Mankind: "I Must Nedys Labure, Yt Ys My Lyvynge"[1]

Relative Wages in Fifteenth Century York

Research Master Thesis
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[1] Anonymous, Mankind (a fifteenth century morality play), c1470, line 350.

Content

List of Graphs and Tables

Introduction

Nothing in life is certain but death and taxes. Death commonly occurs soon for persons lacking the basic necessities for survival, namely: food, drink, clothing, and shelter. Man has toiled for thousands of years to ensure survival by obtaining these commodities - in prehistoric times in small self-sufficient groups such as hunter-gatherers, nowadays as individuals with jobs that allow us to buy food at the market, and pay our taxes. So, for the vast majority of people work is also one of life's certainties.

Traditionally, history has focused on great men and great events, and information is abundant. However, for those of us who wish to know more about common people, source material is not as readily available, as their lives usually remained unrecorded. Work is one of the most important and reasonably well documented aspects of the life of common folk. It provides insight into their standard of living, and quality of life, as these are closely correlated to the nominal wages they received, and the relative value of those wages. Nominal wages are the wages that could be earned by one day of labour. The relative value of the nominal wage is determined by the prices of the commodities that could be bought for those wages. This is the real wage, which is computed by calculating a Consumer Price Index (CPI) - also known as a basket of goods - composed of basic necessities, and then calculating how much of the CPI could be bought on a year's pay. When prices for basic necessities were low, fewer days had to be worked than at times when prices were high. Workers could theoretically choose to work more days in order to buy luxury goods, in which case an industrious revolution took place, or spend more time in leisure after their basic needs had been met. Leisure was, and still is, a very valuable and attractive commodity, especially when doing physical labour.[2] Generally speaking, workers were better off when their relative wages were high.

Ever since the publication of J. E. Thorold Rogers' study of wages and prices in 1884 historians and economists have been intrigued by real wages and numerous local and international studies in real wage development have been made.[3] Based on research done in these studies, in 2001 Robert Allen published an influential study on real wages, from the late Middle Ages to the beginning of the twentieth century, in which he compared real wages of nineteen large European cities. This study showed a divergence in real wages as early as the sixteenth century in the North Sea

[2] J. L. van Zanden. 'Wages and the Standard of Living in Europe, 1500-1800', *European Review of Economic History*, 12 (1999), 178, John Hatcher. 'Labour, Leisure and Economic Thought before the Nineteenth Century', *Past and Present*, 160 (1998) 115.

[3] James Edwin Thorold Rogers. *Six Centuries of Work and Wages, A History of English Labour*. New York, Humboldt, 1884, Ernest Henry Phelps Brown and Sheila V. Hopkins. *A Perspective of Wages and Prices,* London, Methuen, 1981.

Area – the area in which the industrial revolution took place - from the rest of Europe. Real wages increased throughout Europe after the Black Death decimated the population in Europe between 1349 and 1351. As population levels declined, pressure on consumable goods decreased, and prices dropped. When population levels rose again in the sixteenth century, real wages declined dramatically in Europe, as is to be expected according to the Malthusian model discussed below. However, this decline in real wages did not occur in the North Sea Area, where growth only stagnated in the sixteenth century, and slowly rose again throughout the seventeenth and eighteenth century.[4] Ten years after the appearance of Allen's 'Great Divergence', he expounded on his methods and theories, in a joint article with Weisdorf. In this study the contribution of women to a household's income was included, and the number of working days required to stay above the poverty line was computed.[5]

Problems

The study of real wages is not without difficulties. There is no direct relation between real wages and income, as it is unknown how many days per year people worked, and for how many hours per day.[6] Therefore, the number of days worked in a year is held at a constant in real wage calculations. Thorold Rogers indicated a mason likely worked between 235 and 312 days per year in the fifteenth century. Throughout his research Allen used 250 days, five days per week for 50 weeks, a number chosen rather randomly as he admits, even though it fits in rather nicely with Thorold Rogers' description.[7] Furthermore, not all people earned wages, and those that did may only have been partially dependant on it for income.[8] According to De Moor and van Zanden 25-50% of the population engaged in wage labour in the late Middle Ages. The bulk of the population had a garden and kept at least one animal up until the industrial revolution, so, they were not completely dependent on the market for their resources.[9] Additionally, Hatcher has shown that in the late fourteenth century food was often included with work, but these and other fringe benefits, such as

[4] Robert C. Allen. 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38 (2001) 411-447.

[5] R. C. Allen and J.L Weisdorf. 'Was there an 'Industrious Revolution' before the Industrial Revolution? An Empirical Exercise for England, c. 1300-1830', *The Economic History Review,* 64, no. 3 (2011) 715-729.

[6] John Hatcher. 'England in the Aftermath of the Black Death', *Past and Present*, 144 (1994) 14, 28.

[7] Allen. 'The Great Divergence', 425, Thorold Rogers. *Six Centuries of Work and Wages,*180.

[8] J. H. Munro. 'Wage-Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1350–1500, Did Money Matter?', *Research in Economic History*, 21 (2003) 230.

[9] U. Albarella. 'Pig Husbandry and Pork Consumption in Medieval England', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 72-87, C. C. Dyer. 'Gardens and Garden Produce in the Later Middle Ages', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 27-40, C. M. Woolgar. 'Meat and Dairy Products in Late Medieval England', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 88-101.

clothing, or shelter are not taken into account.[10] Moreover, the most common sources for real wage calculation are payment rolls from large building projects for institutions, while builders only represent a fragment of the total population. In order to prevent non-representative results Allen has compared these wages to the wages of agricultural workers.[11] Additionally, wages paid for work on large projects, which were managed by the institution, may have been lower than wages paid in contract work where the craftsman would have managed, and supplied materials himself.[12] Women's work had remained excluded from real wage calculations until Allen and Weisdorf included them in some of their calculations after 1600. The calculations for the basket of goods for England rely heavily on food prices gathered by Lord Beveridge from colleges, hospitals, and the Navy Victualing Service since the publication of his tremendously important work 'Prices and wages in England' in 1939.[13] However, as these institutions likely bought in bulk, the prices they have recorded are probably lower than local market prices. Allen suggested that probate inventories may be useful in gaining more insight at market prices, but this research has not yet been undertaken.[14] Moreover, the composition of the basket of consumables is commonly held at a constant, although in times of high bread prices, the poorer population could switch from wheat or rye bread to pottage, boiled oats or barley, in order to satisfy their hunger.[15]

Nonetheless, the most important problem in calculating real wages is the composition of the Consumer Price Index. It has led to numerous debates and a division of scholars into two groups, those who are optimistic and those who are pessimistic about what real wages indicate about past development.[16] Traditionally, real wages were based solely on the price development of grains, mainly wheat, whilst usually bread was eaten, the price of which was also subject to wages of the baker and taxes. Allen solved this by calculating a regression for bread prices to use as the basis for his basket of goods.[17] Furthermore, Allen included more foodstuffs in his Consumer Price Index, as bread was an important basis, but not the only source of calories. Costs for fuel and clothing were traditionally not included either, but they have also been accounted for by Allen. However, shelter is

[10] Hatcher. 'England in the Aftermath of the Black Death', 21.
[11] Allen. 'The Great Divergence', 414.
[12] Heather Swanson. 'Building Craftsmen in Late Medieval York', *Borthwick Papers*, 63 (1983) 28.
[13] William Henry Beveridge. *Prices and Wages in England, From the Twelfth to the Nineteenth Century*, London, Cass, 1965.
[14] Allen. 'The Great Divergence', 418.
[15] Phelps Brown and Hopkins. *A Perspective of Wages and Prices,* 14. D. J. Stone. 'The Consumption of Field Crops in Late Medival England', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 28.
[16] See for instance: Charles H. Feinstein. 'Pessimism Perpetuated, Real Wages and the Standard of Living in Britain during and after the Industrial Revolution', *The Journal of Economic History,* 58, no. 3 (1998) 625-658, Gregory Clark. 'The Condition of the Working Class in England, 1209-2004', *Journal of Political Economy*, 113, no. 6 (2005) 1307-1340, Robert C. Allen. 'Pessimism Preserved, Real Wages in the British Industrial Revolution', *Oxford University Department of Economics Working Paper,* 314 (2007).
[17] Allen, great divergence, 418-419.

usually not taken into account in modern real wage calculations. The cost of housing has been used in few publications, and these are mainly concerned with the early modern and modern eras.[18] Only Clark uses rent data from the thirteenth century onwards.[19] Allen has made some calculations in which rents were included by assuming rent accounted for 4-5 % of household expenditure. He concluded that adding rent had no effect on his general conclusions, but he has indicated that further research is required to test this assumption.[20] An investigation in rent development is especially important as Allen's research in 1991 showed that the eighteenth century rise in agricultural productivity did not lead to an increase in income due to the rise of rent prices.[21] However, rent prices have not been added to the basket of goods in his recent research.

As I feel real wages are a very important tool in understanding the history of common people, the goal of this thesis is to improve relative wage calculations - the term relative wage will be used to avoid confusion with the term real wages as different methods will be applied - and to solve, or circumvent the problems discussed above, by researching the relative wage development in York, England, in the fifteenth century. I will focus on the following questions:

- How did food prices develop in the fifteenth century, and to what extent do probate inventories provide a more viable source for more realistic price histories than institutional price histories?
-What is the influence of economic developments on relative wages?
- To what extent do regional price differences affect relative wage calculations?
- How did rents develop in fifteenth century York, and to what extent did rent development affect relative wages?
- How did relative wages develop for women, and to what extend could women contribute to the household economy in fifteenth century York?

Throughout the thesis the methods and theories put forth in Allen's - and Weisdorf's – innovative work will be used for comparison. The material used will mainly pertain to artisans and labourers.

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[18] For use of rents in real wage calculations see for instance: Van Zanden, J. L. 'Wages and the Standard of Living in Europe, 1500-1800', *European Review of Economical History*, 3 (1999), 175-197. Feinstein. 'Pessimism Perpetuated'.

[19] Clark. 'The Condition of the Working Class in England'.

[20] Allen. 'The Great Divergence', 422, Sara Horrell. 'Home Demand and British Industrialisation', *Journal of economic History,* 56, no. 3 (1996) 580.

[21] Robert C. Allen. 'The Two English Agricultural Revolutions, 1450-1850', in: Bruce M. S. and Mark Overton ed. *Land, Labour and Livestock, Historical Studies in European Agricultural Productivity.* Manchester, Manchester University Press, 1991, 254.

Why the fifteenth century?

The fifteenth century is exceptionally interesting as a case study for relative wages as the real wage literature has shown that relative wages were consistently high throughout this period. In general people were better fed, and clothed, warmer in winter, and able to enjoy more leisure time. Therefore, the influence of different price histories, locality, rent, and women's work should be readily detectable in relative wage development in the fifteenth century. This century has been labelled the golden age for labourers by Thorold Rogers due to the absolute and relative increase of wages.[22] His conclusion has been confirmed by the work of various scholars, for instance Phelps Brown and Hopkins, and Hatcher.[23] Allen has shown that real wages for masons in London were very high throughout the fifteenth century, and remained unmatched until the mid-nineteenth century.[24] Furthermore, nominal and real wages appear to have remained high throughout the fifteenth century in spite of two long periods of deflation between c1390 and c1420, and c1440 and c1470.[25] However, all studies have shown a high real wage during the fifteenth century, but this century has been underrepresented in the historiography of real wages. More heed has been paid to the rise in real wages in the fourteenth century, the drop in the sixteenth century, and the development during the industrial revolution.

The real wage development as described by Allen is supported by the work on the history of the GDP per capita in England from 1270- 1870 by Broadberry et al - even though they would not agree with this assessment. They have shown that GDP per capita rose by an average of 0.2 % per year. Growth was episodic, GDP per capita rose rapidly after the mid fourteenth century, and hit a plateau between 1450 and 1650 - GDP per capita even declined between 1450 and 1560 - but another period of growth set in after the mid seventeenth century. This is quite similar to Allen's description of real wage development. Broadberry et al. iterate that their research contradicts the description put forth by the real wage literature as GDP per capita was twice as high in the period of negative growth than it had been in the period before the Black Death.[26] However, as the distribution of wealth was not equal, it is not unlikely that certain social groups were hit harder by the decline in economic growth.

According to the popular Malthusian interpretation the real wage boom in the fifteenth century was caused by the population decline in the fourteenth century, as put forth most notably by

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[22] Thorold Rogers. *Six Centuries of Work and Wages,* 326.

[23] Phelps Brown and Hopkins. *A Perspective of Wages and Prices,* 19, Hatcher. 'England in the Aftermath of the Black Death', 9.

[24] Allen. 'The Great Divergence', 434.

[25] Munro. 'Wage-Stickiness', 187.

[26] Stephen Broadberry, Bruce Campbell, Alexander Klein, Mark Overton, and Bas van Leeuwen. 'English Economic Growth, 1270-1700', *Cage Online Working Paper series,* 21 (2011) 2, 24, 55.

Postan.[27] The pressure on agriculture was reduced, which eradicated problems with diminishing returns, and led to a decline in food prices. Hatcher explained that the Black Death was the decisive factor in this process. Table 1, based on figures provided by Goldberg, shows the high population numbers before the Black Death, and the decline afterwards. Hatcher argued that the decline in population solved the problem of underemployment, and unemployment that had plagued the preceding era. It is likely that both the number of days worked, and time actively spend in leisure by wage labourers increased. Complaints about lazy labourers unwilling to work were found in contemporary literature, as were complaints by clerics about labourers working on holy days. The higher income generated by full employment facilitated wage labourers to increase their leisure time, for which previously there had been no budget.[28] There is some dissent about the cause for the wage increase, but the Malthusian theory is yet to be successfully rejected.[29]

Table 1: English Population Estimates, 1086-1551

Year	Population numbers
1086	1-2 million
1315	3.8-6.5 million
1377	2-3 million
1450	2-2.5 million
1525	2.3 million
1541	2.8 million
1551	3 million

Source: Goldberg, Peter Jeremy Piers. *Medieval England, a social history, 1250-1550*, London, Arnold, 2004, 75.

Women

According to scholars such as Goldberg, Barron, De Moor and Van Zanden, women benefitted from these wage developments in the fifteenth century too, and a golden age for women was created. Due to the labour shortage caused by declining population numbers, relatively high wages were offered to women, and they were pulled into the labour force. Women's increased economic power

[27] Michael Moissey Postan. *The Medieval Economy and Society: An Economic History of Brittain, 1100-1500*. Berkeley, University of California, 1972.

[28] Hatcher. 'England in the Aftermath of the Black Death', 4-28.

[29] For a different interpretation see for instance: M. Silver. 'A Non-Neo Malthusian Model of English Land Values, Wages and Grain Yields Before the Black Death', *The Journal of European Economic History*, 12 (1983) 631-650.

also led to greater social and political autonomy. In the early fifteenth century women's work generally consisted of assisting their husbands and fathers until they were widowed, orphaned, or got married. A second labour opportunity was working as a servant. In the early fifteenth century the male to female ratio of servants was about equal, but in the late fifteenth century servants were almost exclusively male. According to Goldberg, this was caused by a further decline in population. He explained that the financial benefits for women in the early fifteenth century led to a delay of marriage, or a choice for chastity by women, in order to accumulate more wealth. A decline in the birth-rate naturally followed these developments, and population declined further until the economic growth could no longer be maintained in the mid-fifteenth century. The model then reversed, women were pushed out of the labour market and became dependent on marriage for their financial security, which led to a lower age at first marriage, a rise in population and a further decline in real wages.[30] Barron points out that especially in large cities - such as London and York - women had more opportunities for economic and personal independence.[31]

However, not all scholars agree with this hopeful assessment. Opposing this positive interpretation, Bardsley and Bennett have argued that the relative position of women did not change. Bennett claimed that the main feature of women's work throughout history has been continuity. Their work was consistently low skilled, low paid, and low profit. They did not have full access to guilds, and were excluded from certain occupations. Experiences changed, but the status of women remained the same. For instance, the main drink was ale in 1300, which was generally brewed by women. In 1600 ale had been replaced by beer, and brewing had become a reputable business practiced by men. Women remained in lower class occupations.[32] Bardsley described that wages were determined by age, health, and sex. Women were consistently paid 25-30% less than men, their pay was comparable to the second rate male workforce - that is crippled, adolescent, and old men - and this wage difference did not shift after the Black Death.[33] In spite of demographic developments, patriarchy was apparently more important than economy. Nevertheless, the

[30] Peter Jeremy Piers Goldberg. *Women, Work and Life Cycle in a Medieval Economy, Women in York and Yorkshire c. 1300-1520*, Oxford, Clarendon Press, 1992, 7, Peter Jeremy Piers Goldberg. *Medieval England, a social history, 1250-1550*, London, Arnold, 2004, 101-107.

[31] Caroline M. Barron. 'Introduction, The Widows World', in: Barron, Caroline M. *Medieval London Widows, 1330-1500*, London, Hambledon Press, 1994, xvi.

[32] Judith M. Bennett. *Ale, Beer, and Brewsters in England, Women's work in a changing world, 1300-1600,* Oxford, Oxford University Press, 1999, 146-147, Judith M. Bennett. 'History that Stands Still, Women's Work in the European Past (a Review Essay)', *Feminist Studies,* 14, no. 2 (1988) 278.

[33] Sandy Bardsley. 'Women's Work Reconsidered, Gender and Wage Differentiation in Late Medieval England', *Past and Present*, 165 (1999) 12, 23, 25.

contribution of women to the household economy has been proven by numerous publications.[34] Therefore, their efforts should be included in the relative wage calculations.

Urban Decline and Rent

Even though the fifteenth century may not be the most exciting period for the study of relative wages, the development of rent was likely subject to major changes. I have chosen to use rent prices, and not house prices, as rent prices are much easier to reconstruct, and the bulk of city dwellers lived in rented housing.[35] During the mid-fifteenth century there was a general economic slump, as is also shown by the GDP per capita development discussed above. Almost all sectors of the economy were in decline, and profits, income, and employment opportunities dwindled. Some branches, such as foreign trade and agricultural economy recovered, but in most towns and cities there was no substantial improvement.[36] In 1977 Dobson described that urban settlements throughout England were in decline during the fifteenth century. This manifested itself in depopulation, a decline in industry, the decay of city walls, urban castles falling into ruin, and the construction of guildhalls and churches grinding to a virtual halt. Increasingly cities applied for reduction of fee farm and exemption from parliamentary subsidies on the basis of poverty. These accounts may have been inflated, but as several remissions and indemnities were granted, this seems an admission of poverty by the crown. Furthermore, many attempts were made to avoid holding civic office due to the strain it put on personal wealth, as officials were made personally responsible to amend any deficiencies in budget, a problem especially apparent in York. Dobson admitted that his material was rather impressionistic, and should be backed up by studies on rent development, which had not been written at the time.[37] However, more recent local quantitative studies into urban rents by Butcher, and Keene on Oxford and Canterbury, and Winchester respectively, have confirmed Dobson's theory of urban decline in the late fifteenth century.[38] Under these economic circumstances one would expect to see a decline

[34] See for instance: Bennett. *Ale, Beer, and Brewsters*, Goldberg. *Medieval England,* J. Humphries, 'Enclosures, Common Rights, and Women, The Proletarianization of Families in the Late Eighteenth and Early Nineteenth Centuries', *The Journal of Economic History,* 50, no. 1 (1999), Goldberg. *Women, Work and Life Cycle,* Sara Horrell and Jane Humphries. 'Women's Labour Force Participation and the Transition to the Male-Breadwinner Family, 1790-1865', *Economic History Review*, 48, no. 1 (1995) 89-118.

[35] Clé Lesger. *Huur en Conjunctuur, de woningmarkt in Amsterdam, 1550-1850,* Amsterdam, Historich Seminarium van de Universiteit van Amsterdam, 1986, 10-11.

[36] John Hatcher. 'The Great Slump of the Mid-Fifteenth Century', in: Richard Britnell and John Hatcher, *Progress and Problems in Medieval England: Essays in Honour of Edward Miller.* Cambridge, Cambridge University Press, 1996, 270.

[37] R. B. Dobson. 'Urban Decline in Late Medieval England', *Transactions of the Royal Historical Society, Fifth Series*, 27 (1977) 5-21.

[38] A. F. Butcher. 'Rent and the Urban Economy, Oxford and Canterbury in the Later Middle Ages', *Southern History, a Review of the History of Southern England*, 1 (1979), 39, Derek Keene and Alexander Richard Rumble. *Survey of Medieval Winchester*, Oxford, Clarendon Press, 1985, 239.

in rent prices due to a decline in housing demands. According to Butcher rents are 'the most sensitive indicator of economic and demographic change.'[39] Therefore, applying rent development to relative stable wages and food prices in the fifteenth century should show a significant effect.

The capital of the north

York has been chosen as the focus of this study for several reasons. All research is limited by the availability of sources, and luckily there are very interesting sources for the study of relative wages in York, as will be discussed below. The literature on real wages has always focussed almost exclusively on southern England and in particular on London, Allen's work is also focused on the south.[40] Most literature on real wages does not take regional variation into account.[41] Munro, and Allen and Weisdorf's recent publication, are the only exceptions known to me.[42] Allen and Weisdorf only focus on the difference between urban building workers in London, and harvest workers in rural southern England. Munro mainly focuses on regional variations in the Low Countries, and rarely touches on northern England. More precise results will be achieved by restricting the source material to York as much as possible – a small excursion to Durham will be made in order to assess price development.

