591.160	560.495	16.100	11.100	68.94%	268.333	277.500
1646-50	729.148	734.390	17.000	12.000	70.59%	283.333	300.000
1651-55	617.277	601.330	17.800	12.000	67.42%	296.667	300.000
1656-60	671.247	640.255	18.000	12.000	66.67%	300.000	300.000
1661-65	679.595	672.970	18.000	12.000	66.67%	300.000	300.000

Year	Total Value of the PBH Basket of Consumables in d sterling	Aggregate M Price Index (Adjusted) 1451-75=100	Nominal Day Wage in d. for a Master	Nominal Day Wage in d. for a Labourer	Labourer's Day Wage as percent of master's wage	Master Nominal Wage Index 1451-75=100 [= 6d daily]	Laborer Nominal Wage Index 1451-75=100 [= 4d daily]
1666-70	600.671	599.645	18.000	12.000	66.67%	300.000	300.000
1671-75	638.202	615.650	18.000	12.000	66.67%	300.000	300.000
1676-80	614.139	611.620	18.000	12.000	66.67%	300.000	300.000
1681-85	592.792	595.145	18.000	12.000	66.67%	300.000	300.000
1686-90	538.696	547.580	18.200	12.000	65.93%	303.333	300.000
1691-95	587.687	604.840	18.900	12.200	64.55%	315.000	305.000
1696-1700	707.813	719.990	19.600	13.400	68.37%	326.667	335

Table 8

Wages of Master Building Craftsmen and Their Labourers in Southern England in pence (d) sterling per day, with wage- and price-relatives from the Phelps Brown & Hopkins Index in quinquennial means, 1401-05 to 1696-1700 mean of 1451-75 = 100

5 year periods	Real Wage Index Master 1451-75=100 harmonic mean	Real Wage Index Labourer 1451-75=100 harmonic mean	Total Value of the PBH Basket of Consumables in d sterling	Master's Annual Income in Baskets 210 days harmonic mean	Labourer's Annual Income in Baskets 210 days harmonic mean
1401-05	73.717	68.693	127.073	8.395	5.218
1406-10	87.067	85.527	123.998	9.843	6.446
1411-15	92.503	92.503	122.119	10.318	6.879
1416-20	88.181	88.181	128.139	9.833	6.555
1421-25	98.546	98.546	117.020	10.767	7.178
1426-30	89.074	89.074	127.025	9.919	6.613
1431-35	92.187	92.187	123.090	10.236	6.824
1436-40	81.960	81.960	140.118	8.992	5.995
1441-45	108.079	108.079	104.424	12.066	8.044
1446-50	99.108	99.108	114.200	11.033	7.356
1451-55	99.751	99.751	114.774	10.978	7.319

5 year periods	Real Wage Index Master 1451-75=100 harmonic mean	Real Wage Index Labourer 1451-75=100 harmonic mean	Total Value of the PBH Basket of Consumables in d sterling	Master's Annual Income in Baskets 210 days harmonic mean	Labourer's Annual Income in Baskets 210 days harmonic mean
1456-60	103.034	103.034	110.500	11.403	7.602
1461-65	97.340	97.340	114.489	11.005	7.337
1466-70	93.681	93.681	115.869	10.874	7.250
1471-75	102.297	102.297	108.370	11.627	7.751
1476-80	111.043	111.043	104.529	12.054	8.036
1481-85	78.505	78.505	136.921	9.202	6.135
1486-90	97.305	97.305	114.232	11.030	7.353
1491-95	93.637	93.637	115.671	10.893	7.262
1496-1500	103.413	103.413	111.152	11.336	7.557
1501-05	93.640	93.640	120.005	10.500	7.000
1506-10	96.365	96.365	118.499	10.633	7.089
1511-15	92.149	92.149	119.584	10.537	7.024
1516-20	83.031	83.031	139.678	9.021	6.014
1521-25	68.472	68.472	165.804	7.599	5.066

5 year periods	Real Wage Index Master 1451-75=100 harmonic mean	Real Wage Index Labourer 1451-75=100 harmonic mean	Total Value of the PBH Basket of Consumables in d sterling	Master's Annual Income in Baskets 210 days harmonic mean	Labourer's Annual Income in Baskets 210 days harmonic mean
1526-30	63.555	63.555	180.336	6.987	4.658
1531-35	64.251	64.251	183.709	6.859	4.572
1536-40	71.118	65.647	173.368	7.873	4.845
1541-45	65.157	56.643	202.607	7.155	4.146
1546-50	52.249	53.966	259.509	5.825	4.013
1551-55	50.718	57.878	306.956	5.749	4.377
1556-60	50.263	56.649	361.264	5.544	4.161
1561-65	57.608	64.809	325.668	6.448	4.836
1566-70	57.021	64.148	319.721	6.568	4.926
1571-75	57.511	63.324	338.647	6.337	4.651
1576-80	56.420	57.134	369.523	6.481	4.375
1581-85	59.257	59.257	367.187	6.863	4.575
1586-90	51.657	51.657	400.272	6.296	4.197
1591-95	48.076	48.076	421.625	5.977	3.985

5 year periods	Real Wage Index Master 1451-75=100 harmonic mean	Real Wage Index Labourer 1451-75=100 harmonic mean	Total Value of the PBH Basket of Consumables in d sterling	Master's Annual Income in Baskets 210 days harmonic mean	Labourer's Annual Income in Baskets 210 days harmonic mean
1596-1600	37.000	37.000	550.228	4.580	3.053
1601-5	43.359	43.359	462.484	5.449	3.633
1606-10	40.242	40.242	522.608	4.822	3.215
1611-15	37.535	37.535	542.507	4.645	3.097
1616-20	38.433	38.433	535.456	4.706	3.138
1621-25	37.756	37.756	550.053	4.581	3.054
1626-30	38.775	40.456	552.630	4.640	3.228
1631-35	37.190	37.773	637.294	4.473	3.029
1636-40	40.324	39.814	622.961	5.017	3.302
1641-45	47.874	49.355	591.160	5.718	3.932
1646-50	38.652	40.850	729.148	4.906	3.456
1651-55	49.256	49.889	617.277	6.048	4.082
1656-60	46.856	46.856	671.247	5.631	3.754
1661-65	44.579	44.579	679.595	5.562	3.708

5 year periods	Real Wage Index Master 1451-75=100 harmonic mean	Real Wage Index Labourer 1451-75=100 harmonic mean	Total Value of the PBH Basket of Consumables in d sterling	Master's Annual Income in Baskets 210 days harmonic mean	Labourer's Annual Income in Baskets 210 days harmonic mean
1666-70	50.030	50.030	600.671	6.293	4.195
1671-75	48.729	48.729	638.202	5.923	3.949
1676-80	49.050	49.050	614.139	6.155	4.103
1681-85	50.408	50.408	592.792	6.377	4.251
1686-90	55.359	54.787	538.696	7.089	4.678
1691-95	52.126	50.493	587.687	6.759	4.365
1696-1700	45.351	46.495	707.813	5.813	3.973

Table 9

The Van der Wee Brabant 'Basket of Consumables' Price Index
in quinquennial means, 1401-05 to 1696-1700, in d. groot Brabant and index numbers
mean of 1451-75 = 100