The north became politically more important during the fifteenth century when the House of York and the House of Lancaster feuded over the throne during the Wars of the Roses. York was generally known as the second city of the realm during this period. The city was celebrated as the 'capital of the north,' in the fourteenth and early fifteenth century: it was a bishopric, a home to a booming cloth industry, and a centre for national, and international wool trade.[43] Table 2 shows the occupational structure of the city as reconstructed by Goldberg, based on the Freemen's register and Poll Tax accounts. According to Swanson, the city was in constant demand for builders to do repairs, and construction until at least 1460. Most crafts were organised in guilds, there were guilds for masons, carpenters, plumbers, glaziers, and plasterers/tilers – this group was joined in a single guild in 1475, as their professions showed great overlap the members were capable of performing both tasks. Pavers were not organised in a separate guild, but in fraternities.[44] A substantial section of the workforce must have consisted of itinerant workers, travelling around to work on building projects. In theory an artisan had to be registered as a freeman of the city. However, enforcement of this

[39] Butcher. 'Rent and the Urban Economy', 12.
[40] See: Thorold Rogers. *Six Centuries of Work and Wages*, Phelps Brown and Hopkins. *A Perspective of Wages and Prices*, Allen. 'The Great Divergence', Allen and Weisdorf. 'Was there an 'Industrious Revolution'.
[41] Samuel Cohn. 'After the Black Death: Labour Legislation and Attitudes Towards Labour in Late-Medieval Western Europe', *The Economic History Review*, 60 (2007), 461.
[42] Munro. 'Wage-Stickiness', 185–297. Allen and Weisdorf. 'Was there an 'Industrious Revolution'.
[43] J. N. Bartlett. 'The Expansion and Decline of York in the Later Middle Ages', *The Economic History Review*, 12 (1959), 33.
[44] Swanson. 'Building Craftsmen', 3-26.

bylaw varied per guild. Therefore, builders may have formed a more significant part of the professional structure of the city than indicated by the figures of around 5% shown in table 2.

Table 2: Occupational Structure of York rom Poll Tax and Franchise Sources, 1350-1509

Category	Occupations included	Occupations excluded	Poll Tax, 1381 N=2193	Freemen, 1350-1399 N=4269	Freemen, 1400-1449 N=4193	Freemen, 1450-1509 N=3532
Victuals	Hucksters, millers, grocers	Chapmen	15.8	11.3	14.2	17.4
Leather	cordwainers, sutors, etc.	cappers, glovers	15.0	13.1	11.4	10.9
Textiles	spinsters		11.6	14.0	11.8	13.2
Clothing	shepsters, cappers, glovers, pointers	mercers, drapers	8.4	11.2	8.5	10.5
Mercantile	mercers, drapers, chapmen	grocers	15.5	16.5	15.1	12.0
Metal	grinders, armourers, potters		12.8	11.3	11.4	11.2
Building	glaziers, painters, strainers	wrights, sawyers	3.6	3.8	5.0	5.4
Wood	wrights, sawyers		5.7	4.8	5.5	4.3
Transport	mariners, carters, porters, boatmen		2.6	3.3	3.6	3.5

Armaments	bowyers, stringers, fletchers	armourers	2.1	2.2	2.2	1.7
Chandlers	soapmakers		0.4	0.2	0.3	0.3
Other	barbers, clerks, doctors, gardeners	yeomen, gentlemen	6.4	8.5	11.1	9.7

Source: Peter Jeremy Piers Goldberg. *Women, Work and Life Cycle in a Medieval Economy, Women in York and Yorkshire c. 1300-1520*, Oxford, Clarendon Press, 1992, 45, 61-62.

However, during the fifteenth century the textile industry declined. With the decline of the trade by the Hanseatic League in northern Europe, and the rise of England's cloth trade with France, and Iberia York lost its geographic advantage. London, Bristol, and Exeter became the new centres for textile production. Some production of cloth in the regions surrounding York remained, but the merchants there started trading directly with London, instead of going through York merchants. The decline of the merchant class can be observed in table 2. An economic recession in York followed the decline of the cloth industry, and population numbers declined.[45] This makes an investigation into relative wage developments in the north all the more interesting, especially as based on the real wage literature one would expect fifteenth century cities to have been prosperous.

Population

The population decline in York during the late fifteenth century is described by Bartlett. Based on the Poll Tax - paid by all lay persons over the age of fourteen, except the very poor – he estimated that there were approximately 11.000 people living in York in 1377. He suggested this number may have risen to 12.000 inhabitants in the early fifteenth century. However, population numbers dwindled, and based on the returns of the Chantry Commissioners, Bartlett extrapolated that there were only about 8.000 inhabitants in York in 1548, a decline of approximately 33% in one and a half century.[46] A conclusion that was supported by Galley's assessment, based on parish registers, of c 8.500 inhabitants in 1561.[47] Dobson and Goldberg have opposed these conclusions. Dobson pointed out several problems with the Freemen's Register, which made it unsuitable to use as a guide to

[45] Goldberg. *Women, Work and Life Cycle,*71-80.
[46] Bartlett. 'The Expansion and Decline of York', 33.
[47] Chris Galley. 'A Model of Early Modern Urban Demography', *Economic History Review,* 48, no. 3 (1995) 448-469.

population development according to him. Not all inhabitants became freemen, and the ratio of freemen versus non-freemen in the city's population may have varied over time, as personal circumstances and occupation were crucial in the decision to become a free citizen. Furthermore, the city's government likely discriminated against certain occupations, such as weavers. In this work Dobson even opposed his later analysis of widespread urban decline in England by pointing out that the persons entering into the franchise showed great willingness to pay to become free at a time when depopulation was bemoaned. Between 1482 and 1487 the admissions to the franchise were divided into three categories of freemen. Those who had joined the franchise (1) by birth, (2) by apprenticeship and (3) by paying admission. It turned out a little over 65% of the 493 new freemen had been willing to pay to become citizens.[48] Goldberg estimated that the population of York was around 12.000-13.000 in 1377. He also based his estimate on the Poll Tax, but came out 9.1-18.2% higher than Bartlett. He argued against an estimate as low as 8.000 inhabitants in the mid sixteenth century, claiming this was based on 'too slender statistical evidence and an over-simplistic correlation of demographic with economic trends.'[49] Sadly, he did not supply an alternative estimate. However, when we examine the available data a relatively large decline in population seems probable. The admissions to the city franchise in the seven decades after 1451 is 35% lower than the admissions before that time, as shown in Graph 1. This correlates nicely with the 33% decline in population estimated by Bartlett based on the returns of the Chantry Commissioners. Dyer showed that York had 7.248 taxpayers for the Poll tax of 1377, which made York the second largest city after London. However, there were only 871 in the subsidy of 1524-1524. This is not as remarkable as it seems, as the subsidy of 1524/1525 was assessed on taxable wealth, and not on age as the Poll Tax of 1377. According to Dyer, York was under-assessed, but to understand the extent to which York was under-assessed a comparison with some of the other large cities must be made.[50] Fourteen cities were selected for comparison. These are the largest cities for which trustworthy data was available from both the Poll Tax and the Subsidy. Not all cities maintained the same standards in recording households, so some variation is to be expected. However, table 3 shows remarkable similarity, all cities apart from Exeters are rather close to an average of 75%, when Exeter is excluded. York shows the largest drop between 1377 and 1524/1525, but as the other evidence indicates a strong population decline in York, this was to be expected. If the corroborating evidence from three sources is acknowledged instead of refuted, the 33-35% decline in population shown by Bartlett and Galley should be accepted.

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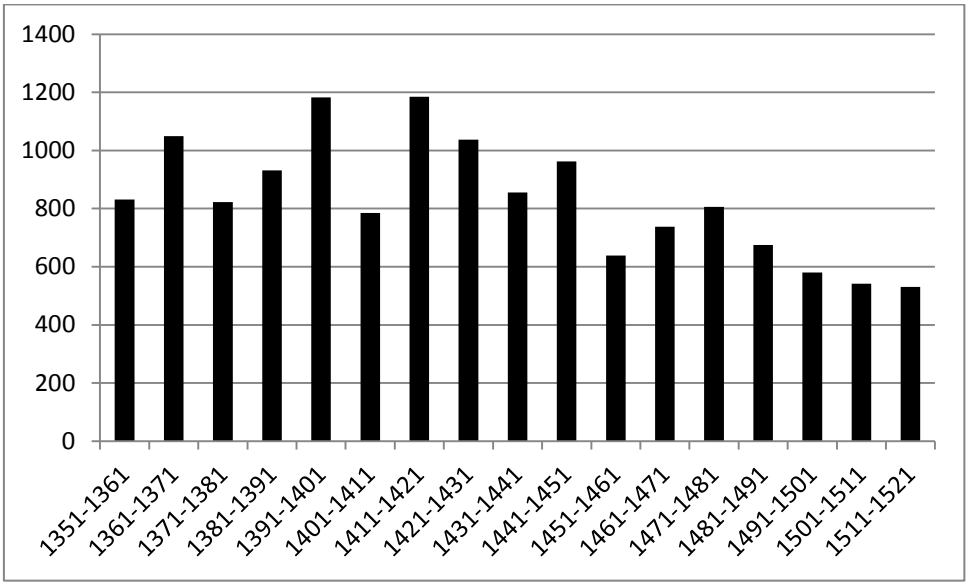
[48] R. B. Dobson 'Admissions to the Freedom of the City of York in the Later Middle Ages', *The Economic History Review*, 26, no. 1 (1973), 14-19.

[49] Goldberg. *Women, Work and Life Cycle,* 78.

[50] Source: Alan Dyer. 'Ranking Lists of English Medieval Towns', in: D. M. Palliser (ed.), *The Cambridge Urban History of Britain, I, 600-1540.* Cambridge, Cambridge University Press, 2000, 758, 761.

Graph 1: Number of Admissions to the City Franchise per Decade, 1351-1521



Source: J. N. Bartlett. 'The Expansion and Decline of York in the Later Middle Ages', *The Economic History Review*, 12 (1959) 22.

Table 3: Percentage Difference in Taxable Population between the 1377 Poll Tax and the 1524/1525 Subsidy

City	Taxable population 1377	Taxable population 1524/1525	Percentage difference 1377-1524/1525
York	7,248	871	- 88%
Bristol	6,345	1,166	- 82%
Norwich	3,952	1,423	- 64%
Lincoln	3,569	626	- 84%
Salisbury	3,373	885	- 74%
Colchester	2,951	701	- 76%
Canterbury	2,574	784	- 70%
Winchester	2,500	596	- 76%
Exeter	1,666	1,050	- 37%
Lincoln	3,569	626	- 82%
Hereford	1,903	611	- 62%
Cambridge	1,902	550	- 71%
Shrewsbury	1,932	550	- 72%
Oxford	2,357	542	- 78%

Hull	1,557	338	- 78%

Source: Alan Dyer. 'Ranking Lists of English Medieval Towns', in: D. M. Palliser (ed.), *The Cambridge Urban History of Britain, I, 600-1540.* Cambridge, Cambridge University Press, 2000) 758, 761.

Data

The York Bridgemasters' Accounts are the basis for the data on wages and rent prices. The accounts contain 786 individual references to wages paid to building workers, and 5878 individual references to rents in the fifteenth century. Bridges were very important for trade during the Middle Ages. They were commonly maintained with money given in testamentary provisions. This was apparently sufficient for small towns. However, large cities, such as London and York, needed a more constant and larger influx of revenue to preserve the bridges. In these cities additional funds were gathered alongside testamentary provisions, by a corporate investment into real estate.[51] In York four bridge masters – two for the Foss Bridge and two for the Ouse Bridge – were appointed every year to collect rents from the estates, and to give orders for the maintenance of the properties. The expenses made, and the revenue received every year, were written down in the Foss and Ouse Bridgemasters' Accounts. Seventeen rolls have survived from the Foss Bridgemasters' Accounts, dating between 1406 and 1488, and twenty-seven rolls from 1400 to 1499 remain from the Ouse Bridgemasters' Accounts. Part of the Foss Bridge Estate has been included in the roll of the Ouse Bridge Estate 1446/1447. There is no indication of this account having been erroneously sown into the Ouse Bridge Rolls, by a break in the parchment, or a change in handwriting.[52] Stell has suggested that the Ouse Bridge may have needed additional revenue for maintenance in that year, and that part of the proceeds from the Foss Bridge Estate were temporarily transferred to the Ouse Bridge Estate.[53] The date of the account appears to be correct for the Foss Bridge Estate as there is a 69% overlap with inhabitants from 1445, and only a 28% overlap with occupants from 1451, Moreover, several tenants, for instance John Cotom, had not yet moved in in 1444.[54] There is no equal time distribution of the rolls that survive, leaving some gaps - the largest of which falls between 1408 and 1424 - and most of the rolls that were handed down are concentrated around the year 1450.[55] Not all rolls have survived in the original form: some pages have been too obscured to read, others torn, and some records are incomplete. Deficiencies in source material like these are common in the study of the

[51] Christian D. Liddy. 'Book Review', *Economic History Review,* 57, no. 4 (2004) 773.

[52] I would like to thank Joy Cann, archivist at the York archives, for her help in investigating this surprising difference in the construction of the accounts.

[53] P. M. Stell. *York Bridgemasters' Accounts,* York, York Archological Trust, 2003, 43.

[54] Stell. *York Bridgemasters' Accounts,* 55-62, 217-218.

[55] Stell. *York Bridgemasters' Accounts*.

Middle Ages. Luckily, these shortcomings are not too problematic as the economy and population development seem to have been reasonably stable during the first decades of the fifteenth century, and decline set in around 1450, a period for which we do have ample source material.

The price history that will be discussed below is based on several sources, the first is unpublished data gathered by Lord Beveridge from various sources of price development in Durham. I received this data from Jan Luiten van Zanden, who copied these files at the LSE.[56] Furthermore, these price series will be augmented by data gathered by Allen and Clark.[57] In an ideal situation food prices for York would be employed, but these are not available and it does not fit within the scope of this research to gather this data. In order to avoid using unrepresentative data, the prices from Durham will be compared to prices from probate inventories from the York Diocese. A probate inventory was sometimes drawn up after the death of a person who was reasonably well off. A team of four assessors, in general a few colleagues of the departed, and presumably a clerk, evaluated the price of the deceased's belongings. On some occasions a specialist was called in, but as the assessors were involved in the same occupation as the deceased, they would have generally known the value of most items. The inventory was usually set up over time, and during this period the property of the departed was sold. Spaces were left empty in the inventory when a buyer was still to be found for certain articles, presumably with the intention to fill them in when the goods had been sold. Apart from the value of all articles, a list of debts owed to and by the departed, and a list of expenses made at the funeral would be entered into the probate inventories.[58] Some references to prices for food, fuel, and livestock are made in these probate inventories, and they should shed some light on the similarities and differences of prices in Durham and York.

In chapter one price histories are compared, the viability of probate inventories as a source for price history, and the regional variation of prices are discussed, Consumer Price Indices excluding rent are constructed, and the number of working days required per year to sustain a family is computed. In the second chapter rent data from the York Bridgemasters' Accounts is analysed, and the influence of rent on wages is discussed. In chapter three the relative wages for women in fifteenth century York, and the contribution of women to the household economy are discussed.

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[56] Beveridge, William Henry. *Prices Durham from Beveridge Files LSE* (no. C8), Jan Luiten van Zanden. 'The Malthusian Intermezzo, Women's Wages and Human Capital Formation between the Late Middle Ages and the Demographic Transition of the 19th Century', *CGEH Working Paper Series, Working Paper no. 14* (August 2011) 5.

[57] Robert C. Allen. *Consumer Price Indices, Nominal / Real Wages and Welfare Ratios of Building Craftsmen and Labourers, 1260-1913, Prices and Wages in London & Southern England, 1259-1914,* (accessed 02-01-2012) www.nuff.ox.ac.uk/users/allen/studer/london.xls, Gregory Clark. *English Prices and Wages, 1209-1914,* (accessed 12-01-2012) http://gpih.ucdavis.edu/files/England_1209-1914_(Clark).xls.

[58] Philip M. Stell. *Probate Inventories of the York Diocese, 1350-1500,* York, York Archaeological Trust, 2006, 487-489.

Chapter 1: The Value of Labour

Wages rose both absolute and relative after the population decline caused by the Great Famine and Black Death in the fourteenth century, in spite of the restrictions placed on wage increase by the Ordinance and Statute of Labourers from 1349 and 1351 respectively. These ordinances attempted to return wage levels to the pre-Black Death level, and the wages paid in effect since 1360 were not legally acknowledged until 1495.[59] The construction workers in York, both artisans and labourers, benefited from this rise in wages. As discussed in the introduction, building workers may not have been a representative social group. However, as data for wages from other occupations is not available, reliance on builders' wages is not optional. More heed will be paid to this issue in chapter two.

Nominal wages

Wages rose steeply after the Black Death in the mid fourteenth century, from 3d to 5d for artisans and from 1 1/2d or 2d to 3d for labourers. The decline in population after the Black Death had led to labour shortage, and nominal wages were driven up. In the early fifteenth century daily wages increased even further in the south of England. Artisans' daily earnings rose from 5d to 6d between 1400 and 1412, while labourer's wages rose from 3d to 4d.[60] The fifteenth century York Bridgemasters' Accounts contain 785 quotes of wages paid per day to artisans and labourers for a total of 4707 days. There are numerous other references. However, these are unusable as no indication was given whether the wages were for one or more days, or just for the completion of the task. This problem is especially common for quotes for unschooled labourers hired to carry building materials. In York artisans' and labourers' wages had already risen to 6d and 4d respectively before 1400, as is shown by the Bridgemasters' Accounts.[61] This indicates that labour scarcity affected the north of England sooner than the south.

The nominal wage rate was determined by skill. Artisans in York earned 50% more than unskilled labourers throughout the fifteenth century. However, the importance of schooling had declined in comparison to the preceding century. Before 1350 artisans earned 50-100% higher wages

[59] Swanson. 'Building Craftsmen', 26.
[60] Phelps Brown and Hopkins. *A Perspective of Wages and Prices,* 11.
[61] Stell. *York Bridgemasters' Accounts*, 127.

than labourers, and between 1360 and 1400 they earned 66.7% more.[62] Labour scarcity decreased the skill premium for building workers after the Black Death, as described by Van Zanden. He argues that a low skill premium is a sign of fairly substantial investment in human capital, and relatively well-organized labour and capital markets, which promotes long term economic growth.[63]

The daily wages recorded in the Bridgemasters' Accounts support this pattern, 89% of the quotes correspond very neatly to the general wage level. The quotes that vary from this pattern stem almost certainly from mistakes in notation, computation, or mistakes in transcription caused by damage to the account. For instance, it is implausible that a carpenter was paid 18d for one day of labour in 1406. It is more likely that he worked for three days, or that the bridge masters had hired three carpenters for one day. Mistakes in computation commonly occurred when a greater number of days were worked, and when half days were worked. The references do not specify beyond half days, so it is possible that 'mistakes' were caused by a lack of precision, for instance when a quarter or three quarter days were worked. On seven occasions a daily wage of 10d was specified for an artisan, but this likely included the wage of his servant. The artisans involved generally worked with a servant, and no mention is made of the servant in these instances.[64] Mistakes were especially bad in the 1457 Ouse Bridge Accounts. In twenty-seven of the 121 daily wages recorded that year, the amount that was said to have been paid per day does not match the total sum of wages. This leads to results of, for instance, a wage total constituting 7.3d per day being paid to a servant, while he is said to have received 4d per day. When excluding these problematic quotes, 253 references for unschooled labour remain. From these remaining quotes, 16 references pertain to wages paid to daubers, 50 to labourers, and 187 to servants – probably well trained apprentices and journeymen. A further 447 quotes remain for schooled artisans, 189 for wages paid to carpenters, 7 for pavers, 220 for plasterers/tilers, 2 for plumbers, and 29 for artisans for which the occupation is unknown.[65]

During winter when days were shorter, and there was not enough daylight to work full days, a lower wage of 3d for labourers and 5d for craftsmen was paid.[66] So, artisans earned 17% less, and labourers 25% less in winter. Winter wages account for 11.7% and 11.8% of the wages recorded in the Bridgemasters' Accounts for artisans and labourers respectively. According to Thorold Rogers, winter wages were only paid during two months (16.6%) per year in the fifteenth century.[67] Therefore, it appears building workers in York worked fewer days in winter than in summer. To

[62] Phelps Brown and Hopkins. *A Perspective of Wages and Prices*, 11.
[63] Jan Luiten van Zanden. 'The Skill Premium and the "Great Divergence"', *European Review of Economic History*, 13, no.1 (2009) 121-153.
[64] Stell. *York Bridgemasters' Accounts,* 59, 163, 483.
[65] Stell. *York Bridgemasters' Accounts.*
[66] Swanson. 'Building Craftsmen', 18.
[67] Thorold Rogers. *Six Centuries of Work and Wages,*326.

account for the loss of income during winter an average wage of 3.88d per day for labourers and 5.88d per day for artisans is used in the relative wage calculations below.

Cheaper down south?

The price of consumption goods is determined by supply and demand. However the availability of certain foodstuffs varies per season and per location. In the late Middle Ages the price of grain, for instance, was 20% higher in the months preceding the harvest, than in the months after the harvest.[68] Wheat required good soil and a long season, limiting the possibilities for it to be cultivated in the north and west of England. Rye was capable of growing in comparatively more adverse weather conditions.[69] To calculate relative wages as close as possible to actual relative wages in fifteenth century York, it would be best to only use prices paid at the market in York. However, these figures do not exist anymore, nor are there any substantial price series from institutions in York available, and it does not fit within the scope of this research to construct these series. Consequently, to approximate prices paid in York, the price histories used by Allen for London and Southern England, unpublished price data from Beveridge for Durham, and prices from probate inventories from the York Diocese will be compared for the fifteenth century. The prices supplied by Beveridge and Allen stem from large institutions. These institutions bought most of their stock in bulk, and it is probable that a discounted price was paid. Allen suggested that probate inventories could be studied to gather prices that were representative of general market prices.[70] To my knowledge this research has not yet been executed.

Roughly one hundred probate inventories from the York Diocese from the fifteenth century have survived. These were written in a mixture of Middle English, Norman French, Medieval Latin, and in some rare occasions even in Dutch.[71] The probate inventories display a wealth of information on the type and value of articles in a household from decoration, to clothing, to kitchen appliances. However, there is no abundance of records for food, fuel, and livestock prices to compare to price histories from institutions. Often the quantity of food items is not recorded. Circa 230 usable quotes for the fifteenth century have been documented in the probate inventories from the York Diocese. Very few quotes appear to have been incorrect, stemming from mistakes in notation. It is for

[68] C. C. Dyer. 'Seasonal Patterns in Food Consumption in the Later Middle Ages', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 213.

[69] C. M. Woolgar, D. Serjeantson and T. Waldron. 'Conclusion', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 274, Stone. 'The Consumption of Field Crops', 12.

[70] Allen. 'The Great Divergence', 418.

[71] Stell. *Probate Inventories,* 487-490.

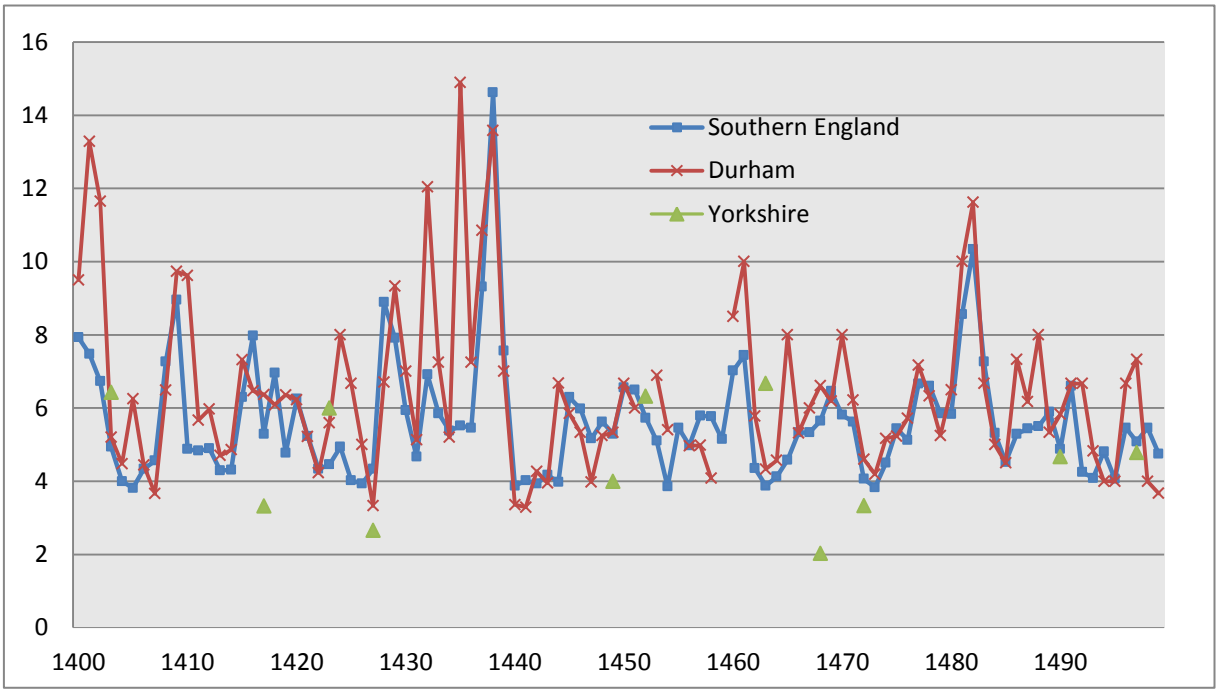
instance highly unlikely that over 30 shillings were paid for a quarter of oats in 1423, over 18 times higher than prices paid in Durham in the same year. References that are clearly erroneous have been eliminated from the following comparisons.[72] Furthermore, the prices recorded in the probate inventories are not representative of the general population. Most of the inventories pertain to high ranking and wealthy clergy and more affluent lay persons. It is likely that they consumed food of a higher quality, which was more expensive, than food consumed by building artisans and labourers. Moreover, valuing foodstuffs was not common in large and wealthy households. Remaining foodstuffs were simply consumed by the remainder of the household. Grains often don't appear in the probate inventories. In some cases provisions were even made in the probate inventory for feeding the household, and paying the staff, for a certain period after the death of the head of the household. For instance, in 1423, after the death of Henry Bowet, archbishop of York, his household consumed 18 quarters of wheat, 32 quarters of malt, and two pipes of red wine, for a total of £19 5s 4d in the month after his death.[73]

Graphs 2-5 show the development of grain prices in Southern England - taken from Allen – Durham - taken from Beveridge - and Yorkshire, including York – taken from the probate inventories. These graphs demonstrate that grain prices in Durham developed in a roughly similar fashion to grain prices in southern England. However, prices in Durham were generally higher than in the south. This was to be expected for wheat, as it was less suitable for production in the north. However, this was also the case for rye which was more suited for the northern climate, as was discussed above. Secondly, prices were more volatile in Durham than in southern England. The harsher northern climate was less suited for growing crops, and it appears bad harvests were more common. Thirdly, the prices from the probate inventories are often significantly lower than the prices paid by institutions, even though the trend is generally similar. These three observations are supported by the price development of wax in graph 6. The development of livestock prices from Durham and Yorkshire in graphs 7-10 show again that prices in the probate inventories were consistently below market prices. There are several possible explanations for this phenomenon. Firstly, the low prices could be caused by a lack of knowledge of the value of food items, fuel, and livestock by the 'appreciatores'. This is highly unlikely as the prices from the probate inventories are consistently lower, and the appraisals were done by persons who would have been well informed about these prices. Secondly, it is possible that the quality of the items listed in the probate inventories are of an inferior quality to the items bought by institutions. This offers at least a partial explanation for extreme price differences. For instance, four horses were sold for 3d per animal in 1458, far below the average price for horses, but they were likely very old. They belonged to John Crosby from

[72] Stell. *Probate Inventories,* 542.
[73] Ibidem, 545.

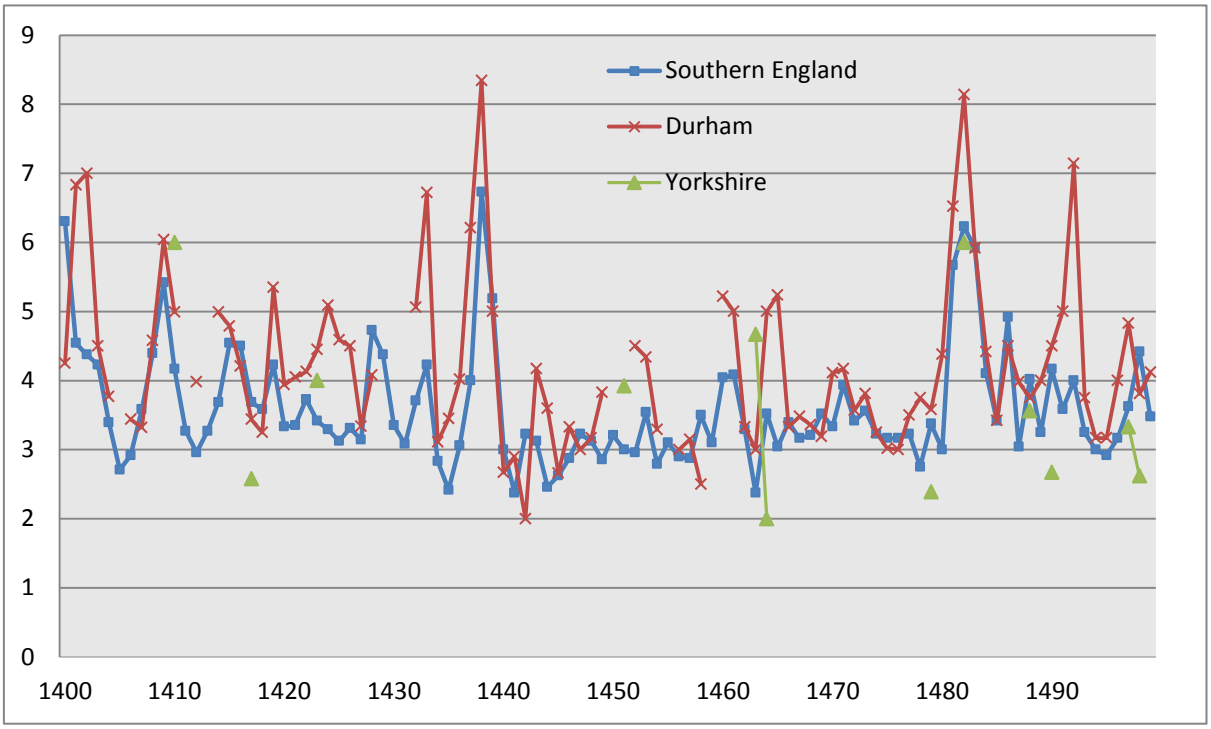
Tollerton, who was one of the few poor persons for whom a probate inventory was made. His meagre assets had a value of £2 6s 3d, and were superseded by his debts by 18s 9d. However, as most of the probate inventories pertain to wealthy households it is highly unlikely that they generally consumed foodstuff, livestock, and fuel of a lesser quality than institutions. A third explanation may be that differences were caused by seasonal price differences. This may account for some of the gaps between the average bulk prices paid by institutions, and prices from the probate inventories. However, it seems highly unlikely that almost all of the over one hundred probate inventories were made in the season during which prices were lower. Thus, the only other explanation for this price gap is that goods recorded in the probate inventories were generally sold below market prices. This was a very practical way to ensure a quick sale of the deceased's estate. Nonetheless, this means that prices for food, fuel and livestock from probate inventories are not representative of prices paid by consumers. Hence, it is not possible to approximate prices paid by small consumers more precisely by constructing price series based on probate inventories, than by relying on prices paid by institutions. Therefore, to calculate relative wages, prices from institutional sources will have to be used.

Graph 2: Wheat in Shilling per Quarter, 1400-1499



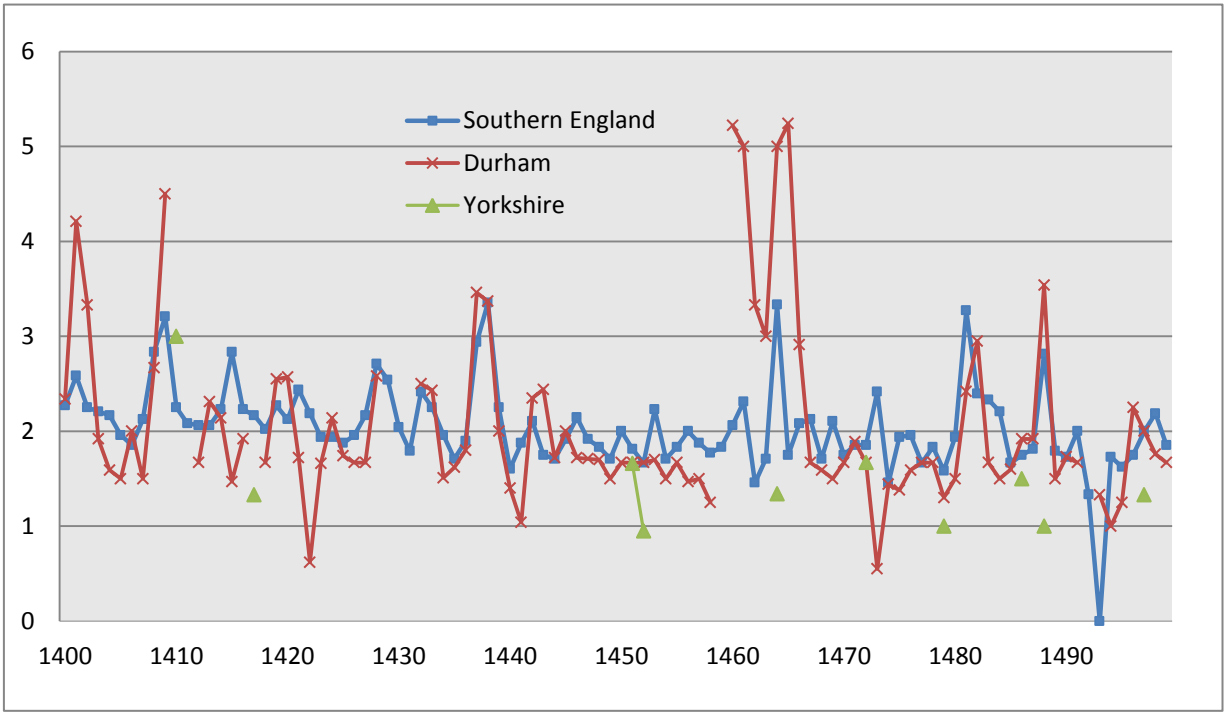
Sources: Philip M. Stell. *Probate Inventories of the York Diocese, 1350-1500,* York, York Archaeological Trust, 2006, William Henry Beveridge. *Prices Durham from Beveridge Files LSE* (no. C8), Robert C. Allen. *Consumer Price Indices, Nominal / Real Wages and Welfare Ratios of Building Craftsmen and Labourers, 1260-1913, Prices and Wages in London & Southern England, 1259-1914,* (accessed 02-01-2012) www.nuff.ox.ac.uk/users/allen/studer/london.xls.

Graph 3: Barley in Shilling per Quarter, 1400-1499



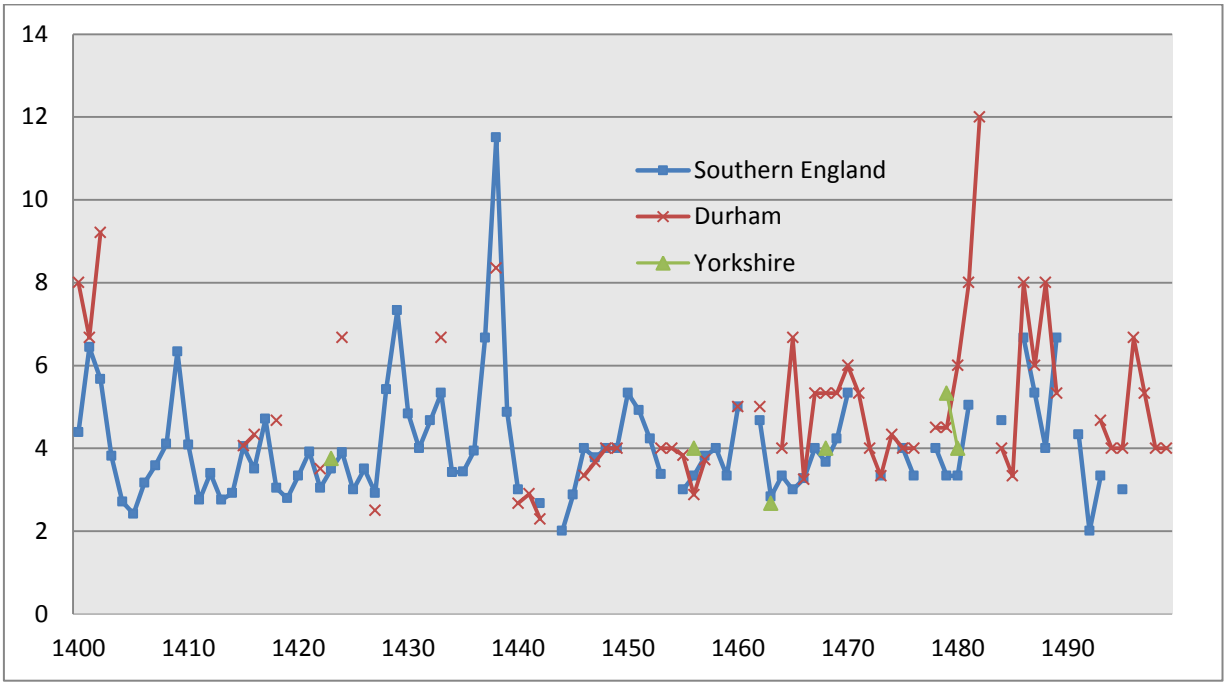
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices.*

Graph 4: Oats in Shilling per Quarter, 1400-1499



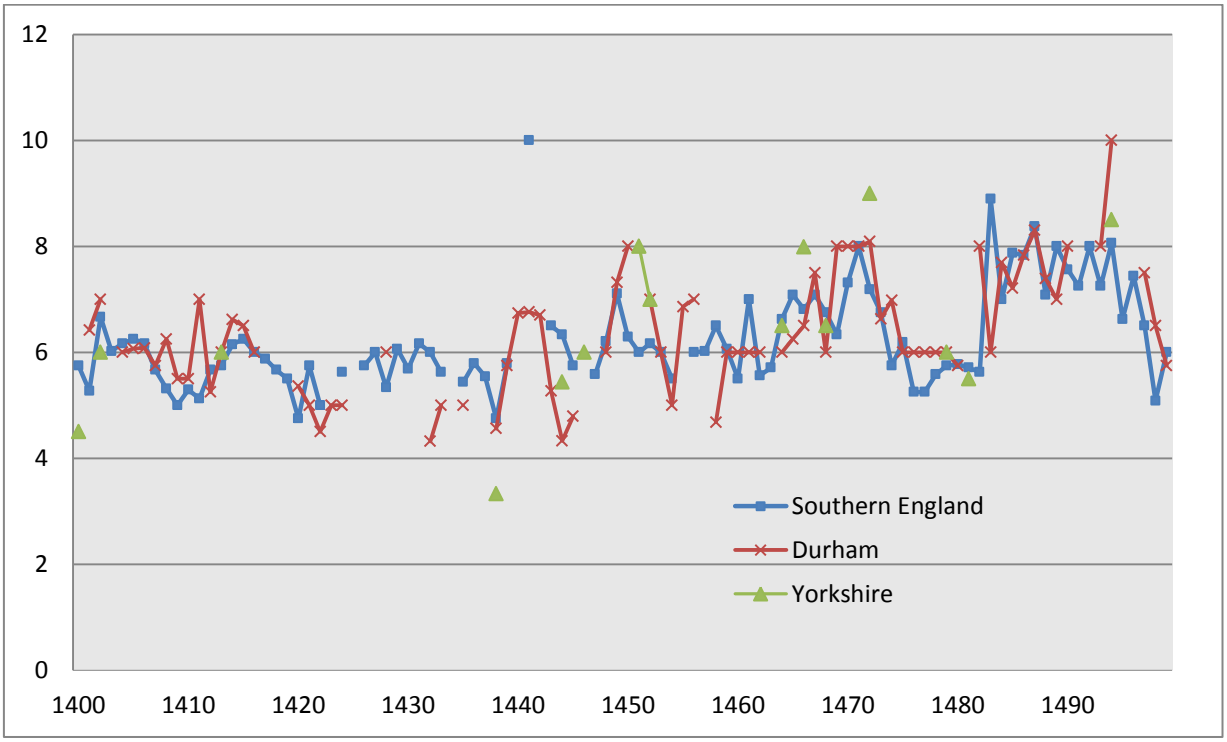
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices.*

Graph 5: Rye in Shilling per Quarter, 1400-1499



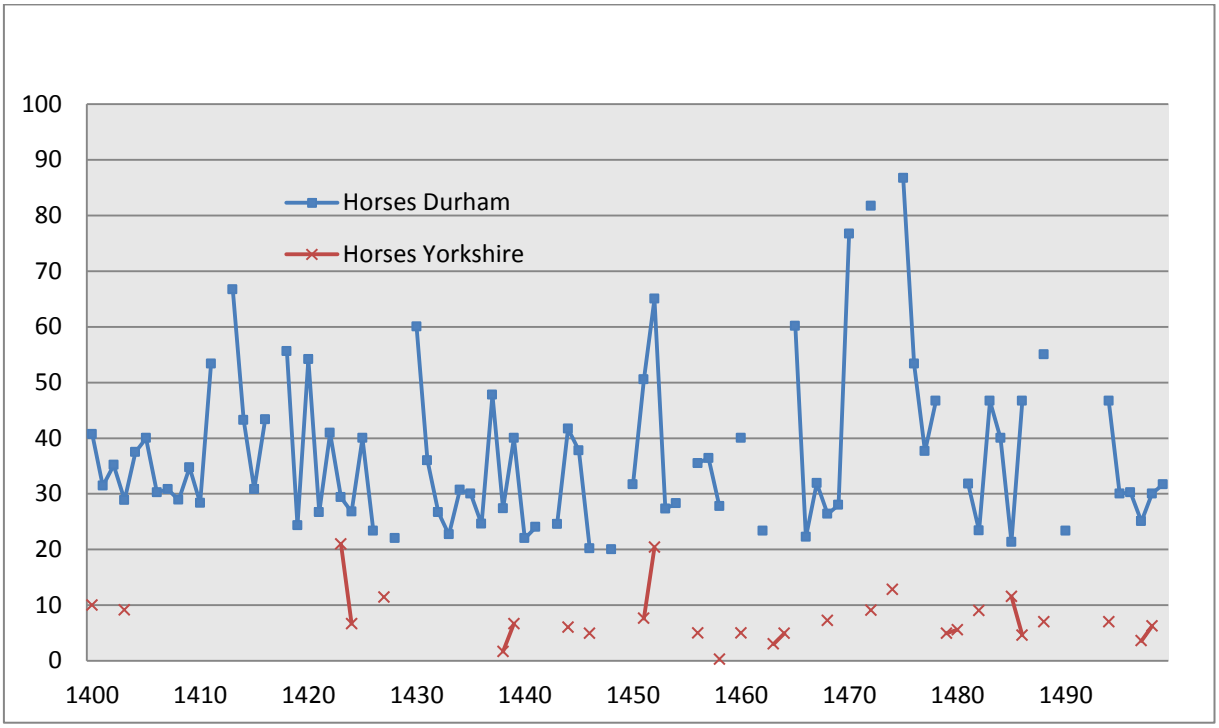
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices.*