Year	Basket of Consumables Total Value in d. gr. Brabant	INDEX 232.524 Base 100= 1451-75	Grains Index as percent of the total basket	Meat-Dairy-Fish Index as percent of the total basket	Industrial Index as percent of the total basket
1401-05	149.440	64.269	28.00%	41.88%	30.13%
1406-10	159.400	68.552	32.76%	39.55%	27.69%
1411-15	172.000	73.971	32.28%	40.16%	27.56%
1416-20	187.280	80.542	29.97%	40.67%	29.37%
1421-25	209.720	90.193	33.79%	39.97%	26.24%
1426-30	232.880	100.153	39.83%	36.25%	23.92%
1431-35	238.940	102.759	35.56%	37.96%	26.48%
1436-40	291.660	125.432	44.83%	31.81%	23.36%
1441-45	245.260	105.477	34.78%	36.31%	28.91%
1446-50	231.540	99.577	36.37%	37.34%	26.28%
1451-55	229.140	98.545	35.49%	37.62%	26.89%
1456-60	266.420	114.577	40.85%	37.20%	21.96%
1461-65	211.760	91.070	30.03%	41.41%	28.56%
1466-70	225.440	96.953	34.16%	39.22%	26.62%
1471-75	229.860	98.854	34.73%	39.39%	25.88%
1476-80	280.640	120.693	38.36%	37.97%	23.67%
1481-85	362.160	155.752	45.65%	33.65%	20.70%
1486-90	404.820	174.098	46.54%	33.05%	20.41%
1491-95	309.760	133.216	41.72%	34.35%	23.93%
1496-1500	268.220	115.352	33.59%	38.62%	27.79%
1501-05	291.700	125.449	38.31%	36.94%	24.75%
1506-10	266.940	114.801	33.18%	38.14%	28.69%
1511-15	320.660	137.904	37.72%	35.66%	26.61%
1516-20	349.400	150.264	38.11%	37.64%	24.25%

Year	Basket of Consumables Total Value in d. gr. Brabant	INDEX 232.524 Base 100= 1451-75	Grains Index as percent of the total basket	Meat-Dairy-Fish Index as percent of the total basket	Industrial Index as percent of the total basket
1521-25	418.400	179.938	42.39%	35.31%	22.30%
1526-30	415.100	178.519	40.02%	37.45%	22.53%
1531-35	404.580	173.995	42.04%	40.24%	17.72%
1536-40	431.660	185.641	43.81%	38.97%	17.22%
1541-45	484.440	208.340	42.85%	38.58%	18.57%
1546-50	463.700	199.420	35.66%	42.77%	21.57%
1551-55	605.760	260.515	43.84%	38.06%	18.10%
1556-60	699.240	300.717	41.59%	39.83%	18.58%
1561-65	729.980	313.937	43.60%	37.34%	19.07%
1566-70	740.100	318.290	41.06%	39.39%	19.54%
1571-75	984.580	423.432	46.40%	35.35%	18.25%
1576-80	1117.780	480.716	47.18%	35.07%	17.75%
1581-85	1435.660	617.424	44.95%	38.69%	16.36%
1586-90	1859.620	799.754	53.48%	31.81%	14.71%
1591-95	1600.540	688.333	45.95%	38.22%	15.83%
1596-1600	1750.780	752.946	48.30%	37.23%	14.47%
1601-05	1423.800	612.324	43.37%	38.74%	17.90%
1606-10	1432.100	615.893	44.79%	37.00%	18.21%
1611-15	1479.160	636.132	46.88%	35.51%	17.60%
1616-20	1457.840	626.963	41.70%	38.89%	19.41%
1621-25	1896.820	815.752	48.08%	36.30%	15.62%
1626-30	2138.400	919.647	47.92%	37.89%	14.19%
1631-35	2112.560	908.534	45.54%	39.56%	14.90%
1636-40	2250.060	967.668	46.91%	38.16%	14.93%
1641-45	2295.400	987.167	43.38%	41.20%	15.42%
1646-50	2360.440	1015.138	45.43%	39.85%	14.72%
1651-55	2102.780	904.328	43.55%	41.53%	14.92%
1656-60	1961.260	843.466	43.45%	41.63%	14.93%
1661-65	2047.640	880.614	47.39%	37.88%	14.72%
1666-70	1716.280	738.109	38.29%	45.51%	16.20%

Year	Basket of Consumables Total Value in d. gr. Brabant	INDEX 232.524 Base 100= 1451-75	Grains Index as percent of the total basket	Meat-Dairy-Fish Index as percent of the total basket	Industrial Index as percent of the total basket
1671-75	1926.940	828.706	42.73%	41.52%	15.75%
1676-80	1827.540	785.958	41.67%	42.20%	16.12%
1681-85	1712.660	736.552	40.89%	42.83%	16.28%
1686-90	1516.560	652.217	40.18%	42.28%	17.54%
1691-95	2083.780	896.157	44.07%	41.17%	14.76%
1696-1700	2250.820	967.995	48.41%	38.57%	13.02%
1401-1700	971.163	417.662	41.07%	38.42%	20.51%

Sources for the tables:

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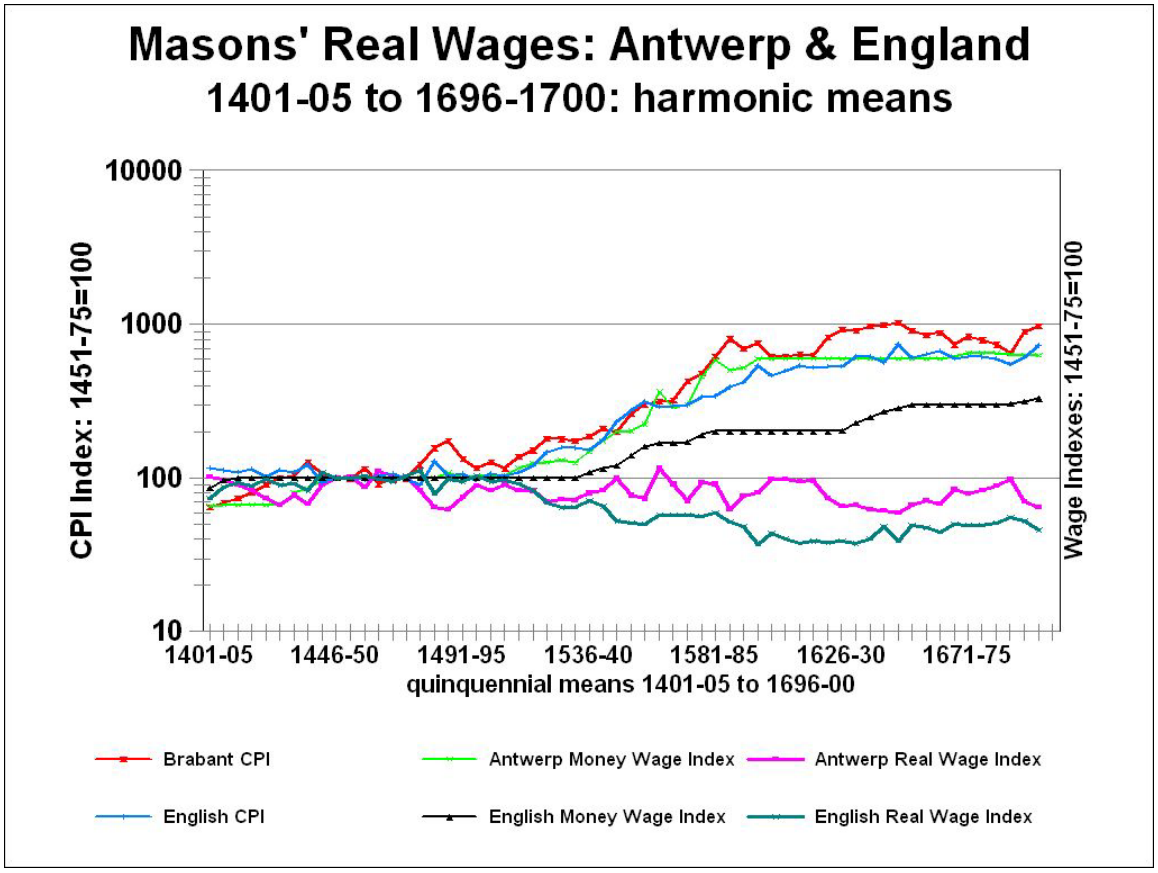
Comparisons of Prices, Nominal Wages, and Real Wages in Antwerp and South-Eastern England, from 1401 to 1700, in quinquennial means