Graph 6: Wax in Pence per Pound, 1400-1499



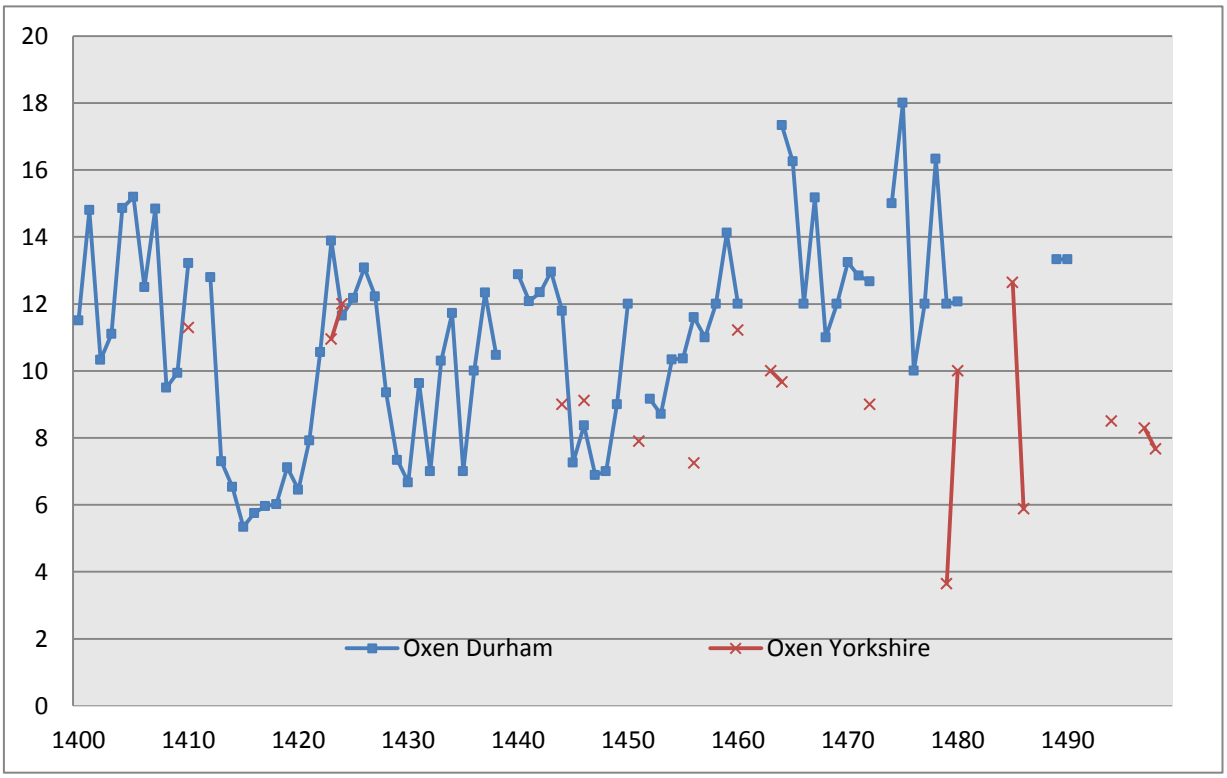
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices.*

Graph 7: Prices for Horses in Yorkshire and Durham in Shilling, 1400-1499



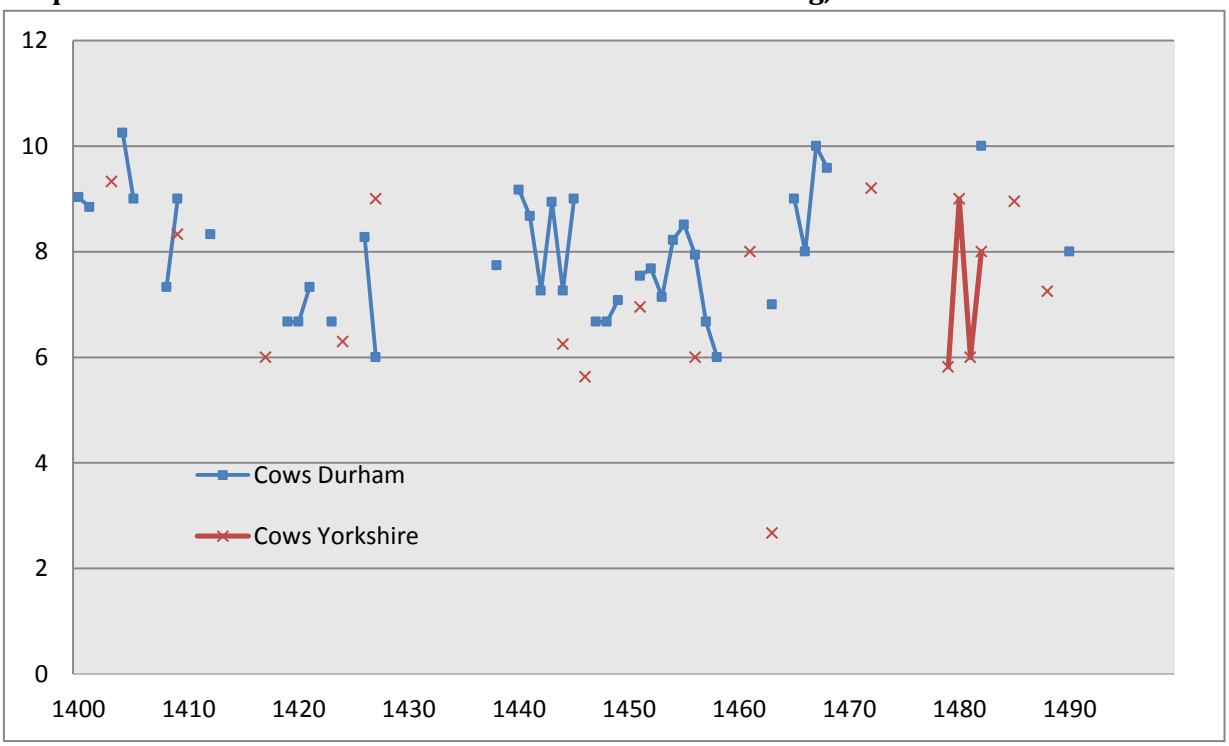
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham.*

Graph 8: Prices for Oxen in Yorkshire and Durham in Shilling, 1400-1499



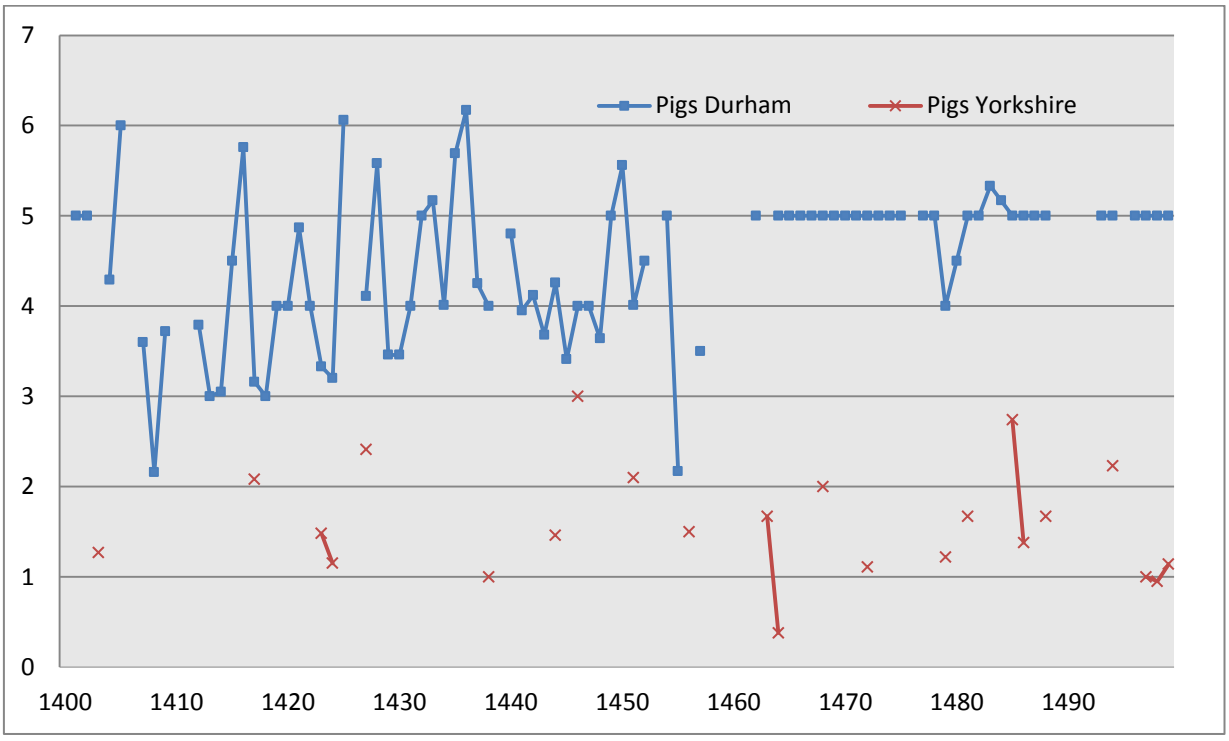
Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham.*

Graph 9: Prices for Cows in Yorkshire and Durham in Shilling, 1400-1499



Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham.*

Graph 10: Prices for Pigs in Yorkshire and Durham in Shilling, 1400-1499



Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham.*

Diet

Income influences the composition of diet. It is not easy to access the fifteenth century diet. The publication of a series of papers on the subject published in 'Food in Medieval England' enlightens much of the subject, although the authors have been very careful, and have rarely indicated the level of consumption of specific food items.[74] Fifteenth century diet was different than early fourteenth century diet. Pressure on resources was relieved as the Great Famine and Black Death decimated the population. As population numbers were high in the early fourteenth century, grains in the form of bread and ale provided the bulk of calories for all people, ranging between 65% and 80% of caloric intake for lay nobility and harvest workers respectively. Lesser grains were used to make bread, and grains were cooked into pottage, a thick soup with vegetables. Pottage was a cheaper and less tasty alternative to bread with a higher caloric value per kg of grain, as no calories were lost in milling.[75] In 1356 harvest workers in Sedgeford received 2.8 pints of ale per person per day and bread made almost entirely out of barley. In the fifteenth century their situation was remarkably better. In 1424 they received 6.4 pints per person per day and wheaten bread was served.[76]

Bread was the foremost source for calories in the fifteenth century. Stone has shown that in the large household of Alice de Bryene in Acton Suffolk an average of 17.76 lb of bread was consumed per member of the household, which would amount to an average of c2,500 kcal per day.[77] Though, the importance of bread dwindled after the Black Death, and it was replaced by other consumable goods.

One gallon of ale per day appears to have been an average daily consumption for moderately wealthy persons.[78] Ale was not an efficient source for calories as 70% of calories were lost during brewing. As grain prices became relatively cheaper in the fifteenth century, ale became stronger. From a quarter of malt barley 53-56 gallons of ale was produced in the 1380s, but only 45-50 gallons in 1500. So, a quarter of malt barley could be brewed into forty-seven gallons of ale, with a caloric value of 3,410.65.[79] This would have been very strong ale, quite comparable to present day barley wine (Strong Ale) from Sierra Nevada which has a caloric value of 3,147 kcal per gallon, and an alcohol percentage of 9.6. However, it does not seem likely that ale with such a high alcohol percentage was commonly consumed. This strong ale was probably reserved for special occasions. It

[74] C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006.
[75] Bruce M. S. Campbell. *English Seigniorial Agriculture, 1250-1450,* Cambridge, Cambridge University Press, 2000, 222.
[76] Stone. 'The Consumption of Field Crops', 11, 23.
[77] Stone. 'The Consumption of Field Crops', 15-16, 20-21. Campbell. *English Seigniorial Agriculture*, 213.
[78] Stone. 'The Consumption of Field Crops', 11.
[79] Campbell. *English Seigniorial Agriculture*, 215, 222.

was common to brew various strengths of ale. For instance, in the early fourteenth century 100 gallons of ale per quarter of malt barley was produced.[80] This had a caloric value of 1,603 kcal per gallon, quite comparable to modern day ale such as John Smith's Bitter which has a caloric value of 1,360 per gallon, with an alcohol percentage of 4.0.

Meat, fish and dairy products partially replaced cereals after the Black Death. In urban areas mainly beef and mutton was consumed in approximately equal parts.[81] Meat consumption increased for almost the entire population after the fifteenth century. Meat supplied only 1,9% of the daily calories for harvest workers at Sedgeford before the Black Death, but in 1424 they received 23.5% of their daily calories in meat products.[82] Pig rearing declined after the eleventh and twelfth century and eating pork had become unfashionable in the fifteenth century. Preserved pork products such as ham and bacon had been a main source of protein for poor urban people until that time.[83] In York, however, pork was more commonly consumed than elsewhere. There main meat product was beef, followed by pork, and mutton came in third place.[84] Fowl was eaten more commonly after the Black Death, and about 60% of all fowl consumed were chickens. However, chickens were mainly kept for their eggs.[85] Fish became a regular component of late medieval diet, due to religious restrictions placed on the consumption of meat on fast days and during Lent. Aristocrats generally consumed fish on as many days as they consumed meat. The military was less strict, and meat was replaced by fish for only one third of the year. In York most of the fish consumed was marine fish. Wild fowl and game were not commonly consumed outside the aristocracy.[86] Dairy does not appear to have been a major component of the late medieval diet.[87]

Fruit and vegetables formed an important nutritional addition to medieval diet. It supplied the necessary vitamins and minerals to prevent scurvy, and to increase resilience against infections. It appears artisans, labourers, and peasants consumed enough fruit and vegetables, as they did not

[80] Stone. 'The Consumption of Field Crops', 11.
[81] N. J. Sykes. 'From *Cu* and *Sceap* to *Beffe* and *Motton*', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 62.
[82] Woolgar. 'Meat and Dairy Products', 91.
[83] Albarella. 'Pig Husbandry and Pork Consumption', 73-74, 80.
[84] Gundula Müldner and Michael P. Richards. 'Stable Isotope Evidence for 1500 years of Human Diet at the City of York, UK', *American Journal of Physical Anthropology*, 133 (2006) 683.
[85] D. J. Stone. 'The Consumption and Supply of Birds in Late Medieval England', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 155-159, D. Serjeantson. 'Birds, Food and a Mark of Status', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 134.
[86] N. J. Sykes. 'The Impact of the Normans on Hunting Practices in England', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 174.
[87] Woolgar. 'Meat and Dairy Products', 97-99.

suffer from scorbutic symptoms.[88] Gardens were common throughout England. Some large gardens produced for the market, but most gardens were small, often less than a quarter acre. Almost all residences in the country had a garden, and many dwellings in urban areas had gardens too. The terms cottage and messuage indicate that the dwelling included land on which gardens could be maintained. Persons without a garden could sometimes rent one separately, although rent prices for land were not cheap as will be discussed in the next chapter. Consumption of vegetables and fruit was commonplace, but inexpensive. Little money was to be made in the trade of vegetables, but it was profitable enough for specialist sellers (huxters). Gardening declined after the Black Death, and land was more often used for grazing. This indicates that meat consumption rose, and gardens were no longer imperative to help with survival in years of bad harvests. Still, enough garden produce remained to provide the population with fruit and vegetables to stay relatively healthy.[89]

According to the authors of 'Diet and Nutrition', caloric intake was much higher in the late Middle Ages than would be expected. The indications for calories derived from bread and ale above are substantial. These figures are augmented further when considering evidence on the consumption of meat presented by Woolgar. According to him an average member of the household of Earl Warwick would be served, 1.84 lb of beef and 1.28 lb of mutton per meat day, worth 2.300 kilocalories, and a gentle member would be served a total of 13.000 calories of meat per day on meat days.[90] In the military an average of 5,500 kilocalories per person was consumed per day.[91] This seems excessively high. The extremely high indications for caloric intake are likely caused by inaccuracies in source materials. It is possible that notational errors, and a lack of registration for casual labourers for households, and military personnel other than soldiers and their superiors caused these unexpectedly high numbers.

Nonetheless, assuming a relatively high caloric intake in the fifteenth century appears to be correct. Waldron's research of skeletons from St Peter's Church in Barton-upon-Humber has shown that the average height of men and women buried there varied very little between 950 and 1850. In the fifteenth century 1.71 meters was the average for men and 1.59 meters was the average for women.[92] Measurements of the maximum diameter of the femoral head indicate that the average weight was 73 kg for men, and 62 kg for women, which is below present day averages. To maintain this weight, while engaging in moderate physical activity 3,400 kcal and 2,500 kcal per day would be required by men and women respectively. Waldron indicates that his weight calculation is probably

[88] T. Waldron. 'Nutrition and the Skeleton', in: C. M. Woolgar, D. Serjeantson and T. Waldron. *Food in Medieval England, Diet and Nutrition,* Oxford, Oxford University Press, 2006, 259, Dyer. 'Gardens and Garden Produce', 38.
[89] Dyer. 'Gardens and Garden Produce', 28-29, 33, 35-39.
[90] Woolgar. 'Meat and Dairy Products', 91.
[91] Woolgar. 'Group Diets', 199.
[92] Waldron. 'Nutrition and the Skeleton', 256.

too high, as he presumes these caloric requirements were likely not met by the average person in the Middle Ages. Furthermore, these weights would supply a BMI of 25, which would indicate that all persons were rather portly, which Waldron considers to be improbable too.[93] However, it would not be implausible to assume that a higher caloric intake was common. A BMI of 25 gives no indication of the distribution of the weight in muscles and body fat. Artisans and labourers employed in construction did moderate to heavy physical activity. Therefore, their weight would likely have been made up of strong muscles and little body fat, which is not recognised by BMI. Bodybuilders are generally classified as overweight by BMI calculations, while no one would describe them as portly. Moreover, the influence of environmental factors on caloric requirements is underestimated. Most of the work of builders would have taken place outdoors, and houses were likely not as warm, and as well insulated as current day buildings. Basic metabolic rates increase in low temperatures. Hence, Waldron's estimates are probably more accurate than he accedes.

Price Data

The CPIs that are constructed below have been based on price data from Beveridge, Allen, Clark and the probate inventories from the York Diocese.[94] The price of bread is unknown throughout the fifteenth century. Traditionally this problem was solved by supplying grain prices for bread prices in real wage calculations. Allen has solved this problem regressing bread prices from grain prices, and substituting the baker's wages with mason's wages. With these computations Allen has shown that grain prices are more volatile than bread prices, as the wage of the baker compensated for some of the price variations. Allen asserts that the assize prescribed a standard amount of grain to be put into a loaf of bread to vouchsafe a stable bread size.[95] Stone, however, contradicts Allen's assumption by stating that the assize attempted to keep bread prices stable by prescribing a size per loaf of bread based on the grain prices. When grain prices were high, the loaves were smaller, and when grain prices were low, the loaves increased in size.[96] However, Allen's assumption is preferable, because using bread with a constant caloric value is more practical, as variations in the size of the loaves of bread would require constant adjustment of the weights of bread in the calculations. Allen's regression has been used to calculate a northern bread price; London wheat prices have been replaced by the Durham wheat prices from Beveridge.[97]

Allen's price data for beer has been used to represent ale prices. These prices likely referred to ale, as beer was uncommon in fifteenth century England. Allen has put the caloric value on 1,612,

[93] Waldron. 'Nutrition and the Skeleton', 259.
[94] William Henry Beveridge. *Prices Durham from Beveridge Files LSE* (no. C8), Allen. *Consumer Price Indices,* Clark. *English Prices and Wages,* Stell. *Probate Inventories.*
[95] Allen. 'The Great Divergence', 419, .
[96] Stone. 'The Consumption of Field Crops', 15.
[97] Allen. 'The Great Divergence', 418-419, Beveridge. *Prices Durham*.

which is comparable to a hundred gallons of ale brewed from one quarter of malt barley. Clark has supplied data for strong beer; again in the fifteenth century prices probably pertained to ale. Gaps in Clark's the data have been closed by a ten year moving average.[98]

Reconstructing price series for meat is difficult. Allen provided a price for beef of 0.64d. per kg from 1450 to 1541.[99] When we correlate this to the average price of cows and oxen, provided by Beveridge, it appears that circa 0.1d per kg of meat was spent on wages for the butcher, based on an average price of cows and oxen of 11s 1d between 1450 and 1499, and an average of 247.5 kg of consumable meat per animal.[100] Price series for beef, and pork have been calculated by dividing animal prices from Durham by the average kilograms of consumable meat per animal, and adding 0.1d for slaughter cost. Gaps in the data have been closed with a ten and five year moving average respectively.[101] No price data is available for fowl or sheep from Beveridge, Allen, or Clark. Therefore, the average price of fowl and sheep in the York probate inventories must be used. It has been shown above that prices from probate inventories are generally below market prices, but it is preferable to use this data over excluding fowl and mutton from the calculations. Butcher's wages were not included in the computation of fowl prices, as most people in the fifteenth century would have killed, and plucked their own birds.[102]

Neither Allen or Beveridge supplied price histories for fish, luckily Clark's provided prices for herring, salt salmon, and salt cod. Gaps in the price histories have been filled with ten, fifteen, and twenty year moving averages respectively.[103]

Reconstructing dairy prices is problematic as the data from Durham is very fragmented. Prices for butter from Beveridge and Clark only show an average price difference of 2.8% when compared per year. However, there are only 4 quotes for butter in Durham, and the differences range between -20% and 41%, while the smallest difference was 0.5%. Therefore, Clark's data will have to be used. Cheese prices were on average 4.7% cheaper in Durham when compared per year, but only 23 quotes for Durham remain, and compared per year the difference ranges between -45% and 54%. To make Clark's prices more comparable, they have been lowered by 4.7% and wherever possible, the quotes for Durham have been used. Gaps have been filled with a five year moving average. A change in cheese prices does not warrant a significant shift in relative wages. When replacing Clark's figures with the Durham price for cheese, the difference in the CPI is c. 0.1% for

[98] Allen. *Consumer Price Indices,* Clark. *English Prices and Wages.*
[99] Allen. *Consumer Price Indices.*
[100] There is no data available on the average kg of consumable meat per animal in the Middle Ages. Therefore, modern data has been used, animals were probably smaller in medieval times, but as the consumption of meat has become less frugal, this compensates in part for the larger size of animals.
[101] Beveridge. *Prices Durham.*
[102] Stell. *Probate Inventories.*
[103] Clark. *English Prices and Wages.*

1485, the year with the largest price difference. No northern prices are available for eggs, so, the egg price series has been taken from Clark, and gaps have been filled with a five year moving average.[104]

Calculating the price of fruit and vegetables in the medieval diet is challenging. Consumption has rarely been recorded, and the products were grown by the consumers themselves. As there is almost no price data for vegetables, and none for fruit, calculations will have to be based on prices for peas and beans. This is not a major problem as vegetables represent only a small part of expenditure. Price data for peas is available from Durham, gaps in the data have been filled by a ten year moving average. Allen's price data for beans is used in the calculations.[105]

Beveridge does not offer prices of other basic necessities. Therefore, Allen's price history for soap, and Clark's price data for candles, woollen cloth, linen cloth, shoes, lamp oil, and charcoal, have been used. Clark's series were more complete than the ones used by Allen. Gaps in the price histories of woollen and linen cloth, and candles have been filled with a five year moving average. Gaps in charcoal prices were closed with a ten year moving average, and gaps in the prices of shoes have been filled with a fifteen year moving average.[106]

Relative Prices

To calculate relative wages a Consumer Price Index is required. The two most common ways to calculate a CPI are the Laspeyres index, and the geometric index. In a Laspeyres index the quantity of each type of consumption goods is fixed at a certain quantity to calculate the influence of price developments over time. A geometric index uses expenditure shares as weights, and assumes a constant share of expenditure while relative prices shift. Allen has shown that there is little difference in outcomes between the Laspeyres and the geometric index, but a Laspeyres index has the advantage of keeping the caloric value of the basket of goods constant. Therefore, a Laspeyres index will be used here.