Graph no. 1

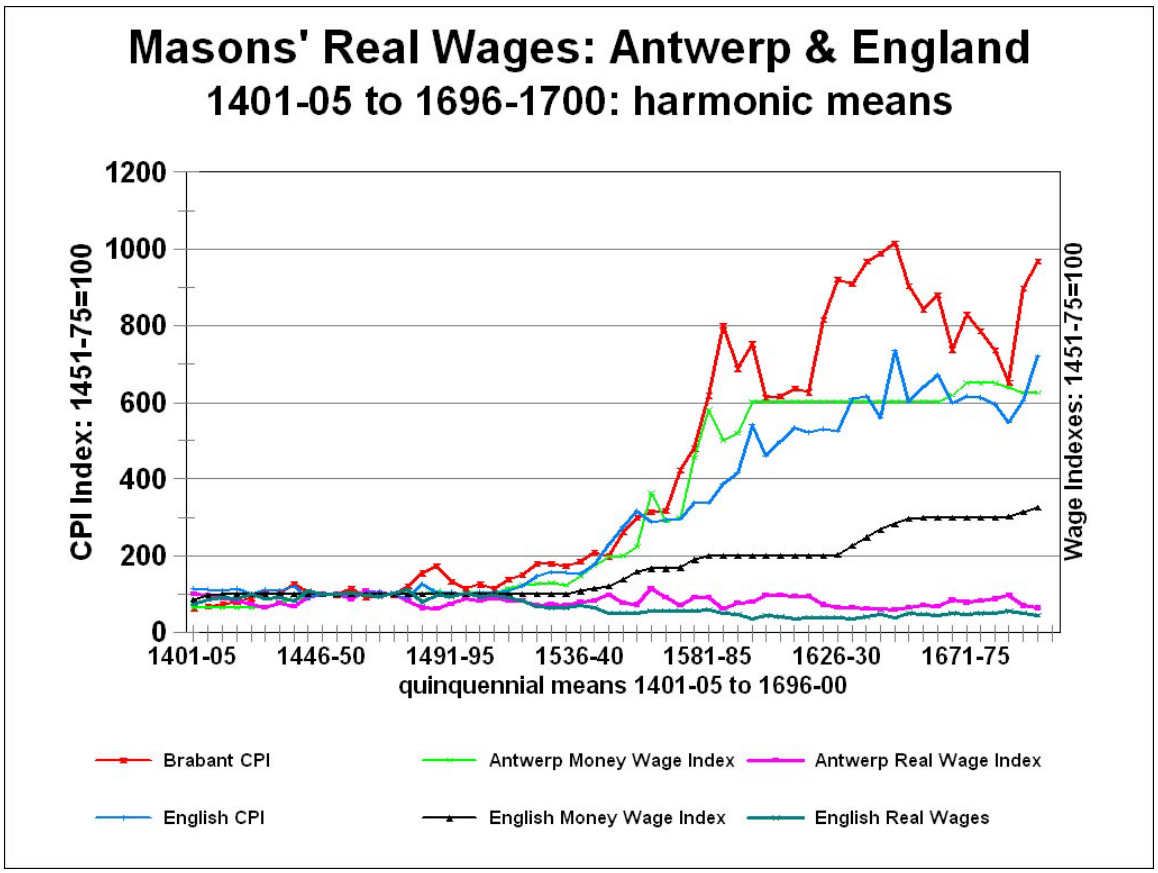


Prices and Wages, Nominal and Real, in Antwerp and South-Eastern England, 1401- 1700: semi-log scale

The Consumer Price Index ('Basket of Consumables'), the Nominal Wage Index, and the Real Wage Index (RWI = NWI/CPI) for Master Masons in Antwerp and towns of South-East England, in quinquennial harmonic means, for the Real Wage Index, and arithmetic means for the CPI and Nominal Wage Index, from 1401-05 to 1696-1700.