Table 4 shows the percentages of household expenditure on basic necessities according to Phelps Brown and Hopkins, Clark, and Allen. Based on these CPIs, and the data on fifteenth century diet, a comfort CPI for labourers and a comfort CPI for artisans has been constructed. Clark does not treat labourers and craftsmen separately, as he argues that the differences are too little.[107] However, as labourers presumably had a lower income, their diet was also less luxurious. Hence, the two groups will be treated independently.

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104 Beveridge. *Prices Durham,* Clark. *English Prices and Wages.*
105 Allen. *Consumer Price Indices,* Beveridge. *Prices Durham.*
106 Allen. *Consumer Price Indices,* Clark. *English Prices and Wages.*
107 Clark. 'The Condition of the Working Class in England', 1326.

Income was decisive in the composition of the diet. Therefore, it is important to approximate the fifteenth century diet for building artisans and labourers as closely as possible to construct reasonably reliable relative wage computations. Especially the consumption of cereals on the one hand, and meat and fish on the other hand appears to have shifted due to income development. Phelps Brown and Hopkins have shown that William Savernaks' account book, which recorded weekly expenditure for a small household - consisting of two priests, and one servant - 20% of total expenditure was for cereals, and 35% was for meat and fish, between 1453 and 1460.[108] As shown above, meat and fish provided harvest workers with 23,5% of their daily calories in 1424. However, during harvest time left-over stock had to be finished to make space for fresh products. It is likely that they ate better quality foods, and a higher quantity of meat and fish during harvest time than throughout the rest of the year.[109] Furthermore, artisans and labourers probably ate less fish than aristocrats and clergy, as it was rather expensive. In the military fish was consumed during one third of the year, this is assumed to be comparable to the consumption level of labourers and craftsmen. Therefore, expenditure on meat and fish has been estimated at a little below 19.5% and 22.6% of expenditure for labourers and craftsmen respectively, and at 23% and 28% of calories for labourers and artisans respectively.

To calculate relative wages, the number of working days required per year to feed a family of four, with two children under the age of six, has been calculated based on the method put forth by Allen and Weisdorf.[110] These number of working days computations do not represent the actual number of days worked by artisans and labourers in the fifteenth century, but rather show the minimum number of days a man had to work to provide the basic necessities for a family of four at different consumption levels. The advantage of this method is that in traditional real wage calculations a fixed number of working days is assumed, while it is highly probable that the number of working days shifted downwards when relative wages rose, and vice versa, to maximize leisure time. Hatcher has shown that a rise in relative wages in the late fourteenth century led to an increase in leisure time for artisans and labourers.[111] Furthermore, this method approximates the actual situation in the fifteenth century more than traditional real wage calculations, and it is easily understandable to those without a background in statistics, or economics.

To calculate the number of working days per year a full dependence on the market has to be assumed, even though this was not the case in the fifteenth century, as many people had access to gardens, and produced part of their own food. This still required a time investment, and wages for a

[108] Phelps Brown and Hopkins. *A Perspective of Wages and Prices,* 14.
[109] Woolgar et al. 'Conclusion', 272.
[110] Allen and Weisdorf. 'Was there an 'Industrious Revolution' 719.
[111] Hatcher. 'Labour, Leisure and Economic Thought'.

gardener were comparable to those of an artisan.[112] Hence, home produce is calculated as goods procured through wage labour. Hatcher has pointed out that meals were often given in addition to wages after the Black Death.[113] In the York Bridgemasters' Accounts only one reference is made to food being given to the workmen during the construction of a house on the Ouse Bridge Estate in 1459. Breakfast and dinner was provided to the builders for the sum of 4s 6d.[114] No other references are made, and the accounts are generally fairly detailed, so it appears that receiving food with wages was not the norm for the building workers employed by the York bridge masters.

Table 5 shows the weights and respective calories for the consumption goods in Allen's poverty line and the labourer and artisan comfort CPIs. Allen's basket of goods has been chosen for comparison to the CPIs based on the fifteenth century diet. Allen calculations represent the poverty line. One basket provides 1,941 kcal per year. Allen's assumed that an average family consisted of a man and wife with two children, aged between one and three years old, and four and six years old. To satisfy their basic caloric requirements they would require three baskets of goods per year to stay above the poverty line.[115] This puts the man's caloric intake per day at 1,890 kcal, based on the assumption that food deprivation causes minimal caloric intake to drop by 30%.[116] Some of Allen's estimates for caloric value of certain food items is rather high, most notably for eggs and beef, but to keep the baskets comparable, his caloric values have been maintained as much as possible. Postulating a family of four is rather arbitrary. In their 2011 article Allen and Weisdorf assumed a notational family of two adults and two and a half child. As the data they used from Wrigley et al. are not available before 1541, this assumption, nor Allen's assumption from 2001 can be verified for the fifteenth century. However, as discussed above, women's average age at first marriage was high in the fifteenth century. Therefore, smaller families are to be expected. Moreover, children over the age of six were likely capable of contributing to the household economy, thereby (partially) providing the higher income required for their increase in caloric requirement with age. Hence, assuming a notational family of four is not overly problematic.

Allen has constructed two other CPIs too. In his 2009 book he constructed 'subsistence', and 'respectable' CPIs, with a respective caloric value of 1,938 kcal and 2,500 kcal. The subsistence CPI resembles the poverty line CPI in terms of caloric intake. However, the subsistence CPI is cheaper as bread is replaced by oats for oatmeal, and in comparison to the 'poverty line' CPI, Allen reduced the

[112] Dyer. 'Gardens and Garden Produce', 28.
[113] Hatcher. 'England in the Aftermath of the Black Death' 21.
[114] Stell. *York Bridgemasters' Accounts,* 353.
[115] Allen. 'The Great Divergence', 426.
[116] Ibidem.

consumption of cloth by 40%, candles, lamp oil and soap by 50% and fuel by 60%.[117] It is preferred to use the poverty line CPI for comparison. Stone has shown that the consumption of bread was only abandoned when absolutely necessary in the late Middle Ages. It was more common to switch to lesser grains to produce bread, rather than switching to different forms of cereal consumption, as this was considered to be a sign of poverty.[118] Moreover, Allen's estimate for the caloric value of oats is rather high at 3,902 kcal per kilo, when compared to the 3,695 kcal per kilo estimated by Campbell. Furthermore, he does not take into account the low extraction rate of only 56% for oats when they are milled.[119] This would present problems in chapter three where a destitution CPI for women is constructed in which oats boiled into pottage are the main source for calories.

Allen's respectability basket supplies a higher caloric value of 2,500 kcal per day. This is closer to the higher quantity and quality of consumption goods that was common in the fifteenth century. However, his estimate for caloric intake per day is still rather low, and substantially lower in terms of meat and fish consumption that should be expected for the fifteenth century. Therefore, two CPIs are constructed representing relative comfort for labourers and artisans. The income levels for labourers and craftsmen were different; therefore, their consumption patterns would have been different. It is assumed that labourers and their family ate more bread and vegetables, and consumed less ale, meat, candles, lamp oil, soap, cloth, shoes and fuel. Both CPIs represent a reasonable level of comfort, as the perception of comfort is influenced by a person's surroundings, assuming reasonable comfort for two different consumption patterns should not be challenging.

Table 4: Percentage of Expenditure for Basic Necessities, Excluding Rent, per Category for Building Workers

Category	Phelps Brown & Hopkins (1453-1460)	Allen (Poverty Line CPI) (1209-1914)	Clark (1734-1854)	Comfort Artisans (1400)	Comfort Labourers (1400)
Farinaceous	20	30.4	26	22.4	29.4
Meat/fish	35	13.9	12	22.6	19.5
Dairy	2	9.2	11.5	3.4	4
Sugars	-	-	4.5	-	-
Drink	23	20.6	10	22.4	20.1

[117] Robert C. Allen. *The British Industrial Revolution in Global Perspective,* (Cambridge, Cambridge University Press, 2009) 37.
[118] Stone. 'The Consumption of Field Crops', 23.
[119] Campbell. *English Seigniorial Agriculture,* 224.

Vegetables/Legumes	-	6	1	0.8	0.8
Fuel/Light	7.5	12.8	9	10.3	10.8
Soap	-	1.8	0.5	3.3	2.9
Services	-	-	2.5	-	-
Tobacco	-	-	1	-	-
Clothing	12.5	5.3	12	14.8	11.9

Sources: Ernest Henry Phelps Brown and Sheila V. Hopkins. *A Perspective of Wages and Prices,* London, Methuen, 1981, 14, Robert C. Allen. 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38 (2001) 421, Gregory Clark. 'The Condition of the Working Class in England, 1209-2004', *Journal of Political Economy*, 113, no. 6 (2005) 1327, Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Gregory Clark. *English Prices and Wages, 1209-1914,* (accessed 12-01-2012) http://gpih.ucdavis.edu/files/England_1209-1914_(Clark).xls.

Table 5: Consumer Price Index with Weights and Caloric Value of Food Items 1400-1499

	Poverty Line CPI (Allen) Quantity per Person per Year	**Comfort Artisans CPI Quantity per Person per Year**	**Labourer Quantity CPI per Person per Year**	**Caloric Value per kg/l**	**Calories per day Poverty Line CPI (Allen) (1941 kcal)**	**Calories per Day Comfort Artisan (2777 kcal)**	**Calories per Day Comfort Labourer (2747 kcal)**
Bread	182 kg	168 kg	201.3 kg	2452	1223	1128.6	1352.3
Ale							
Normal	182 l.	605.6 l.	504.7 l.	426	212	706.6	587.4
Strong		5.1 l.	1.5 l.	900.8		12.4	3.8
Meat:							
Beef	26 kg	36 kg	35.3 kg	2500	178	246.6	241.8
Pork		25.3 kg	18 kg	2470		171.2	121.8
Mutton		17.3 kg	12 kg	2170		102.9	71.3
Fowl		8 kg	5.3 kg	1650		36.2	24.0
Fish:	-				-		
Herring		32 kg	29.3 kg	2140		187.6	174.7
Salted Salmon		0.9 kg	0.1 kg	1850		4.6	0.5
Salt Cod		2.7 kg	0.4 kg	3550		26.3	3.9

Dairy:							
Butter	5.2 kg	2.1 kg	2 kg	7286	104	41.9	39.9
Cheese	5.2 kg	1.3 kg	1.5 kg	3750	53	13.4	15.4
Egg	2.6 kg	1.3 kg	1.5 kg	1550	11	5.0	5.8
Vegetables/legumes	c.78 kg				160		
Peas		22.7 kg	25.3 kg	600		37.3	41.6
Beans		22.7 kg	25.3 kg	900		56.0	62.4
Soap	2.6 kg	3.5 kg	2.9 kg				
Clothing							
Linen cloth	5 m.	6.3 m	5.9 m				
Wool cloth		0.3 m	0.1 m				
Shoes		0.07 pair	0.03 pair				
Candles	2.6 kg	3.5 kg	2.9 kg				
Lamp oil	2.6 litre	3.5 litre	2.9 litre				
Fuel (charcoal)	252 kg	336 kg	336 kg				

Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Graph 11 and 12 show the number of working days required per year for artisans and labourers to keep a family of four reasonably comfortable with their respective CPIs. As discussed above, adjusted average wages have been applied to the calculations of the comfort CPIs. This has not been done for the poverty line calculations for York and Southern England, as Allen did not adjust his wages to account for winter wages.

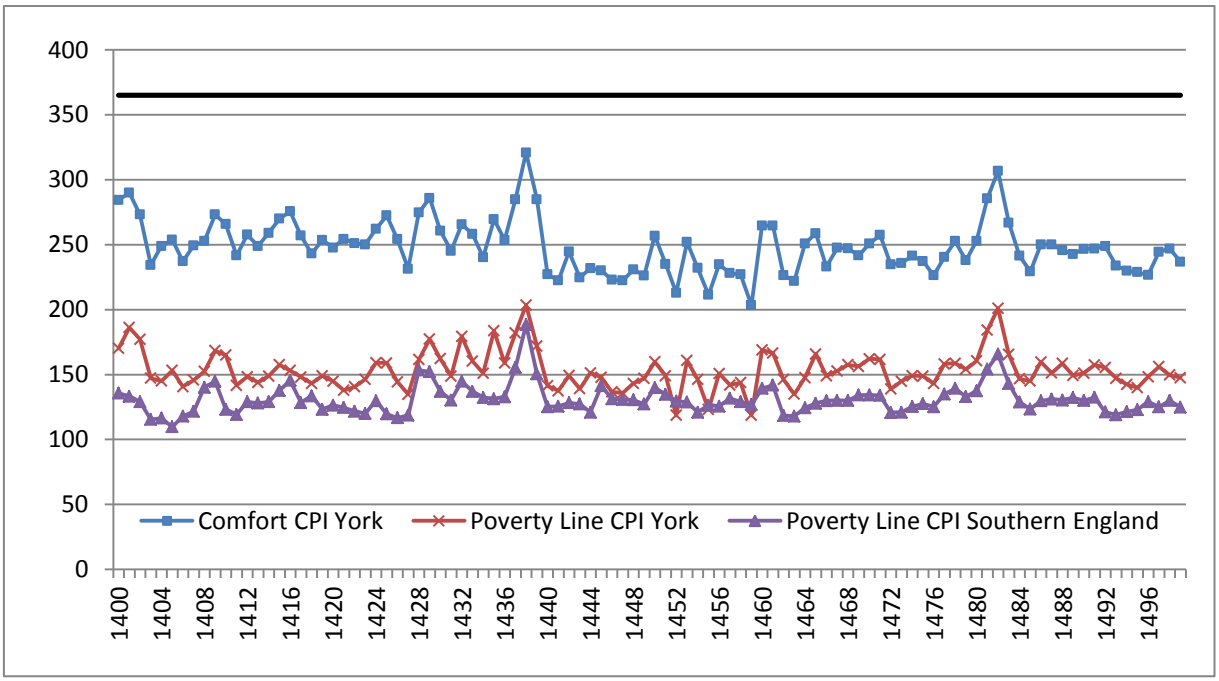
From these two graphs five important observations can be made. Firstly, a significantly larger number of working days was required to provide for a family in the fifteenth century than is suggested by the poverty line CPI. The number of working days per year to keep a family reasonably comfortable to fifteenth century standards, excluding the cost of rent, rose 48% for labourers, and 62% for artisans above the requirements to stay above the poverty line. Secondly, a more comfortable lifestyle with a higher quantity and quality of consumption goods was provided by the artisans' CPI, when compared to labourers CPI. Furthermore, they could work 91 days less per year on average, due to the higher nominal wages. Thirdly, after 1439 the average number of working days per year decreased by 8%. This is surprising as this period coincides with economic decline,

depopulation, and negative growth of the GDP/capita discussed above.[120] Munro offers an explanation of this phenomenon by reconsidering Keynesian theory. Keynes explains how rising relative wages can occur during a decline in the demand for labour when there is wage rigidity during periods of inflation, as was the case during the 15th century. Subsequently, a decline in employment and output then leads to recession, which is what happened in relative wage development in the sixteenth century.[121] Fourthly, the graph shows that food prices were generally lower in the south. No northern prices for soap, cloth, fuel, and light have been included, therefore, differences must stem from higher food prices. On average life on the poverty line was 15% cheaper in the south. Only in a few extreme cases, in 1452 and 1458, life in the north was slightly cheaper. Finally, it appears prices were more volatile in northern England, especially between 1430 and 1470.

In conclusion this chapter has shown that prices histories from probate inventories do not offer a viable alternative to institutional price indexes, as goods were generally sold below market prices to ensure a quick sale. Due to generally high relative wages, diet improved in quantity and quality during the fifteenth century, bread was no longer made from lesser grains, and the consumption of meat and fish increased. Relative wages were high in the late fifteenth century in spite of economic decline, depopulation and a decrease in GDP per capita. Compared to the south, wages in the north were equal in absolute terms, but not in relative terms. Life in northern England was harder, not just because of the higher prices, but also because the north was generally darker and colder. For a comparable number of working days, people in York were colder than their countrymen in the south.

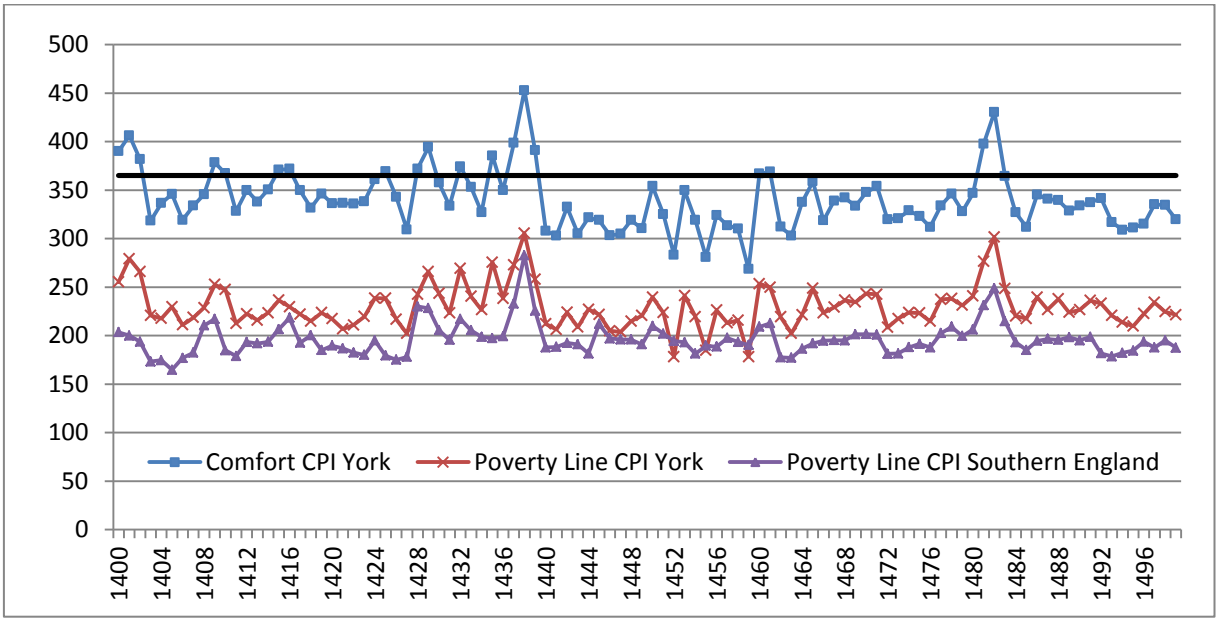
[120] Goldberg. *Women, Work and Life Cycle,* 71-80, Bartlett. 'The Expansion and Decline of York', 33, Broadberry et al. 'English Economic Growth', 55.
[121] Munro. 'Wage-Stickiness', 229.

Graph 11: Number of Working Days Required per Year for a Building Artisan to Feed a Family of Four, Excluding Rent, in York and Southern England, 1400-1499



Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Graph 12: Number of Working Days Required per Year for a Building Labourer to Feed a Family of Four, Excluding Rent, in York and Southern England, 1400-1499



Sources: Stell. *Probate Inventories,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Chapter 2: Home is where the hearth is

Most people lived in rented housing during the fifteenth century. Baer described that there were four different types of landlords, a small part consisted of aristocrats, but most were gentry, and then there were about equal parts commoners and institutions. He does not give any estimate for the percentage of institutional, or other landowners.[122]

Little is known about the cost of housing in the later Middle Ages, as few studies have been devoted to the subject. The research on rent development generally focusses on the shifts in total income from rents. Using this method Butcher and Keene respectively focus on rent development in Oxford and Cambridge, and Winchester in the late Middle Ages. Their work will be discussed for comparison below.[123] The only real wage study to include rent prices is conducted by Clark, who for his pre-1540 rental quotes used individual housing rents from the south of England calculated from the works of Keene on Winchester, and Keene and Harding on London.[124] Clark has gathered 20.000 quotes for residences between 1260 and 1869, and 3,759 of these quotes cover the nearly three hundred year period between 1260 and 1540.[125] However, the York Bridgemasters' Accounts give 5,878 quotes for the fifteenth century, a significantly larger amount of references. Generally rents from religious institutions have been studied, as most source material survives for these institutions. The rents recorded in the Bridgemasters' Accounts originate from a secular institution situated in the north, while most research is focused on the south. This makes the study of rents from the York Bridgemasters' Accounts particularly interesting.