Base: 1451 – 1475 = 100

Graph no. 2

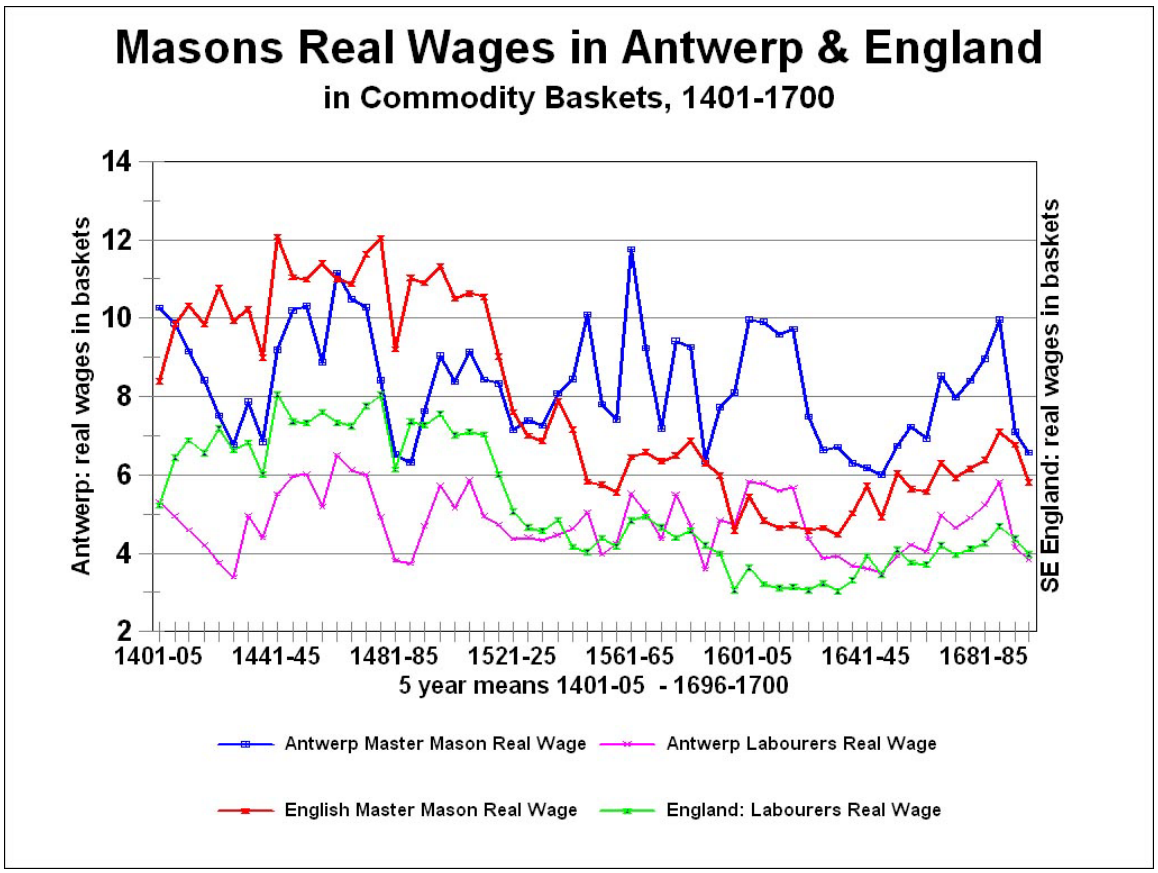


Prices and Wages, Nominal and Real, in Antwerp and South-Eastern England, 1401- 1700: arithmetic scale

The Consumer Price Index ('Basket of Consumables'), the Nominal Wage Index, and the Real Wage Index (RWI = NWI/CPI) for Master Masons in Antwerp and towns of South-East England, in quinquennial harmonic means, for the Real Wage Index, and arithmetic means for the CPI and Nominal Wage Index, from 1401-05 to 1696-1700.