In fifteenth century York most buildings were constructed from wood. Most residences had three stories and were usually built at a right angle to the street with the upper stories leaning towards the street. In medieval times this type of construction was indicative of building congestion.[126]

Residences were often let on a year to year basis, but sometimes long term leases were made for several years, several decades, life, or even longer. The longest lease recorded in the York Bridgemasters' Accounts was for a plot of land known as Calomhall let for 99 years to Robert Roos, and presumably his heirs.[127] Rent was due in advance, and to be paid in two terms, at Pentecost and Martinmas. Naturally not all tenants were eager to pay, but measures which seem extreme in this

[122] William C. Baer. 'Landlords and Tenants in London, 1550-1700', *Urban History,* 38, no. 2 (2011) 245.
[123] Keene and Rumble. *Survey of Medieval Winchester*, Butcher. 'Rent and the Urban Economy'.
[124] Clark. 'The Condition of the Working Class in England', 1328.
[125] Gregory Clark. 'Shelter from the Storm, Housing and the Industrial Revolution, 1550-1909', *Journal of Economic History,* 62, no. 2 (2002) 489. Clark. 'The Condition of the Working Class in England', 1321.
[126] Swanson. 'Building Craftsmen', 3.
[127] Stell. *York Bridgemasters' Accounts,* 370, 395, 430.

day and age were taken against tenants who fell behind on their payments, for instance, their roof would be removed.[128]

Leases generally made a provision for the upkeep of the residence. The exact nature of maintenance agreements in the Bridgemasters' Accounts is difficult to ascertain. Many improvements and repairs on properties were ordered by the bridge masters. Therefore, it appears that for most residences rent agreements included maintenance provided by the landlord.

Most properties were let at farm, and a small number at free farm, a type of freehold tenure without any services. A few properties were let as freeholds, a type of tenure generally granted for life. It appears that additional rents were collected for private landlords by the bridge masters. Part of the income from properties let as frank-fermes, a type of freehold tenure for a fixed rent, was paid to the owners of the properties, and a portion of the rent was retained by the bridge masters. There are a few other legal terms mentioned in the accounts to describe a type of letting agreement of which the meaning is difficult to establish with certainty, such as, 'for *perpetuum remansurum*', '*superreditum*', and 'by a *scriptum*'.[129]

Everything has a price

Rent price was generally determined by several factors, mainly the size, location, use, age, and condition of the property, and the demand for housing were decisive in determining rent value.[130] Rent prices in the Bridgemasters' Accounts ranged between 1d and 147s.[131] Lower rents were more common, and the average rent price throughout the fifteenth century was 9s 3 ¼d, the median was 6s, and the mode was 1s. Table 6 shows the average rent per common type of property, subdivided into three categories, namely residential, commercial and landed properties. The properties in the Bridgemasters' Accounts consisted of 67.5% residential, 19.2% commercial, and 13.3% landed properties. A few special types of buildings appear infrequently in the York Bridgemasters' Accounts, such as a bakery, a mill, and alms houses. There were too few observations to calculate a statistically valid average price for these special properties, so to avoid creating unrepresentative rent price series, they have been excluded from further calculations. The most expensive residential properties in the Bridgemasters' Accounts were the capital-messuages. A capital-messuage included a main residence with land and several other dwellings - which were likely sublet, or used to house staff. The most common residential property was the tenement, a general term which described anything from

[128] Ibidem, 44, 357.
[129] Ibidem, 44.
[130] Keene and Rumble. *Survey of Medieval Winchester*, 237.
[131] Stell. *York Bridgemasters' Accounts,* 156, 423.

the meanest shelters, to the grandest dwellings. Sometimes tenements included a shop or workshop. Cottages fetched a slightly higher average price than houses, which is likely because cottages included more land. It appears land was a valuable, and desired asset in fifteenth century York.

Table 6: Average Rent Price per Type of Property in Fifteenth Century York

Type of Property	Average Rent in Shilling	Sample Size
Residence: Camera	3.78	26
Residence: Capital-Messuage	29.76	100
Residence: Cottage	2.97	252
Residence: House	2.49	218
Residence: Messuage	18.02	16
Residence: Tenement	9.83	2524
Residence: Tower	3.74	38
Commercial: Cellar	7.03	33
Commercial: Shop/Workshop	12.88	460
Commercial: Stall	6.15	27
Land: Ditch	4.09	117
Land: Garden	1.52	129
Land: Gutter	3.05	22
Land: Hay/Mote	3,89	111
Land: Land	3.68	346
Land: Vennel	4.67	37

Source: P. M. Stell. *York Bridgemasters' Accounts,* York, York Archological Trust, 2003.

Representing

Real wage calculations are commonly based on wages for building labourers and artisans working for large institutions. In the previous chapter the number of working days for building labourers and craftsmen has been calculated. Building workers only represent a portion of the professional urban population. According to Goldberg's research discussed in the introduction, about five per cent of the population consisted of artisans engaged in construction. In order to assess the extent to which building workers constitute a representable portion of fifteenth century society, their socio-economic position must be analysed. Rent data from the York Bridgemasters' Accounts provides an interesting insight into the socio-economic structure of fifteenth century. It is assumed

that persons with a higher socio-economic position spent more on rent, as they preferred to lease residences of a higher quality to provide more comfort, and improve status. Occupations were not recorded by the bridge masters in most references. The occupation of c. 24% of tenants in the Bridge Estates was ascertained by assuming that a person, whose name and occupation was recorded in one account, had the same occupation in a previous or later account, when a similar name was recorded - provided the name was not too common, and spelling did not significantly alter. It would have been possible to regard the last name of people to reflect their profession. However, it is not uncommon for a person with a job specific last name to have a different occupation recorded in the accounts, for instance, John Clerk, servant, John Baker, tapiter, Thomas Butler, spurrier, John Taillour, shipman, Richard Buckler, glover, and John Smyth, skinner, who all rented property on the Bridge Estates.[132] Table 7 shows the average rent paid per occupation groups, based on the categories as described by Goldberg – see table 2 in the introduction.[133] The division is not completely straightforward, as some persons had multiple occupations. Artisans often worked for wages, but they generally supplied the wares for their labour too, such as stones, wood, lime etc., so they were also involved in trade. Sadly, it is not possible to determine the extent of this practice. A large part of the occupations recorded in the Bridgemasters' Accounts do not fit comfortably within Goldberg's occupational structure. Eight new categories have been added, and the category of soap-makers was removed as no soap-makers were recorded as tenants in the Bridgemasters' Accounts. The occupation of only four women was recorded by the bridge masters. Therefore, table 7 mainly refers to the socio-economic position of men in fifteenth century York. In spite of these minor shortcomings, table 7 shows that building artisans belonged to the below average echelons of the urban population, and were economically less successful than artisans involved in other trades. Labourers and servants appear to have been at the bottom of the social ladder. The only social group below the labourers appears to be the chaplain/knights. However, only one chaplain knight is recorded in the Bridgemasters' Accounts, namely Alexander Nevell, who rented a tenement between 1436 and 1464. It is unlikely that a chaplain knight would have belonged to the lowest socio-economic class. This tenement was probably not his primary residence, and he may have rented it to house his servant or used it for storage. The same reasoning applies to explain the low average rent paid by the nobility. Consequently, it appears that the relative wage development of building artisans and labourers represents wage earners between the below average socio-economic and lower strata of the fifteenth century York population.

[132] Ibidem, 109, 157, 205, 233, 295.
[133] Goldberg. *Women, Work and Life Cycle,* 45, 61-62.

Table 7: Average Yearly Rent per Occupation Category in Descending Order of Average Rent in Shillings, 1400-1499

Occupation	Including	Average Rent Residence	Sample Size
Metal	Smith, goldsmith, ironmonger, armourer	15.90	20
Mercantile	Mercer, draper	15.66	26
Textiles	Weaver, tapiter, cardmaker, lister	14.54	60
Clothing	Tailor, glover, capper	11.27	75
Barber		10.75	14
Leather	Skinner, cordwainer, barker	10.59	73
Books	Parchmenter, coucher, bookbinder	10.27	8
Alderman		9.86	17
Religious	Vicar, clerk, chaplain	8.13	93
Armaments	Spurrier, bower	8.03	21
Wood	Wright, cooper	7.93	35
Building	Tiler, plasterer, carpenter, mason etc.	7.87	43
Victuals	Cook, butcher, waterleader etc.	6.61	39
Military	Sergeant-at-mace, knight, armiger	6.15	50
Transport	Shipman, carter, porter, ferryman	5.30	28
Nobility	Gentleman, Earl, Duke	3.64	31
Labourers	Servant, labourer	2.55	3
Religious/Military	Knight/chaplain	0.50	8
Total		9.31	644

Source: Stell. *York Bridgemasters' Accounts.*

Furthermore, it is important to ascertain whether or not the socio-economic position of the builders shifted during the fifteenth century. It can be assumed with relative certainty that labourers were always the lowest paid occupation group, but this is not as certain for artisans working in construction. Blondé and Hanus' study of poll taxes in sixteenth century Bois-le Duc ('s Hertogenbosch, the Netherlands) has shown that the socio-economic position of building craftsmen declined steeply between 1500 and 1560. Their welfare dropped due to increasing underemployment and wage-stickiness. After this period, wages started to be more in sync with price development, and the socio-economic position of builders improved again. However, the extent of

improvement is not covered by the article.[134] It is important to determine whether a similar degradation of the socio-economic position of building craftsmen did not take place in fifteenth century York. Table 8 shows the average rent recorded by the York Bridgemasters' Accounts for building artisans. The sample size is very small, especially for the period after 1440. It appears that average rent for artisans declined in the second half of the fifteenth century, but this is in line with the general development of rent prices in fifteenth century York as will be demonstrated below. Based on this data no positive or negative development of the relative socio-economic position of building artisans can be determined. More research is required to establish this with greater certainty. Furthermore, not all builders had the same socio-economic position. According to Swanson's research into testaments of building artisans, masons and glaziers were generally far wealthier than carpenters - who were the poorest of the building craftsmen.[135] This is problematic as 25 of the 43 quotes pertain to carpenters. Table 9 shows the average rent paid by building artisans in in fifteenth century York per occupation. This generally supports Swanson's conclusions. Only John Middelton, plumber, appears to have paid less than the average rent paid by carpenters, for a tenement in 1475. There is only one reference, and it is likely that this tenement was not Middelton's primary residence.[136]

Table 8: Average Rent per Year in Shilling for Building Craftsmen, 1400-1499

Year	Average Rent Residence	Sample Size
1400	33.92	1
1424	8.00	1
1428	9.75	4
1435	11.08	4
1436	4.89	3
1437	8.00	5
1440	10.89	3
1444	3.00	1
1453	6.00	1
1454	4.00	2
1457	4.50	2
1458	4.75	2
1459	6.00	1
1464	3.67	1
1466	4.00	1
1468	5.44	6

[134] Bruno Blondé and Jord Hanus. 'Beyond Building Craftsmen, Economic Growth and Living Standards in the Sixteenth Century Low Countries, the case of 's-Hertogenbosch, 1500-1560', *European Review of Economic History,* 14, no.2 (2010) 189-191, 194-197.
[135] Swanson. 'Building Craftsmen', 28.
[136] Stell. *York Bridgemasters' Accounts,* 103.

1475	7.42	2
1488	11.67	2
Total	7.87	43

Source: Stell. *York Bridgemasters' Accounts.*

Table 9: Average Yearly Rent in Shillings Paid by Building Artisans, per Occupation, in Fifteenth Century York

Occupation	Average Yearly Rent	Sample Size
Mason	15.5	2
Plasterer/Tiler	9.40	15
Carpenter	6.59	25
Plumber	1.50	1
Total	7.87	43

Source: Stell. *York Bridgemasters' Accounts.*

The Accounts

Applying Clark's method, the York Bridgemasters' Accounts can be analysed as constant quality rents, rents that were recorded for properties at multiple instances, with the assumption that the quality of the property did not significantly alter during this period.[137] It would be preferable to exclusively use properties that have rent prices recorded for every year the accounts cover. However, this is not possible as damages to the accounts and vacancy would exclude most properties from the calculations. Only rents that were actually paid have been included in the averages calculated below. This was done to prevent pollution of average rent prices with price indications given for vacant properties.

In fifteenth century York population numbers declined, especially after the mid fifteenth century, as has been discussed above. Therefore, it is probable that by the late fifteenth century more houses remained vacant. Moreover, as rent prices were subject to a competitive housing-market, a decline in rent prices is to be expected. The development of average rents paid in the Foss Bridge Estate, presented in table 10, supports these assumptions. When comparing the average rents of all properties in the Foss Bridge Estate between 1451-1468 and 1472-1488 the average yearly rent declined 32% after 1470. During this same period properties remained vacant more often than in the preceding decades. Before the 1470s the total average rent prices were rather stable, when one disregards the incomplete accounts from 1406, 1444, 1446/1447 and 1470.

[137] Clark. 'Shelter from the Storm', 493.

The average rent prices for residential properties, which made up 82% of the Foss Bridge Estate, shows a depression during the 1450s when prices declined by 22%. A partial recovery of 8% occured between 1459 and 1470, after which prices dropped by another 28%, culminating in a 42% decline of housing prices in half a century. It appears more properties were added to the Estate to compensate for the loss of income per property. The Foss Bridge Estate contained thirty-five properties in 1407, forty-six in 1445, and eighty-three in 1488. The expansion of the estate did not create a substantial increase in income. The initial addition of properties between 1407 and 1445 brought income up from £14 7s 8d to £25 5s 7d, but as rent prices plummeted after this period, income averaged around £25, in spite of a 45% rise in the number of properties in the estate after 1445.[138]

Table 10: Average Yearly Rent Paid in Shilling per Property in the Foss Bridge Accounts, 1406-1488

Year	Estate	Average Rent Residences in Shillings	Sample Size Residences	Average Rent Commercial Properties in Shillings	Sample Size Commercial Properties	Average Rent Land in Shillings	Sample Size Land	Total Rent Average	Total Sample Size	Vacant/Decayed	Damaged References
1406	Foss	10.94	12	2.50	4	-	-	8.83	16	9	12
1407	Foss	11.23	22	22.00	2	-	-	12.13	24	11	-
1408	Foss	14.07	10	4.83	6	-	-	10.60	16	9	12
1444	Foss	19.44	16	1.00	1	1.33	1	17.41	18	3	24
1445	Foss	13.29	37	1.00	1	1.74	5	11.66	43	3	-
1446/7	Foss	14.25	29	-	-	1.00	1	13.81	30	2	-
1451	Foss	13.52	41	1.00	1	1.65	6	11.77	48	-	-
1453	Foss	10.75	40	1.00	1	1.78	5	10.50	47	2	-
1454	Foss	10.23	39	1.00	1	2.97	3	10.51	44	5	-
1457	Foss	10.77	36	1.00	1	2.01	5	10.52	43	6	-
1459	Foss	11.22	38	1.00	1	2.25	4	11.13	44	6	-
1462	Foss	11.71	30	1.00	1	2.50	4	12.32	37	12	-
1468	Foss	11.44	50	-	-	5.13	5	11.63	56	10	-

[138] Stell. *York Bridgemasters' Accounts,* 50, 54, 98-99, 110, 117.

1470	Foss	12.15	28	1.00	1	-	-	13.16	30	1	16
1472	Foss	8.26	56	-	-	1.66	11	8.11	69	13	1
1475	Foss	8.71	53	-	-	1.66	14	7.96	72	9	-
1486	Foss	8.52	44	1.67	3	1.51	12	7.51	61	19	1
1488	Foss	7.85	51	1.50	2	1.62	15	7.04	69	14	-
Total	Foss	10.75	603	3.58	26	1.96	90	10.12	737	132	66

Source: Stell. *York Bridgemasters' Accounts.*

The development of rent prices from the Ouse Bridge Estate is less straight forward. The accounts are statistically more interesting, as they contain more rents, and cover a larger area of the city. However, the accounts are more often damaged or incomplete than the rolls from the Foss Bridge Estate. Especially the accounts from 1424, 1436, 1438, 1445, 1449, 1451, 1453, 1457, 1466, and 1499 have taken heavy damage. Consequently, this sometimes leads to volatile differences in average prices as only records for the streets with more expensive properties, such as parts of Coney street, Nessgate, Castlegate (now Friargate), Kergate, and Hertergate (part remains as Friargate), or streets with cheaper properties, such as parts of Walmgate, and Fisshergate have survived.[139]

Table 11 shows that vacancy increased after 1451, and total average prices became depressed at the same time. So, it appears there was a strong similarity in the rent price development in the Ouse and Foss Bridgemasters' Accounts. However, in the Ouse Bridge Estate the average rent price for housing seems to have been remarkably stable throughout the fifteenth century, even though much of the pattern is obscured by damages to the accounts. The average rent was slightly higher in the first three decades, and values declined in 1468, but no data is available for the following two decades, and the account from 1488 shows remarkable strength. This may have been caused by a temporal upheaval, and the 1499 account is too damaged to give any reliable indication. However, throughout the Ouse Bridge Accounts references were made about the improvement of properties on the estate, while far fewer references to improvements were made in the Foss Bridge Accounts. This may explain in part the dichotomy between stable rents in the Ouse Bridge Accounts versus declining rents in the Foss Bridge Accounts. In general, rent prices did not rise for improved properties, but improvements may have prevented a steep decline. In 1445, for instance, a chimney was built in the house rented by Henry Moss, located on the corner of the church of Holy Trinity in Kings Court, for a total cost of 5s 4d, while his rent gradually decreased from 24s 4d in 1440 to 22s in 1454.[140] Peter Bardsley received 8s in 1458 for having built a chimney in the tenement he rented, a rather substantial investment from the bridge masters for a property worth

[139] Gate is the old Norse word for street, it is still used today and serves as a reminder of the city's Viking ancestry.

[140] Stell. *York Bridgemasters' Accounts,* 199, 222, 249, 255, 293.

18s, while the tenement did not increase - or decrease - in value.[141] This would explain the consistently high value of residential properties in the Ouse Bridge Accounts, because improvements had increased the quality of the properties, and kept the rent price stable. This shows that the quality of the properties was not constant in the fifteenth century.

Furthermore, it appears that the bridge masters were not precise in writing down all vacant properties. For instance, Beatrice Garlicker appears in the list of decrement from 1440, an almost completely undamaged account, but neither she, nor the property she was renting was entered in the rental accounts. No certainty can be given to the extent of vacancy in the last decades of the 15th century. The 1488 account has a total sample size of 233 properties, just like the 1454, and 1468 accounts. However, in 1454 and 1468, respectively, 71 and 62 properties were reported as vacant, or decayed, while in 1488 only 5 properties were described as vacant or decayed. With high relative wages in the late fifteenth century, it is likely that lower quality, and lower priced residences remained vacant more often. Higher quality dwellings, which fetched a higher rent, likely became the norm for York's population by the end of the fifteenth century. This development is shown when higher rents from the Ouse Bridgemasters' Accounts are excluded in calculating average rent prices. Table 12 shows that the inordinate amount of more expensive rents in the 1488 Ouse Bridgemasters' Accounts caused an unexpectedly high average rent price, and that rents below 10s were underrepresented in 1488.

The extent of rent decline and properties remaining vacant can be further exemplified by following the rent development of two small shops on Ratton Rowe. The two shops were often leased out together. They fetched 17s per year between 1424 and 1437, but their value declined between 1440 and 1454, when rents were received ranging between 13s 4d and 15s. In 1457 and 1458 the value had declined further and the shops only fetched 10s. Both shops were empty in 1459 and 1462. Between 1466 and 1468 7s 8d was received in rent per annum. In 1488 and 1499 a rent of only 3s was paid for the first shop, the second shop was not rented out, and neither were the five adjacent shops. This is a massive 65% decline in rent value over a 75 year period.[142] Furthermore, in 1499 the shops were described as small, indicating that larger properties had become the norm.[143]

The general development of rent prices in the Ouse Bridge Accounts is supported by the development of income and profits. The annual profits of the Ouse Bridge Estate averaged around £65 in the 1440s, but declined to around £51 in the 1450s and 1460s. Total income declined during

[141] Ibidem, 293, 329.
[142] Ibidem, 130, 136, 148, 171, 187, 233, 260, 267, 271, 280, 305, 310, 332, 359, 383, 411, 420, 441, 445.
[143] Ibidem, 440.

the same period from an average of circa £157, to circa £101.[144] It appears no properties were added to the Ouse Bridge Estate to compensate for a loss of income.

Table 11: Average Yearly Rent paid in Shilling per Property in the Ouse Bridge Accounts, 1400-1499

Year	Estate	Average Rent Residences in Shillings	Sample Size Residences	Average Rent Commercial Properties in Shillings	Sample Size Commercial Properties	Average Rent Land in Shillings	Sample Size Land	Total Average Rent	Total Sample Size	Vacant/ Decayed	Damaged References
1400	Ouse	14.79	61	15.57	40	3.24	39	12.51	147	5	22
1424	Ouse	5.72	38	5.17	8	7.31	26	6.81	74	17	-
1428	Ouse	8.33	99	14.56	55	8.69	29	10.75	187	36	6
1435	Ouse	8.92	161	17.81	57	4.66	49	10.97	274	12	22
1436	Ouse	6.61	60	11.33	4	2.40	16	6.23	82	-	29
1437	Ouse	8.20	116	17.63	58	3.52	29	10.67	206	3	2
1438	Ouse	11.62	43	16.28	56	2.95	9	13.80	111	2	-
1440	Ouse	7.64	158	15.42	64	3.69	53	9.55	281	59	1
1444	Ouse	7.20	129	13.64	36	7.01	32	8.80	203	3	21
1445	Ouse	8.00	49	1.46	4	2.94	21	8.30	78	10	9
1446/7	Ouse	8.21	142	14.03	62	3.22	38	9.98	249	33	11
1449	Ouse	3.93	55	4.00	2	9.71	21	5.56	80	13	3
1451	Ouse	4.63	25	1.00	1	12.59	9	6.58	35	5	1
1453	Ouse	8.76	71	10.04	9	10.70	15	9.08	100	48	1
1454	Ouse	8.10	163	9.58	16	5.65	42	7.89	233	71	2
1457	Ouse	3.85	38	1.00	1	13.68	13	6.74	55	24	-
1458	Ouse	7.93	165	10.51	17	7.67	36	8.84	229	75	12
1459	Ouse	7.83	158	10.58	16	5.85	41	8.22	226	76	4
1462	Ouse	8.44	167	9.38	14	5.69	41	8.41	227	74	7
1464	Ouse	8.24	171	8.22	20	5.08	39	8.28	237	65	3

[144] Ibidem, 209, 231, 258, 357, 266, 302, 330, 381, 409, 440.

1466	Ouse	8.24	79	9.00	14	10.78	13	8.60	108	34	1
1468	Ouse	7.80	159	8.52	22	5.11	44	7.93	233	62	-
1488	Ouse	8.43	146	12.96	14	3.33	42	8.34	233	5?	5
1499	Ouse	4.61	17	36.44	3	4.58	13	7.71	40	?	5
Total	Ouse	8.13	2500	14.02	593	5.21	801	9.14	3958	499	167

Source: Stell. *York Bridgemasters' Accounts.*

Table 12: Average Rent Prices per Year from the Ouse Bridgemasters' Accounts, Excluding Prices of 30s and Above, 20s and Above, and 10s and Above, 1400-1499

Year	Average Rent Price in Shillings, Excluding Rents of >30s	Sample Size	Average Rent Price in Shillings, Excluding Rents of >20s	Sample Size	Average Rent Price in Shillings, Excluding Rents of >10s	Sample Size
1400	11.06	56	8.88	48	4.23	26
1424	5.72	38	5.72	38	5.15	34
1428	6.65	95	5.63	90	4.43	75
1435	7.80	157	5.90	141	4.25	114
1436	5.92	59	5.06	56	4.41	50
1437	6.84	112	5.85	106	4.71	89
1438	8.99	40	7.19	36	4.43	25
1440	6.93	155	5.54	144	3.75	115
1444	6.09	125	5.49	121	4.16	104
1445	8.00	49	5.38	42	3.65	34
1446/1447	7.15	138	5.90	129	3.95	101
1449	3.93	55	3.93	55	3.63	53
1451	4.63	25	4.63	25	4.27	24
1453	8.31	70	6.04	60	3.39	46
1454	7.75	161	5.70	142	3.35	109
1457	3.85	38	3.85	38	3.35	36
1458	7.74	164	5.89	145	3.41	111

1459	7.62	157	5.62	138	3.36	108
1462	8.44	167	6.09	144	3.24	104
1464	8.05	170	5.79	147	3.21	109
1466	7.84	78	6.45	70	3.07	48
1468	7.80	159	5.74	140	3.35	109
1488	8.27	145	7.04	134	3.20	83
1499	4.61	17	3.36	16	2.35	14

Source: Source: Stell. *York Bridgemasters' Accounts,* 118-456.

Comparable rent developments

The rent price development in fifteenth century York resembles the development of housing prices in Winchester, Canterbury and Oxford. Keene researched rent development through rent totals instead of individual rents as has been done above. His method is faster, which has allowed him to analyse rent development on a geographical basis. He has shown that the decline in income from rents was sharpest in the areas of the city where clothing was produced, due to the crisis in that sector. The cheap cottages in the western part of Winchester experienced a slight rise in rent price. All shops and valuable residences in Winchester declined in value during the fifteenth century.

Keene does not systematically specify the average value per type of property, but has given some indications. Cottages located near Winchester's High Street, generally fetched between 1 and 4 shillings. The average rent for cottages in York falls neatly in this range. Shops on St. Giles Fair in Winchester were usually let for prices between 3 and 10 shillings, which is a few shillings lower than the average for shops in York. St. Giles may have been one of the less popular streets, or the shops may have been smaller. Most tenements in Winchester were rented out for c. £1. This is about double the average price for tenements in York, although it was not uncommon for tenements to fetch one pound or more in York. The difference in average prices appears to have been caused by a difference in terminology. In Winchester only the larger cottages were worthy of being called a tenement, whereas in York, even the meanest dwellings were referred to as tenements.

Butcher's work on Oxford and Canterbury showed that both cities experienced a substantial decline in average rent value. In Oxford, Butcher studied rent income from Oseney Abbey. The accounts showed that in the early sixteenth century average rent prices had dropped by 56%, and income was at its lowest at £200 15s 10d. In Canterbury Cathedral Priory income increased 25% during the fifteenth century, caused by acquiring new and improving old properties. However, at the same time arrears and decays nearly trebled. Declining rent values plagued Canterbury earlier than

Oxford. Both cities still showed buoyancy in the early fifteenth century, Canterbury until the 1420s, and Oxford until the 1440s. In York the first signs of decline started in the 1450s. It is possible that urban decline started in the south, and slowly affected northern cities. A study of rent development for more cities would be needed to determine whether this was the case.

Arrears were a large problem for Oxford's Oseney Abbey and Canterbury's Cathedral Priory, but not for the York Bridge Estates. The bridge masters were financially accountable for the rent income. Therefore, arrears did not build up like they did in Oxford and Canterbury. Butcher claimed that vacancy was never a severe problem in Oxford, even though it was always present, and probably rather tenacious in the second half of the fifteenth century. [145] This was not the case in York, where in the latter half of the fifteenth century up to 25% of all properties remained vacant, a significant, but predictable occurrence in a city with increasingly fewer inhabitants. Thus, rent development was relatively similar in Canterbury, Oxford, Winchester, and York.[146]

The figures used by Clark do not show a similar rent development. His index indicates an increase in rent prices in the late fourteenth century. Values dropped in the 1430s, and gradually recovered from the 1460s onwards until the pre-1430s level was reached again in the early sixteenth century. This is in stark contrast with rent development in Canterbury, Oxford, Winchester, and York. This is rather surprising as Clark lists Keene's work as a source for these figures.[147] The figures he presented may have been representative of London, one of the few cities that did continue to grow while others declined, but are not representative for other urban areas.

Rent data into price series

In order to determine the influence of rent on relative wages, a rent series based on the York Bridgemasters' Accounts has been developed. Several allowances must be made when turning the rent data from the York Bridgemasters' Accounts into rent series. One must assume that the quality of housing was relatively stable, while many houses in the Ouse Bridge Estate were improved during the fifteenth century, as discussed above. As fewer improvements were conducted on the Foss Bridge Estate, the rent data from the end of the fifteenth century from the Ouse Bridge Estate has been excluded. Furthermore, family structure is assumed to be constant, even though children grow up and move out. It is likely that considerations about the size of the family, and the presence and age of children were taken into account - just like the price of housing – when renting property. For instance, John Foulford, carpenter, moved in 1457 when the rent of his house declined from 6s to 4s, to a house with a rent of 6s. It should be assumed that this property was of a higher quality and likely

[145] Butcher. 'Rent and the Urban Economy', 37-42.
[146] Keene and Rumble. *Survey of Medieval Winchester*, 234, 238, 240-248.
[147] Clark. 'The Condition of the Working Class in England', 1328, 1330-1331.

bigger than his previous residence. When the rent for this new house declined again from 6s to 4s in 1466, he remained there, having to work eight days instead of twelve at the summer wage rate.[148] No mention is made of Foulford's family in the York Bridgemasters' Accounts, but it does not seem unlikely that he decided to get a larger house when his family grew in size, especially as he did not have to pay more rent than before, and opted for a lower rent for the same property when his children moved out. In any case, his living standards improved.

The computation below is based on the average price for properties rented by artisans and labourers, but other statistical data should be considered as well. The average rent for an artisan was 7s 10.4d per year. Almost sixteen days at the summer wage rate, and almost twenty-four days at winter wage rate were required to pay this rent. Rent prices ranged between 4d, paid for a cottage in 1468 by Thomas Pilly, tiler, and 33s 11d, paid for a tenement by John Syther, paver, in 1400. So, respectively, between two thirds of a day and almost sixty-eight days of work at the summer wage rate, and one day and almost 102 days of work at the winter wage rate were required to pay for the rent of either craftsmen.[149] At 6s per year the rent median and mode are lower than the average rent. This indicates that a lower rent was more common than the mean indicates. However, the least successful artisans engaged in building, the carpenters, were overrepresented in the average, as has been shown in table 9. Furthermore, the standard deviation is very high at 5s 10.5d. Therefore, it is preferable to use the mean in calculations, as the mode and median would obscure the higher rents paid by more successful artisans.

There are only three references to rents paid by labourers and servants in the York Bridgemasters' Accounts. There were many more labourers in York throughout the fifteenth century, but the occupation of the great majority of tenants has not been recorded in the Bridgemasters' Accounts. Over one third of rents for residences recorded in the Bridgemasters' Accounts pertained to rents of 4s or below. It is likely that many of these dwellings were occupied by labourers and servants. The average rent per residence rented by servants and labourers was 2s 6.5d per year, which required seven and two-thirds of a day or ten and one quarter day of work at the summer and winter wage rate respectively. Rents ranged between 3s 8d, paid by Richard Taillior, labourer, for two tenements in 1468, and 4s, paid by the servant of Robert Pereson for a cottage in 1446/7. They would have respectively had to work eleven and twelve days at the summer wage rate.[150]. However, as c15% of all rents recorded for residences were of 1s or below, clearly not all labourers and servants spent such high amounts on housing. Therefore, the average rent per dwelling recorded for

[148] Stell. *York Bridgemasters' Accounts*, 272, 281, 305, 306, 310, 383, 411, 420.
[149] Ibidem, 120, 428.
[150] Ibidem, 251, 434

labourers in the Bridgemasters' Accounts is used in the computation of the number of working days required to supply a family of four with the basic necessities.

In order to construct rent price series for labourers/servants and artisans, only representative yearly averages from the accounts have been used. From the Foss Bridgemasters' Accounts 1444 has been excluded, and 1400, 1424, 1438, 1449, 1451, 1457, 1488, and 1499 from the Ouse Bridgemasters' Accounts have been excluded, as these are clearly not representative. The average rent prices per year have been adjusted to construct a rent price series that is representative for artisans. Prices from the Foss and Ouse Bridgemasters' Accounts have respectively been adjusted downward 30%, and 8%. This is based on the difference in the average rent per residence for the fifteenth century, and the average rent paid by artisans in the fifteenth century. To close the gaps in the account a ten year moving average has been used. The gaps remaining after this have been filled with the average of the five years known before, and the five years known after the gap. The same technique has been applied to calculate the average rent price for servants and labourers, only with an adjustment of -76% and -69% for the Foss and Ouse Bridgemasters' Accounts respectively. These series have been used below to investigate the influence of rent prices on the number of working days required per year.

The Influence of Rent

Graph 13 shows the development in the number of working days for labourers and artisans when rent is included in the CPI. The rise in the number of working days required to meet basic necessities is not enormous, especially in case of the labourers and servants, but it is still a significant difference. On average fifteen additional working days for craftsmen, and seven for labourers are required when rent is applied to the fifteenth century CPI reconstructed above. It appears craftsmen spent relatively more on rent than labourers and servants. In the respective comfort CPIs rent accounted for 5.2% of total household expenditure on basic necessities for craftsmen and for 2.0% for labourers in 1400. This correlates closely to Allen's estimate of rent accounting for 4-5% of expenditure.[151] Table 13 shows the rise in total expenditure when rents were included in the basket of goods in terms of percentages in the artisan and labourer comfort CPIs constructed above, and in the poverty line CPI computed using Allen's weights. Consequently, it appears that Allen's estimate of 4-5% was rather low for artisans, and a bit high for labourers. His estimate was based on the work of Horrell, who has analysed 283 household budgets from the eighteenth and nineteenth century, from working class families, occupied in agriculture, mining, factory work, outwork, and trades, where husband and wife were both employed. Her research has shown that expenditure for rent ranged between 4.1% and

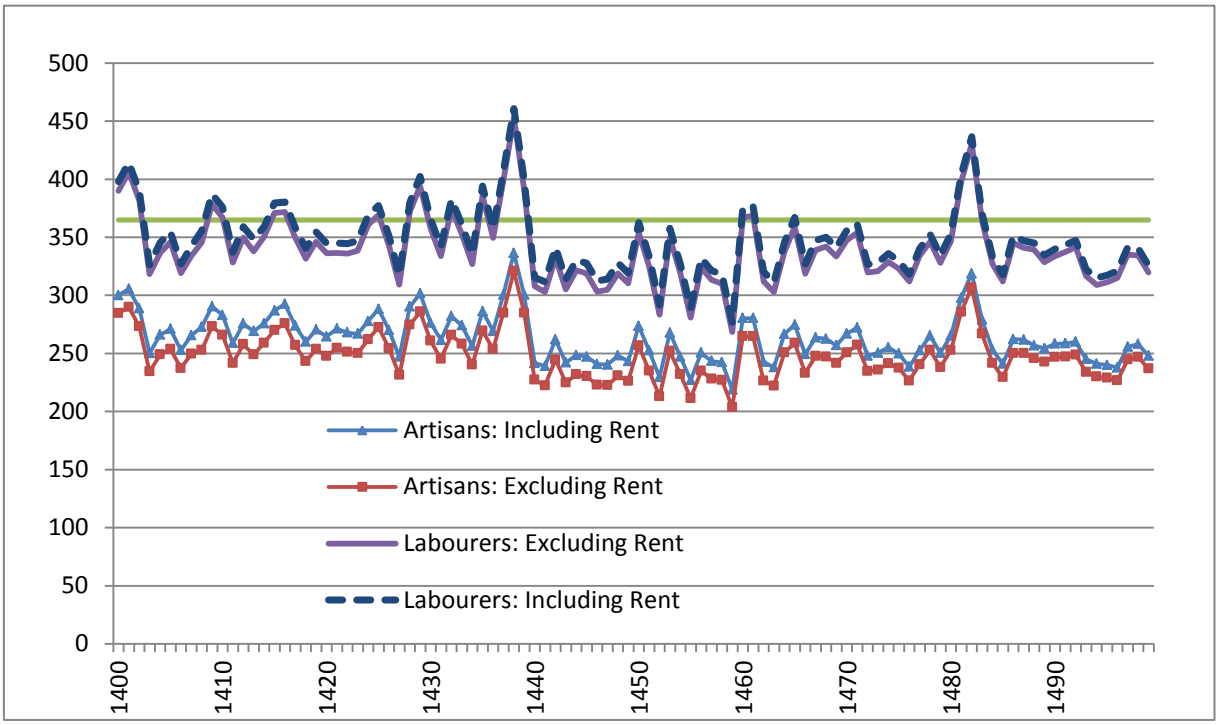
[151] Allen. 'The Great Divergence', 422.

20.5%, with an average of 9.7%.[152] Therefore, when compared to Horrell's investigation, applying 4-5% of expenditure to account for rent in the CPI, such as Allen did, appears to have been an underestimation. However, it would not be correct to simply assume higher rent prices in relative wage calculations, or in calculations of the minimal number of working days per year. Rent prices differ per occupational group. Furthermore, rent prices are subject to supply and demand. Between 1410 and 1419, an average of 17 days of work was required from artisans at the summer wage rate to pay for their residence, while between 1480 and 1489 an average of only 11.5 days sufficed.

In conclusion, rent prices declined after the mid fifteenth century, and dropped substantially after 1470, while the quality of housing improved throughout the century. These results were observed in Canterbury, Oxford, Winchester and York. Therefore, these results are probably comparable to other parts of the country. Artisans and labourers benefited from this development by paying relatively less rent, for relatively better residences, which led to a rise in living standards. Allen's estimate for the share of rent in household expenditure has been shown to be too low for craftsmen, and too high for labourers in the fifteenth century. More research on rent prices per social group remains to be done to gain clearer and more precise results in real wage and number of days worked computations. Even though labourers and servants spent relatively less on housing than craftsmen, the addition of rent to the CPI pushes the number of working days required for basic necessities further beyond the total number of days in one year. In light of this problem, the following chapter will cover the economic value of women.

[152] Horrell. 'Home Demand', 565, 568.

Graph 13: Number of Working Days Required by Labourers and Artisans to Afford Basic Necessities, Including and Excluding Rent, 1400-1499



Sources: Stell. *Probate Inventories,* Stell. *York Bridgemasters' Accounts,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Table 13: Percentage Rise in Total Expenditure in Ten Year Averages Caused by Including Rent in the Consumer Price Index for Artisans and Labourers, 1400-1499*

Period	Comfort Artisan	Poverty Line Artisan	Comfort Labourer	Poverty Line Labourer
1400-1409	6.4	10.4	2.4	3.5
1410-1419	6.8	11.4	2.6	3.9
1420-1429	6.3	10.7	2.4	3.6
1430-1439	6.0	9.3	2.2	3.2
1440-1449	7.4	11.7	2.8	4.0
1450-1459	7.0	11.3	2.6	3.8
1460-1469	6.5	10.2	2.4	3.5
1470-1479	5.5	8.7	2.1	3.0
1480-1489	4.6	7.3	1.7	2.5
1490-1499	4.7	7.5	1.8	2.6

*Computations are based on the CPI constructed for the fifteenth century above, and the CPI constructed by Allen in "Allen, 'The Great Divergence,' 421."

Sources: Stell. *Probate Inventories,* Stell. *York Bridgemasters' Accounts,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Chapter 3: The value of women's work

Women and children are generally not included in relative wage calculations. Allen and Weisdorf's work is the only research known to me to attempt to include women and children. However, they do not treat women and children separately, but only in light of their results for men's relative wages, while it is highly interesting to treat women's relative wages separately before evaluating their financial contribution to the household.[153] The fifteenth century has been proclaimed as the golden century for women with increasing job opportunities, and less dependence on marriage. Van Zanden and De Moor have argued that in the North Sea Area consensual marriages were the norm - a practice that was promoted by the Catholic Church, and largely excluded the parents from the choice of their child's spouse. Families generally lived in a nuclear household, with parents, and children, but without grandparents. Adolescent children often moved out of the house, for instance to do an apprenticeship, or to become a servant. In this society children were required to arrange their own funds for marriage. High real wages and abundant job opportunities for women were an incentive to postpone marriage and childbirth to increase wealth before marriage, as certain jobs would no longer be available afterwards, and young children decreased the time available to engage in wage labour. Therefore, in the fifteenth century the average age at first marriage for women was high. This led to couples having fewer children - as fertility decreases with age - while human capital formation increased.[154] Klemp and Weisdorf have shown a 10% decline in the chance of literacy per additional child. With fewer mouths to feed, parents would be able to contribute a larger part of their income to education, and that part had to be shared by fewer children.[155] However, as job opportunities for women diminished in the late fifteenth and early sixteenth century, and wages declined, women were pushed back into early marriage, and birth rates increased, leading to a rise in population numbers.[156]

It seems the fifteenth century marked a relatively better time for women. However, as discussed in the introduction, Bennett has postulated that the fifteenth century was characterised by continuity instead of change, women's work was always low class and low paid - there was no equality. According to Bennett researchers of women's history wish for - professional - equality for women, and by postulating a "golden age" in the past, it appears possible to regain equality in the

[153] Allen and Weisdorf. 'Was there an 'Industrious Revolution', 723-727

[154] Tine de Moor and Jan Luiten van Zanden. 'Girlpower, The European Marriage Pattern (EMP) and Labour Markets in the North Sea Region in the Late Medieval and Early Modern Period', *The Economic History Review,* 63, no. 1 (2010) 1-28, Van Zanden. 'The Malthusian Intermezzo', 1-5.

[155] Klemp and Weisdorf: Child quantity/quality trade off, 9.

[156] Van Zanden. 'The Malthusian Intermezzo', 10-11.

future.[157] Bardsley has shown that in spite of a possible rise in job opportunities for women, the male-female wage gap did not alter after the Black Death. She has shown that a wage gap of 25-30% lower wages for women remained. This was equal to the rate paid to 'second-rate' labourers, such as children, disabled people, and elderly persons. She has convincingly argued that the reason for the wage gap was not biological, but cultural – gender was an important and permanent factor in determining nominal wages.[158]

Nominal Wages

Due to a lack of information, determining women's nominal wages in fifteenth century York is a little difficult. None of the wages recorded in the Ýork Bridgemasters' Accounts decisively pertain to women, for 34% of all wages a name was not recorded, and it is possible that some of these wages were paid to women. Therefore, reliance on literature cannot be avoided. From this literature it appears women were generally less capable than men to bargain for high wages, in spite of the advantages they must have had from the absolute and relative wage rise. Bardsley's research has shown that wages of female harvest workers in Wakefield 1363/64 ranged between 2d and 6d, with 4d as the mode and mean, while men earned between 3d and 8d. The wage ratio was 0.73, the same as the 0.73 ratio shown in Ebury in 1330-1339.[159] Van Zanden has shown that the wage ratio of women to men for reaping was 0.76 and for haymaking 0.79 between 1560 and 1609 in England.[160] Since Van Zanden and Bardsley concur on women's wages being 20-30% lower before and after the fifteenth century, a daily wage of 3d for women will be used to calculate the number of days women had to work to satisfy their basic needs.

Rent

The York Bridgemasters' Accounts offer an interesting insight into rent differentiation between men and women. Female tenants accounted for about 9% of all tenants in the York Bridgemasters' Accounts. The great majority of these women will have been unmarried women and widows, as it is unlikely that a rent was registered in the name of the wife instead of the husband in the case of married women. Women generally rented property alone, 8% of rents recorded in the Accounts pertained to multiple persons, and only 4% of these – 0.32% of all rents recorded - included one or more female tenants. Moreover, women generally lived in cheaper housing than men. Their rents

[157] Bennett. *Ale, Beer, and Brewsters,*146-147, Bennett. 'History that Stands Still', 278.
[158] Bardsley. 'Women's Work Reconsidered', 12-28.
[159] Ibidem, 12, 25.
[160] Van Zanden. 'The Malthusian Intermezzo', 7.

were on average c. 22% lower, as shown by table 18. The highest rent recorded for a dwelling for a woman was 80s paid in 1458 for a capital-messuage with other tenements in Conyngstrete by the wife of [the late] John Marshall; she likely sublet part of the residence. The highest rent recorded by the bridge masters that was paid by a man was 147s for a capital-messuage on Conyngstrete rented by Thomas Farnlay, spurrier, in 1435. It is likely that a woman living without a husband, perhaps even without children, had a smaller, cheaper residence, than a married man with a family. Although marriage age increased, marriage was still the norm throughout the fifteenth century. Consequently, most men renting property in the Bridge Estates were likely married, and most had offspring. On average women paid a little more than men for commercial properties, c.1.5%, which indicates some women were in an economically strong position during the fifteenth century. Single women appear to have had less interest in renting landed property than men. When they did rent land they likely rented smaller, cheaper plots.