Base: 1451 – 1475 = 100

Graph no. 3

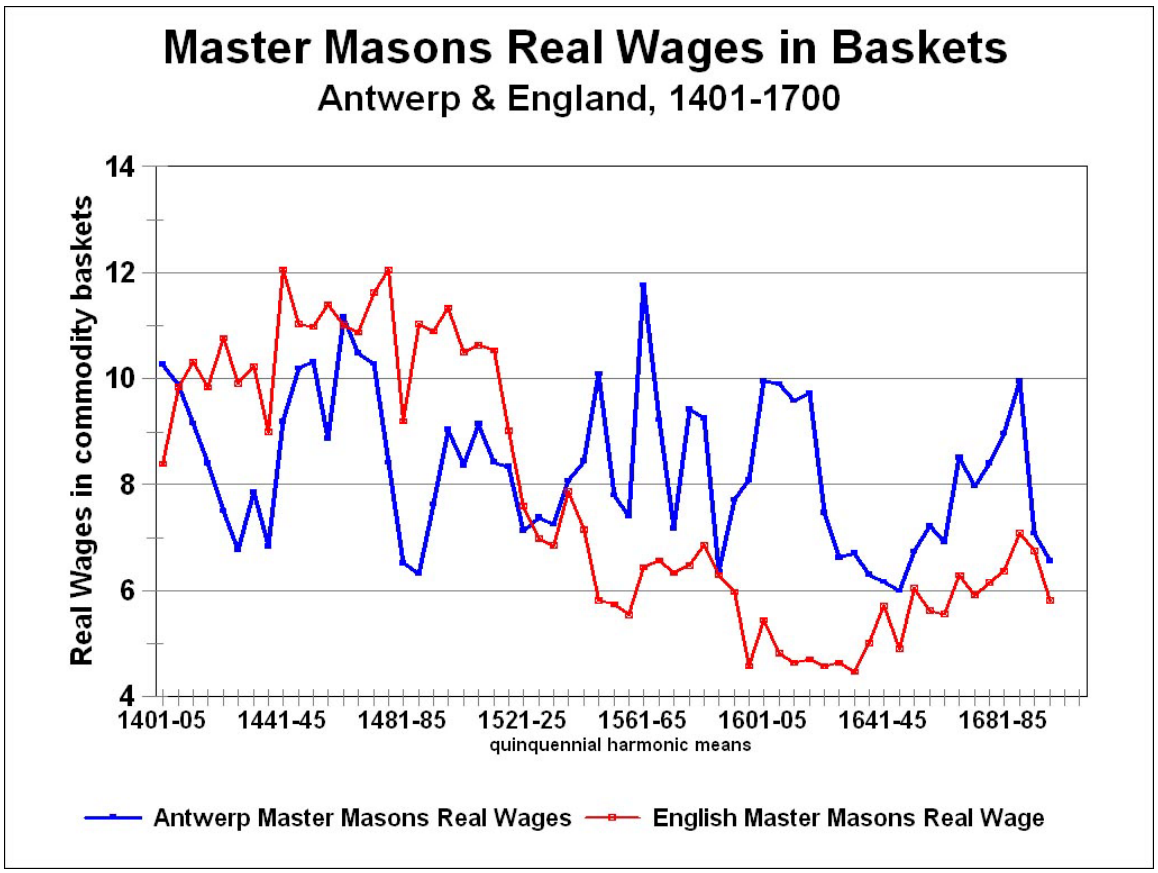


Real Wages of Master Masons and Their Labourers in Antwerp and South Eastern England, 1401 - 1700

as measured by the number of fixed commodity baskets ('baskets of consumables') that could have been purchased each year with the (nominal) money wage income, for 210 days employment

In quinquennial harmonic means, 1401-5 to 1696-1700

Graph no. 4



Real Wages of Master Masons in Antwerp and South Eastern England

Real wages as measured by the number of fixed commodity baskets ('baskets of consumables') that a master mason could have purchased each year with his (nominal) money wage income for 210 days employment.

In quinquennial harmonic means: from 1401-05 to 1696-1700.