It is not possible to reconstruct the socio-economic background of women by analysing the occupational structure of female tenants in the Bridgemasters' Accounts, as has been done in chapter 2. The occupation of only four women was recorded in the accounts. Three were involved in the clothing industry, Agnes del Hill and Agnes Geldale were both seamstresses who rented a shop on the Ouse Bridge, for 5s in 1438 and 20s in 1440 respectively. The same Agnes del Hill rented a tenement in the same year for 3s 4d, and Joanna [Pootherson], lister (dyer) rented a tenement on North Street for 14s in 1444. Domina (lady) Margaret Griffith leased a tower on North Street in 1488 for 6d, but this was probably not used as a residence.[161]

Table 14: Average Rents Paid per Year by Men and Women per Property Category, 1400-1499

Tenant	Average Rent Residence	Sample Size	Average Rent Commercial Property	Sample Size	Average Rent Land	Sample Size	Total Average Rent	Total Sample Size
Male	8.85	2756	13.58	572	5.24	785	8.82	4113
Percentage of Total	102.43%	88.82%	99.85%	92.41%	100.58%	98.00%	101.26%	90.94%
Female	6.96	347	13.78	47	3.61	16	7.62	410
Percentage of Total	80.56%	11.18%	101.32 %	7.59%	69.29%	2.00%	87.49%	9.06%
Total	8.64	3103	13.60	619	5.21	801	8.71	4523

Source: Stell. *York Bridgemasters' Accounts.*

[161] Stell. *York Bridgemasters' Accounts*, 182, 193, 198, 237, 443.

Prices and Weights

In order to calculate how much a woman could contribute to a family's income three CPIs have been constructed below to represent three consumption levels, namely destitution, poverty line and reasonable comfort. Table 15 shows the weights used in calculating the three CPIs, and the corresponding caloric values. The destitution, poverty line and comfort CPIs provide 1502 kcal, 1632 kcal, and 2120 kcal per day respectively. The poverty line CPI has been based on Allen's calculations, and the comfort CPI has been founded on the labourer's comfort CPI constructed in the first chapter. Weights for food items have been adjusted downward to represent the basic necessities of women in terms of caloric requirement; weights for other basic necessities have been kept at the same level. The destitution CPI represents the bare minimum to survive for a single woman. It is based on the assumption that most calories stem from cereals, as has been argued by Stone.[162] At this level of consumption bread would have been too expensive. Therefore, bread has been replaced by oats, the cheapest grain, to produce pottage, which has the advantage of having a very high caloric extraction rate.[163] Very little ale and animal products are included in this basket, while vegetables and legumes feature more heavily, as Dyer has argued that garden produce was essential during times of hardship, as it added flavour and nutrients to the diet.[164] The cost of soap, light, fuel, and clothing has been decreased substantially, assuming frugal use, rising and retiring with the sun, being cold in winter, buying second hand clothing and bedding, and walking barefoot.

It is assumed that most women dependant on wage labour were not as well off as most of the women who's rent prices have been recorded in the Bridgemasters' Accounts. Hence, rent levels have been significantly lowered. For the destitution CPI, rent is estimated at 1s per year throughout the fifteenth century and adjusted per year by the rent development shown in the York Bridgemasters' Accounts. Rent for the poverty line CPI is put at 5% of total expenditure in 1400 to be in line with Allen's estimate. The rent price per year is adjusted again by the rent development discussed above. Rent for the comfort CPI is put at the average rent paid by labourers and servants calculated in the previous chapter.

[162] Stone. 'The Consumption of Field Crops', 11.
[163] Campbell. *English Seigniorial Agriculture,* 224.
[164] Dyer. 'Gardens and Garden Produce', 38.

Table 15: Weight per Item in Single Female Consumer Price Indexes and Calories per Day at Three Consumption Levels, 1400-1499

	Destitution CPI: Quantity of Items	poverty line CPI: Quantity of Items	Comfort CPI: Quantity of Items	Caloric Value per Litre/Kg	Calories per Day Destitu-tion (1502 kcal)	Calories per Day Poverty Line (Allen) (1632 kcal)	Calories per Day Comfort (2120 kcal)
Farinaceous							
Bread		150 kg	155.5 kg	2452		1007.7	1044.6
Oats (pottage)	115 kg				1164.2		
Ale							
Normal	20 l.	150 l.	389.7 l.	426	88.3	175.0	454.7
Strong			1.1 l.	900.8			2.7
Meat:							
Beef	5 kg	21.4 kg	27.3 kg	2500	34.2	178.1	186.9
Pork			13.9 kg	2470			94.1
Mutton			9.3 kg	2170			55.3
Fowl			4.1 kg	1650			18.5
Fish:	-	-			-	-	
Herring			22.7 kg	2140			133.1
Salt Salmon			0.1 kg	1850			0.5
Salt Cod			0.3 kg	3550			2.9
Dairy:							
Butter	1.55 kg	4.3 kg	1.5 kg	7286	30.9	85.8	29.9
Cheese	3.3 kg	4.3 kg	1.1 kg	3750	33.9	44.2	11.3
Egg	0.1 kg	2.1 kg	1.1 kg	1550	0.4	8.9	4.7
Vegetables/Legumes							
Peas	36.5 kg	32.1 kg	19.6 kg	600	60	52.8	32.2
Beans	36.5 kg	32.1 kg	19.6 kg	900	90	79.8	48.3
Soap	1 kg	2.6 kg	2.9 kg				

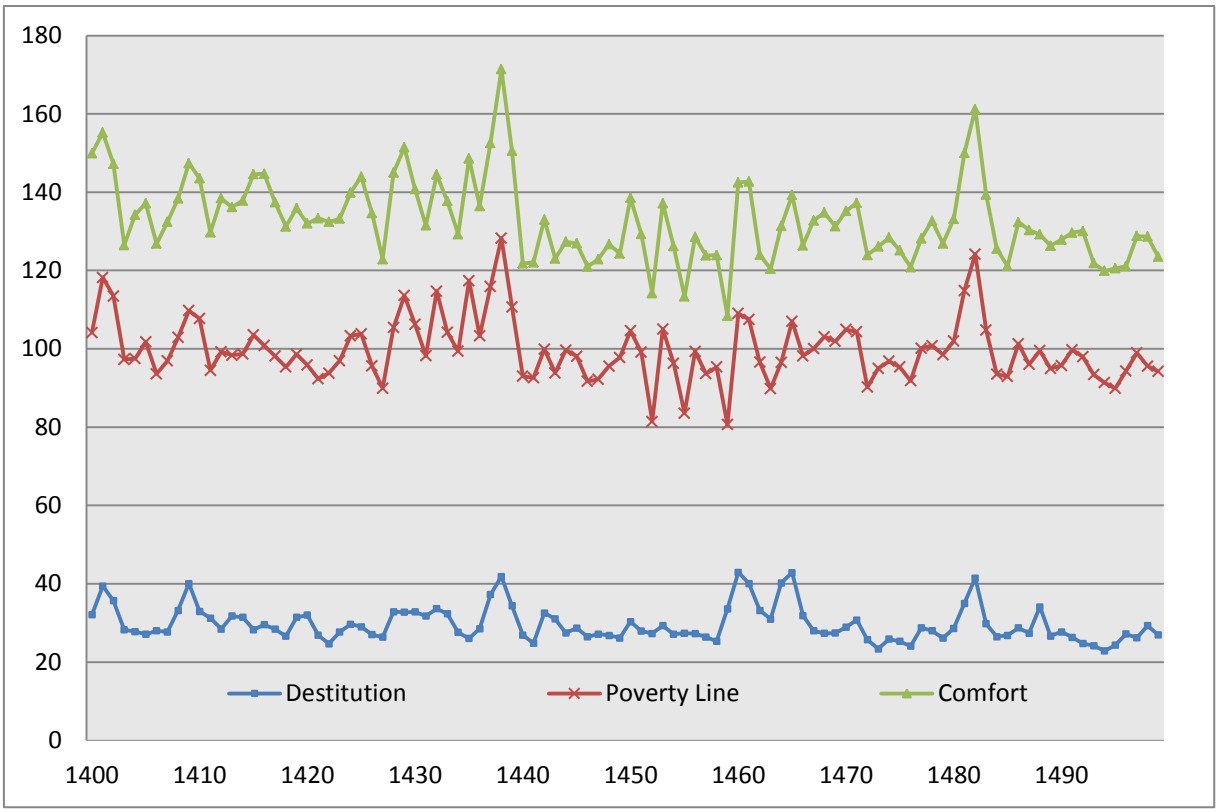
Clothing Linen Cloth Wool Cloth Shoes	0.5 m.	5 m.	5.9 m 0.1 m 0.03 pair				
Candles	0.5 kg	2.6 kg	2.9 kg				
Lamp Oil	0.5 l.	2.6 litre	2.9 litre				
Fuel (charcoal)	80 kg	252 kg	336 kg				
Rent	1s	1s 2.4d	2s 6d				

Sources: Stell. *Probate Inventories,* Stell. *York Bridgemasters' Accounts,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Women at work

Graph 14 shows the number of days a single woman had to work per year at 3d per day to supply basic necessities at three consumption levels for herself. In spite of the differences in construction of the CPIs, the price developments are rather similar. The destitution CPI is less volatile than the other two CPIs due to the replacement of bread with oats. The number of days a single woman had to work to survive is low during the fifteenth century, on average 30 days would suffice. In order to stay above the poverty line an average of 100 days of labour was required, and with an average of 133 working days a single woman could live reasonably comfortable. As rents for women were on average much higher than assumed in these calculations, it appears most single women in York were capable of taking care of themselves financially and living comfortably. Furthermore, the literature discussed above indicates that there was room for women on the labour market in the fifteenth century, especially in the early fifteenth century. It is reasonable to assume that the total prices in the baskets of goods are a fair indication of what a woman could financially contribute to a family in fifteenth century York.

Graph 14: Number of Working Days per Year for a Single Woman at Three Consumption Levels, 1400-1499



Sources: Stell. *Probate Inventories,* Stell. *York Bridgemasters' Accounts,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Contributing to the household

Allen and Weisdorf have calculated the contribution of women and children to a family's income based on the work of Humphries and Horrell, which they have put at ranging between 20% in the 1800s and 70% in the 1600s. Adjusting minimal income with women's wages is necessary, as the number of days a labourer had to work to feed, house, and clothe his family at a reasonably comfortable level in difficult years superseded the total number of days per year. Allen and Weisdorf indicate that their calculation of the maximum contribution to the household by the wife and children in the 1600s is surprisingly high, but they are not able to offer an explanation for this.[165] Approaching this matter from the other end, comparable, but less varied results can be obtained. Allen and Weisdorf have included the work of children in their calculations. Whereas Allen supplied a notational family of two children, Allen and Weisdorf assume two and a half child per family. When children grew older they were likely able to contribute more to the family's income. As children were part of what Bardsley described as the 'second rate' workforce, it would not be illogical to assume

[165] Allen and Weisdorf. 'Was there an 'Industrious Revolution', 723-727. Horrell and Humphries. 'Women's Labour Force Participation', 89-118.

that by the time they were about to leave the house, they would contribute at least as much as the mother.[166] Postulating two and a half children, earning 20% of a family's income per child, like the mother, brings the total contribution of woman and children up to 70%. Further research would be required, but this might serve as an explanation to the high proportion of income being earned by women and children around 1600.

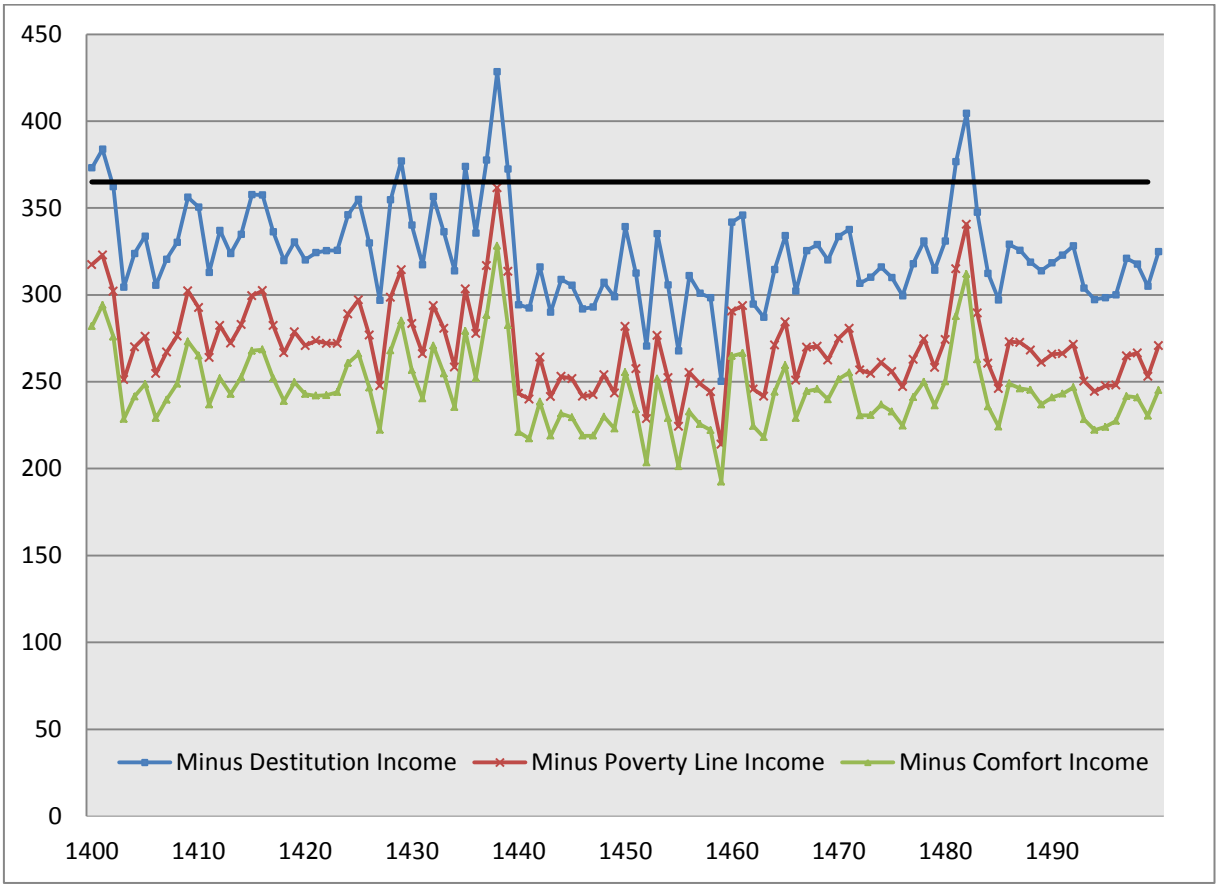
In the calculations in chapter one and two, the notational family of two children under the age of six have been assumed, therefore, this family structure will be maintained here. In the fifteenth century, before the rise of the putting out system, the financial contribution of children under the age of six would likely have been negligible. Hence, they will be excluded from the computations below. Young children required more attention from their mother, but as the number of working days required to earn even the most expensive 'comfort' CPI is not excessively high, it is likely that a woman could work this many days, without it substantially interfering with her duties as a wife and mother. Graph 15 shows how many days a labourer had to work for him and his family to live a reasonably comfortable life, when his wife was able to bring home the equivalent of the price of the three baskets calculated above. Calculations have only been made for labourers, because on average artisans were able to supply a comfortable living without the help of their spouse. This is not to say that artisan's wives did not contribute to the family income, for instance by attending to the workshop when her husband was out for work, but rather that their income supplied additional comfort, a chance to invest in the future of their children, and save up for old age. Without the additional income of a spouse, a labourer would have had to work on average 348 days per year to live comfortably in the fifteenth century, far higher than the 235 to 312 working days per year for masons in the fifteenth century postulated by Thorold Rogers. Building labourers and artisans appear to have worked simultaneously in the York Bridge Estates, so, it is likely that their number of working days per year was comparable.[167] When the wife was able to supply additional income the number of days a labourer had to work dropped to 325, 271 and 245 days when his minimum income was adjusted with the value of the female destitution, poverty line, and comfort CPIs respectively. Adjusting the number of working days for a labourer with the price of the poverty line or comfort CPI puts it in the range specified by Thorold Rogers, which means that circa 22-30% of a family's income was probably generated by the wife in the fifteenth century. This neatly correlates to the figures produced by Allen and Weisdorf for the seventeenth and nineteenth centuries.

In conclusion, women in the fifteenth century were clearly capable of taking care of themselves - as is shown by the rent data from the York Bridgemasters' Accounts - as well as providing for their family. Their income made a significant contribution to the household economy,

[166] Bardsley. 'Women's Work Reconsidered', 1999, 23
[167] Thorold Rogers. *Six Centuries of Work and Wages,* 180.

which may have constituted up to 30% of the family's income. When children grew older, they were likely able to provide a substantial percentage of the family's income too, which, combined with the income generated by the mother, may even have amounted to 70%.

Graph 15: Working Days for a Labourer Required to Live Comfortably Minus the Income Generated by his Spouse, for Three Female Income Levels, 1400-1499



Sources: Stell. *Probate Inventories,* Stell. *York Bridgemasters' Accounts,* Beveridge. *Prices Durham,* Allen. *Consumer Price Indices*, Clark. *English Prices and Wages*.

Conclusion

In this thesis six integral parts of relative wage calculations have been addressed, namely, the prices used in calculations, the influence of diet on the Consumer Price Index, the influence of regional price differences, rent, and economic fluctuations on relative wage development, and women's ability to provide for themselves and contribute financially to the household economy in fifteenth century York. The way in which the relative value of wages has been calculated is a little unorthodox. In real wage calculations a Consumer Price Index is generally constructed to calculate how much food, fuel, clothing and light could be bought for a given number of working days per year. In this thesis relative wage calculations for York have been expressed in the number of working days required per year. The needs of a notational family of a man, a wife and two children under the ages of six have been kept constant, to see how many days per year the man – with and without the aid of his spouse - had to work in order to provide for them. This has the advantage of linking relative wages closer to living standards, by considering leisure as a valuable commodity. Furthermore, it makes relative wage literature more accessible to people without a background in statistics or economics.

In the first chapter Consumer Price Indices were constructed. The price series that are currently available for relative wage calculations are based on institutional price histories, even though these may not be representative of prices paid by the general public. In an attempt to circumvent this problem, probate inventories from the York Diocese have been combed for price data for food, fuel, and livestock to serve as an alternative source for price data. However, it has turned out that prices recorded in probate inventories were considerably below market value. Goods were sold at a lower price to ensure a quick sale. Therefore, probate inventories are unsuitable for gathering more representative price data, and prices from institutions are still the only available source.

Furthermore, chapter one addresses the problem of regional price differences. The prices used for the relative wage calculations were based on as many prices from northern sources as possible. Even though price development was comparable, some prices, especially wheat prices, were significantly lower in the south. As a result of generally higher food prices, feeding a family was on average 15% more expensive in the north than in the south. Consequently, life in the south included more comfort and leisure time.

The basket of goods was constructed based on fifteenth century diet in order to approximate living standards in terms of the consumption of food, light, and warmth. As the fifteenth century was a time of reasonable wealth, the consumption of cereal declined, and meat and fish - which were more expensive - became a substantial part of the diet after the Black Death. A craftsman could keep

a family of four reasonably comfortable in terms of food, clothing, light, heating, and housing with an average of 263 working days per year - which left him with plenty of time for leisure. A labourer had significantly less leisure time when attempting to feed, clothe, and house a family of four at a relatively comfortable consumption level. He would have to work an average of 348 days, which indicates the need for additional income to be produced by a spouse. Life was less comfortable for the lower echelons of society. Relative wages increased after 1439, and the average number of working days required per year to live in reasonable comfort declined by 8%. Munro explains that this is not contradictory to the literature on economic depression, depopulation of York and a decline in GDP per capita, as Keynes has shown that during periods of wage rigidity and inflation, relative wages could rise, while the demand for labour declined. Furthermore, it shows the importance of Marxist theory, even though this philosophy has lost most of its adherence since the 1990s. The effect of economic downturn in York stemming from the declining cloth industry and overseas trade was likely felt by the urban elite sooner than by the craftsmen and labourers. So, it seems that the experience of economic development in the fifteenth century varied due to social, and geographic factors.

Rent, discussed in chapter two, is generally not included in real wage calculations, and few sources for rent development in the fifteenth century have survived. The York Bridgemasters' Accounts have shown a decline in rent prices, and an increase in vacancy, especially of small residences. This was a predictable outcome, as there were fewer inhabitants in the late fifteenth century, and York had a competitive rent market. The influence of rent on calculating the number of days worked is not very big, Allen's assumption of 4 to 5 per cent of household expenditure on rent is supported for the comfort CPIs in fifteenth century York. However, simply postulating a fixed percentage of expenditure on rent would lead to incorrect results, as it would not acknowledge that the quality of residences can shift when average rent prices alter. Furthermore, it appears rents were relatively higher in the eighteenth century and in London. Thus, it is important to include rent data in relative wage calculations, while allowing the share of expenditure to fluctuate to avoid quality fluctuations.

The value of women's labour is discussed in chapter three. From the rent data from the York Bridgemasters' Accounts it appears that single and widowed women were very well capable of providing for themselves. They were able to live above the poverty line, or even in relative comfort, while having time left to enjoy leisure, or increase their number of working days to feed possible children, or save for the future. By combining the amount a single woman could earn in a year with the wages a man could produce per year, it has been shown that a woman could be expected to bring in circa 22-30% of household income for a family of four. This is comparable to the 20-70% of

income generated by wives and children in the sixteenth and eighteenth centuries respectively, as described by Allen and Weisdorf.

In conclusion, the goal of this thesis was to improve relative wage calculations by approximating the circumstances prevailing in fifteenth century York as closely as possible. The importance of paying more heed to alternative sources for price histories, the contribution of women to the household economy, the development of diet, the impact of regional price variations, rent, and economic change on relative wage computation has been shown. More research into these topics is required to extend and test the conclusions reached here for other centuries and regions.

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